STP00-0009-02(092) GLYNN COUNTY

SR 25 (US 17) OVER THORNHILL CREEK

SITE No. 1

PI NO. 532650

HYDRAULIC AND HYDROLOGICAL STUDY

EXAMINED AND APPROVED:

4/9/16
DATE

WILLIAM M. DUVALL, P.E.

STATE BRIDGE ENGINEER

_____FEMA and Community Coordination Required
_____Community Coordination Only Required
__X__No FEMA or Community Coordination Required

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HYDRAULIC AND HYDROLOGICAL STUDY

This project involves the replacement of the existing 81 ft long by 28 ft wide (gutter to gutter) bridge at the crossing of SR 25 (US 17) over Thornhill Creek. The proposed replacement structure is to be a 280 ft long by 88 ft wide PSC beam bridge with spillthrough abutments. The proposed construction centerline is to be located approximately 24 ft west of the existing bridge centerline. The bents of the proposed bridge are to be built parallel to bent 4 which is 90 degrees to the roadway centerline to align with flood flow. The drainage area of 2.6 sq mi was obtained using the USGS StreamStats web application. The hydraulic slope was obtained from the USGS quad maps for this area.

A bridge width of 88 ft was determined from MOG 4265-10 for rural multilane (divided) State Routes. The proposed typical section has four 12 ft travel lanes, one 14 ft turn lane, 8 ft outside shoulders, a 4 ft raised median, 2 ft offset right of the median and 2 ft curb and gutter on each side. The design year ADT is 8250 vpd and the design speed is 55 mph. The design flood is the 25 year storm tide per the Drainage Manual for a State Route in a tidal area. The proposed site is located in Glynn County, Georgia, approximately 4 miles north of Brunswick. Glynn County participates in the National Flood Insurance Program administered by the Federal Emergency Management Agency (FEMA). A detailed study with regulatory floodways has not been done for this reach of Thornhill Creek, so coordination with FEMA or Glynn County will

not be required. However, since this site is located in a zone AE floodplain, a copy of the approved hydraulic study will be sent to Glynn County for informational purposes.

Thornhill Creek transitions into a tidal marsh surrounding the Mackay River approximately 0.25 miles downstream of the proposed bridge. This reach of Thornhill Creek is affected by semidiurnal tides. Tide elevations were determined by using the simple harmonic formula and a NOAA active and subordinate gage station. The proposed bridge is also located in an area with the potential for hurricane storm tides.

The 10, 25, 100 and 500 year storm discharges were obtained from the latest USGS publication, "Methods for Estimating the Magnitude and Frequency of Floods for Urban and Small, Rural Streams in Georgia, South Carolina, and North Carolina, 2011." The entire drainage basin is located in Region 4. The floodstage elevations, areas of opening, velocities and backwaters for the existing and proposed structures were calculated for the daily tidal influence by using the unsteady flow model in the HEC-RAS computer program. The downstream boundary conditions utilized stage hydrographs and the upstream boundary condition utilized small base flows for the purpose of model stability.

Storm tide hydrographs were developed for the 10, 25 and 100 year events using the techniques described in the FHWA publication, "Hydraulic Engineering Circular No. 25, 2004." Harmonic constituents were obtained from the active NOAA gage at Fort Pulaski and the results were calibrated to the NOAA tide prediction station at the Mackay River (Daymark #239). ADCIRC surge estimates were used to determine the 100 year storm surge. The 10 and 25 year storm surges were estimated by using the NOAA Technical Memorandum "Storm Tide Frequency Analysis for the Coast of Georgia, 1974" and subtracting the average height of the rising tide calculated using the harmonic equations. The floodstage elevations, areas of opening,

and velocities for the existing and proposed structures were calculated for storm tide floods with a minimal amount of base flow used to stabilize the HEC-RAS model. Since the drainage area is only 2.6 sq miles, it not unreasonable to assume that a hurricane storm surge of a given recurrence interval might correspond to a rainfall event of a similar recurrence interval across the entire drainage area. For this reason, HEC-RAS was also used to calculate the above mentioned outputs assuming that a riverine flood of the same recurrence interval occurs concurrently with the storm tides.

The existing and proposed bridges clear the 25 year floodstage elevations with no roadway overtopping occurring. The existing bridge has channel velocities of 4.17 fps for tidal flows, 4.19 fps and 11.87 fps for the 25 and 100 (overtopping) year storm tide floods, and 4.90 fps and 11.90 fps for the 25 and 100 (overtopping) year combined storm tide/riverine floods respectively. Backwater was not calculated for the existing bridge due to the bridge site being affected by daily tides

The proposed 280 ft long bridge was chosen as the replacement bridge to span the channel, provide the required freeboard above the design storm, and improve channel velocities when compared to the existing condition. For the 100 year overtopping storm tide, the proposed structure has velocities that exceed 1.75 times the natural condition, but are an improvement over the existing condition. The proposed bridge has channel velocities of 3.85 fps for tidal flows, 3.80 fps and 9.91 fps for the 25 and 100 (overtopping) year storm surge, and 3.83 fps and 9.29 fps for the 25 and 100 (overtopping) year combined storm tide/riverine floods respectively. Backwater was not calculated for the existing bridge due to the bridge site being affected by daily tides.

The maximum calculated contraction scour depth for the 100 year overtopping storm tide plus

base flow is 10.9 ft, (See the attached Predicted Scour Report). A risk assessment was performed and no risk was found due to the fact that backwater and channel velocities are reduced for the proposed condition.

Guide bank calculations were not performed due to the tidal influence. Calculations for riprap, performed in accordance with the FHWA publication HEC No. 23, "Bridge Scour and Stream Instability Countermeasures," show that Type 1 riprap is sufficient at both endrolls of the proposed bridge.

Calculations for deck drainage were performed using the method shown in the FHWA publication, HEC No. 21, "Design of Bridge Deck Drainage," and the results indicate that deck drains are not required. A culvert was not considered an alternative to the replacement bridge because Thornhill Creek is affected by tidal flows which may result in silting of the barrels. Traffic is to be maintained by staged construction, (see the attached construction staging plans). The required maps, calculations, computer runs, roadway sheets and preliminary layout are included in the following pages.

February 26, 2016 Prepared by: Robert Moreman

STP00-0009-02(092) GLYNN COUNTY

SR 25 (US 17) OVER THORNHILL CREEK

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HYDRAULIC SITE INSPECTION

A hydraulic site inspection was made at the crossing of State Route 25 over Thornhill Creek on September 14, 2015. The upstream floodplain north and south of the creek is moderately wooded with some undergrowth. Residential neighborhoods exist upstream and downstream of the bridge. Overhead utility lines are located approximately 30 ft downstream from the bridge and cross the road north and south of the bridge. Utilities are attached to the upstream and downstream face of the structure.

The channel is approximately 35 ft wide upstream and downstream of the bridge. The banks are well defined and are approximately 2 ft high. Water at the site is influenced by tides and the site inspection was performed 1 hour after high tide as the tide was falling. At the time of the site inspection the water was approximately 3 ft deep and moving slowly downstream. The channel is composed primarily of medium to fine grain sand. The channel approaches and exits the bridge at 90 degrees. Thornhill Creek converges with the marsh surrounding the Mackay River approximately 0.25 miles downstream.

The existing 81 ft bridge consists of 3 reinforced concrete deck girder spans on concrete pile bents. The south abutment has scour along the toe of the endroll. The existing bridge has spillthrough abutments with concrete rubble in place. The existing roadway is a paved State Route and is approximately 10 feet above the natural groundline near the bridge site.

September 16, 2015 Prepared by: Robert Moreman

STP00-0009-02(092) GLYNN COUNTY

SR 25 (US 17) OVER THORNHILL CREEK

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PREDICTED SCOUR REPORT

Theoretical scour depths for the proposed bridge at this site were calculated by using the methods shown in the FHWA publication, HEC No. 18, "Evaluating Scour at Bridges". Contraction scour and local scour were calculated for the 100 year overtopping storm tide as called for in this publication. The predicted scour depth at each intermediate bent of the proposed bridge will be provided to the Office of Materials Soils Lab and the Bridge Structural Designer for inclusion in the analysis and design of the bridge foundations. Tables and calculations showing these predicted scour depths are included in this study.

February 26, 2016

Prepared by: Robert Moreman

P.I. No. 532650, GLYNN COUNTY
SR 25 (US 17) OVER THORNHIILL CREEK

HYDRAULIC TABLE	25 YEAR STORM SURGE		TIDAL FLOWS
	EXISTING BRIDGE STORM TIDE BASE FLOW ONLY	EXISTING BRIDGE STORM TIDE COMBINED W/ US FLOODS	EXISTING BRIDGE BASE FLOW ONLY
	L = 81' (90°)	L = 81' (90°)	L = 81' (90°)
FLOODSTAGE	10.69	10.75	4.90
DISCHARGE THRU STRUCTURE (ft3/s)	350	834	411.47
DISCHARGE OVER ROAD (ft^3/s)	0	0	0
AREA OF OPENING THRU STRUCTURE (ft2)	84	185	138.98
VELOCITY THRU STRUCTURE (ft/s)	4.19	4.50	2.96
CHANNEL VELOCITY (ft/s)	4.19	4.90	4.17
NATURAL CHANNEL VELOCITY =	3.84	3.75	3.84

THE SIMULATION TIME AT MAXIMUM CHANNEL VELOCITY IS 918.
THE SIMULATION TIME FOR MAXIMUM FLOODSTAGE IS 1448.

	100 YEAR OVERTOPPING STORM SURGE	
	EXISTING BRIDGE STORM TIDE BASE FLOW ONLY	EXISTING BRIDGE STORM TIDE COMBINED W/ US FLOODS
	L = 81' (90°)	L = 81' (90°)
FLOODSTAGE	14.11	14.11
DISCHARGE THRU STRUCTURE (ft3/s)	5748	5762
DISCHARGE OVER ROAD (ft3/s)	0	0
AREA OF OPENING THRU STRUCTURE (ft2)	643	694
VELOCITY THRU STRUCTURE (ft/s)	8.94	8.30
CHANNEL VELOCITY (ft/s)	11.87	11.90
NATURAL CHANNEL VELOCITY =	4.81	4.45

THE SIMULATION TIME AT MAXIMUM CHANNEL VELOCITY PRIOR TO OVERTOPPING IS 1336.
THE SIMULATION TIME FOR OVERTOPPING FLOODSTAGE IS 1354.

P.I. No. 532650, GLYNN COUNTY
SR 25 (US 17) OVER THORNHIILL CREEK

HYDRAULIC TABLE

	25 YEAR STORM SURGE		TIDAL FLOWS
	PROPOSED 280' BRIDGE STORM TIDE BASE FLOW ONLY L = 280' (90°)	PROPOSED 280' BRIDGE STORM TIDE COMBINED W/ US FLOODS L = 280' (90°)	PROPOSED 280' BRIDGE TIDAL FLOWS BASE FLOW ONLY L = 280' (90°)
FLOODSTAGE	10.68	10.71	4.90
DISCHARGE THRU STRUCTURE (ft3/s)	350	834	410.59
DISCHARGE OVER ROAD (ft3/s)	0	0	0
AREA OF OPENING THRU STRUCTURE (ft2)	105	362	366.07
VELOCITY THRU STRUCTURE (ft/s)	3.33	2.30	1.12
CHANNEL VELOCITY (ft/s)	3.80*	3.83	3.85
NATURAL CHANNEL VELOCITY =	3.84	3.75	3.84

THE SIMULATION TIME AT MAXIMUM CHANNEL VELOCITY IS 918.

THE SIMULATION TIME FOR MAXIMUM FLOODSTAGE IS 1448.

**ANOTHER MAXIMUM VELOCITY OF 3.86 FT/S OCCURS AT SIMULATION TIME 2212. THE SIMULATION TIME OF 918 IS USED FOR UNIFORM COMPARISON ACROSS ALL EXISTING AND PROPOSED 25 YEAR RUNS.*

	100 YEAR OVERTOPPING STORM SURGE	
	PROPOSED 280' BRIDGE STORM TIDE BASE FLOW ONLY L = 280' (90°)	PROPOSED 280' BRIDGE STORM TIDE COMBINED W/ US FLOODS L = 280' (90°)
FLOODSTAGE	13.40	13.61
DISCHARGE THRU STRUCTURE (ft3/s)	7764	7448
DISCHARGE OVER ROAD (ft3/s)	0	0
AREA OF OPENING THRU STRUCTURE (ft2)	1584	1630
VELOCITY THRU STRUCTURE (ft/s)	4.90	4.57
CHANNEL VELOCITY (ft/s)	9.91	9.29
NATURAL CHANNEL VELOCITY =	4.81	4.45

THE SIMULATION TIME AT MAXIMUM CHANNEL VELOCITY PRIOR TO OVERTOPPING IS 1336.

THE SIMULATION TIME FOR OVERTOPPING FLOODSTAGE IS 1354.

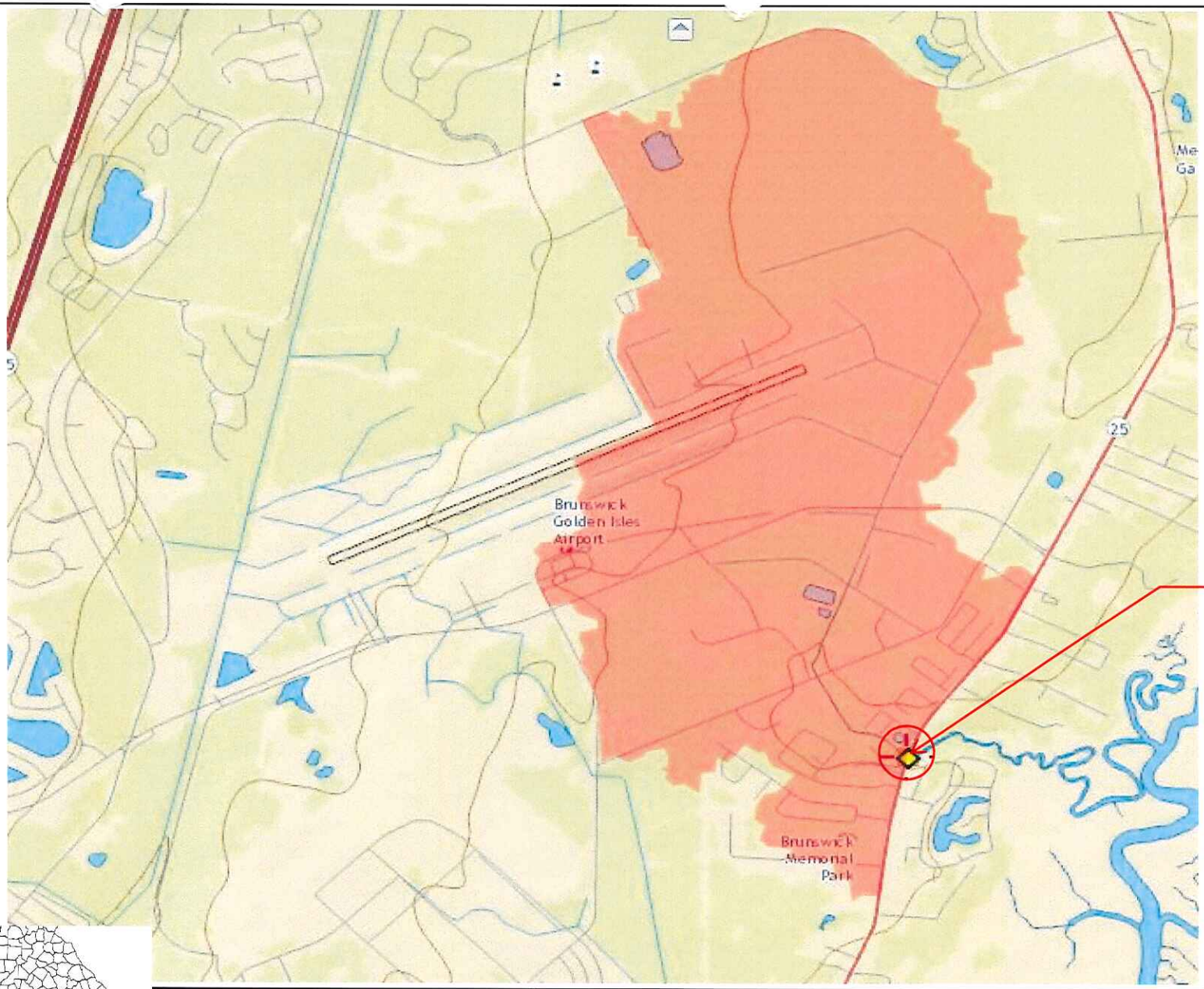
GLYNN COUNTY
SR 25 (US17) OVER THORNHILL CREEK
PI NO. 532650

PROPOSED 280 FT LONG BRIDGE
STORM TIDE ELEVATIONS

PROFILE GRADE ELEVATION	20.53
DEPTH OF CROSS SLOPE	1.58
DEPTH OF SLAB AND BEAM	5.60
BOTTOM OF BEAM ELEVATION	13.34

BOTTOM OF BEAM ELEVATION	13.34
25 YEAR STORM TIDE ELEVATION	10.70
CLEARANCE	2.64

*Clearance Calculated at Bent 2



DRAINAGE AREA

P.I. No. 532650

STATE ROUTE 25 (US 17) OVER THORNHILL CREEK

This spreadsheet computes the 50-, 20-, 10-, 4-, 2-, 1-, 0.5-, and 0.2-percent chance exceedance flows for an ungaged urban or small, rural stream in Georgia, South Carolina, and North Carolina that has a drainage area within hydrologic region 4. The spreasheet also includes the 95-percent prediction intervals, the minus and plus standard error of prediction intervals, and the average standard error of prediction. To use the spreadsheet, enter requested information in the yellow cells below.

Discharge for Urban or Small Rural Streams (Hydraulic Region 4)

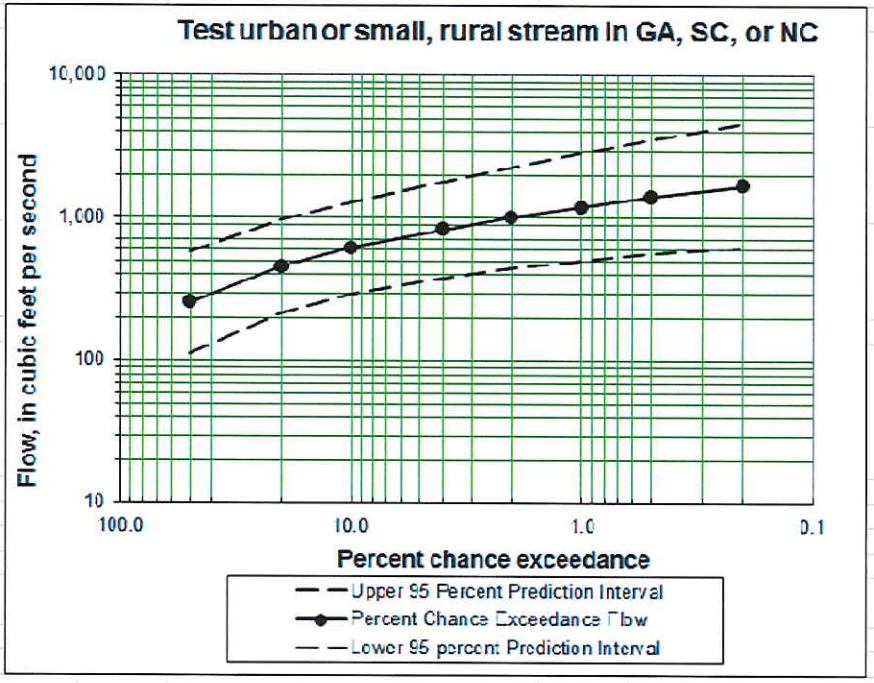
Enter a site-description name:	Test urban or small, rural stream in GA, SC, or NC

Enter the explanatory variables:

Drainage area, in square miles	2.57	Applicable range of draingage area is 0.1 to 53.5 square miles.
24-hour, 50-year maximum precipitation	10.8	Applicable range of 24-hour, 50-year maximum precipitation is 6.5 to 10.9 inches.
Percentage of impervious area, in percent	10.8	Applicable range of percentage of impervious area is 0.0 to 34.8 percent

Warnings and Cautions

Percent chance exceedance	Percent chance exceedance flow, in ft^3/s	Lower 95 percent prediction interval flow, in ft^3/s	Upper 95 percent prediction interval flow, in ft^3/s	$-S_{P,i}$ (percent)	$+S_{P,i}$ (percent)	Average $S_{P,i}$ (percent)
50	255	113	576	-33.8	51.0	43.0
20	458	217	966	-31.4	45.9	39.1
10	615	294	1,290	-31.1	45.2	38.6
4	834	384	1,810	-32.4	48.0	40.8
2	1,010	449	2,270	-33.7	50.7	42.8
1	1,200	509	2,830	-35.2	54.4	45.6
0.5	1,400	561	3,500	-37.1	58.9	48.9
0.2	1,680	620	4,540	-39.5	65.4	53.7



StreamStats Version 3 Beta

Basin Characteristics Ungaged Site Report

Date: Thurs Aug 27, 2015 9:05:03 AM GMT-4
NAD 1983 Latitude: 31.2451 (31 14 42)
NAD 1983 Longitude: -81.4495 (-81 26 59)

Label	Value	Units	Definition
DRNAREA	2.57	square miles	Area that drains to a point on a stream
ELEV	16.6	feet	Mean Basin Elevation
PRECIP	50	inches	Mean Annual Precipitation
LC06IMP	9.56	percent	Percentage of impervious area determined from NLCD 2006 impervious dataset
LC06FOREST	34.652	percent	Percentage of forest from NLCD 2006 classes 41-43
LC06AGRI	0	percent	Percent agriculture computed as total of grass, pasture, and crops, NLCD classes 71, 81 and 82
LC06DEV	54.273	percent	Percentage of land-use from NLCD 2006 classes 21-24
I24H10Y	7.35	inches	Maximum 24-hour precipitation that occurs on average once in 10 years
I24H25Y	9.2	inches	Maximum 24-hour precipitation that occurs on average once in 25 years
I24H50Y	10.8	inches	Maximum 24-hour precipitation that occurs on average once in 50 years
I24H100Y	12.4	inches	Maximum 24-hour precipitation that occurs on average once in 100 years
BSLDEM10M	1.516	percent	Mean basin slope computed from 10 m DEM
PCTREG1	0	percent	Percentage of drainage area located in Region 1
PCTREG2	0	percent	Percentage of drainage area located in Region 2
PCTREG3	0	percent	Percentage of drainage area located in Region 3
PCTREG4	100	percent	Percentage of drainage area located in Region 4
PCTREG5	0	percent	Percentage of drainage area located in Region 5
CSL10_85	3.58	feet per mi	Change in elevation divided by length between points 10 and 85 percent of distance along main channel to basin divide - main channel method not known
LC11IMP	10.8	percent	Percentage of impervious area determined from NLCD 2011 impervious dataset
LC11DEV	56	percent	Percentage of land-use from NLCD 2011 classes 21-24

Accessibility **FOIA** **Privacy** **Policies and Notices**

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USA.gov

532650 Glynn County
SR 25 (US17) over Thornhill Creek

Slope Calculation for Thornhill Creek (Quad maps)

Upstream elevation	=	10 ft
Downstream elevation	=	5 ft
Horizontal Distance	=	1350 ft

Slope =	0.003704 ft/ft
	19.56 ft/mi

Slope Calculation (Survey at bridge to downstream NOAA Nautical Chart Soundings converted to NAVD 88)

At Bridge	=	-2.5 ft
500' Downstream	=	-13 ft
Horizontal Distance	=	6860 ft

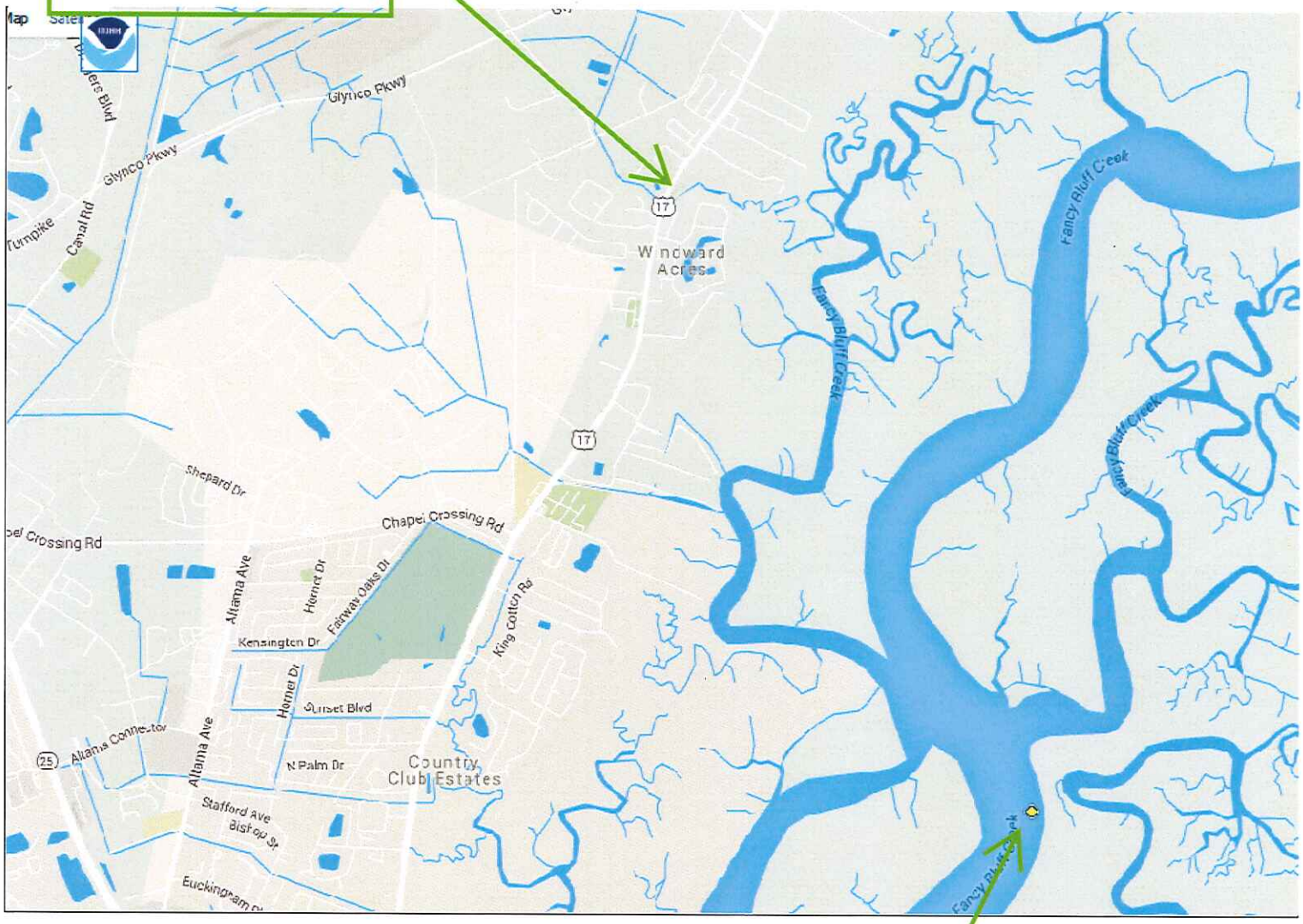
Slope =	0.0015 ft/ft
	8.081633 ft/mi

Flow Transition Analysis

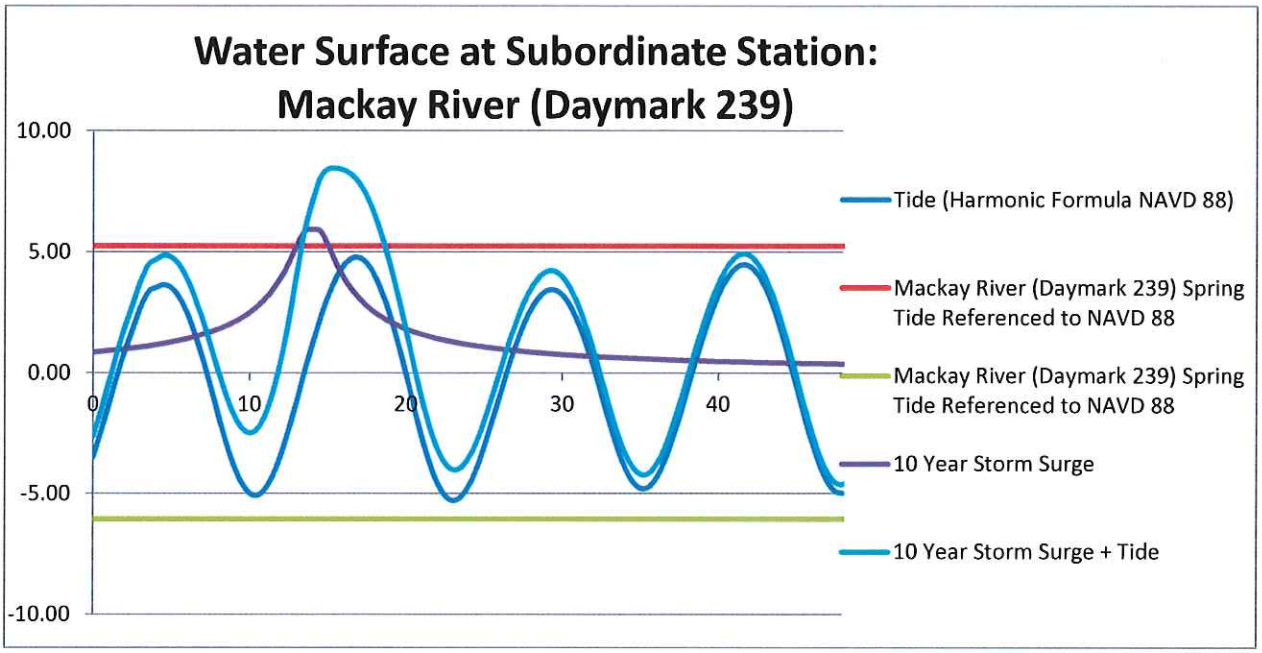
From the hydraulic design of safe bridges (2012) FHWA Publication No. FHWA-HIF-12-018. The CR and ER were set to 1.5:

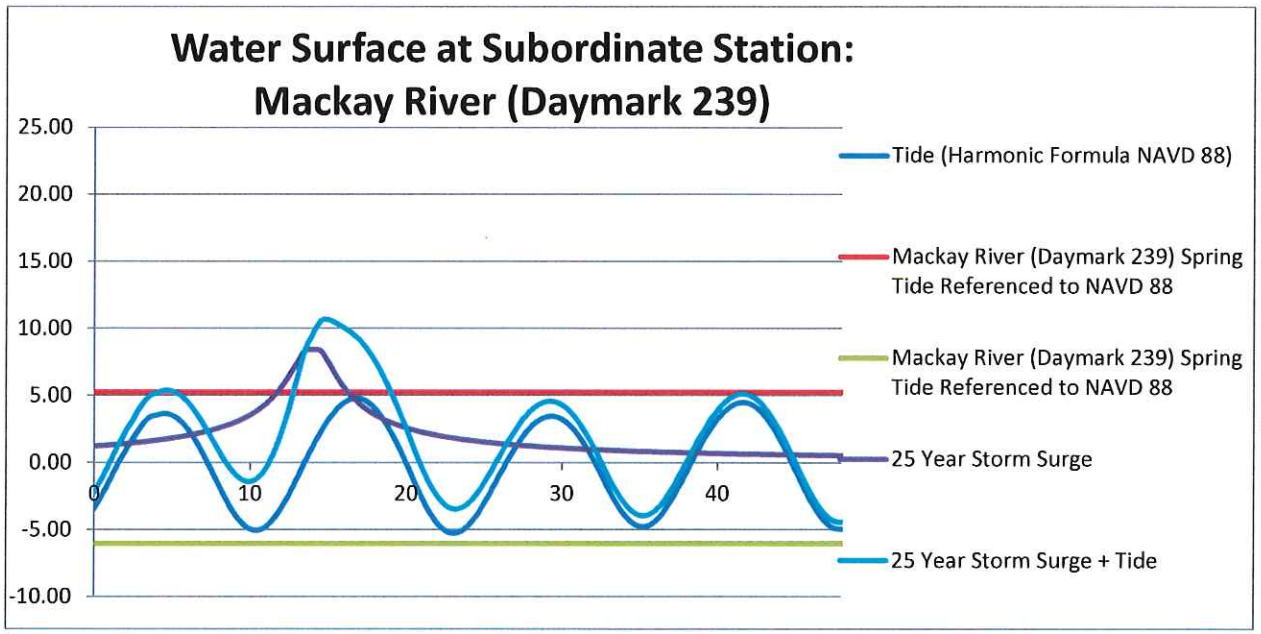
Tidal Bridges. When bridges over tidal streams are analyzed with one-dimensional unsteady flow models, cross section locations must accommodate flow in both directions. The approach section during ebb tide conditions, in which flow is toward the ocean, will be the exit section during flood tide conditions, in which the flow is away from the ocean. In this case the CR and ER values should be the same, and should be a compromise between the ER and CR values that would have been selected if the bridge were not tidal. In many cases it is appropriate to use a value of 1.5 for both CR and ER.

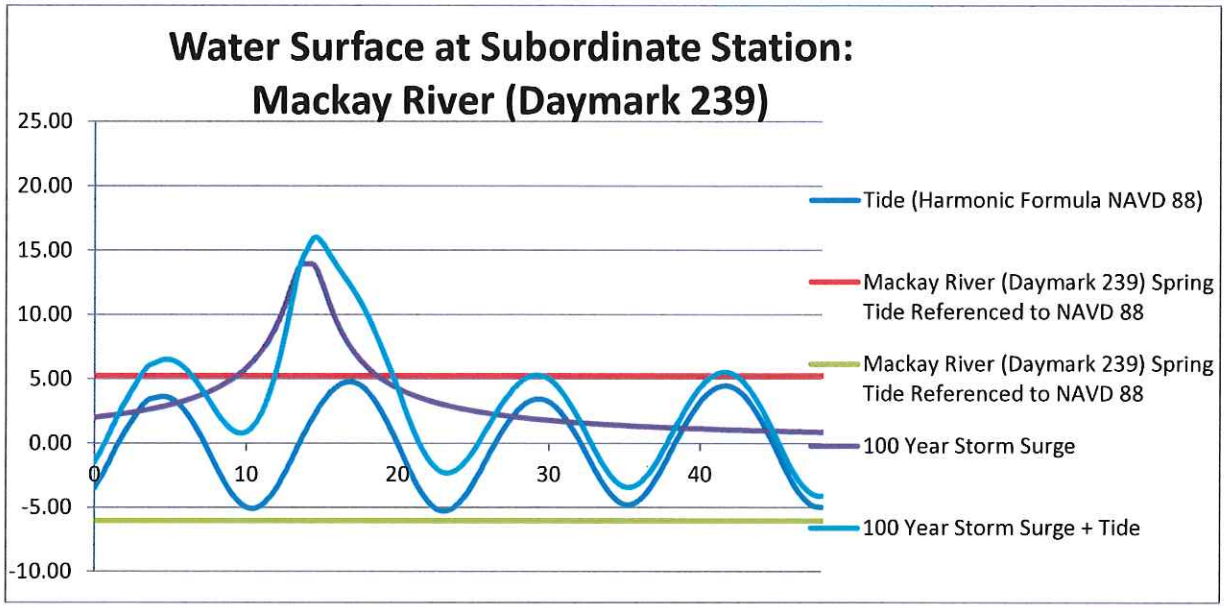
Proposed Bridge Location

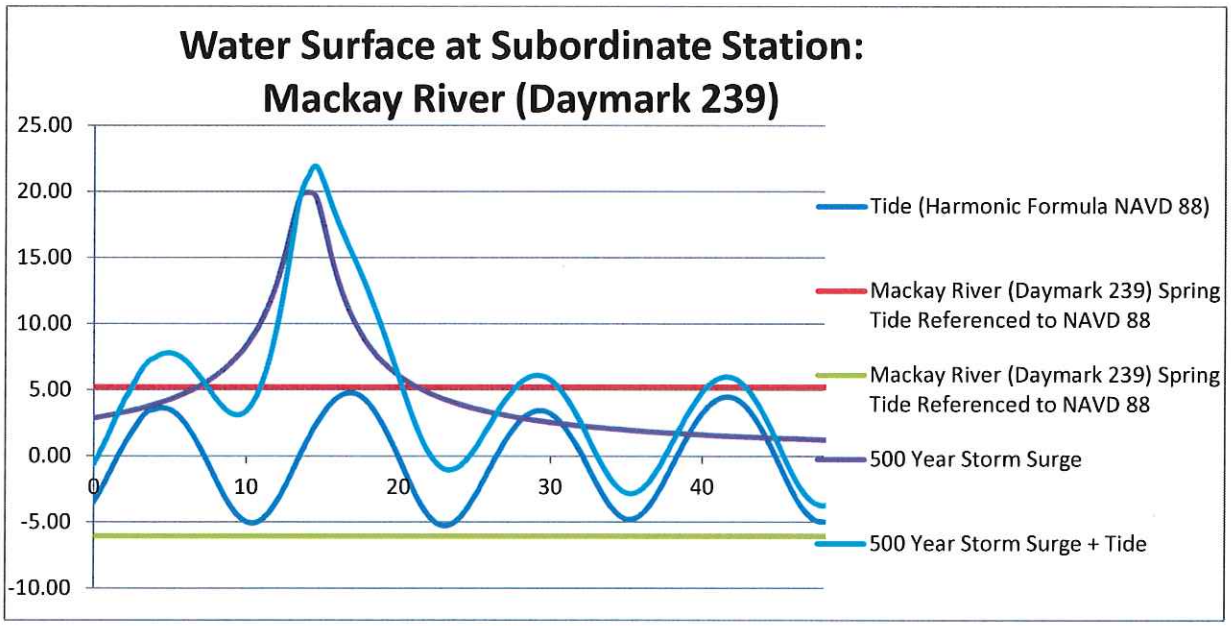


Mackay River (Day Mark 239) Tide Prediction Station


Water Surface at Subordinate Station:
Mackay River (Daymark 239)
10.00
5.00
0.00
-5.00
-10.00
0
10
20
30
40
Tide (Harmonic Formula NAVD 88)
Mackay River (Daymark 239) Spring Tide Referenced to NAVD 88
Mackay River (Daymark 239) Spring Tide Referenced to NAVD 88
10 Year Storm Surge
10 Year Storm Surge + Tide


Water Surface at Subordinate Station:
Mackay River (Daymark 239)
25.00
20.00
15.00
10.00
5.00
0.00
-5.00
-10.00
0
10
20
30
40
Tide (Harmonic Formula NAVD 88)
Mackay River (Daymark 239) Spring Tide Referenced to NAVD 88
Mackay River (Daymark 239) Spring Tide Referenced to NAVD 88
25 Year Storm Surge
25 Year Storm Surge + Tide


Water Surface at Subordinate Station:
Mackay River (Daymark 239)
25.00
20.00
15.00
10.00
5.00
0.00
-5.00
-10.00
0
10
20
30
40
Tide (Harmonic Formula NAVD 88)
Mackay River (Daymark 239) Spring Tide Referenced to NAVD 88
Mackay River (Daymark 239) Spring Tide Referenced to NAVD 88
100 Year Storm Surge
100 Year Storm Surge + Tide


Water Surface at Subordinate Station:
Mackay River (Daymark 239)
25.00
20.00
15.00
10.00
5.00
0.00
-5.00
-10.00
0
10
20
30
40
Tide (Harmonic Formula NAVD 88)
Mackay River (Daymark 239) Spring Tide Referenced to NAVD 88
Mackay River (Daymark 239) Spring Tide Referenced to NAVD 88
500 Year Storm Surge
500 Year Storm Surge + Tide

Harmonic Constituents for 8670870, Fort Pulaski GA

Constituent #
Order in which the National Ocean Service lists the constituents

Name
Common name used to refer to a particular constituent, subscript refers to the number of cycles per day

Amplitude
One-half the range of a tidal constituent

Phase
The phase lag of the observed tidal constituent relative to the theoretical equilibrium tide

Speed
The rate change in the phase of a constituent, expressed in degrees per hour. The speed is equal to 360 degrees divided by the constituent period expressed in hours

Description
The full name of the tidal constituent

Showing Harmonic Constituents for

8670870 Fort Pulaski, GA

Data Units: Feet / Meters

Timezone: Local / GMT

Submit

Please refer to the Tide and Current Glossary (/publications/glossary2.pdf) for definitions of terms. Amplitudes are in feet. Phases are in degrees, referenced to Local. Z_0 (MSL): 0 feet

Constituent #	Name	Amplitude	Phase	Speed	Description
1	M2	3.32	232.9	28.984104	Principal lunar semidiurnal constituent
2	S2	0.52	255.8	30.0	Principal solar semidiurnal constituent
3	N2	0.72	220.0	28.43973	Larger lunar elliptic semidiurnal constituent
4	K1	0.36	125.4	15.041069	Lunar diurnal constituent
5	M4	0.14	318.2	57.96821	Shallow water overtides of principal lunar constituent
6	O1	0.26	136.7	13.943035	Lunar diurnal constituent

Constituent #	Name	Amplitude	Phase	Speed	Description
7	M6	0.02	345.6	86.95232	Shallow water overtides of principal lunar constituent
[illegible]	MK3	0.03	172.9	44.025173	Shallow water terdiurnal
9	S4	0.02	109.4	60.0	Shallow water overtides of principal solar constituent
10	MN4	0.06	314.7	57.423832	Shallow water quarter diurnal constituent
11	NU2	0.14	212.8	28.512583	Larger lunar evectional constituent
12	S6	0.0	0.0	90.0	Shallow water overtides of principal solar constituent
13	MU2	0.11	270.3	27.968208	Variational constituent
14	2N2	0.09	209.6	27.895355	Lunar elliptical semidiurnal second-order constituent
15	OO1	0.02	132.6	16.139101	Lunar diurnal
16	LAM2	0.06	218.3	29.455626	Smaller lunar evectional constituent
17	S1	0.06	93.1	15.0	Solar diurnal constituent
18	M1	0.02	176.7	14.496694	Smaller lunar elliptic diurnal constituent
9	J1	0.02	150.0	15.5854435	Smaller lunar elliptic diurnal constituent
20	MM	0.0	0.0	0.5443747	Lunar monthly constituent
21	SSA	0.2	51.3	0.0821373	Solar semiannual constituent
22	SA	0.28	175.7	0.0410686	Solar annual constituent
23	MSF	0.0	0.0	1.0158958	Lunisolar synodic fortnightly constituent
24	MF	0.0	0.0	1.0980331	Lunisolar fortnightly constituent
25	RHO	0.01	137.3	13.471515	Larger lunar evectional diurnal constituent
26	Q1	0.06	131.9	13.398661	Larger lunar elliptic diurnal constituent
27	T2	0.06	240.9	29.958933	Larger solar elliptic constituent
28	R2	0.03	135.3	30.041067	Smaller solar elliptic constituent
29	2Q1	0.01	147.9	12.854286	Larger elliptic diurnal
0	P1	0.13	125.0	14.958931	Solar diurnal constituent
31	2SM2	0.01	327.3	31.015896	Shallow water semidiurnal constituent
32	M3	0.08	294.7	43.47616	Lunar terdiurnal constituent

Constituent #	Name	Amplitude	Phase	Speed	Description
33	L2	0.14	224.5	29.528479	Smaller lunar elliptic semidiurnal constituent
34	2MK3	0.02	222.3	42.92714	Shallow water terdiurnal constituent
35	K2	0.13	255.4	30.082138	Lunisolar semidiurnal constituent
36	M8	0.0	0.0	115.93642	Shallow water eighth diurnal constituent
37	MS4	0.08	339.4	58.984104	Shallow water quarter diurnal constituent

Return to Top

Show nearby stations

Products available at 8670870 Fort Pulaski, GA

TIDES/WATER LEVELS

Water Levels (/waterlevels.html?id=8670870)

NOAA Tide Predictions (/noaatidepredictions/NOAATidesFacade.jsp?Stationid=8670870)

Harmonic Constituents (/harcon.html?id=8670870)

Sea Level Trends (/sltrends/sltrends_station.shtml?stnid=8670870)

Datums (/datums.html?id=8670870)

Bench Mark Sheets (/benchmarks.html?id=8670870)

Extreme Water Levels (/est/est_station.shtml?stnid=8670870)

Reports (/reports.html?id=8670870)

METEOROLOGICAL/OTHER

Meteorological Observations (/met.html?id=8670870)

Water Temp/Conductivity

PORTS®

This station is not a member of PORTS®

OPERATIONAL FORECAST SYSTEMS

This station is not a member of OFS

INFORMATION

Station Home Page (/stationhome.html?id=8670870)

Data Inventory (/inventory.html?id=8670870)

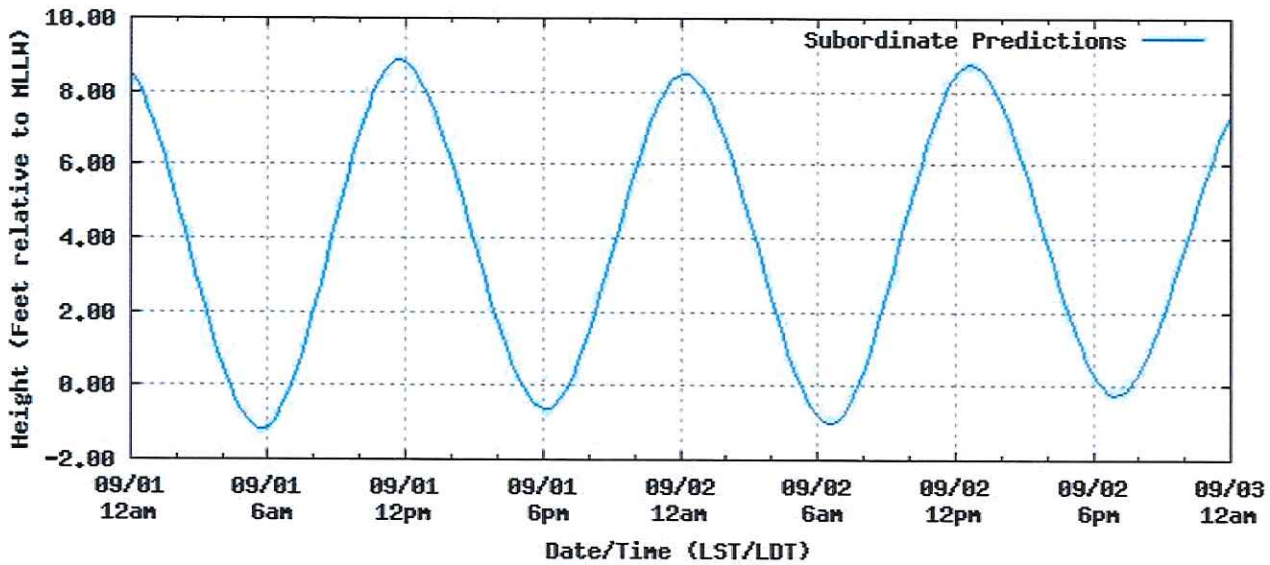
Measurement Specifications (/measure.html)

(Daymark 239), GA StationId: 8676766

n: Fort Pulaski (8670870)
high:58 low: 56) Height offset in feet (high:* 1.03 low: *1.09)

eet

2015/09/01 - 2015/09/02



are based upon the latest information available as of the date of your request, and may differ from the published tide tables.
Subordinate stations, the solid blue line depicts a curve fit between the high and low values and approximates the segments between.

2015

Time Range: Daily

Time Zone: LST/LDT

Dat Fe

Refereneced Gauge Information

Name	Vertical offset	Name	Amplitude	Phase	Speed
MLLW	3.82	M2	3.32	232.9	28.984104
MSL	0	S2	0.52	255.8	30
NAVD 88	-0.23	N2	0.72	220	28.43973
		K1	0.36	125.4	15.041069
		M4	0.14	318.2	57.96821
		O1	0.26	136.7	13.94305

Local Subordinate Station Water Surface Predictions

	* Height Offset (ft)		Time Offset (minutes)	
Name	High	low	High	low
Mackay River (Daymark 239)	1.03	1.09	58	56

Notes:

MSL is 3.82' higher than MLLW

MSL is 0.23' lower than NAVD88 (0)

0 NAVD 88 is 4.05' higher than MLLW

$$\eta = \alpha_0 + \alpha_1 \cos(\sigma_1 t + \delta_1) + \alpha_2 \cos(\sigma_2 t + \delta_2) + \alpha_3 \cos(\sigma_3 t + \delta_3) + \ldots \qquad (2.2)$$

where:

$\eta = H_t(t)$	=	Astronomical tide at time t (ft, m)
α_0	=	Vertical offset or datum adjustment (ft, m)
α_i	=	Amplitude of the tidal constituent (ft, m)
σ_i	=	Angular frequency, or speed (degrees or radians/hr)
t	=	Time since start of epoch (hr)
δ_i	=	Phase angle, or epoch (degrees or radians)

Tide Stage Hydrograph (Harmonic Formula)

Time (in hours)	Reference Station Height (NAVD 88)	Mackay River (Daymark 239) Converted to NAVD 88 and Adjusted by Subordinate Station Height Offset Factors)
0	-3.21	-3.49
0.5	-2.24	-2.44
1	-1.19	-1.30
1.5	-0.13	-0.15
2	0.87	0.90
2.5	1.77	1.82
3	2.52	2.75
3.5	3.08	3.36
4	3.42	3.53
4.5	3.53	3.64
5	3.39	3.49
5.5	3.00	3.09
6	2.38	2.45
6.5	1.56	1.60
7	0.57	0.59
7.5	-0.50	-0.55
8	-1.60	-1.74
8.5	-2.63	-2.86
9	-3.51	-3.82
9.5	-4.17	-4.55
10	-4.56	-4.97
10.5	-4.65	-5.06
11	-4.42	-4.82
11.5	-3.90	-4.25
12	-3.13	-3.41
12.5	-2.17	-2.37
13	-1.09	-1.19
13.5	0.03	0.04
14	1.14	1.18
14.5	2.18	2.24
15	3.07	3.17
15.5	3.80	3.91
16	4.31	4.44
16.5	4.59	4.73
17	4.61	4.75
17.5	4.38	4.51
18	3.88	4.00

18.5	3.15	3.24
19	2.20	2.27
19.5	1.10	1.14
20	-0.09	-0.10
20.5	-1.29	-1.41
21	-2.43	-2.65
21.5	-3.41	-3.72
22	-4.18	-4.55
22.5	-4.66	-5.08
23	-4.84	-5.28
23.5	-4.72	-5.14
24	-4.30	-4.69
24.5	-3.65	-3.97
25	-2.80	-3.06
25.5	-1.84	-2.01
26	-0.83	-0.90
26.5	0.17	0.18
27	1.10	1.14
27.5	1.92	1.97
28	2.57	2.65
28.5	3.04	3.13
29	3.29	3.39
29.5	3.32	3.42
30	3.11	3.20
30.5	2.67	2.75
31	2.02	2.08
31.5	1.18	1.22
32	0.22	0.22
32.5	-0.82	-0.89
33	-1.84	-2.01
33.5	-2.78	-3.03
34	-3.55	-3.87
34.5	-4.10	-4.47
35	-4.37	-4.77
35.5	-4.35	-4.74
36	-4.04	-4.40
36.5	-3.46	-3.77
37	-2.67	-2.91
37.5	-1.72	-1.87
38	-0.68	-0.74
38.5	0.39	0.40
39	1.41	1.45
39.5	2.34	2.41
40	3.13	3.22
40.5	3.74	3.85
41	4.15	4.27
41.5	4.33	4.46

42	4.28	4.41
42.5	3.98	4.10
43	3.44	3.54
43.5	2.68	2.77
44	1.75	1.80
44.5	0.68	0.70
45	-0.46	-0.50
45.5	-1.58	-1.72
46	-2.61	-2.85
46.5	-3.48	-3.79
47	-4.12	-4.49
47.5	-4.49	-4.89
48	-4.57	-4.98
48.5	-4.36	-4.75
49	-3.89	-4.24
49.5	-3.22	-3.51
50	-2.39	-2.60
50.5	-1.47	-1.60
51	-0.52	-0.57
51.5	0.39	0.40
52	1.23	1.26
52.5	1.94	2.00
53	2.50	2.58
53.5	2.88	2.97
54	3.07	3.16
54.5	3.04	3.13
55	2.79	2.88
55.5	2.33	2.40
56	1.69	1.74
56.5	0.88	0.90
57	-0.04	-0.04
57.5	-1.00	-1.09
58	-1.94	-2.11
58.5	-2.77	-3.02
59	-3.44	-3.75
59.5	-3.88	-4.23
60	-4.06	-4.43
60.5	-3.96	-4.32
61	-3.60	-3.93
61.5	-3.01	-3.28
62	-2.24	-2.44
62.5	-1.34	-1.46
63	-0.37	-0.41
63.5	0.59	0.61
64	1.50	1.55
64.5	2.32	2.39
65	2.99	3.08

65.5	3.50	3.61
66	3.83	3.94
66.5	3.94	4.06
67	3.84	3.95
67.5	3.51	3.62
68	2.97	3.06
68.5	2.24	2.30
69	1.34	1.38
69.5	0.34	0.35
70	-0.71	-0.77
70.5	-1.73	-1.88
71	-2.65	-2.89
71.5	-3.40	-3.70
72	-3.93	-4.28
72.5	-4.20	-4.57
73	-4.20	-4.58
73.5	-3.94	-4.30
74	-3.46	-3.77
74.5	-2.80	-3.05
75	-2.02	-2.20
75.5	-1.17	-1.27
76	-0.31	-0.34
76.5	0.51	0.52
77	1.25	1.28
77.5	1.87	1.93
78	2.35	2.42
78.5	2.67	2.75
79	2.81	2.89
79.5	2.76	2.84
80	2.50	2.58
80.5	2.06	2.12
81	1.44	1.48
81.5	0.68	0.70
82	-0.17	-0.18
82.5	-1.05	-1.14
83	-1.90	-2.07
83.5	-2.64	-2.87
84	-3.21	-3.50
84.5	-3.57	-3.90
85	-3.69	-4.02
85.5	-3.56	-3.88
86	-3.19	-3.48
86.5	-2.62	-2.86
87	-1.90	-2.07
87.5	-1.08	-1.18
88	-0.22	-0.24
88.5	0.63	0.65

89	1.43	1.47
89.5	2.14	2.20
90	2.72	2.80
90.5	3.15	3.24
91	3.41	3.52
91.5	3.49	3.60
92	3.38	3.48
92.5	3.06	3.15
93	2.55	2.62
93.5	1.86	1.92
94	1.03	1.06
94.5	0.11	0.12
95	-0.84	-0.92
95.5	-1.76	-1.91
96	-2.57	-2.80
96.5	-3.22	-3.51
97	-3.66	-3.99
97.5	-3.86	-4.20
98	-3.81	-4.16
98.5	-3.54	-3.86
99	-3.07	-3.35
99.5	-2.45	-2.67
100	-1.73	-1.89
100.5	-0.96	-1.05
101	-0.19	-0.21
101.5	0.54	0.55
102	1.20	1.23
102.5	1.75	1.80
103	2.18	2.25
103.5	2.47	2.54
104	2.59	2.67
104.5	2.53	2.61
105	2.30	2.37
105.5	1.89	1.94

2.6.1 Combining Storm Surge and Astronomical Tides

With the selection of S_p the storm surge plus tide (storm tide) hydrc determined by combining Equation 2.1 or 2.2 with either Equation 2.6 or 2 following equation:

$$S_{tot}(t) = S_t(t) + H_t(t)$$

$H_t(t)$	see results above		
R (n-mile)	24		
f (forward sped in knots)	11		
S_p (ft) local msl 10 YEAR	6.16	S_p (ft) NAVD 88 10 YEAR	5.93
S_p (ft) local msl 25 YEAR	8.66	S_p (ft) NAVD 88 25 YEAR	8.43
S_p (ft) local msl 50 YEAR	11.58	S_p (ft) INAVD 88 50 YEAR	11.35
S_p (ft) local msl 100 YEAR	14.17	S_p (ft) NAVD 88 100 YEAR	13.94
S_p (ft) local msl 500 YEAR	20.18	S_p (ft)NAVD 88 500 YEAR	19.95
t_o (hr) low tide	11		
t_o (hr) rising tide	14		
t_o (hr) high tide	17		
t_o (hr) falling tide	20		
Select: Low (L), Rising (R), High (H), Falling (F)	R	<- ENTER l L, R, H or F	14

Storm Tide - Stage Hydrographs (SDH Approach)

	25 Year			50 year			100 year			500 year		
Time (hours)	Mackay River (Daymark 239) Storm Surge to NAVD 88	Mackay River (Daymark 239) Tide to NAVD 88	Mackay River (Daymark 239) Storm Surge + Tide to NAVD 88	Mackay River (Daymark 239) Storm Surge to NAVD 88	Mackay River (Daymark 239) Tide to NAVD 88	Mackay River (Daymark 239) Storm Surge + Tide to NAVD 88	Mackay River (Daymark 239) Storm Surge to NAVD 88	Mackay River (Daymark 239) Tide to NAVD 88	Mackay River (Daymark 239) Storm Surge + Tide to NAVD 88	Mackay River (Daymark 239) Storm Surge to NAVD 88	Mackay River (Daymark 239) Tide to NAVD 88	Mackay River (Daymark 239) Storm Surge + Tide to NAVD 88
0.0	1.22	-3.49	-2.28	1.64	-3.49	-1.86	2.01	-3.49	-1.48	2.88	-3.49	-0.61
0.5	1.26	-2.44	-1.18	1.69	-2.44	-0.75	2.08	-2.44	-0.36	2.98	-2.44	0.54
1.0	1.30	-1.30	0.00	1.75	-1.30	0.46	2.15	-1.30	0.86	3.08	-1.30	1.78
1.5	1.35	-0.15	1.20	1.82	-0.15	1.67	2.23	-0.15	2.09	3.19	-0.15	3.05
2.0	1.40	0.90	2.30	1.89	0.90	2.79	2.32	0.90	3.22	3.32	0.90	4.21
2.5	1.46	1.82	3.28	1.96	1.82	3.79	2.41	1.82	4.23	3.45	1.82	5.27
3.0	1.52	2.75	4.26	2.04	2.75	4.79	2.51	2.75	5.25	3.59	2.75	6.34
3.5	1.58	3.36	4.94	2.13	3.36	5.49	2.62	3.36	5.97	3.74	3.36	7.10
4.0	1.65	3.53	5.18	2.23	3.53	5.75	2.73	3.53	6.26	3.91	3.53	7.44
4.5	1.73	3.64	5.37	2.33	3.64	5.97	2.86	3.64	6.50	4.09	3.64	7.73
5.0	1.81	3.49	5.31	2.44	3.49	5.94	3.00	3.49	6.49	4.29	3.49	7.79
5.5	1.91	3.09	5.00	2.57	3.09	5.66	3.16	3.09	6.25	4.52	3.09	7.61
6.0	2.01	2.45	4.46	2.71	2.45	5.16	3.33	2.45	5.78	4.76	2.45	7.21
6.5	2.13	1.60	3.73	2.87	1.60	4.47	3.52	1.60	5.12	5.04	1.60	6.64
7.0	2.26	0.59	2.85	3.04	0.59	3.63	3.73	0.59	4.32	5.34	0.59	5.93
7.5	2.40	-0.55	1.85	3.24	-0.55	2.69	3.98	-0.55	3.43	5.69	-0.55	5.14
8.0	2.57	-1.74	0.83	3.46	-1.74	1.72	4.25	-1.74	2.51	6.08	-1.74	4.34
8.5	2.76	-2.86	-0.10	3.72	-2.86	0.86	4.57	-2.86	1.70	6.53	-2.86	3.67
9.0	2.98	-3.82	-0.84	4.01	-3.82	0.19	4.93	-3.82	1.11	7.05	-3.82	3.23
9.5	3.24	-4.55	-1.31	4.36	-4.55	-0.19	5.36	-4.55	0.81	7.67	-4.55	3.12
10.0	3.54	-4.97	-1.43	4.77	-4.97	-0.20	5.86	-4.97	0.89	8.39	-4.97	3.42
10.5	3.91	-5.06	-1.16	5.27	-5.06	0.20	6.47	-5.06	1.40	9.25	-5.06	4.19
11.0	4.36	-4.82	-0.46	5.87	-4.82	1.05	7.21	-4.82	2.39	10.31	-4.82	5.49
11.5	4.91	-4.25	0.66	6.61	-4.25	2.36	8.12	-4.25	3.87	11.62	-4.25	7.36
12.0	5.60	-3.41	2.18	7.54	-3.41	4.13	9.26	-3.41	5.85	13.25	-3.41	9.84
12.5	6.46	-2.37	4.09	8.70	-2.37	6.33	10.69	-2.37	8.32	15.29	-2.37	12.92
13.0	7.48	-1.19	6.28	10.07	-1.19	8.88	12.37	-1.19	11.18	17.70	-1.19	16.51
13.5	8.32	0.04	8.35	11.21	0.04	11.24	13.77	0.04	13.80	19.70	0.04	19.73
14.0	8.43	1.18	9.60	11.35	1.18	12.53	13.94	1.18	15.12	19.95	1.18	21.13
14.5	8.32	2.24	10.56	11.21	2.24	13.45	13.76	2.24	16.00	19.69	2.24	21.93
15.0	7.47	3.17	10.64	10.07	3.17	13.23	12.37	3.17	15.53	17.69	3.17	20.86
15.5	6.46	3.91	10.37	8.70	3.91	12.61	10.68	3.91	14.59	15.28	3.91	19.19

16.0	5.59	4.44	10.03	7.54	4.44	11.98	9.26	4.44	13.70	13.24	4.44	17.68
16.5	4.90	4.73	9.63	6.61	4.73	11.33	8.12	4.73	12.84	11.61	4.73	16.34
17.0	4.35	4.75	9.11	5.86	4.75	10.62	7.20	4.75	11.96	10.31	4.75	15.06
17.5	3.91	4.51	8.42	5.26	4.51	9.77	6.47	4.51	10.98	9.25	4.51	13.76
18.0	3.54	4.00	7.54	4.77	4.00	8.77	5.86	4.00	9.86	8.38	4.00	12.38
18.5	3.24	3.24	6.48	4.36	3.24	7.60	5.36	3.24	8.60	7.66	3.24	10.90
19.0	2.98	2.27	5.25	4.01	2.27	6.28	4.93	2.27	7.20	7.05	2.27	9.32
19.5	2.76	1.14	3.90	3.72	1.14	4.85	4.57	1.14	5.70	6.53	1.14	7.67
20.0	2.57	-0.10	2.47	3.46	-0.10	3.36	4.25	-0.10	4.15	6.08	-0.10	5.98
20.5	2.40	-1.41	0.99	3.24	-1.41	1.83	3.98	-1.41	2.56	5.69	-1.41	4.28
21.0	2.26	-2.65	-0.39	3.04	-2.65	0.39	3.73	-2.65	1.08	5.34	-2.65	2.69
21.5	2.13	-3.72	-1.60	2.86	-3.72	-0.86	3.52	-3.72	-0.20	5.03	-3.72	1.31
22.0	2.01	-4.55	-2.54	2.71	-4.55	-1.84	3.33	-4.55	-1.22	4.76	-4.55	0.21
22.5	1.91	-5.08	-3.18	2.57	-5.08	-2.51	3.16	-5.08	-1.93	4.52	-5.08	-0.57
23.0	1.81	-5.28	-3.47	2.44	-5.28	-2.84	3.00	-5.28	-2.28	4.29	-5.28	-0.99
23.5	1.73	-5.14	-3.41	2.33	-5.14	-2.81	2.86	-5.14	-2.28	4.09	-5.14	-1.05
24.0	1.65	-4.69	-3.04	2.22	-4.69	-2.47	2.73	-4.69	-1.96	3.91	-4.69	-0.78
24.5	1.58	-3.97	-2.39	2.13	-3.97	-1.84	2.62	-3.97	-1.36	3.74	-3.97	-0.23
25.0	1.52	-3.06	-1.54	2.04	-3.06	-1.01	2.51	-3.06	-0.55	3.59	-3.06	0.53
25.5	1.46	-2.01	-0.55	1.96	-2.01	-0.04	2.41	-2.01	0.40	3.45	-2.01	1.44
26.0	1.40	-0.90	0.50	1.89	-0.90	0.99	2.32	-0.90	1.42	3.32	-0.90	2.41
26.5	1.35	0.18	1.53	1.82	0.18	2.00	2.23	0.18	2.41	3.19	0.18	3.37
27.0	1.30	1.14	2.44	1.75	1.14	2.89	2.15	1.14	3.29	3.08	1.14	4.22
27.5	1.26	1.97	3.23	1.69	1.97	3.67	2.08	1.97	4.05	2.98	1.97	4.95
28.0	1.22	2.65	3.86	1.64	2.65	4.29	2.01	2.65	4.66	2.88	2.65	5.53
28.5	1.18	3.13	4.31	1.59	3.13	4.71	1.95	3.13	5.08	2.79	3.13	5.91
29.0	1.14	3.39	4.53	1.54	3.39	4.93	1.89	3.39	5.28	2.70	3.39	6.09
29.5	1.11	3.42	4.52	1.49	3.42	4.91	1.83	3.42	5.25	2.62	3.42	6.04
30.0	1.07	3.20	4.28	1.45	3.20	4.65	1.78	3.20	4.98	2.54	3.20	5.75
30.5	1.04	2.75	3.79	1.41	2.75	4.16	1.73	2.75	4.48	2.47	2.75	5.22
31.0	1.01	2.08	3.09	1.37	2.08	3.44	1.68	2.08	3.76	2.40	2.08	4.48
31.5	0.99	1.22	2.21	1.33	1.22	2.55	1.63	1.22	2.85	2.34	1.22	3.56
32.0	0.96	0.22	1.19	1.30	0.22	1.52	1.59	0.22	1.82	2.28	0.22	2.50
32.5	0.94	-0.89	0.05	1.26	-0.89	0.37	1.55	-0.89	0.66	2.22	-0.89	1.33
33.0	0.91	-2.01	-1.09	1.23	-2.01	-0.78	1.51	-2.01	-0.49	2.16	-2.01	0.16
33.5	0.89	-3.03	-2.14	1.20	-3.03	-1.83	1.48	-3.03	-1.55	2.11	-3.03	-0.92
34.0	0.87	-3.87	-3.00	1.17	-3.87	-2.70	1.44	-3.87	-2.43	2.06	-3.87	-1.81
34.5	0.85	-4.47	-3.62	1.15	-4.47	-3.32	1.41	-4.47	-3.06	2.01	-4.47	-2.45
35.0	0.83	-4.77	-3.94	1.12	-4.77	-3.65	1.38	-4.77	-3.39	1.97	-4.77	-2.80
35.5	0.81	-4.74	-3.93	1.10	-4.74	-3.65	1.35	-4.74	-3.40	1.92	-4.74	-2.82

36.0	0.80	-4.40	-3.61	1.07	-4.40	-3.33	1.32	-4.40	-3.09	1.88	-4.40	-2.52
36.5	0.78	-3.77	-2.99	1.05	-3.77	-2.72	1.29	-3.77	-2.48	1.84	-3.77	-1.93
37.0	0.76	-2.91	-2.14	1.03	-2.91	-1.88	1.26	-2.91	-1.65	1.81	-2.91	-1.10
37.5	0.75	-1.87	-1.12	1.01	-1.87	-0.86	1.24	-1.87	-0.63	1.77	-1.87	-0.10
38.0	0.73	-0.74	0.00	0.99	-0.74	0.25	1.21	-0.74	0.48	1.73	-0.74	1.00
38.5	0.72	0.40	1.12	0.97	0.40	1.37	1.19	0.40	1.59	1.70	0.40	2.10
39.0	0.70	1.45	2.16	0.95	1.45	2.40	1.17	1.45	2.62	1.67	1.45	3.12
39.5	0.69	2.41	3.10	0.93	2.41	3.34	1.14	2.41	3.55	1.64	2.41	4.04
40.0	0.68	3.22	3.90	0.91	3.22	4.13	1.12	3.22	4.34	1.61	3.22	4.83
40.5	0.67	3.85	4.52	0.90	3.85	4.75	1.10	3.85	4.95	1.58	3.85	5.43
41.0	0.65	4.27	4.93	0.88	4.27	5.15	1.08	4.27	5.36	1.55	4.27	5.82
41.5	0.64	4.46	5.10	0.87	4.46	5.33	1.06	4.46	5.53	1.52	4.46	5.98
42.0	0.63	4.41	5.04	0.85	4.41	5.26	1.05	4.41	5.45	1.50	4.41	5.90
42.5	0.62	4.10	4.72	0.84	4.10	4.93	1.03	4.10	5.12	1.47	4.10	5.57
43.0	0.61	3.54	4.15	0.82	3.54	4.37	1.01	3.54	4.55	1.45	3.54	4.99
43.5	0.60	2.77	3.37	0.81	2.77	3.57	0.99	2.77	3.76	1.42	2.77	4.19
44.0	0.59	1.80	2.39	0.80	1.80	2.60	0.98	1.80	2.78	1.40	1.80	3.20
44.5	0.58	0.70	1.28	0.78	0.70	1.48	0.96	0.70	1.66	1.38	0.70	2.08
45.0	0.57	-0.50	0.08	0.77	-0.50	0.27	0.95	-0.50	0.45	1.36	-0.50	0.86
45.5	0.56	-1.72	-1.16	0.76	-1.72	-0.96	0.93	-1.72	-0.79	1.33	-1.72	-0.39
46.0	0.56	-2.85	-2.29	0.75	-2.85	-2.10	0.92	-2.85	-1.93	1.31	-2.85	-1.53
46.5	0.55	-3.79	-3.24	0.74	-3.79	-3.05	0.91	-3.79	-2.89	1.30	-3.79	-2.50
47.0	0.54	-4.49	-3.95	0.73	-4.49	-3.76	0.89	-4.49	-3.60	1.28	-4.49	-3.21
47.5	0.53	-4.89	-4.36	0.72	-4.89	-4.18	0.88	-4.89	-4.01	1.26	-4.89	-3.63
48.0	0.52	-4.98	-4.45	0.71	-4.98	-4.27	0.87	-4.98	-4.11	1.24	-4.98	-3.74
48.5	0.52	-4.75	-4.23	0.70	-4.75	-4.06	0.85	-4.75	-3.90	1.22	-4.75	-3.53
49.0	0.51	-4.24	-3.73	0.69	-4.24	-3.56	0.84	-4.24	-3.40	1.21	-4.24	-3.04
49.5	0.50	-3.51	-3.00	0.68	-3.51	-2.83	0.83	-3.51	-2.68	1.19	-3.51	-2.32
50.0	0.50	-2.60	-2.11	0.67	-2.60	-1.93	0.82	-2.60	-1.78	1.17	-2.60	-1.43
50.5	0.49	-1.60	-1.11	0.66	-1.60	-0.94	0.81	-1.60	-0.79	1.16	-1.60	-0.44
51.0	0.48	-0.57	-0.09	0.65	-0.57	0.08	0.80	-0.57	0.23	1.14	-0.57	0.57
51.5	0.48	0.40	0.88	0.64	0.40	1.05	0.79	0.40	1.19	1.13	0.40	1.53
52.0	0.47	1.26	1.73	0.63	1.26	1.90	0.78	1.26	2.04	1.11	1.26	2.38
52.5	0.46	2.00	2.46	0.63	2.00	2.63	0.77	2.00	2.77	1.10	2.00	3.10
53.0	0.46	2.58	3.04	0.62	2.58	3.20	0.76	2.58	3.34	1.09	2.58	3.66
53.5	0.45	2.97	3.42	0.61	2.97	3.58	0.75	2.97	3.72	1.07	2.97	4.04
54.0	0.45	3.16	3.61	0.60	3.16	3.76	0.74	3.16	3.90	1.06	3.16	4.22
54.5	0.44	3.13	3.57	0.60	3.13	3.72	0.73	3.13	3.86	1.05	3.13	4.18
55.0	0.44	2.88	3.31	0.59	2.88	3.46	0.72	2.88	3.60	1.03	2.88	3.91
55.5	0.43	2.40	2.84	0.58	2.40	2.99	0.71	2.40	3.12	1.02	2.40	3.43

56.0	0.43	1.74	2.16	0.57	1.74	2.31	0.71	1.74	2.44	1.01	1.74	2.75
56.5	0.42	0.90	1.33	0.57	0.90	1.47	0.70	0.90	1.60	1.00	0.90	1.90
57.0	0.42	-0.04	0.37	0.56	-0.04	0.52	0.69	-0.04	0.65	0.99	-0.04	0.94
57.5	0.41	-1.09	-0.68	0.56	-1.09	-0.54	0.68	-1.09	-0.41	0.98	-1.09	-0.12
58.0	0.41	-2.11	-1.70	0.55	-2.11	-1.56	0.67	-2.11	-1.44	0.96	-2.11	-1.15
58.5	0.40	-3.02	-2.62	0.54	-3.02	-2.48	0.67	-3.02	-2.36	0.95	-3.02	-2.07
59.0	0.40	-3.75	-3.35	0.54	-3.75	-3.21	0.66	-3.75	-3.09	0.94	-3.75	-2.81
59.5	0.39	-4.23	-3.84	0.53	-4.23	-3.70	0.65	-4.23	-3.58	0.93	-4.23	-3.30
60.0	0.39	-4.43	-4.04	0.53	-4.43	-3.90	0.65	-4.43	-3.78	0.92	-4.43	-3.50
60.5	0.39	-4.32	-3.94	0.52	-4.32	-3.80	0.64	-4.32	-3.68	0.91	-4.32	-3.41
61.0	0.38	-3.93	-3.55	0.51	-3.93	-3.41	0.63	-3.93	-3.30	0.90	-3.93	-3.02
61.5	0.38	-3.28	-2.90	0.51	-3.28	-2.77	0.63	-3.28	-2.66	0.90	-3.28	-2.39
62.0	0.37	-2.44	-2.06	0.50	-2.44	-1.93	0.62	-2.44	-1.82	0.89	-2.44	-1.55
62.5	0.37	-1.46	-1.08	0.50	-1.46	-0.96	0.61	-1.46	-0.84	0.88	-1.46	-0.58
63.0	0.37	-0.41	-0.04	0.49	-0.41	0.09	0.61	-0.41	0.20	0.87	-0.41	0.46
63.5	0.36	0.61	0.97	0.49	0.61	1.10	0.60	0.61	1.21	0.86	0.61	1.47
64.0	0.36	1.55	1.91	0.48	1.55	2.03	0.60	1.55	2.14	0.85	1.55	2.40
64.5	0.36	2.39	2.74	0.48	2.39	2.87	0.59	2.39	2.98	0.84	2.39	3.23
65.0	0.35	3.08	3.44	0.48	3.08	3.56	0.58	3.08	3.67	0.84	3.08	3.92
65.5	0.35	3.61	3.96	0.47	3.61	4.08	0.58	3.61	4.19	0.83	3.61	4.44
66.0	0.35	3.94	4.29	0.47	3.94	4.41	0.57	3.94	4.51	0.82	3.94	4.76
66.5	0.34	4.06	4.40	0.46	4.06	4.52	0.57	4.06	4.63	0.81	4.06	4.87
67.0	0.34	3.95	4.29	0.46	3.95	4.41	0.56	3.95	4.52	0.80	3.95	4.76
67.5	0.34	3.62	3.95	0.45	3.62	4.07	0.56	3.62	4.17	0.80	3.62	4.41
68.0	0.33	3.06	3.39	0.45	3.06	3.51	0.55	3.06	3.61	0.79	3.06	3.85
68.5	0.33	2.30	2.63	0.45	2.30	2.75	0.55	2.30	2.85	0.78	2.30	3.09
69.0	0.33	1.38	1.71	0.44	1.38	1.82	0.54	1.38	1.92	0.78	1.38	2.16
69.5	0.32	0.35	0.67	0.44	0.35	0.79	0.54	0.35	0.89	0.77	0.35	1.12
70.0	0.32	-0.77	-0.45	0.43	-0.77	-0.34	0.53	-0.77	-0.24	0.76	-0.77	-0.01
70.5	0.32	-1.88	-1.56	0.43	-1.88	-1.45	0.53	-1.88	-1.36	0.76	-1.88	-1.13
71.0	0.32	-2.89	-2.57	0.43	-2.89	-2.46	0.52	-2.89	-2.36	0.75	-2.89	-2.14
71.5	0.31	-3.70	-3.39	0.42	-3.70	-3.28	0.52	-3.70	-3.18	0.74	-3.70	-2.96
72.0	0.31	-4.28	-3.97	0.42	-4.28	-3.86	0.51	-4.28	-3.76	0.74	-4.28	-3.54
72.5	0.31	-4.57	-4.27	0.42	-4.57	-4.16	0.51	-4.57	-4.06	0.73	-4.57	-3.84
73.0	0.31	-4.58	-4.27	0.41	-4.58	-4.16	0.51	-4.58	-4.07	0.72	-4.58	-3.85
73.5	0.30	-4.30	-3.99	0.41	-4.30	-3.89	0.50	-4.30	-3.80	0.72	-4.30	-3.58
74.0	0.30	-3.77	-3.47	0.41	-3.77	-3.37	0.50	-3.77	-3.28	0.71	-3.77	-3.06
74.5	0.30	-3.05	-2.76	0.40	-3.05	-2.65	0.49	-3.05	-2.56	0.71	-3.05	-2.35
75.0	0.30	-2.20	-1.90	0.40	-2.20	-1.80	0.49	-2.20	-1.71	0.70	-2.20	-1.50
75.5	0.29	-1.27	-0.98	0.40	-1.27	-0.88	0.49	-1.27	-0.79	0.70	-1.27	-0.58

76.0	0.29	-0.34	-0.05	0.39	-0.34	0.05	0.48	-0.34	0.14	0.69	-0.34	0.35
76.5	0.29	0.52	0.81	0.39	0.52	0.91	0.48	0.52	1.00	0.68	0.52	1.21
77.0	0.29	1.28	1.57	0.39	1.28	1.67	0.47	1.28	1.76	0.68	1.28	1.96
77.5	0.28	1.93	2.21	0.38	1.93	2.31	0.47	1.93	2.40	0.67	1.93	2.60
78.0	0.28	2.42	2.71	0.38	2.42	2.80	0.47	2.42	2.89	0.67	2.42	3.09
78.5	0.28	2.75	3.03	0.38	2.75	3.13	0.46	2.75	3.22	0.66	2.75	3.42
79.0	0.28	2.89	3.17	0.37	2.89	3.27	0.46	2.89	3.35	0.66	2.89	3.55
79.5	0.28	2.84	3.11	0.37	2.84	3.21	0.46	2.84	3.29	0.65	2.84	3.49
80.0	0.27	2.58	2.85	0.37	2.58	2.95	0.45	2.58	3.03	0.65	2.58	3.23
80.5	0.27	2.12	2.39	0.37	2.12	2.49	0.45	2.12	2.57	0.64	2.12	2.76
81.0	0.27	1.48	1.75	0.36	1.48	1.85	0.45	1.48	1.93	0.64	1.48	2.12
81.5	0.27	0.70	0.97	0.36	0.70	1.06	0.44	0.70	1.15	0.63	0.70	1.34
82.0	0.27	-0.18	0.08	0.36	-0.18	0.18	0.44	-0.18	0.26	0.63	-0.18	0.45
82.5	0.26	-1.14	-0.88	0.36	-1.14	-0.79	0.44	-1.14	-0.71	0.63	-1.14	-0.52
83.0	0.26	-2.07	-1.80	0.35	-2.07	-1.71	0.43	-2.07	-1.63	0.62	-2.07	-1.45
83.5	0.26	-2.87	-2.61	0.35	-2.87	-2.52	0.43	-2.87	-2.44	0.62	-2.87	-2.26
84.0	0.26	-3.50	-3.24	0.35	-3.50	-3.15	0.43	-3.50	-3.07	0.61	-3.50	-2.89
84.5	0.26	-3.90	-3.64	0.35	-3.90	-3.55	0.42	-3.90	-3.47	0.61	-3.90	-3.29
85.0	0.25	-4.02	-3.77	0.34	-4.02	-3.68	0.42	-4.02	-3.60	0.60	-4.02	-3.42
85.5	0.25	-3.88	-3.63	0.34	-3.88	-3.54	0.42	-3.88	-3.46	0.60	-3.88	-3.28
86.0	0.25	-3.48	-3.23	0.34	-3.48	-3.14	0.42	-3.48	-3.06	0.60	-3.48	-2.88
86.5	0.25	-2.86	-2.61	0.34	-2.86	-2.52	0.41	-2.86	-2.45	0.59	-2.86	-2.27
87.0	0.25	-2.07	-1.83	0.33	-2.07	-1.74	0.41	-2.07	-1.66	0.59	-2.07	-1.49
87.5	0.25	-1.18	-0.93	0.33	-1.18	-0.85	0.41	-1.18	-0.77	0.58	-1.18	-0.60
88.0	0.24	-0.24	0.00	0.33	-0.24	0.09	0.41	-0.24	0.16	0.58	-0.24	0.34
88.5	0.24	0.65	0.89	0.33	0.65	0.98	0.40	0.65	1.05	0.58	0.65	1.23
89.0	0.24	1.47	1.71	0.33	1.47	1.80	0.40	1.47	1.87	0.57	1.47	2.05
89.5	0.24	2.20	2.44	0.32	2.20	2.52	0.40	2.20	2.60	0.57	2.20	2.77
90.0	0.24	2.80	3.04	0.32	2.80	3.12	0.39	2.80	3.19	0.56	2.80	3.36
90.5	0.24	3.24	3.48	0.32	3.24	3.56	0.39	3.24	3.64	0.56	3.24	3.81
91.0	0.24	3.52	3.75	0.32	3.52	3.83	0.39	3.52	3.91	0.56	3.52	4.07
91.5	0.23	3.60	3.83	0.32	3.60	3.91	0.39	3.60	3.99	0.55	3.60	4.15
92.0	0.23	3.48	3.71	0.31	3.48	3.79	0.38	3.48	3.86	0.55	3.48	4.03
92.5	0.23	3.15	3.38	0.31	3.15	3.46	0.38	3.15	3.53	0.55	3.15	3.70
93.0	0.23	2.62	2.85	0.31	2.62	2.93	0.38	2.62	3.00	0.54	2.62	3.17
93.5	0.23	1.92	2.14	0.31	1.92	2.22	0.38	1.92	2.29	0.54	1.92	2.46
94.0	0.23	1.06	1.29	0.31	1.06	1.37	0.38	1.06	1.44	0.54	1.06	1.60
94.5	0.23	0.12	0.34	0.30	0.12	0.42	0.37	0.12	0.49	0.53	0.12	0.65
95.0	0.22	-0.92	-0.69	0.30	-0.92	-0.61	0.37	-0.92	-0.54	0.53	-0.92	-0.38
95.5	0.22	-1.91	-1.69	0.30	-1.91	-1.61	0.37	-1.91	-1.55	0.53	-1.91	-1.39

96.0	0.22	-2.80	-2.58	0.30	-2.80	-2.50	0.37	-2.80	-2.43	0.52	-2.80	-2.28
96.5	0.22	-3.51	-3.29	0.30	-3.51	-3.21	0.36	-3.51	-3.14	0.52	-3.51	-2.99
97.0	0.22	-3.99	-3.77	0.29	-3.99	-3.69	0.36	-3.99	-3.62	0.52	-3.99	-3.47
97.5	0.22	-4.20	-3.99	0.29	-4.20	-3.91	0.36	-4.20	-3.84	0.51	-4.20	-3.69
98.0	0.22	-4.16	-3.94	0.29	-4.16	-3.87	0.36	-4.16	-3.80	0.51	-4.16	-3.65
98.5	0.21	-3.86	-3.64	0.29	-3.86	-3.57	0.36	-3.86	-3.50	0.51	-3.86	-3.35
99.0	0.21	-3.35	-3.14	0.29	-3.35	-3.06	0.35	-3.35	-3.00	0.51	-3.35	-2.84
99.5	0.21	-2.67	-2.46	0.29	-2.67	-2.39	0.35	-2.67	-2.32	0.50	-2.67	-2.17
100.0	0.21	-1.89	-1.68	0.28	-1.89	-1.60	0.35	-1.89	-1.54	0.50	-1.89	-1.39
100.5	0.21	-1.05	-0.84	0.28	-1.05	-0.77	0.35	-1.05	-0.70	0.50	-1.05	-0.55
101.0	0.21	-0.21	0.00	0.28	-0.21	0.07	0.35	-0.21	0.14	0.49	-0.21	0.28
101.5	0.21	0.55	0.76	0.28	0.55	0.83	0.34	0.55	0.90	0.49	0.55	1.05
102.0	0.21	1.23	1.44	0.28	1.23	1.51	0.34	1.23	1.57	0.49	1.23	1.72
102.5	0.21	1.80	2.01	0.28	1.80	2.08	0.34	1.80	2.14	0.49	1.80	2.29
103.0	0.20	2.25	2.45	0.27	2.25	2.52	0.34	2.25	2.58	0.48	2.25	2.73
103.5	0.20	2.54	2.74	0.27	2.54	2.81	0.34	2.54	2.88	0.48	2.54	3.02
104.0	0.20	2.67	2.87	0.27	2.67	2.94	0.33	2.67	3.00	0.48	2.67	3.14
104.5	0.20	2.61	2.81	0.27	2.61	2.88	0.33	2.61	2.94	0.48	2.61	3.09
105.0	0.20	2.37	2.57	0.27	2.37	2.64	0.33	2.37	2.70	0.47	2.37	2.84
105.5	0.20	1.94	2.14	0.27	1.94	2.21	0.33	1.94	2.27	0.47	1.94	2.41

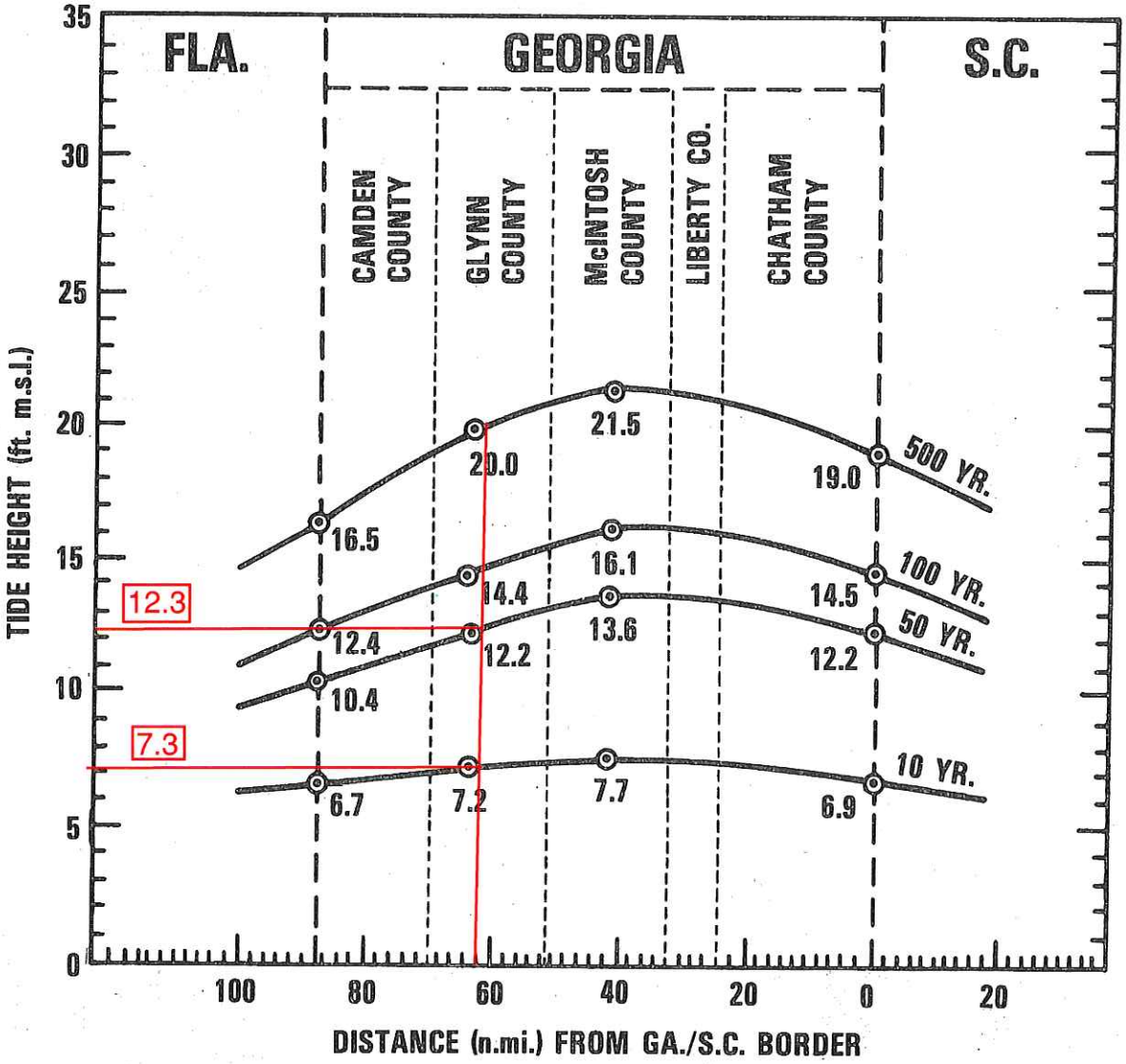


Figure 6.--Tide frequency profile along Georgia coast.

STORM TIDE FREQUENCY ANALYSIS FOR THE COAST OF GEORGIA
NOAA Technical Memorandum NWS HYDRO-19 (1974)

For the purpose of the study all elevations were converted to NAVD 88. The 25 year elevation was determined by interpolation. Because interpolation of frequency curves is not exact and can yield too low of results, the interpolated value for the 30 year elevation was used in the model as the 25 year elevation.

From HEC 25 (2004)

APPENDIX E

ADCIRC Surge Estimates*

State	Waterway Name	ADCIRC Results (local mean sea level) 50-Year (m)	100-Year (m)	500-Year (m)
LOUISIANA				
	Sabine Pass	3.28	4.20	6.34
	Calcasieu Pass	3.33	4.08	5.82
	Vermilion, West &	2.32	2.82	3.98
	East Cote Blanche Bay	1.90	2.31	3.26
	Terrebonne, Timbalier Bay	1.59	2.07	3.18
	Barataria Bay	1.61	2.10	3.24
	Lake Borgne	5.49	6.78	9.78
MISSISSIPPI				
	Pearl River	5.49	6.78	9.78
	Heron Bay	5.49	6.78	9.78
	St Louis Bays	5.49	6.78	9.78
	Biloxi Bay	4.68	6.13	9.50
	Graveline Bay	2.53	3.29	5.05
	Pascagoula Bay	2.53	3.29	5.05
	Pascagoula River	2.53	3.29	5.05
	Bayou Casotte	2.53	3.29	5.05
	Point Aux Chenes Bay	2.53	3.29	5.05
FLORIDA				
	Pensacola Bay	1.79	2.13	2.92
	Choctawhatchee Bay	1.30	1.53	2.06
	West, N, E Bay	1.17	1.38	1.87
	(Panama city)	1.17	1.38	1.87
	St Joseph Bay	1.02	1.19	1.58
	Apalachicola Bay	1.54	1.89	2.70
		1.54	1.89	2.70
		2.03	2.56	3.79
	Ochlockonee Bay	2.98	3.71	5.41
	Dickerson Bay, Levy Bay	2.98	3.71	5.41
	Oyster Bay	2.98	3.71	5.41
		2.98	3.71	5.41
	Walker Creek	2.98	3.71	5.41
	Goose Creek Bay	2.98	3.71	5.41
	St Marks River	2.98	3.71	5.41
	Aucilla River	3.50	4.21	5.86
	Henderson River	3.77	4.65	6.69
	Deadman Bay	3.80	5.01	7.82
	Suwannee River	3.45	4.60	7.27
	Waccasassa River	3.30	3.99	5.59
	Crystal Bay	2.58	3.06	4.17
	Homosassa Bay	2.58	3.06	4.17
	Chassahowitzka Bay	2.58	3.06	4.17
	Pithlachascotee River	2.28	2.71	3.71
	Anclote River	2.28	2.71	3.71
	Tampa Bay	2.78	3.54	5.30
	Lemon Bay	3.09	4.00	6.11
	Charlotte Harbor	3.60	4.51	6.62
		3.66	4.51	6.48
		3.83	4.80	7.05
Sarasota Bay	Longboat Pass	2.92	3.83	5.94
	New Pass	3.05	4.00	6.21
	Big Sarasota Bay	3.05	4.00	6.21
	Venice Inlet	2.93	3.83	5.92
	Estero Bay	3.83	4.80	7.05

State	Waterway Name	ADCIRC Results (local mean sea level) 50-Year (m)	100-Year (m)	500-Year (m)
		3.67	4.60	6.76
	Gordon Pass	3.43	4.32	6.39
	Big Marco Pass	3.37	4.18	6.06
	Caxambas Bay	3.37	4.18	6.06
	First Bay	3.27	3.92	5.43
	Whitewater Bay	3.27	3.92	5.43
	Biscayne Bay	1.00	1.21	1.70
	Miami	1.00	1.21	1.70
	Bakers Haulover Inlet	0.82	0.99	1.38
	Turning Basin	0.82	0.99	1.38
	Hillsboro Bay	0.77	0.91	1.24
	Boca Raton Inlet	0.77	0.91	1.24
	South Lake worth Inlet	0.77	0.90	1.20
	Lake Worth Inlet	0.79	0.94	1.29
	Loxahatchee River	0.76	0.94	1.36
	St Lucie River	0.91	1.13	1.64
	Fort Pierce Inlet	1.17	1.45	2.10
	Sebastian Inlet	1.41	1.75	2.54
	Cape Canaveral	0.84	0.97	1.27
	Ponce De Leon Inlet	0.95	1.10	1.45
	Matanzas Inlet	2.12	2.46	3.25
	St Augustine Inlet	2.17	2.51	3.30
	St Johns River	2.58	3.02	4.04
	Nassau Sound	2.17	2.51	3.30
GEORGIA				
	St Marys River	3.06	3.60	4.85
	St Andrew Sound	3.53	4.32	6.15
	St Simons Sound	3.53	4.32	6.15
	Hampton River	3.31	3.96	5.47
	Altamaha River	3.31	3.96	5.47
	Sapelo	3.31	3.96	5.47
	Sapelo Sound	3.86	4.71	6.68
	St Catherines Sound	3.86	4.71	6.68
	Ossabaw Sound	3.42	4.30	6.34
	Wassaw Sound	3.42	4.30	6.34
	Savannah River	3.42	4.30	6.34
SOUTH CAROLINA	Calibogue Sound	3.42	4.30	6.34
	Port Royal Sound	3.34	4.05	5.70
	St Helena Sound	3.02	3.52	4.68
	North Edisto River	3.06	3.64	4.99
	Stono Inlet	3.06	3.64	4.99
	Lighthouse Inlet	3.06	3.64	4.99
	Charleston Harbor	2.92	3.59	5.15
	Breach Inlet	2.92	3.59	5.15
	Bulls Bay	2.92	3.59	5.15
	North Santee Bay	3.06	3.94	5.98
	Winyah Bay	3.42	4.39	6.64
	North Inlet	3.42	4.39	6.64
	Pawleys Inlet	3.42	4.39	6.64
	Midway Inlet	3.42	4.39	6.64
	Murrells Inlet	3.24	4.16	6.30
	Hog Inlet	3.24	4.02	5.83
	Little River Inlet	3.24	4.02	5.83
NORTH CAROLINA	Tubbs Inlet	3.24	4.02	5.83
	Shallotte Inlet	3.24	4.02	5.83
	Lockwoods Folly Inlet	2.07	2.53	3.60

DECK DRAINAGE CALCULATIONS

P.I. : 532650

Description: SR 25 (US 17) Over Thornhill Creek- Top of Super Elevation (above raised median and includes the turn lane)

County: Glynn

Preliminary Data Analysis Variables:

Yellow = Required Input

Wp =	48	ft	*The width of the area bring drained. Usually half the width of the crown deck or the entire super-elevated deck*
S =	Varies	ft/ft	*The longitudinal grade of the deck*
Sx =	0.036	ft/ft	*The cross-slope of the deck*
T =	16	ft	*The design spread, width of the flow on the deck*
n =	0.016	[ ]	*Manning's roughness coefficient, typically n = 0.016 for pavements*
C =	0.9	[ ]	*Runoff coefficient, typically C = 0.9 for pavements. See Table 1 in HEC-21 for other factors*

Geometric Variables:

g1 =	0.021961	ft/ft	*Grade 1, type in in terms of ft/ft*
g2 =	-0.007003	ft/ft	*Grade 2, type in in terms of ft/ft if any. Vertical curve must have g2*
Lvc =	335	ft	*Enter length of curve*
PVC =	560+75.95	[ ]	*Enter station for the beginning of curve*
Bridge Sta. =	561+74.00	[ ]	*Enter station for the beginning of bridge*
Bridge Len =	280	ft	*Length of bridge*

Select Grade

FLAT

CONSTAN

-->> VERTICAL

Other Significant Data:

Road class =	Major Collectors and Arterials	*Select road classification. This is also used for rainfall intensity calculation*
Nearest City =	Brunswick	*Select the nearest city to your project. This is used for rainfall intensity calculation*
Grates =	○ Neenah ◉ Hec-21 ○ Curb	*Select the inlet type to be used for drainage on the deck*
Inlet Type =	Circular Scupper	*Select design speed*
Vehicle Spd =	55 mph	

Auto-populated Values From Input:

Rtrn Period =	10	yr	*From GA Rainfall intensity chart*
n =	0.987		*From GA Rainfall intensity chart*
a =	250.550		*From GA Rainfall intensity chart*
b =	29.000		*Return period of rainfall event for the road class chosen*
Wd =	0.330	ft	*Width of grate/opening for the inlet type chosen*
Lg =	0.333	ft	*Length of grate/opening for the inlet type chosen*
d =	0.333	ft	*Hydroplaning depth, ~ 0.08 for 55 mph, and 0.047 for 65 mph*
i_calculated =	5.318	in/hr	*Rainfall intensity for this area*
Hydroplain =	**At Risk**		*Risk of hydroplaning at the rain intensity given based on the width and spread used*
Visibility =	**Reduced**		*Risk of impaired vision due to rain, using 4 in/hr due to splash and night time*

Neenah Grates Only

Determining K

ST:	4%	ft/ft
SL:	2%	ft/ft

Click link below to select

Select Grate

Determine K and Enter K

K = 8

DECK DRAINAG ALCULATIONS

P.I. : 532650

Description: SR 25 (US 17) Over Thornhill Creek- Top of Super Elevation (above raised median and includes the turn lane)

County: Glynn

Calculated Values:

L_{E1} (ft) =	155.95	ft
L_{E2} (ft) =	124.05	ft
High Point =	563+29.95	
End bridge sta =	564+54.00	

Final t_c =	20.567	min
i (in/hr) =	5.318	in/hr
t_g =	19.416	min
t_o =	1.150	min
t_c =	20.566	min
Si =	0.021961	ft/ft
Qi =	33.031	cfs
Li =	22.82	ft
Eoi =	0.05	
Vi =	7.168	ft/s
Voi =	1.777	ft/s
Rfi =	0.515	
Rsi =	0.001	
Ei =	0.028	
Lci =	177.77	ft
StoredL =	6787.87	
Enter a grac Su =	0.021961	
Also the spa Ki =	0.028384827	

You can round down the spacing of inlets further to your specifications. Remember the physical layout of the bridge such as joints or bents and space inlets accordingly.

Inlets Not Needed

Spacing of inlets from the high point to begin/end bridge

L_i	Long Side (ft)	Station	Short Side (ft)	Station	Local S (ft/ft)	Gutter Flow (cfs)
L_0	No Inlet	-	No Inlet	-	-	-
L_1	-	-	-	-	-	-
L_2	-	-	-	-	-	-
L_3	-	-	-	-	-	-
L_4	-	-	-	-	-	-
L_5	-	-	-	-	-	-
L_6	-	-	-	-	-	-
L_7	-	-	-	-	-	-
L_8	-	-	-	-	-	-
L_9	-	-	-	-	-	-
L_{10}	-	-	-	-	-	-
L_{11}	-	-	-	-	-	-
L_{12}	-	-	-	-	-	-
L_{13}	-	-	-	-	-	-
L_{14}	-	-	-	-	-	-
L_{15}	-	-	-	-	-	-
L_{16}	-	-	-	-	-	-
L_{17}	-	-	-	-	-	-
L_{18}	-	-	-	-	-	-
L_{19}	-	-	-	-	-	-
L_{20}	-	-	-	-	-	-
L_{21}	-	-	-	-	-	-
L_{22}	-	-	-	-	-	-
L_{23}	-	-	-	-	-	-
...	...	...	...	...	...	...
Total Length	**Under**		**Under**			

If inlets are NOT needed, make sure the design is not at risk for hydroplaning.

DECK DRAINAG ALCULATIONS

P.I. 532650

Description: SR 25 (US 17) Over Thornhill Creek (Bottom half of bridge below the raised median and turn lane)

County: Glynn

Preliminary Data Analysis Variables:

Yellow = Required Input

Wp =	40	ft	*The width of the area bring drained. Usually half the width of the crown deck or the entire super-elevated deck*
S =	Varies	ft/ft	*The longitudinal grade of the deck*
Sx =	0.036	ft/ft	*The cross-slope of the deck*
T =	8	ft	*The design spread, width of the flow on the deck*
n =	0.016	[ ]	*Manning's roughness coefficient, typically n = 0.016 for pavements*
C =	0.9	[ ]	*Runoff coefficient, typically C = 0.9 for pavements. See Table 1 in HEC-21 for other factors*

Geometric Variables:

g1 =	0.021961	ft/ft	*Grade 1, type in in terms of ft/ft*
g2 =	-0.007003	ft/ft	*Grade 2, type in in terms of ft/ft if any. Vertical curve must have g2*
Lvc =	335	ft	*Enter length of curve*
PVC =	560+75.95	[ ]	*Enter station for the beginning of curve*
Bridge Sta. =	561+74.00	[ ]	*Enter station for the beginning of bridge*
Bridge Len =	280	ft	*Length of bridge*

Select Grade

FLAT

CONSTAN

-->> VERTICAL

Other Significant Data:

Road class =	Major Collectors and Arterials	*Select road classification. This is also used for rainfall intensity calculation*
Nearest City =	Brunswick	*Select the nearest city to your project. This is used for rainfall intensity calculation*
Grates =	○ Neenah ◉ Hec-21 ○ Curb	*Select the inlet type to be used for drainage on the deck*
Inlet Type =	Circular Scupper	*Select design speed*
Vehicle Spd =	55 mph	

Auto-populated Values From Input:

Rtrn Period =	10	yr	*From GA Rainfall intensity chart*
n =	0.987		*From GA Rainfall intensity chart*
a =	250.550		*From GA Rainfall intensity chart*
b =	29.000		*Return period of rainfall event for the road class chosen*
Wd =	0.250	ft	*Width of grate/opening for the inlet type chosen*
Lg =	0.333	ft	*Length of grate/opening for the inlet type chosen*
d =	0.333	ft	*Hydroplaning depth, ~ 0.08 for 55 mph, and 0.047 for 65 mph*
i_calculated =	7.740	in/hr	*Rainfall intensity for this area*
Hydroplain =	**At Risk**		*Risk of hydroplaning at the rain intensity given based on the width and spread used*
Visibility =	**Reduced**		*Risk of impaired vision due to rain, using 4 in/hr due to splash and night time*

Neenah Grates Only

Determining K

ST:	4%	ft/ft
SL:	2%	ft/ft

Click link below to select

Select Grate

Determine K and Enter K

K = 8

DECK DRAINAGE CALCULATIONS

P.I. 532650

Description: SR 25 (US 17) Over Thornhill Creek (Bottom half of bridge below the raised median and turn lane)

County: Glynn

Calculated Values:

L_{E1} (ft) =	155.95	ft
L_{E2} (ft) =	124.05	ft
High Point =	563+29.95	
End bridge sta =	564+54.00	
Final t_c =	4.890	min
i (in/hr) =	7.740	in/hr
t_g =	4.002	min
t_o =	0.887	min
t_c =	4.890	min
Si =	0.021961	ft/ft
Qi =	5.190	cfs
Li =	22.82	ft
Eoi =	0.08	
Vi =	4.505	ft/s
Voi =	1.777	ft/s
Rfi =	0.754	
Rsi =	0.001	
Ei =	0.062	
Lci =	50.70	ft
StoredL =	1336.27	
Enter a grac Su =	0.021961	
Also the spa Ki =	0.062488222	

You can round down the spacing of inlets further to your specifications. Remember the physical layout of the bridge such as joints or bents and space inlets accordingly.

Inlets Not Needed

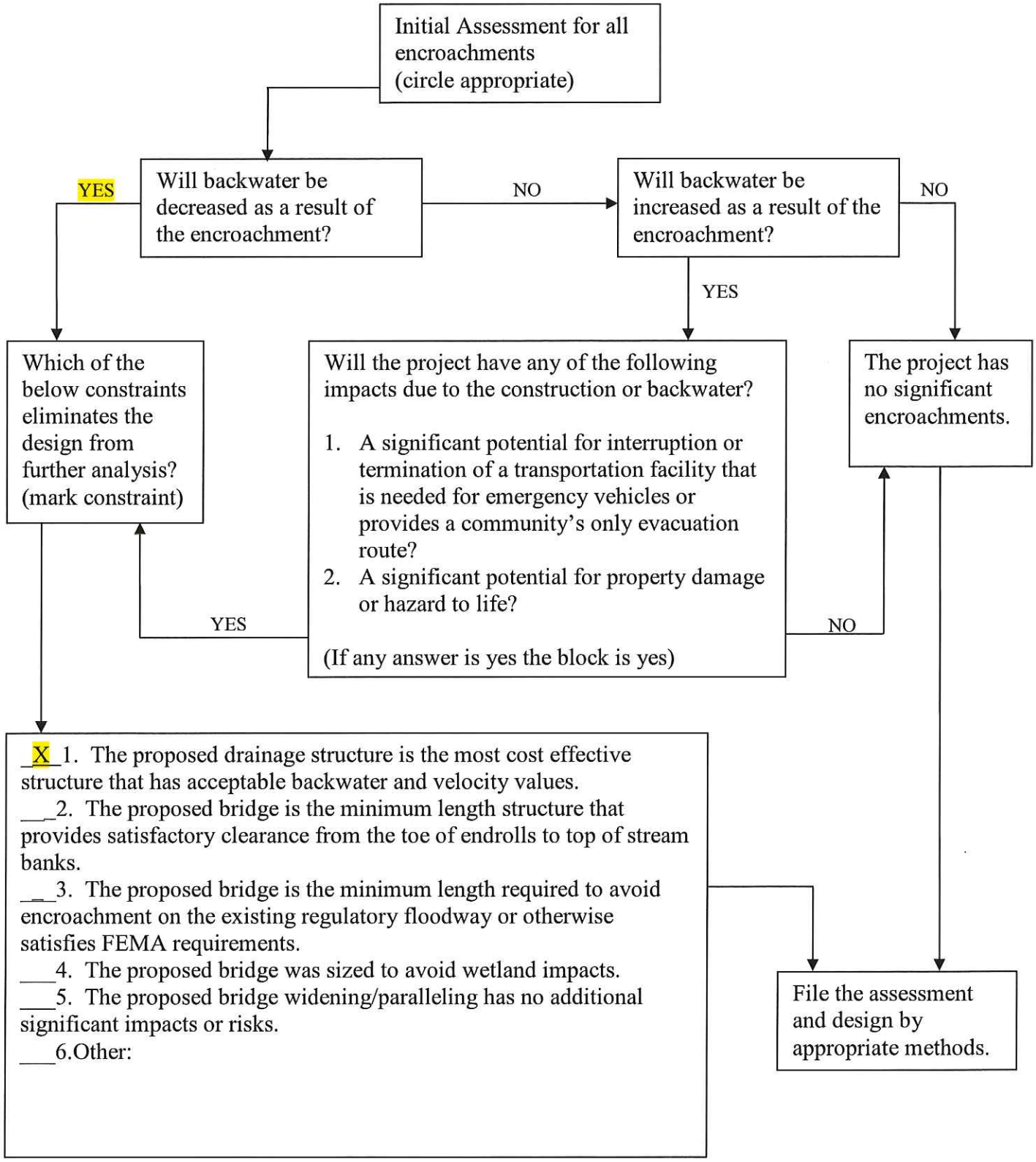
Spacing of inlets from the high point to begin/end bridge

L_i	Long Side (ft)	Station	Short Side (ft)	Station	Local S (ft/ft)	Gutter Flow (cfs)
L_0	No Inlet	-	No Inlet	-	-	-
L_1	-	-	-	-	-	-
L_2	-	-	-	-	-	-
L_3	-	-	-	-	-	-
L_4	-	-	-	-	-	-
L_5	-	-	-	-	-	-
L_6	-	-	-	-	-	-
L_7	-	-	-	-	-	-
L_8	-	-	-	-	-	-
L_9	-	-	-	-	-	-
L_{10}	-	-	-	-	-	-
L_{11}	-	-	-	-	-	-
L_{12}	-	-	-	-	-	-
L_{13}	-	-	-	-	-	-
L_{14}	-	-	-	-	-	-
L_{15}	-	-	-	-	-	-
L_{16}	-	-	-	-	-	-
L_{17}	-	-	-	-	-	-
L_{18}	-	-	-	-	-	-
L_{19}	-	-	-	-	-	-
L_{20}	-	-	-	-	-	-
L_{21}	-	-	-	-	-	-
L_{22}	-	-	-	-	-	-
L_{23}	-	-	-	-	-	-
...	...	...	...	...	...	...
Total Length	**Under**		**Under**			

If inlets are NOT needed, make sure the design is not at risk for hydroplaning.

APPENDIX B

RISK ASSESSMENT



SITE INSPECTION PHOTOS

Road Centerline Looking North Toward Bridge

Neighborhood in the Floodplain (Southwest of Bridge)

SITE INSPECTION PHOTOS CONTINUED…

Downstream Face of Bridge

Contraction Scour at South Endroll

SITE INSPECTION PHOTOS CONTINUED…

Thornhill Creek Downstream of Bridge

Upstream Floodplain and Old Roadbed

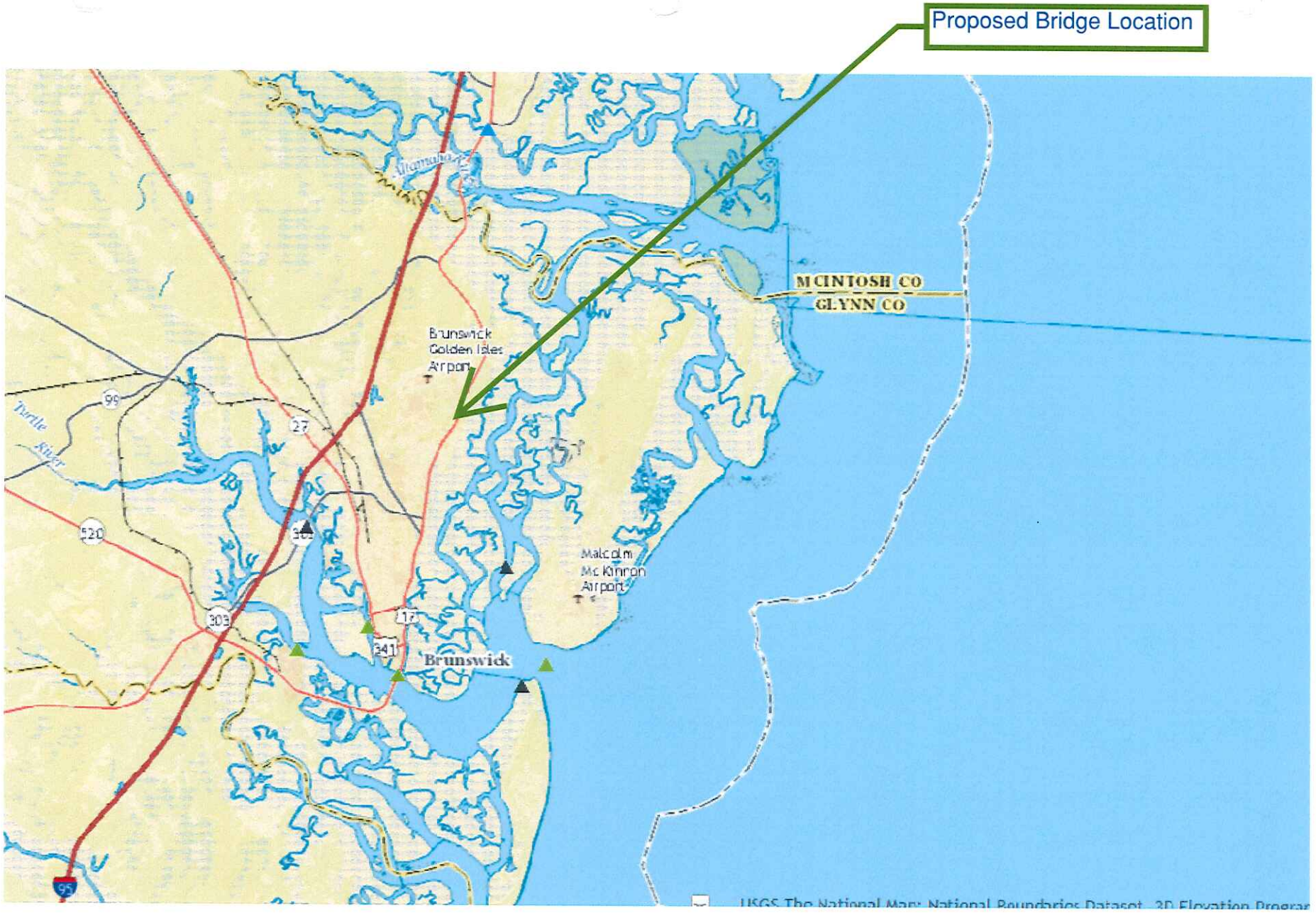
SITE INSPECTION PHOTOS CONTINUED…

Upstream Face of Bridge

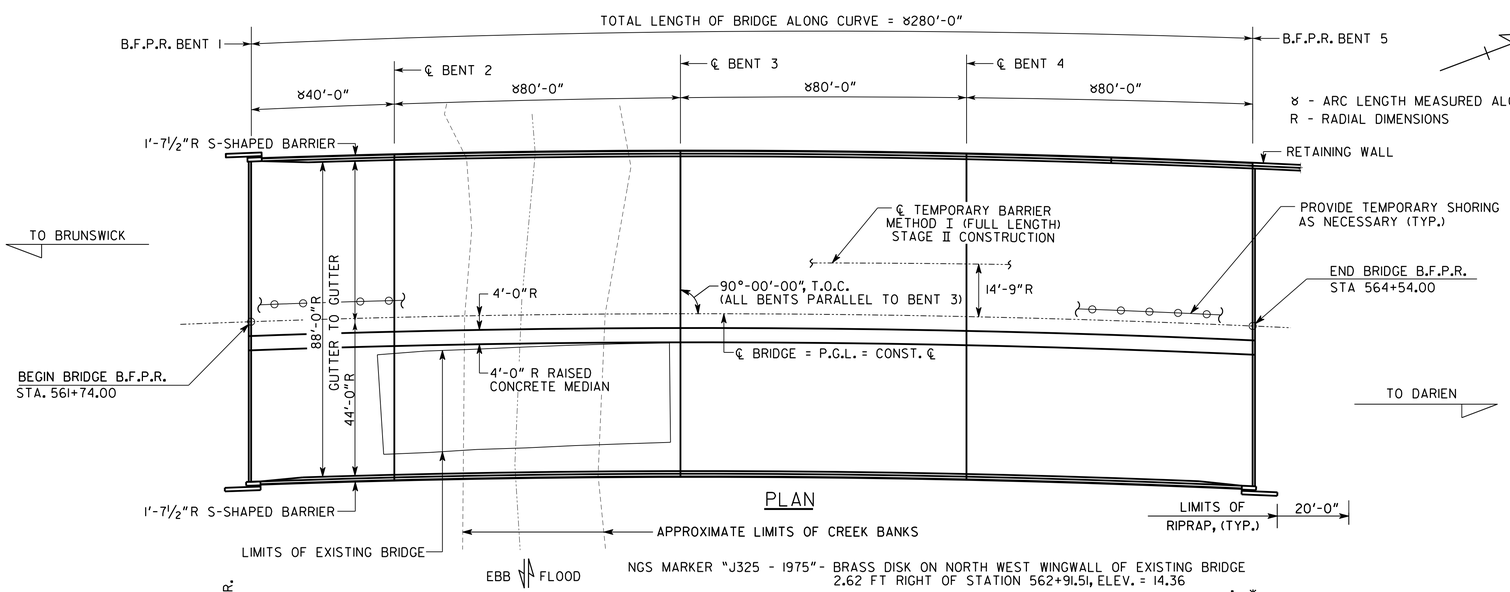
Thornhill Creek Upstream of Bridge

SITE INSPECTION PHOTOS CONTINUED…

Back, Mackay and Frederica Rivers Converging at St. Simons Sound (South of Bridge)


Proposed Bridge Location
MCINTOSH CO
GLYNN CO
Brunswick
Golden Isles
Airport
Malcolm
McKinnon
Airport
Brunswick
Turtle
River
99
27
520
303
17
341
95

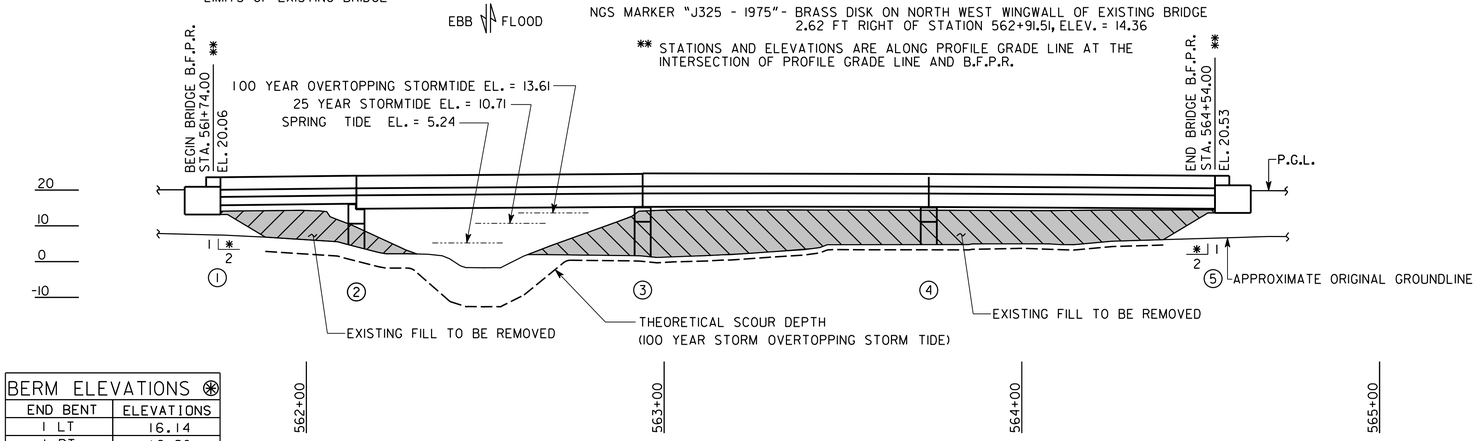
P.I. NO. 532650



PLAN

NGS MARKER "J325 - 1975" - BRASS DISK ON NORTH WEST WINGWALL OF EXISTING BRIDGE 2.62 FT RIGHT OF STATION 562+91.51, ELEV. = 14.36

** STATIONS AND ELEVATIONS ARE ALONG PROFILE GRADE LINE AT THE INTERSECTION OF PROFILE GRADE LINE AND B.F.P.R.



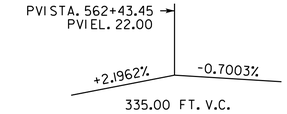
ELEVATION

BERM ELEVATIONS ⊛	
END BENT	ELEVATIONS
1 LT	16.14
1 RT	12.98
7 LT	16.61
7 RT	13.45

⊛ NOTE: FOR BRIDGE ENDROLL STAKING PURPOSES ONLY.

N.

ȣ - ARC LENGTH MEASURED ALONG CURVE AT CONST. ℄
R - RADIAL DIMENSIONS



PROPOSED VERTICAL CURVE

BRIDGE CONSISTS OF

1 - 40'-0" TYPE I MOD PSC BEAM SPAN ---------- SPECIAL DESIGN
3 - 80'-0" TYPE III PSC BEAM SPANS ---------- SPECIAL DESIGN
2 - PILE END BENTS ---------- SPECIAL DESIGN
3 - CONCRETE INTERMEDIATE BENTS ---------- SPECIAL DESIGN
24" TYPE I RIP RAP

TRAFFIC DATA

TRAFFIC ---------- ADT = 7350 (2022)
ADT = 8250 (2042)
DESIGN SPEED ---------- 55 MPH
TRUCKS ---------- 2%
24 HR TRUCKS ---------- 3.5%
DIRECTIONAL ---------- 57%

EXISTING UTILITIES

OVERHEAD UTILITIES LOCATED 30 FT UPSTREAM OF EXISTING BRIDGE
TELECOMMUNICATION CONDUITS ATTACHED TO UPSTREAM AND DOWNSTREAM SIDES OF EXISTING BRIDGE

DESIGN DATA

SPECIFICATIONS ---------- AASHTO LRFD 7TH EDITION, 2014
DESIGN VEHICLE LIVE LOAD ---------- HL-93
FUTURE PAVING ALLOWANCE ---------- 30 LBS PER SQ FT

NOTES

CROSS-SLOPE - THE PROPOSED BRIDGE DECK SHALL HAVE A CONSTANT CROSS-SLOPE OF 3.6% SLOPING DOWN TO THE RIGHT.

DECK DRAINS - ELIMINATE DECK DRAINS ON BRIDGE.

BENT LAYOUT - ALL BENTS ARE PARALLEL TO BENT 4

BEAM ELEVATION - MINIMUM BOTTOM OF BEAM ELEVATION FOR PROPOSED BRIDGE SHALL BE NO LOWER THAN ELEVATION 12.71.

BRIDGE REMOVAL - REMOVE EXISTING BRIDGE. REMOVE EXISTING SUBSTRUCTURE AS PER THE SPECIFICATIONS.

TRAFFIC CONTROLS - TRAFFIC TO BE MAINTAINED BY STAGE CONSTRUCTION. SEE CONSTRUCTION SEQUENCE FOR DETAILS.

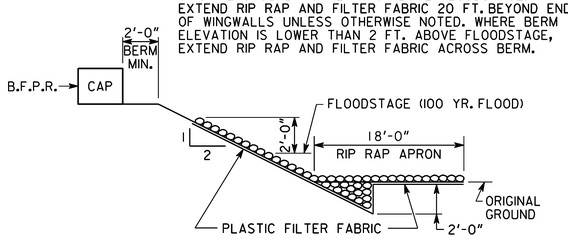
DRAINAGE DATA

DRAINAGE AREA ---------- 2.6 SQ MILES

STORM TIDE FLOODS

FLOOD FREQUENCY	TOTAL DISCHARGE	MEAN VELOCITY	AREA OF OPENING UNDER FLOODSTAGE
25 YEAR	834 CFS	2.30 FPS	362 SQ FT
100 YEAR (OVERTOPPING)	7,448 CFS	4.57 FPS	1,630 SQ FT

PLACE RIP RAP AND FILTER FABRIC FROM 2 FT. BELOW ORIGINAL GROUND TO 2 FT. ABOVE FLOODSTAGE. EXTEND RIP RAP AND FILTER FABRIC 20 FT. BEYOND END OF WINGWALLS UNLESS OTHERWISE NOTED. WHERE BERM ELEVATION IS LOWER THAN 2 FT. ABOVE FLOODSTAGE, EXTEND RIP RAP AND FILTER FABRIC ACROSS BERM.



RIP RAP DETAIL

NO SCALE

P.I. STA. = 564+23.84
P.C. STA. = 554+69.23
P.T. STA. = 573+33.12
Δ = 30°-30'-44.00" (RT)
D = 01°-38'-13.28"
T = 954.61 FT.
L = 1863.89 FT.
R = 3500.00 FT.
E = 127.85 FT.
S.E. = 3.6%

PROPOSED HORIZONTAL CURVE

THEORETICAL SCOUR DEPTHS (FT)			
100 YEAR OVERTOPPING STORM TIDE			
BENT LOCATION	GENERAL	LOCAL	TOTAL
BENT 2	0.9	3.1	4.0
BENT 3	0.1	6.9	7.0
BENT 4	0.1	6.9	7.0

NOTE: THE 100 YEAR SCOUR IN THE CREEK IS 10.9 FT

EXISTING BRIDGE SERIAL NO. 127-0009-0
EXISTING BRIDGE I.D. NO. 127-00025D-019.05N
PROJECT P.I. NO. 532650-
BRIDGE NO. 1

GEORGIA
DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION-OFFICE OF BRIDGES AND STRUCTURES

PRELIMINARY LAYOUT
SR 25 (US 17) OVER THORNHILL CREEK
GLYNN COUNTY STP00-0009-02(092)

SCALE 1" = 20-0" (UNLESS OTHERWISE NOTED) FEBRUARY 2016

DRAWING NO. 35-0001
BRIDGE SHEET 1 OF 2

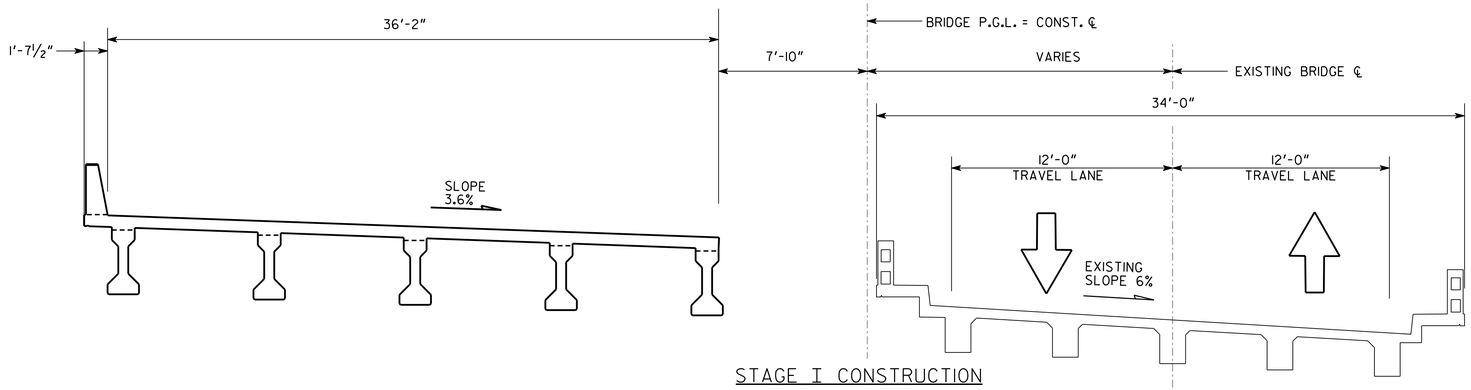
REVISIONS | DATE | BY

DESIGNED RCM | CHECKED STB | REVIEWED DLC/SKG
DRAWN RCM | DESIGN GROUP STB | APPROVED WMD

1 INCH WHEN PRINTED FULL SIZE

USER:rmoreman 4/12/2016 9:54:54 AM

P.I. NO. 532650

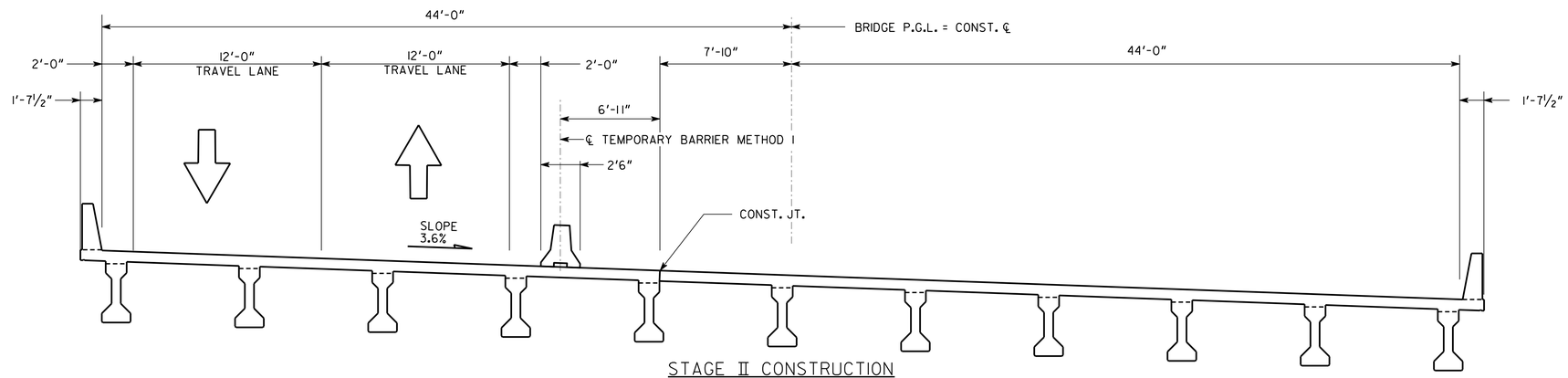


STAGE I CONSTRUCTION
TYPICAL SECTION
SPAN 2 SHOWN
(LOOKING AHEAD)

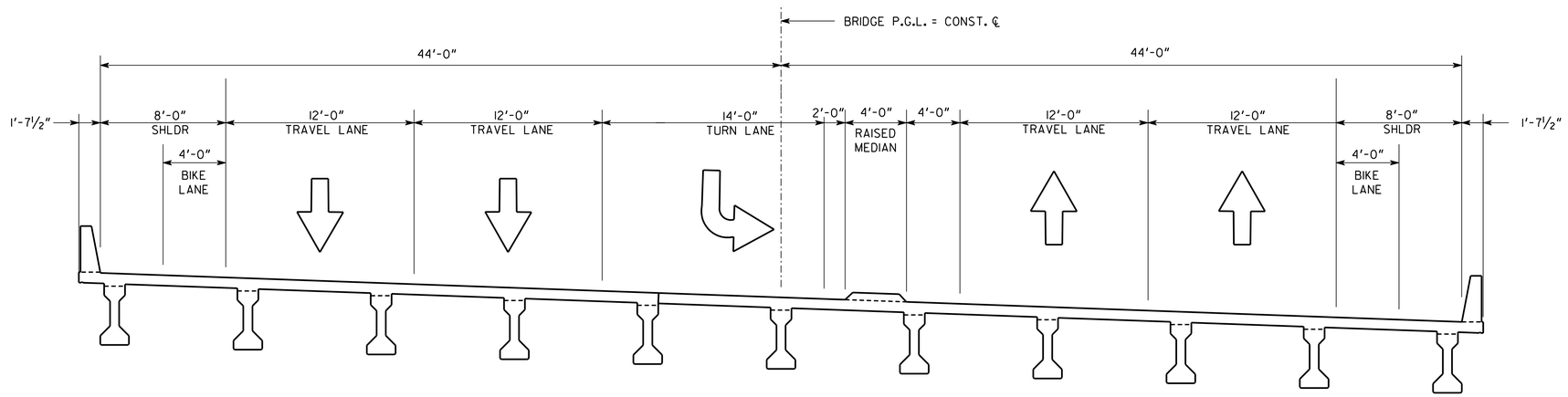
CONSTRUCTION SEQUENCE

1. PLACE TEMPORARY SHORING AS NECESSARY. MAINTAIN 2 - 12'-0" TRAFFIC LANES ON EXISTING BRIDGE.
2. BUILD STAGE I ACCORDING TO PLANS.
3. PLACE TEMPORARY BARRIER ACCORDING TO PLANS. SHIFT TRAFFIC TO STAGE I CONSTRUCTION, MAINTAINING 2 - 12'-0" TRAVEL LANES.
4. REMOVE EXISTING BRIDGE.
5. COMPLETE STAGE II CONSTRUCTION ACCORDING TO PLANS.
6. REMOVE TEMPORARY BARRIER, SHIFT TRAFFIC TO PERMANENT LOCATIONS, AND OPEN COMPLETED BRIDGE TO TRAFFIC.

THE AFOREMENTIONED SEQUENCE SHALL BE COORDINATED WITH ROADWAY OPERATIONS, SEE ROADWAY PLANS. IN LIEU OF THE ABOVE CONSTRUCTION SEQUENCE, THE CONTRACTOR MAY SUBMIT A PROPOSED CONSTRUCTION SEQUENCE FOR APPROVAL.



STAGE II CONSTRUCTION
TYPICAL SECTION
SPAN 2 SHOWN
(LOOKING AHEAD)



COMPLETE DECK SECTION
SPAN 2 SHOWN
(LOOKING AHEAD)

BRIDGE NO. 1

GEORGIA
DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION-OFFICE OF BRIDGES & STRUCTURES

CONSTRUCTION STAGING
SR 25 (US 17) OVER THORNHILL CREEK
GLYNN COUNTY STP00-0009-02(092)

REVISIONS	DATE	BY

DRAWING NO. 35-0002
BRIDGE SHEET 2 OF 2

NOT TO SCALE — FEBRUARY 2016

DESIGNED RCM — CHECKED STB — REVIEWED DLC/SKG
DRAWN RCM — DESIGN GROUP STB — APPROVED WMD

1 INCH WHEN PRINTED FULL SIZE

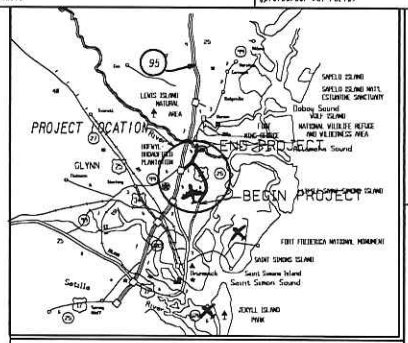
2/18/2016 tmcdonald | GPLOT-V8 gplotborder-V8(-PG.tb) | 532650_01-0001.dgn GRMCOV | GDOT | P.I. No. 532650

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

PLAN AND PROFILE OF PROPOSED SR25/US17 FROM YACHT DRIVE TO SR99
STP00-0009-02(092)
GLYNN COUNTY

FEDERAL AID PROJECT

FEDERAL ROUTE • US17
STATE ROUTE • SR25
P.I.NO. 532650



LOCATION SKETCH

DESIGN DATA:
TRAFFIC A.D.T.: 7350 (2022)
TRAFFIC A.D.T.: 8250 (2042)
TRAFFIC D.H.V.: 870 (2042)
DIRECTIONAL DIST: 57%
% TRUCKS: 2
24 HR.TRUCKS %: 3.5
SPEED DESIGN: 55

LOCATION & DESIGN APPROVAL DATE:

FUNCTIONAL CLASS:
MINOR URBAN ARTERIAL

THIS PROJECT IS 100% IN GLYNN COUNTY AND IS 100% IN CONG.DIST.NO.1.

PROJECT DESIGNATION: EXEMPT

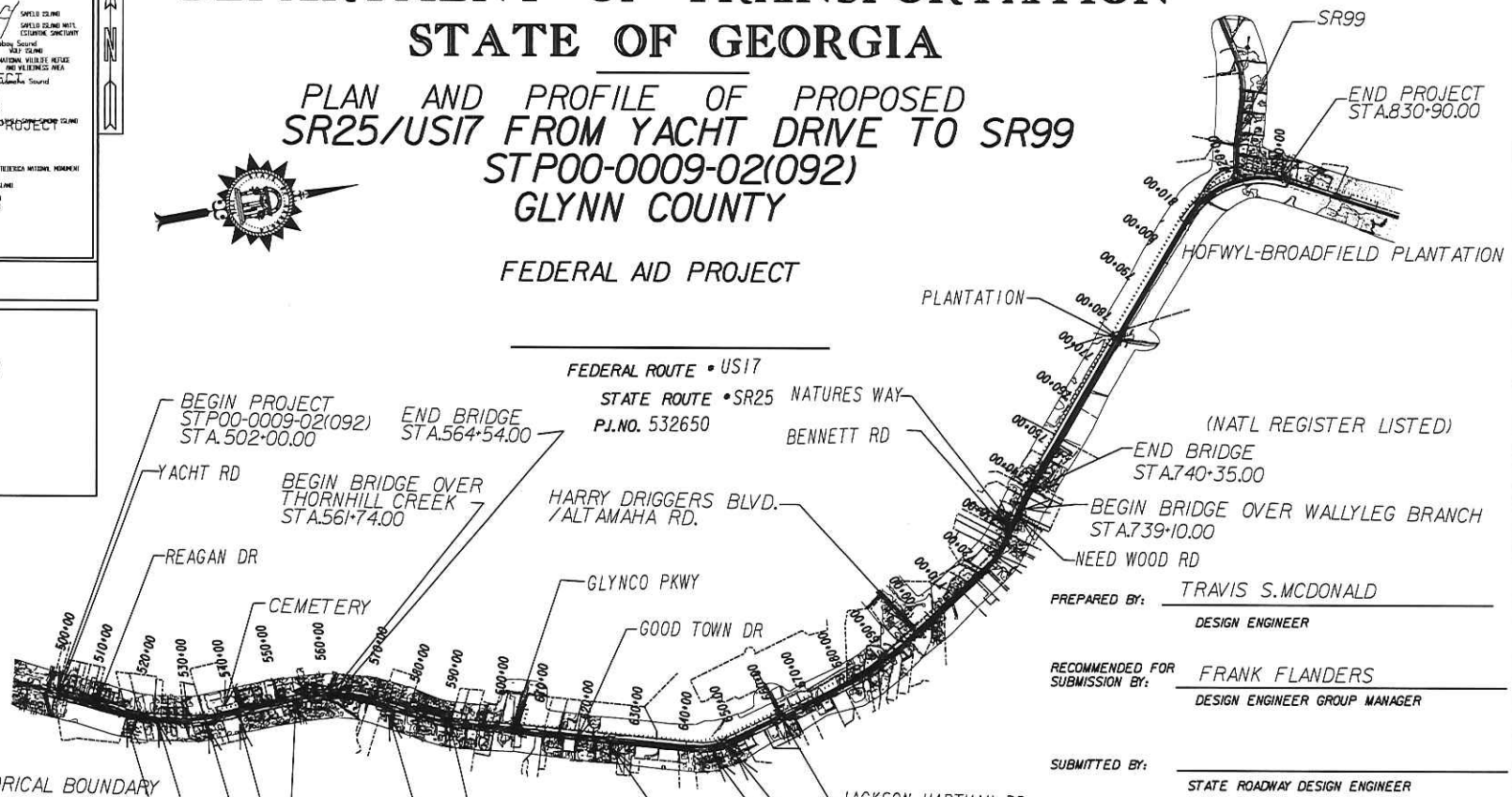
DESIGNED IN ENGLISH UNITS.

THIS PROJECT HAS BEEN PREPARED USING THE HORIZONTAL GEORGIA COORDINATE SYSTEM OF 1984 (NAD 1983)1/94 WEST ZONE, AND THE NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988.

NOTE:
ALL REFERENCES IN THIS DOCUMENT, WHICH INCLUDES ALL PAPERS, WRITINGS, DOCUMENTS, DRAWINGS, OR PHOTOGRAPHS USED, OR TO BE USED IN CONNECTION WITH THIS DOCUMENT, TO "STATE HIGHWAY DEPARTMENT OF GEORGIA", "STATE HIGHWAY DEPARTMENT", "GEORGIA STATE HIGHWAY DEPARTMENT", "HIGHWAY DEPARTMENT", OR "DEPARTMENT" WHEN THE CONTEXT THEREOF MEANS THE STATE HIGHWAY DEPARTMENT OF GEORGIA, AND SHALL BE DEEMED TO MEAN THE DEPARTMENT OF TRANSPORTATION.

MID-POINT COORDINATES
STA STA.666+45.00
N-462948.4665
E-884066.0201

THE DATA, TOGETHER WITH ALL OTHER INFORMATION SHOWN ON THESE PLANS OR IN ANYWAY INDICATED THEREBY, WHETHER BY DRAWINGS OR NOTES, OR IN ANY OTHER MANNER, ARE BASED UPON FIELD INVESTIGATIONS AND ARE BELIEVED TO BE INDICATIVE OF ACTUAL CONDITIONS. HOWEVER, THE SAME ARE SHOWN AS INFORMATION ONLY, ARE NOT GUARANTEED, AND DO NOT BIND THE DEPARTMENT OF TRANSPORTATION IN ANY WAY. THE ATTENTION OF BIDDER IS SPECIFICALLY DIRECTED TO SUBSECTIONS 102.04, 102.05, AND 104.03 OF THE SPECIFICATIONS.



LENGTH OF PROJECT	COUNTY No.127 Project No. STP00-0009-02(092) MILES
NET LENGTH OF ROADWAY	6.324
NET LENGTH OF BRIDGES	0.0113
NET LENGTH OF PROJECT	6.324
NET LENGTH OF EXCEPTIONS	0.00
GROSS LENGTH OF PROJECT	6.229

SCALE IN FEET
0 1000 2000 4000

PREPARED BY: TRAVIS S. MCDONALD
DESIGN ENGINEER

RECOMMENDED FOR SUBMISSION BY: FRANK FLANDERS
DESIGN ENGINEER GROUP MANAGER

SUBMITTED BY:
STATE ROADWAY DESIGN ENGINEER

DATE CHIEF ENGINEER

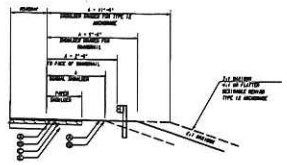
PLANS COMPLETED	- -
REVISIONS	

DRAWING No. 01-0001

07/31/2015

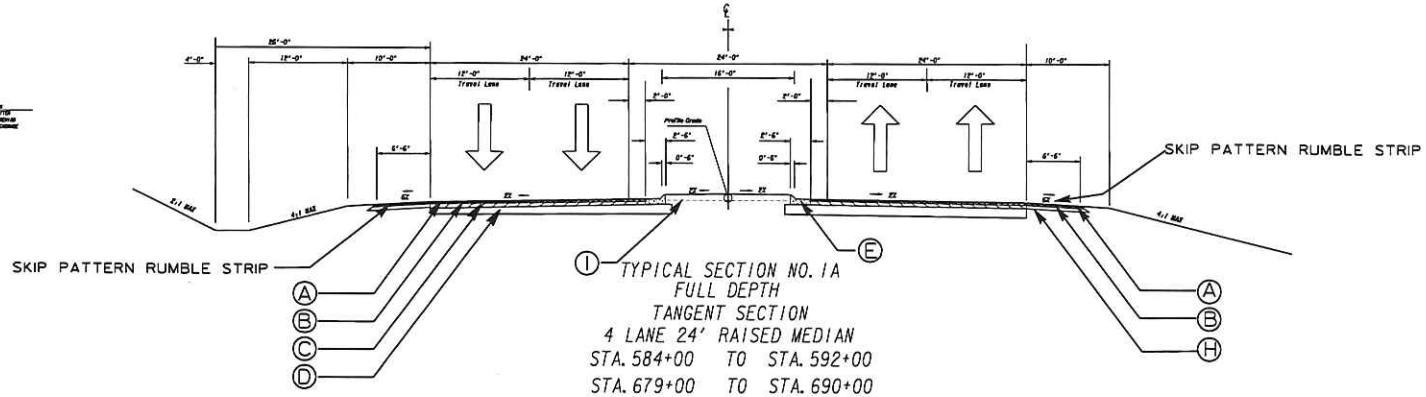
2/18/2016	5:19:58 PM	GPLOI-V8	532650-.05.dgn	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
devlnwilliams		gplotborder-V8I-PO.tbl		GA			

SR 25/US 17 FROM YACHT DR. TO SR99

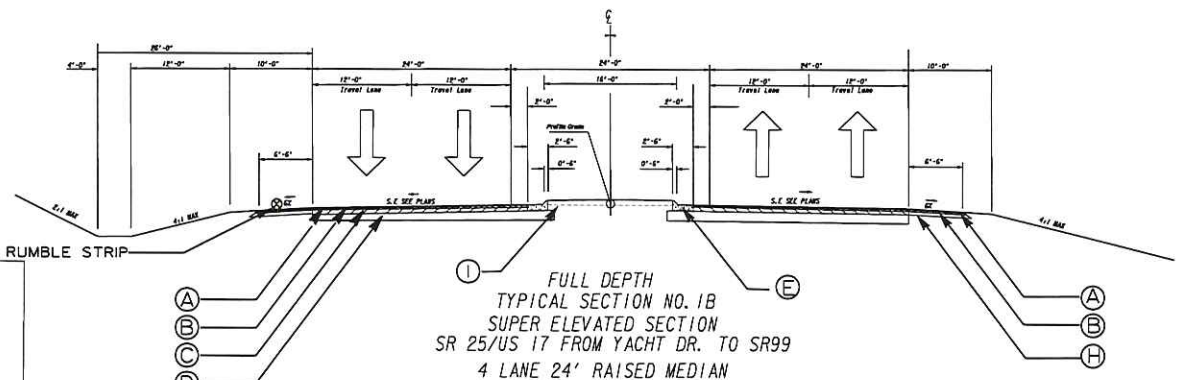


ASPHALT PAVING SHOULDER DETAIL FOR GUARDRAIL

SEE PLANS FOR LOCATIONS



TYPICAL SECTION NO. 1A
FULL DEPTH
TANGENT SECTION
4 LANE 24' RAISED MEDIAN
STA. 584+00 TO STA. 592+00
STA. 679+00 TO STA. 690+00
STA. 705+00 TO STA. 717+00



FULL DEPTH
TYPICAL SECTION NO. 1B
SUPER ELEVATED SECTION
SR 25/US 17 FROM YACHT DR. TO SR99
4 LANE 24' RAISED MEDIAN

SEE ROADWAY PLANS FOR SUPERELEVATION RATES AND TRANSITIONS

REQUIRED PAVEMENT:

A- 165 lbs/yd^2 RECYCLED ASPH CONC 12.5 MM SUPERPAVE GP 2 ONLY, INCL BITUM MATL AND H LIME

B- 220 lbs/yd^2 RECYCLED ASPH CONC 19 MM SUPERPAVE GP 1 OR 2, INCL BITUM MATL AND H LIME

C- 330 lbs/yd^2 RECYCLED ASPH CONC 25 MM SUPERPAVE GP 1 OR 2, INCL BITUM MATL AND H LIME

D- GR AGGR BASE CRS, 8 INCH, INCL MATL

E- CONCRETE CURB AND GUTTER 8"X30" TP7

F- RECYCLED ASPH CONC LEVELING, INCL BITUM MATERIAL & H LIME

G- MILL ASPH CONC PVMT, 3.5 INCH

H- GR AGGR BASE CRS, 6 INCH, INCL MATL

I- CONCRETE MEDIAN 4"

GDOT

ROADWAY DESIGN

REVISION DATES

STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION
OFFICE: ROADWAY DESIGN
TYPICAL SECTIONS
SR25/US17 FROM YACHT DR. TO SR99

DRAWING No. 05-001

01/26/2015 GPLN

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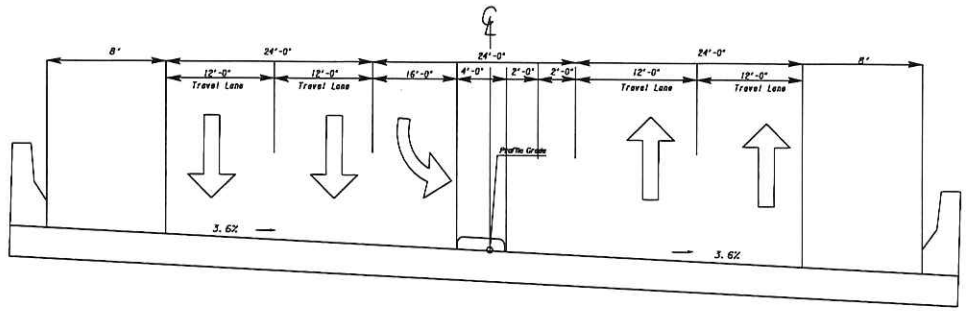
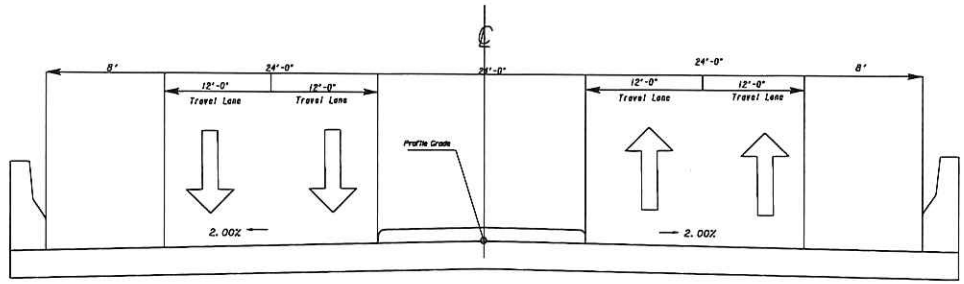
SR25/US17 BRIDGE SECTION

TYPICAL SECTION



BRIDGE OVER THORNHILL CREEK

STA. 561+74.00 TO STA. 564+54.00



BRIDGE OVER WALLEYLEG BRANCH

STA. 739+10.00 TO STA. 740+35.00

REQUIRED PAVEMENT:

A- 165 lbs/yd^2 RECYCLED ASPH CONC 12.5 MM SUPERPAVE GP 2 ONLY, INCL BITUM MATL AND H LIME

B- 220 lbs/yd^2 RECYCLED ASPH CONC 19 MM SUPERPAVE GP 1 OR 2, INCL BITUM MATL AND H LIME

C- 440 lbs/yd^2 RECYCLED ASPH CONC 25 MM SUPERPAVE GP 1 OR 2, INCL BITUM MATL AND H LIME

D- GR AGGR BASE CRS, 8 INCH, INCL MATL

E- 7¼" CONCRETE MEDIAN w/Type 7 curb face

F- RECYCLED ASPH CONC LEVELING, INCL BITUM MATERIAL & H LIME

G- MILL ASPH CONC PVMT, VARIABLE DEPTH

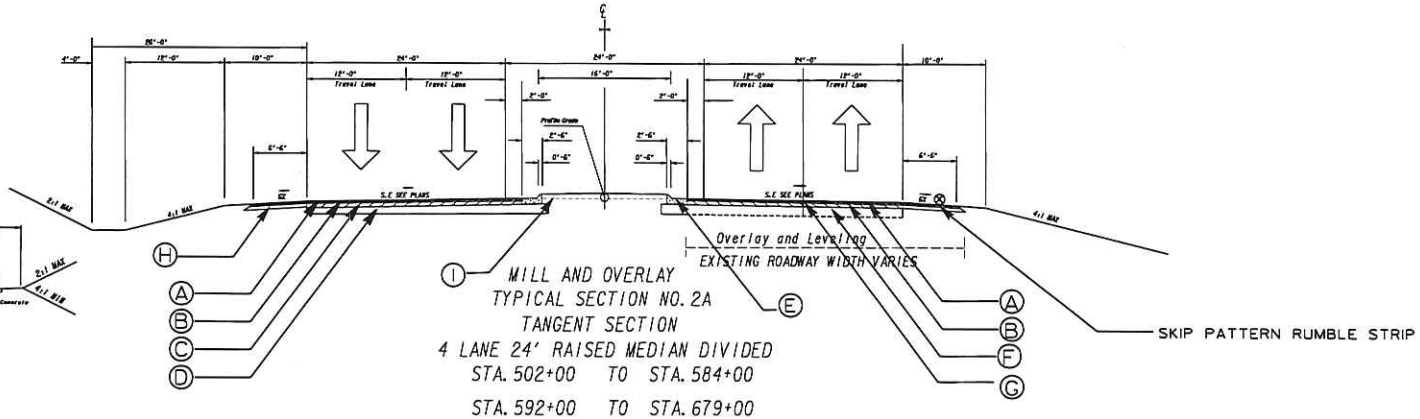
GEORGIA
DEPARTMENT OF TRANSPORTATION

REVISION DATES

STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION
OFFICE: ROADWAY DESIGN
TYPICAL SECTIONS
GLYNN COUNTY
SR25/US17 FROM YACHT DR. TO SR99

DRAWING No. 05-002

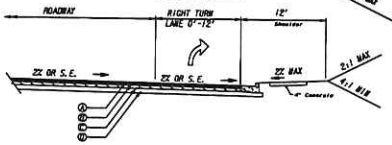
SR 25/US 17 FROM YACHT DR. TO SR99



MILL AND OVERLAY
TYPICAL SECTION NO. 2A
TANGENT SECTION
4 LANE 24' RAISED MEDIAN DIVIDED

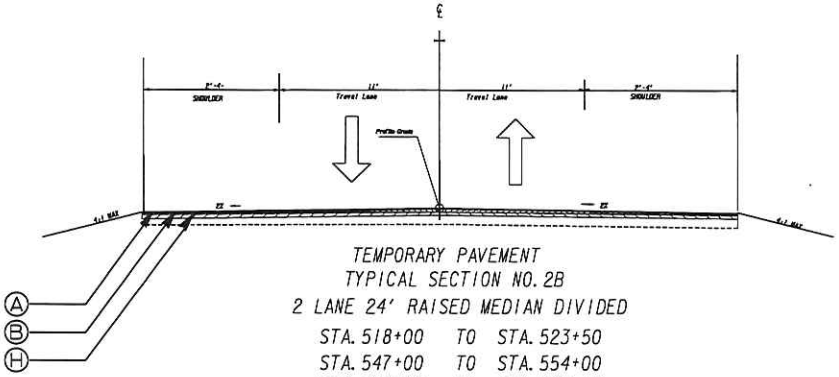
STA. 502+00 TO STA. 584+00
STA. 592+00 TO STA. 679+00
STA. 690+00 TO STA. 705+00
STA. 717+00 TO STA. 830+90

PHILEMA ROAD



RIGHT TURN DETAIL

SR 25/US17 & SR99



TEMPORARY PAVEMENT
TYPICAL SECTION NO. 2B
2 LANE 24' RAISED MEDIAN DIVIDED

STA. 518+00 TO STA. 523+50
STA. 547+00 TO STA. 554+00
STA. 690+00 TO STA. 696+50
STA. 717+00 TO STA. 724+50
STA. 717+00 TO STA. 724+50

REQUIRED PAVEMENT:

A- 165 lbs/yd^2 RECYCLED ASPH CONC 12.5 MM SUPERPAVE GP 2 ONLY, INCL BITUM MATL AND H LIME
B- 220 lbs/yd^2 RECYCLED ASPH CONC 19 MM SUPERPAVE GP 1 OR 2, INCL BITUM MATL AND H LIME
C- 330 lbs/yd^2 RECYCLED ASPH CONC 25 MM SUPERPAVE GP 1 OR 2, INCL BITUM MATL AND H LIME
D- GR AGGR BASE CRS, 8 INCH, INCL MATL
E- CONCRETE CURB AND GUTTER 8"X30" TP7
F- RECYCLED ASPH CONC LEVELING, INCL BITUM MATERIAL & H LIME
G- MILL ASPH CONC PVMT, 3.5 INCH
H- GR AGGR BASE CRS, 6 INCH, INCL MATL
I- CONCRETE MEDIAN 4"

GDOT
ROADWAY DESIGN

REVISION DATES

STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION
OFFICE: ROADWAY DESIGN
TYPICAL SECTIONS
SR25/US17 FROM YACHT DR. TO SR99
DRAWING No. 05-002

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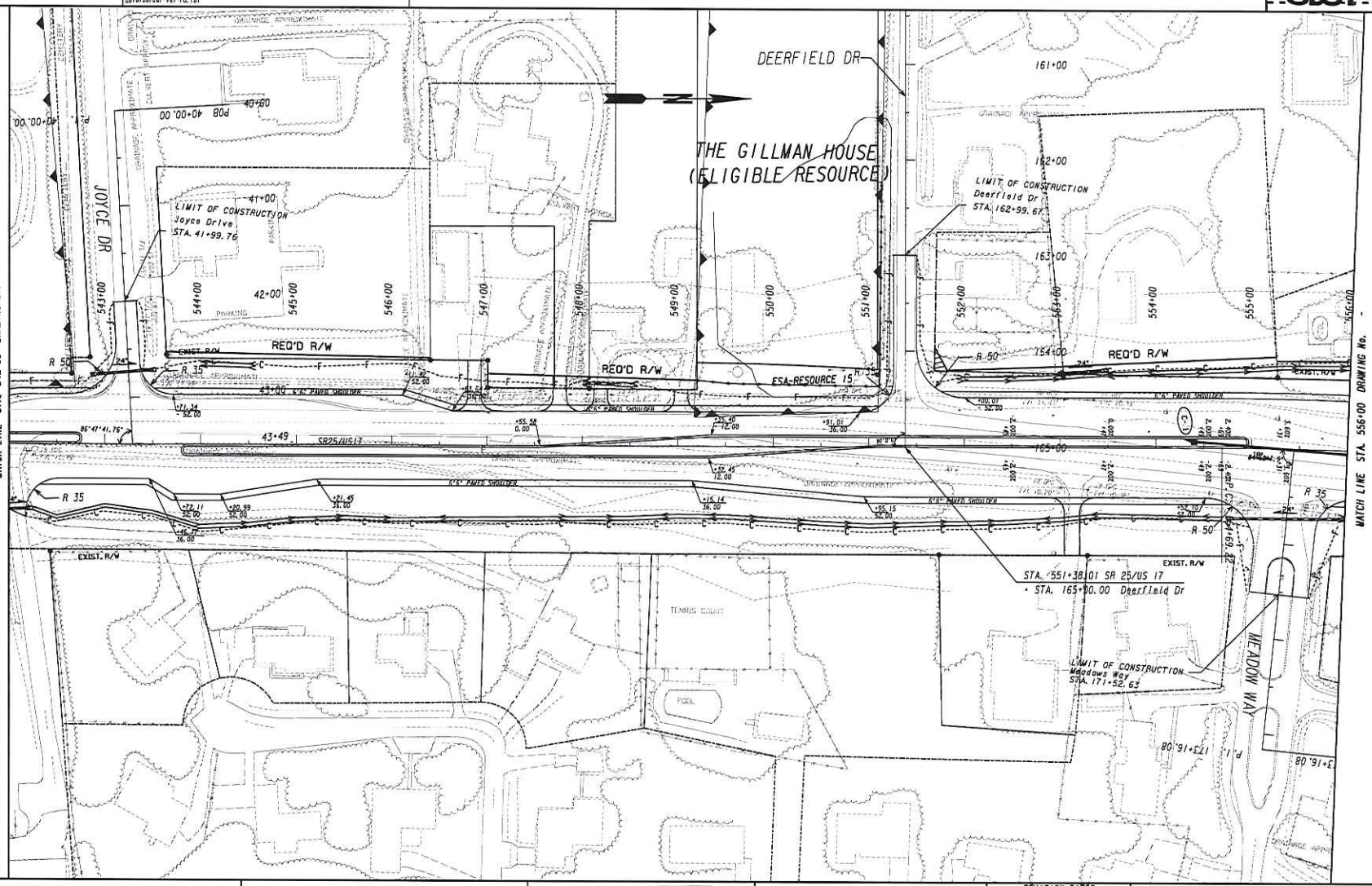
P.I. No. 532650



BEGIN LIMIT OF ACCESS	BLA
END LIMIT OF ACCESS	ELA
LIMIT OF ACCESS	
REQ'D R/W & LIMIT OF ACCESS	
ORANGE BARRIER FENCE	
ESA - ENV. SENSITIVE AREA (SEE ERIT TABLE)	
PROPERTY AND EXISTING R/W LINE	
REQUIRED R/W LINE	
CONSTRUCTION LIMITS	
EASEMENT FOR CONSTR & MAINTENANCE OF SLOPES	
EASEMENT FOR CONSTR OF SLOPES	
EASEMENT FOR CONSTR OF DRIVES	

GDOT

ROADWAY DESIGN

SCALE IN FEET
0 50 100 200

REVISION DATES

MAINLINE PLAN
SR25/US17 FROM YACHT DRIVE TO SR99
STA. 542+00 TO STA. 556+00

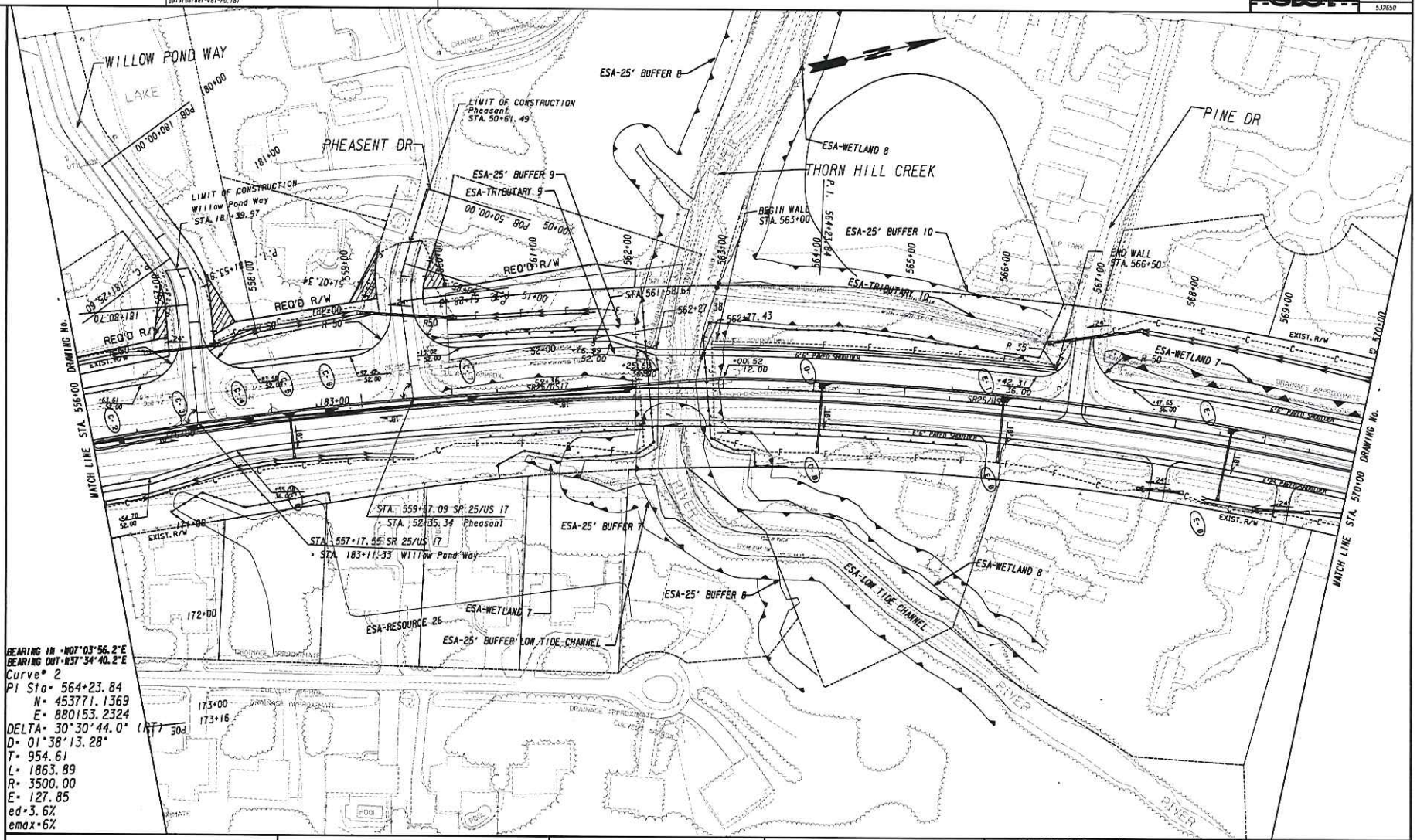
CHECKED:		DATE:	
BACKCHECKED:		DATE:	
CORRECTED:		DATE:	
VERIFIED:		DATE:	

DRAWING No. 13-0004

2/25/2016 11:31:02 AM GPLOT-V8 537650_13-0005.dgn

mcdonald splotborder-V8I-PO.tbl

GDOT P.I. No. 537650



BEARING IN = N07°03'56.2"E
BEARING OUT = N37°34'40.2"E
Curve # 2
PI Sta = 564+23.84
N = 453771.1369
E = 880153.2324
DELTA = 30°30'44.0" (RT)
D = 01°38'13.28"
T = 954.61
L = 1863.89
R = 3500.00
E = 127.85
ed = 3.6%
emax = 6%

BEGIN LIMIT OF ACCESS ..... BLA
END LIMIT OF ACCESS ..... ELA
LIMIT OF ACCESS
REQ'D R/W & LIMIT OF ACCESS
ORANGE BARRIER FENCE
ESA - ENV. SENSITIVE AREA (SEE ERIT TABLE)

PROPERTY AND EXISTING R/W LINE
REQUIRED R/W LINE
CONSTRUCTION LIMITS
EASEMENT FOR CONSTR & MAINTENANCE OF SLOPES
EASEMENT FOR CONSTR OF SLOPES
EASEMENT FOR CONSTR OF DRIVES

GDOT

ROADWAY DESIGN

SCALE IN FEET 0 50 100 200

REVISION DATES

MAINLINE PLAN

SR25/US17 FROM YACHT DRIVE TO SR99
STA. 556+00 TO STA. 570+00

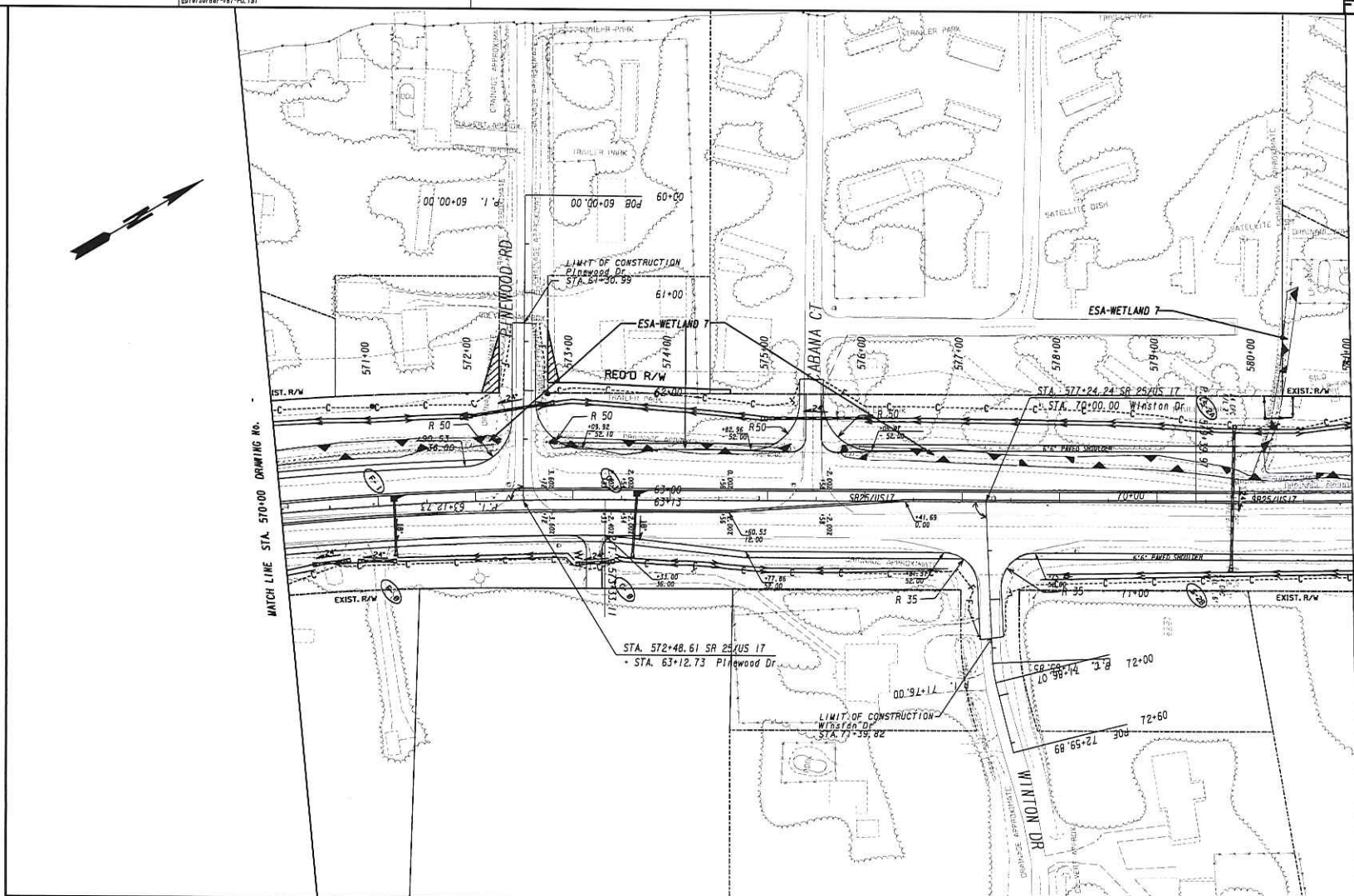
CHECKED: DATE:
BACKCHECKED: DATE:
CORRECTED: DATE:
VERIFIED: DATE:

DRAWING No. 13-0005

7/3/2015 GPLW

2/18/2016 4:15:51 PM GPLOT-V8 532650_13-0006.dgn

GDOT P.I. No. 532650



BEGIN LIMIT OF ACCESS	BLA
END LIMIT OF ACCESS	ELA
LIMIT OF ACCESS	
REQ'D R/W & LIMIT OF ACCESS	
ORANGE BARRIER FENCE	
ESA - ENV. SENSITIVE AREA (SEE ERIT TABLE)	
PROPERTY AND EXISTING R/W LINE	
REQUIRED R/W LINE	
CONSTRUCTION LIMITS	
EASEMENT FOR CONSTR & MAINTENANCE OF SLOPES	
EASEMENT FOR CONSTR OF SLOPES	
EASEMENT FOR CONSTR OF DRIVES	

GDOT

ROADWAY DESIGN

SCALE IN FEET 0 50 100 200

REVISION DATES

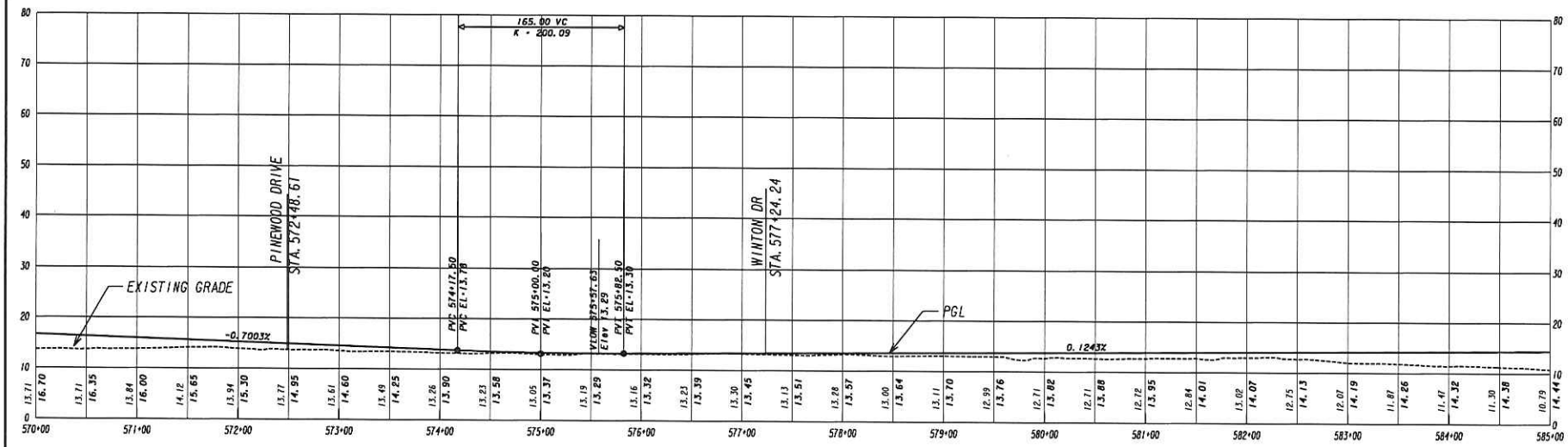
MAINLINE PLAN
SR25/US17 FROM YACHT DRIVE TO SR99
STA. 570+00 TO STA. 581+00

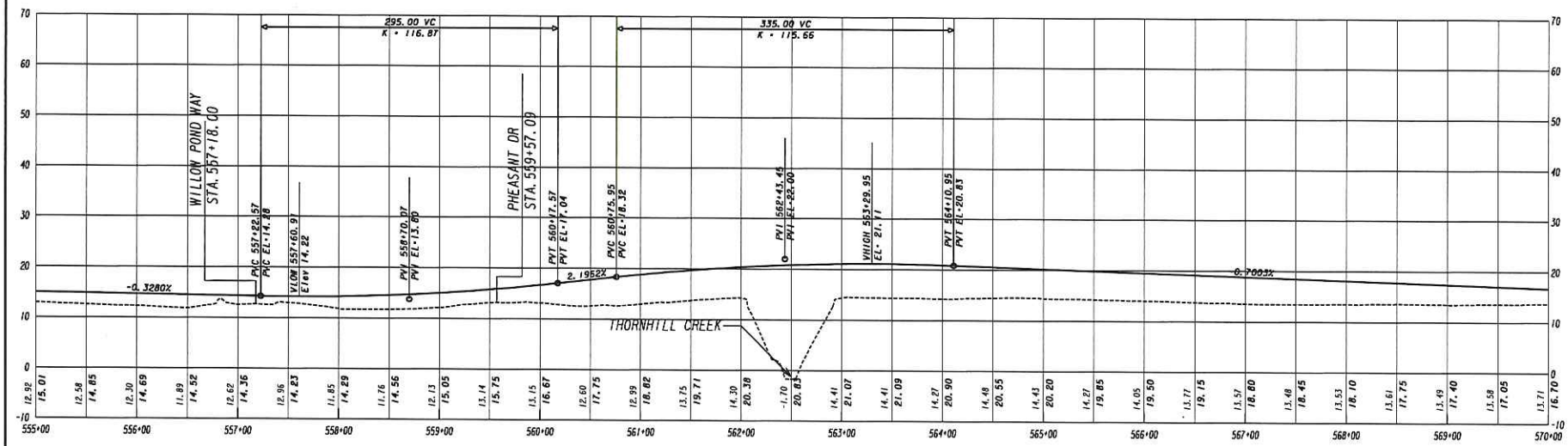
CHECKED: DATE:
HACKCHECKED: DATE:
CORRECTED: DATE:
VERIFIED: DATE:

DRAWING No. 13-0006

2/18/2016 4:09:37 PM GPLOT-V8 gplotborder-V8I-PO.tbl 5SP650PROS1.dgn

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA			





REVISION DATES

STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION

OFFICE: RODAWAY DESIGN

MAINLINE PROFILE

DRAWING No. 15-0003

Proposed 280 ft bridge 100 year Storm Tide + River Flood
Time of overtopping in downstream direction 1636 on sep 28

Hydraulic Design Data
Contraction Scour

	Left	Channel	Right
Input Data			
Average Depth (ft):	4.71	12.47	4.08
Approach Velocity (ft/s):	0.57	3.51	0.52
Br Average Depth (ft):	6.72	13.52	5.35
BR Opening Flow (cfs):	774.36	4939.23	1114.65
BR Top WD (ft):	69.77	48.93	148.22
Grain Size D50 (mm):	0.19	0.19	0.19
Approach Flow (cfs):	1933.01	2789.11	1345.89
Approach Top WD (ft):	720.99	63.78	635.23
K1 Coefficient:	0.640	0.690	0.640
Results			
Scour Depth Ys (ft):	0.86	10.91	0.07
Critical Velocity (ft/s):	1.24	1.46	1.21
Equation:	Clear	Live	Clear

Pier Scour
Pier: #1 (CL = 56214)
Input Data

Pier Shape:	Square nose
Pier Width (ft):	3.00
Grain Size D50 (mm):	0.19000
Depth Upstream (ft):	7.42
Velocity Upstream (ft/s):	1.10
K1 Nose Shape:	1.10
Pier Angle:	0.00
Pier Length (ft):	88.00
K2 Angle Coef:	1.00
K3 Bed Cond Coef:	1.10
Grain Size D90 (mm):	0.38000
K4 Armouring Coef:	1.00
Results	
Scour Depth Ys (ft):	3.20
Froude #:	0.07
Equation:	CSU equation

Pier: #2 (CL = 56294)
Input Data

Pier Shape:	Square nose
Pier Width (ft):	3.00
Grain Size D50 (mm):	0.19000
Depth Upstream (ft):	11.85
Velocity Upstream (ft/s):	5.60
K1 Nose Shape:	1.10
Pier Angle:	0.00
Pier Length (ft):	88.00
K2 Angle Coef:	1.00
K3 Bed Cond Coef:	1.10
Grain Size D90 (mm):	0.38000
K4 Armouring Coef:	1.00
Results	
Scour Depth Ys (ft):	6.86
Froude #:	0.29
Equation:	CSU equation

Pier: #3 (CL = 56334)
Input Data
Input Data

Pier Shape:	Square nose
Pier Width (ft):	3.00

Grain Size D50 (mm):	0.19000
Depth Upstream (ft):	11.85
Velocity Upstream (ft/s):	5.60
K1 Nose Shape:	1.10
Pier Angle:	0.00
Pier Length (ft):	88.00
K2 Angle Coef:	1.00
K3 Bed Cond Coef:	1.10
Grain Size D90 (mm):	0.38000
K4 Armouring Coef:	1.00
Results	
Scour Depth Ys (ft):	6.86
Froude #:	0.29
Equation:	CSU equation

Combined Scour Depths

Pier : #1 (CL = 56214) (Contr + Pier) (ft):	4.06
Pier : #2 (CL = 56294) (Contr + Pier) (ft):	17.77
Pier : #3 (CL = 56334) (Contr + Pier) (ft):	6.93

280 ft bridge 100 Storm Tide overtopping in DS direction time 1630 Sep 28

Hydraulic Design Data

Contraction Scour

	Left	Channel	Right
Input Data			
Average Depth (ft):	4.65	12.41	4.03
Approach Velocity (ft/s):	0.51	3.14	0.46
Br Average Depth (ft):	6.74	13.54	5.37
BR Opening Flow (cfs):	697.23	4439.90	1004.53
BR Top WD (ft):	69.77	48.93	148.25
Grain Size D50 (mm):	0.19	0.19	0.19
Approach Flow (cfs):	1704.16	2489.29	1182.96
Approach Top WD (ft):	720.99	63.78	635.23
K1 Coefficient:	0.640	0.690	0.690
Results			
Scour Depth Ys (ft):	0.18	10.93	0.00
Critical Velocity (ft/s):	1.24	1.46	1.21
Equation:	Clear	Live	Clear

Pier Scour

Pier: #1 (CL = 56214)

Input Data	
Pier Shape:	Square nose
Pier Width (ft):	3.00
Grain Size D50 (mm):	0.19000
Depth Upstream (ft):	7.39
Velocity Upstream (ft/s):	0.99
K1 Nose Shape:	1.10
Pier Angle:	0.00
Pier Length (ft):	88.00
K2 Angle Coef:	1.00
K3 Bed Cond Coef:	1.10
Grain Size D90 (mm):	0.38000
K4 Armouring Coef:	1.00
Results	
Scour Depth Ys (ft):	3.06
Froude #:	0.06
Equation:	CSU equation

Pier: #2 (CL = 56294)

Input Data	
Pier Shape:	Square nose
Pier Width (ft):	3.00
Grain Size D50 (mm):	0.19000
Depth Upstream (ft):	11.82
Velocity Upstream (ft/s):	5.05
K1 Nose Shape:	1.10
Pier Angle:	0.00
Pier Length (ft):	88.00
K2 Angle Coef:	1.00
K3 Bed Cond Coef:	1.10
Grain Size D90 (mm):	0.38000
K4 Armouring Coef:	1.00
Results	
Scour Depth Ys (ft):	6.56
Froude #:	0.26
Equation:	CSU equation

Pier: #3 (CL = 56334)

Input Data	
Pier Shape:	Square nose
Pier Width (ft):	3.00
Grain Size D50 (mm):	0.19000
Depth Upstream (ft):	11.82
Velocity Upstream (ft/s):	5.05

K1 Nose Shape:	1.10
Pier Angle:	0.00
Pier Length (ft):	88.00
K2 Angle Coef:	1.00
K3 Bed Cond Coef:	1.10
Grain Size D90 (mm):	0.38000
K4 Armouring Coef:	1.00
Results	
Scour Depth Ys (ft):	6.56
Froude #:	0.26
Equation:	CSU equatio

Combined Scour Depths

Pier : #1 (CL = 56214) (Contr + Pier) (ft):	3.24
Pier : #2 (CL = 56294) (Contr + Pier) (ft):	17.49
Pier : #3 (CL = 56334) (Contr + Pier) (ft):	6.56

P.I. No. 532650 GLYNN COUNTY
SR 25 (US17) OVER THORNHILL CREEK

PROPOSED 280 FT LONG MAIN BRIDGE

ENDROLL RIPRAP CALCULATIONS (100 YEAR STORM)
METHOD IN HEC-23,"BRIDGE SCOUR AND STREAM INSTABILITY COUNTERMEASURES"

BRIDGE ABUTMENT LOCATION	561+74.00	564+54.00

SET BACK LENGTH (ft)	51.00	183.00
MAIN CHANNEL AREA @ BRIDGE (ft2)	632.79	632.79
TOP WIDTH OF MAIN CHANNEL @ BRIDGE (ft)	50.98	50.98
AVERAGE DEPTH OF MAIN CHANNEL @ BR (ft)	12.41	12.41
SET BACK RATIO	4.11	14.75

CHARACTERISTIC AVG VELOCITY CALCULATIONS

DISCHARGE @ ABUTMENT (cfs)	5718.86	2719.22
AREA @ ABUTMENT (ft2)	844.45	1581.44
AVERAGE VELOCITY, V (ft/s)	6.77	1.72

AREA OF OVERBANK FLOW @ BRIDGE (ft2)	211.66	1581.44
LENGTH OF OVERBANK FLOW @ BRIDGE (ft)	38.78	172.04
AVERAGE DEPTH OF OVERBANK FLOW (ft)	5.46	9.19

FROUDE NUMBER	0.51	0.13

IF FROUDE NUMBER $\leq$ 0.80, THEN D50 =	0.77	0.05
IF FROUDE NUMBER > 0.80, THEN D50 =	1.67	1.78

MEDIAN STONE DIAMETER REQUIRED, D50 =	0.77	0.05

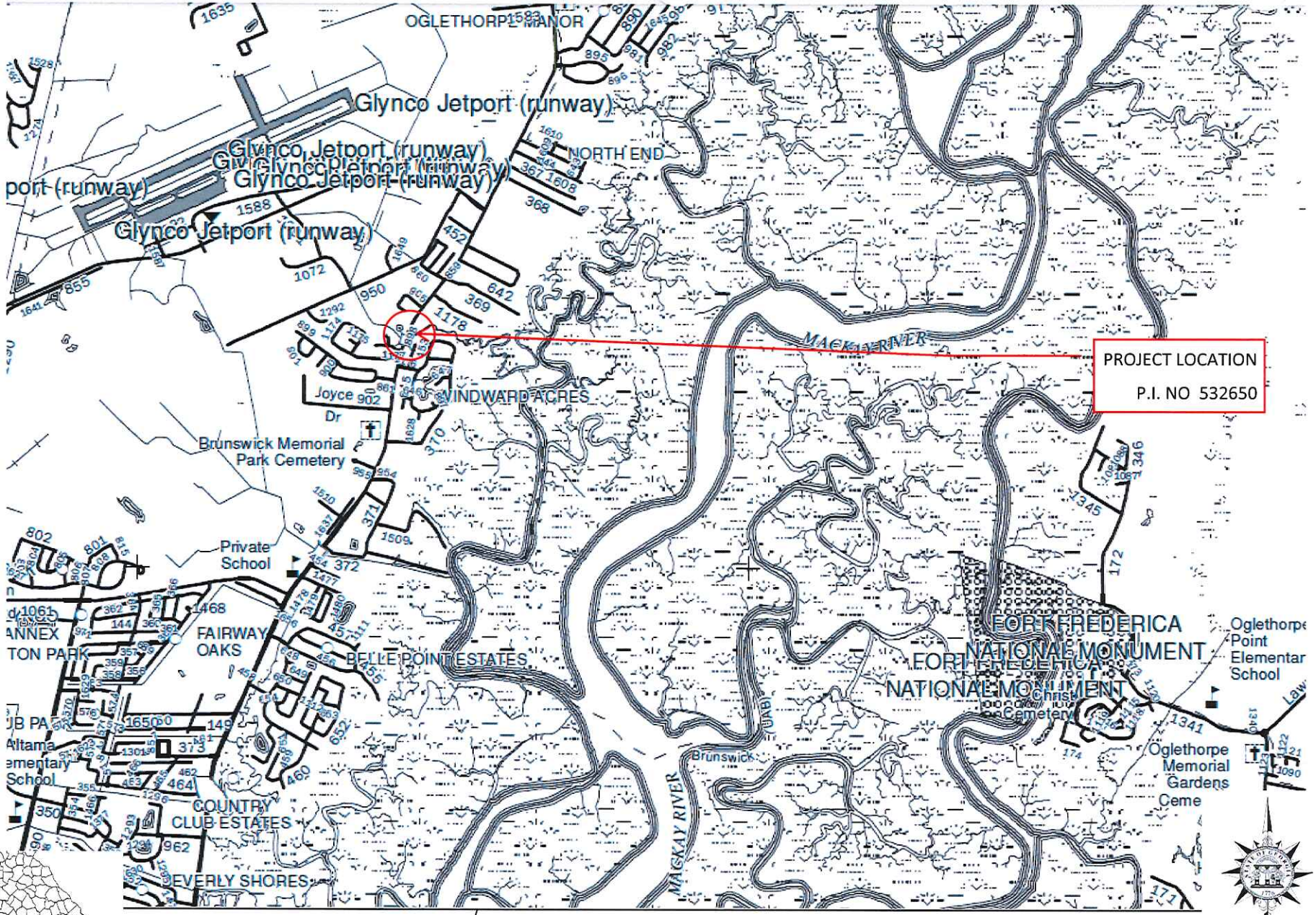
TYPE OF RIPRAP REQUIRED	TYPE 1	TYPE 3

(TYPE 1 D50 = 1.14 ft. TYPE 3 D50 =0.64 ft)

Use Type I riprap at both endrolls per Drainage Manual.

Rip Rap Data

Plan: Pro4 100 ST only	Thornhill Creek	Bridge Area RS: -23	BR D	Profile: 28SEP2008 1348	
E.G. Elev (ft)	13.85	**Element**	**Left OB**	**Channel**	**Right OB**
Vel Head (ft)	0.76	**Wt. n-Val.**	0.1	0.03	0.1
W.S. Elev (ft)	13.09	**Reach Len. (ft)**			
Crit W.S. (ft)		**Flow Area (sq ft)**	211.66	632.79	1581.44
E.G. Slope (ft/ft)	0.001128	**Area (sq ft)**	211.66	632.79	1581.44
Q Total (cfs)	8438.08	**Flow (cfs)**	264.16	5454.7	2719.22
Top Width (ft)	261.8	**Top Width (ft)**	38.78	50.98	172.04
Vel Total (ft/s)	3.48	**Avg. Vel. (ft/s)**	1.25	8.62	1.72
Max Chl Dpth (ft)	15.63	**Hydr. Depth (ft)**	5.46	12.41	9.19
Conv. Total (cfs)	251277.1	**Conv. (cfs)**	7866.4	162435.3	80975.5
Length Wtd. (ft)		**Wetted Per. (ft)**	54.5	53.63	251.4
Min Ch El (ft)	-2.54	**Shear (lb/sq ft)**	0.27	0.83	0.44
Alpha	4.05	**Stream Power (lb/ft s)**	59803.2	0	0
Frctn Loss (ft)		**Cum Volume (acre-ft)**	3240.76	143.63	1724.05
C & E Loss (ft)		**Cum SA (acres)**	340.08	7.12	210.83



LOCATION MAP

P.I. No. 532650

STATE ROUTE 25 (US 17) OVER THORNHILL CREEK

MAP SCALE 1" = 500'

250 0 500 1000 FEET

METER

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0227F

FIRM

FLOOD INSURANCE RATE MAP

GLYNN COUNTY, GEORGIA

AND INCORPORATED AREAS

PANEL 227 OF 345

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
GLYNN COUNTY	130092	0227	F

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
13127C0227F

EFFECTIVE DATE
SEPTEMBER 6, 2006

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

APPENDIX A

HYDRAULIC ENGINEERING FIELD REPORT

I. HYDRAULIC AND HYDROGLOGICAL DATA REQUIRED FOR ALL EXISTING OR PROPOSED BRIDGE STREAM CROSSING PROJECTS.

A. Project Location

District 5 *County* Glynn *Project No.* PESTP0009020920 & BHF-009-2(91)

P.I. No. 532650 & 532655 *Route* SR25/US17 *Stream Name* Thornhill Creek

Surveyed By SI&S2 *Date* 07-27-07

B. Site Information

Floodplain and Stream Channel description:

1. *Flat, rolling, mountainous, etc.* Flat
2. *Wooded, heavily vegetated, pasture, swampy, etc.* Wooded
3. *Stream channel description: well-defined banks, meandering, debris, etc.* Well Defined
4. *Is there any fill in the upstream or downstream floodplain, which will affect the natural drainage or limit the floodplain width at this site?* No

C. Required Existing Bridge Information at Project Site

Bridge Identification No. 127-0009-0
Date Built 1955
Skew angle of bridge bents 90°
Substructure Information:
Column type (concrete, steel, etc.) Concrete
Size of column 12in. X 12in.
Number of columns per bent 2 Bents, 10 colums
Height of curb, parapet or barrier 1 foot
GuideBank (Spur Dike) length, elevation and location if applicable N/A

Note any scour problems at intermediate bents or abutments: N/A

Note: The above information is required for all bridges within the floodplain (main and overflow bridges) along the roadway. In addition, the location, size and number of barrels are required for all box culverts located within the floodplain.

D. Normal Water Surface Data

	WS ELVE
500 feet upstream of the survey centerline	3.71
At the survey centerline	3.91
500 feet downstream of the survey centerline	3.88
Normal high tide	
Normal low tide	

E. Historical Flood Data

Extreme high-water elevation at site 4.59 *Date* 7-27-06
Highest observed tide elevation 3.91 *Date* 9-5-07
Location where extreme high-water elevation was taken (upstream or downstream face of bridge, distance upstream or downstream, centerline) Face of bridge
Source of high-water information Bridge Column

Location and floor elevation of any houses/buildings/structures that have been flooded
NONE

Information about flood (number of times house/building/structure has been flooded, water surface elevation(s) and date(s) of flood
NONE

Location and floor elevation of any houses/buildings/structures that have floor elevations within 2 feet of the extreme high-water elevation Blue block house ELEV. 6.813

F. Benchmark Information

Benchmark number BM #4
Location (CaiCE pt. no. or project station/offset) Pt. # 3717
Physical description Nail set in Power pole

Benchmark number BM # 5
Location (CaiCE pt. no. or project station/offset) Pt. # 3718
Physical description Nail set in Power pole

BM # 6
Pt. # 3719
Nail set in Power pole

II. REQUIRED SURVEY INFORMATION REQUIRED FOR ALL EXISTING OR PROPOSED BRIDGE STREAM CROSSING PROJECTS

Note: It is preferred that the hydraulic survey data be taken in a DTM format. The coverage shall be detailed enough to cover all required areas specified in this field report. These survey points should be included in the CAiCE file that is provided to the bridge hydraulics office. All survey points should be labeled consistently and clearly identified. Sketches and/or plots can be used to clarify the survey data, but are not required. ALL SURVEY DATA SHALL BE REFERENCED TO NGVD.

Topo coverage shall be taken at least 100 feet to the left and right of the centerline, except for the area 500 feet before the beginning of the existing bridge to 500 feet beyond the end of the bridge. The coverage in this area normally should be 200 feet let and right of the centerline of the existing road and/or construction/survey centerline. This topo coverage shall extend to a point 2 feet above the flood of record elevation on each end of the floodplain. The above coverage limits shall apply to both the existing centerline and proposed centerline, if different.

The topo shall be detailed enough to accurately define the profile of the terrain beneath the bridge, to include endrolls, stream channel banks, streambed elevations, and any other breaks in the terrain.

Bridge deck and bottom of beam shots shall be included for all bridges within the floodplain. Invert elevations and locations shall be provided for all box culverts within the floodplain.

A. Benchmarks

Three benchmarks are required. One at the beginning of the survey, one at the bridge or stream site, and one at the end of the survey. Location referenced to the project stations, elevation, and a complete physical description are required for each benchmark.

B. Stream Traverse

A stream traverse extending 500 feet upstream and downstream of the proposed bridge site. Cross sections of the stream channel are required underneath the existing bridge and at the centerline of the proposed bridge site, if different. Cross sections of the stream channel are required at 50 feet and 100 feet upstream and downstream of the proposed bridge centerline. Additional cross sections are required at 100 foot intervals along this traverse. These cross sections should include top of stream bank, edge of water and streambed shots. A sufficient number of streambed shots shall be taken to insure an accurate stream channel cross section. Traverses and stream cross sections shall be provided for all stream channels in the floodplain. As stated above, the DTM method is

preferred, as long as it is detailed enough to accurately define the location and cross section profile of the stream channel 500 feet upstream and downstream of the proposed bridge site.

C. ***Floodplain Survey Data***

Note: The required floodplain cross sections shall be extended on both sides of the stream channel until an elevation is reached that is a minimum of 2.0 feet above the Flood of Record Elevation. The top of stream banks and channel cross section shall be included. A sufficient number of streambed shots shall be included. A sufficient number of streambed shots shall be taken to insure an accurate stream channel cross section. The floodplain cross sections shall include shots where there is a significant change in elevation.

1. *Floodplain cross sections are required upstream and downstream of the bridge site. These cross sections shall be located 50 to 100 feet from the roadway centerline, along original ground. These floodplain cross sections should be parallel to the existing bridge and roadway.* ***This data is also required for bridge and roadway sites located along the stream that are no further than 2000 feet upstream and/or downstream of the project site.***
2. *Parallel bridge projects and/or projects with the proposed alignment shifted a relatively small distance require a floodplain cross section be taken along the new and/or parallel alignment.*
3. *New location projects require that a floodplain cross section be taken along the new alignment.*

D. ***Existing Roadway Data***

Note: This data is also required for roadway and railroad embankments located along the stream and within the floodplain that are not further than 2000 feet upstream and/or downstream of the project site.

1. *A profile along the existing roadway extending the full width of the floodplain. This profile shall include shots along the centerline and top outside edges of the roadway embankment. For roads built on a constant cross slope, only the top outside edge of roadway shots are required.*
2. *Profiles are required of all intersecting roads that are located within the limits of the floodplain. These profiles shall extend 500 feet upstream and/or downstream of the intersection with the project road.*
3. *Shots along the toe of roadway embankment are required within the limits of the floodplain.*

E. *Existing Bridge Data*

Note: This data shall be provided for all bridges located within the floodplain. Culvert location, invert elevations, and the size and number of barrels shall be provided for all culverts located within the floodplain.

This data is also required for bridges located along the stream and within the floodplain that are no further than 2000 feet upstream and/or downstream of the project site.

For bridge widening projects where the existing bridge plans are not available, a more detailed survey that gives a complete description of the superstructure and substructure will be required.

1. *For bridge replacement and paralleling projects, top of deck shots at the beginning and end of bridge at the intersection of the Back Face Paving Rest (BFPR) with the centerline and gutter-lines are required. If the bridge is built on a constant cross slope/super-elevation, only the gutter-line shots are required.*
2. *For bridge widening projects, in addition to the begin and end of bridge deck shots, top of deck shots are also required at the centerline of bents and at mid-spans along the centerline of the bridge and gutter-lines.*
3. *Bottom of beam shots for the outside beams at each bent are required.*
4. *A profile of the ground-line and endrolls under the bridge. Shots along the toe of endrolls are required. A stream cross section shall be included. All points shall be clearly labeled.*

F. ***Normal Water Surface Data***

1. *Water surface elevations are required at the survey centerline, and at 500 feet upstream and downstream of the survey centerline. These shots shall be taken in the same time period.*
2. *For tidal sites the normal high and low tide elevations are required.*

G. ***Historical Flood Data***

Note: The high-water elevations should be obtained from longtime local residents and/or city/county officials.

1. *The extreme high-water elevation (flood of record) shall be obtained along with the date of occurrence, location (upstream or downstream face of the bridge, distance upstream, downstream, or at the centerline), and the source for this information. If the site is tidal, then the highest observed tide elevation is needed.*
2. *The floor elevation and locations of any houses, buildings or any other structures that have been flooded, or have floor elevations within 2 feet of the flood of record. For buildings/structures that have been flooded, the information about*

the flood shall be provided. This information includes the number of times the structure has been flooded, the date(s), and the high-water elevations.

H. Miscellaneous Survey Data

1. Dams and Spillways.
For sites affected by an upstream or downstream dam, survey shots are required that describe the location, length, width and elevation of the dam embankment and spillway opening. The water surface elevation of the impounded water shall be provided.

2. Guide Banks (Spur Dikes).
Shots shall be taken that will reflect the location, length and elevation of the guide bank.

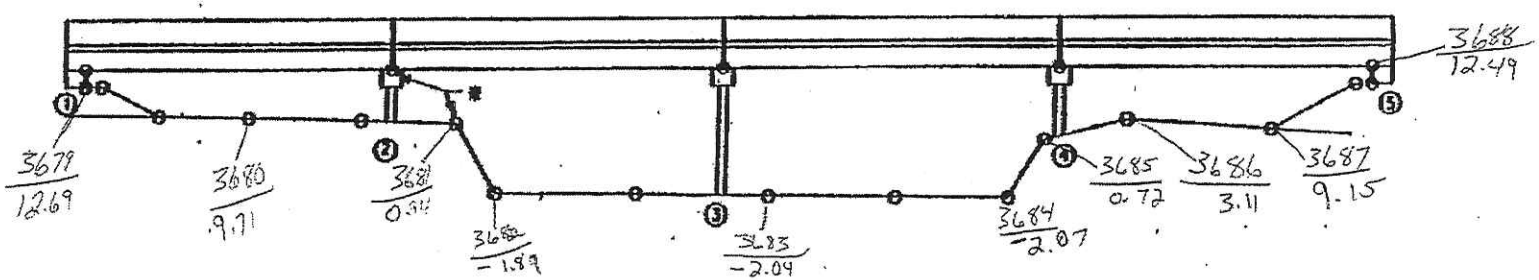
3. Longitudinal Roadway Encroachments on Floodplains.
Additional floodplain cross sections will be required to determine the effects of the longitudinal encroachment. ***The surveyor can contact the Office of Bridge Hydraulics for guidance on the extent of additional data that will be required.***

4. If the hydraulics at the project site is affected by other factors such as confluence with other streams, narrow floodplain cross sections, and/or roadway, railroad, bridge crossings, etc., additional floodplain cross sections may be required. The hydraulic engineer will identify any additional information that is required, and provide the surveyor with this information. ***The surveyor can contact the Office of Bridge Hydraulics if a question arises during the field survey of the project.***

EXAMPLE OF BRIDGE OPENING PROFILE

East Side of Bridge @
Thornhill Creek

* PROVIDE STATIONS AND ELEVATIONS OF BRIDGE OPENING AS REQUIRED BY ITEMS C2 AND C3 UNDER REQUIRED EXISTING BRIDGE DATA SECTION.

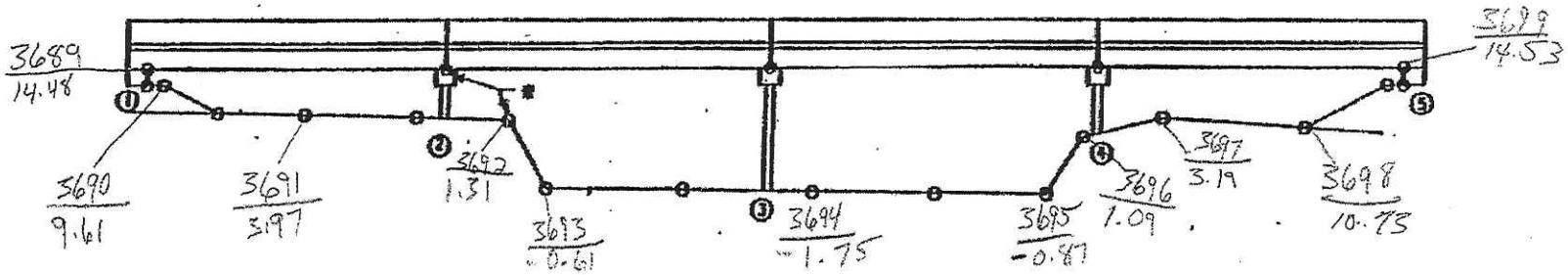


TYPICAL SECTION-PROFILE OF BRIDGE OPENING

EXAMPLE OF BRIDGE OPENING PROFILE

West side of bridge @
Thornhill Creek

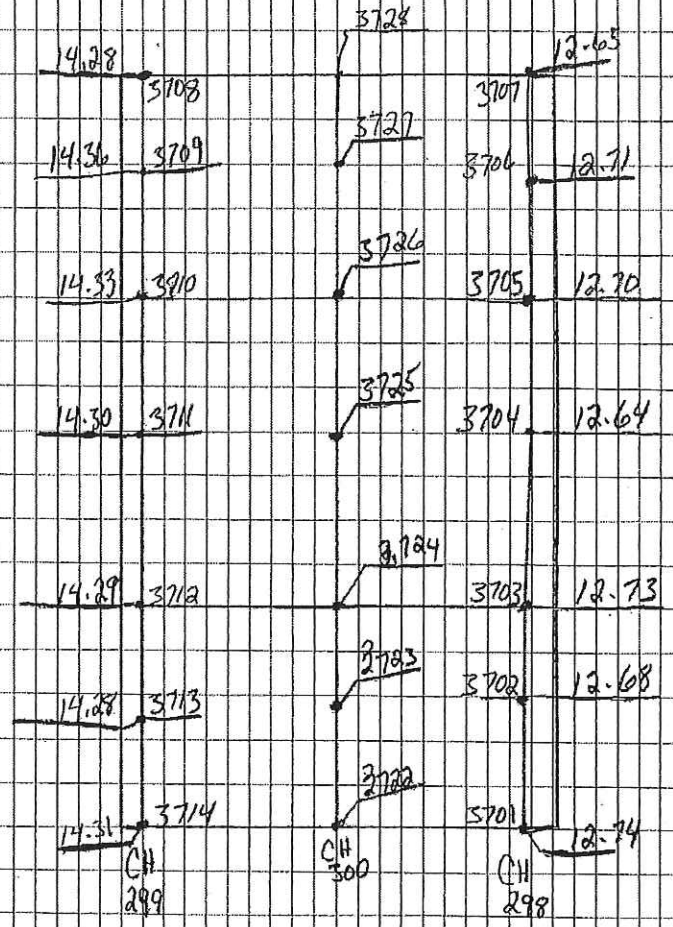
* PROVIDE STATIONS AND ELEVATIONS OF BRIDGE OPENING AS REQUIRED BY ITEMS C2 AND C3 UNDER REQUIRED EXISTING BRIDGE DATA SECTION.



TYPICAL SECTION-PROFILE OF BRIDGE OPENING

ev. Page

Thornhill Creek Bridge Deck Elev. and Bridge Chains



Used the same pts for Bridge gutter line and Bridge Deck elev.

High water mark was pt 3674 Elev = 4.59

Shot Top of Pile Caps Feature Code 44

Northeast Side	3675
Southeast Side	3676
Northwest Side	3716
Southwest Side	3715

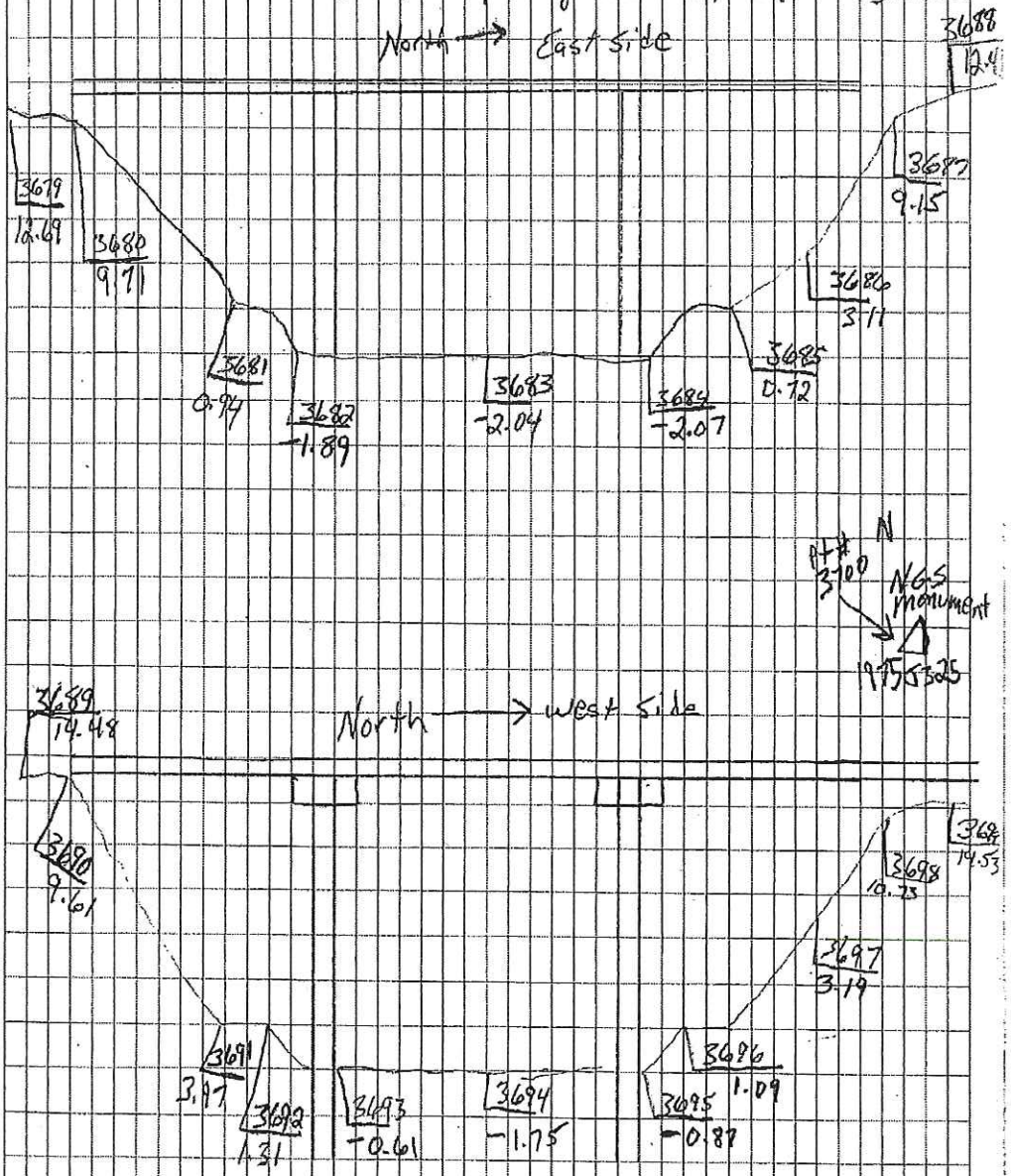
27-06

lev. on
tup

Bridge at Thornhill Creek 7-26-06

Bridge opening Profile (Code2)

North → East side



Pt# 3700 N
NGS monument
1975 5325

North → west side

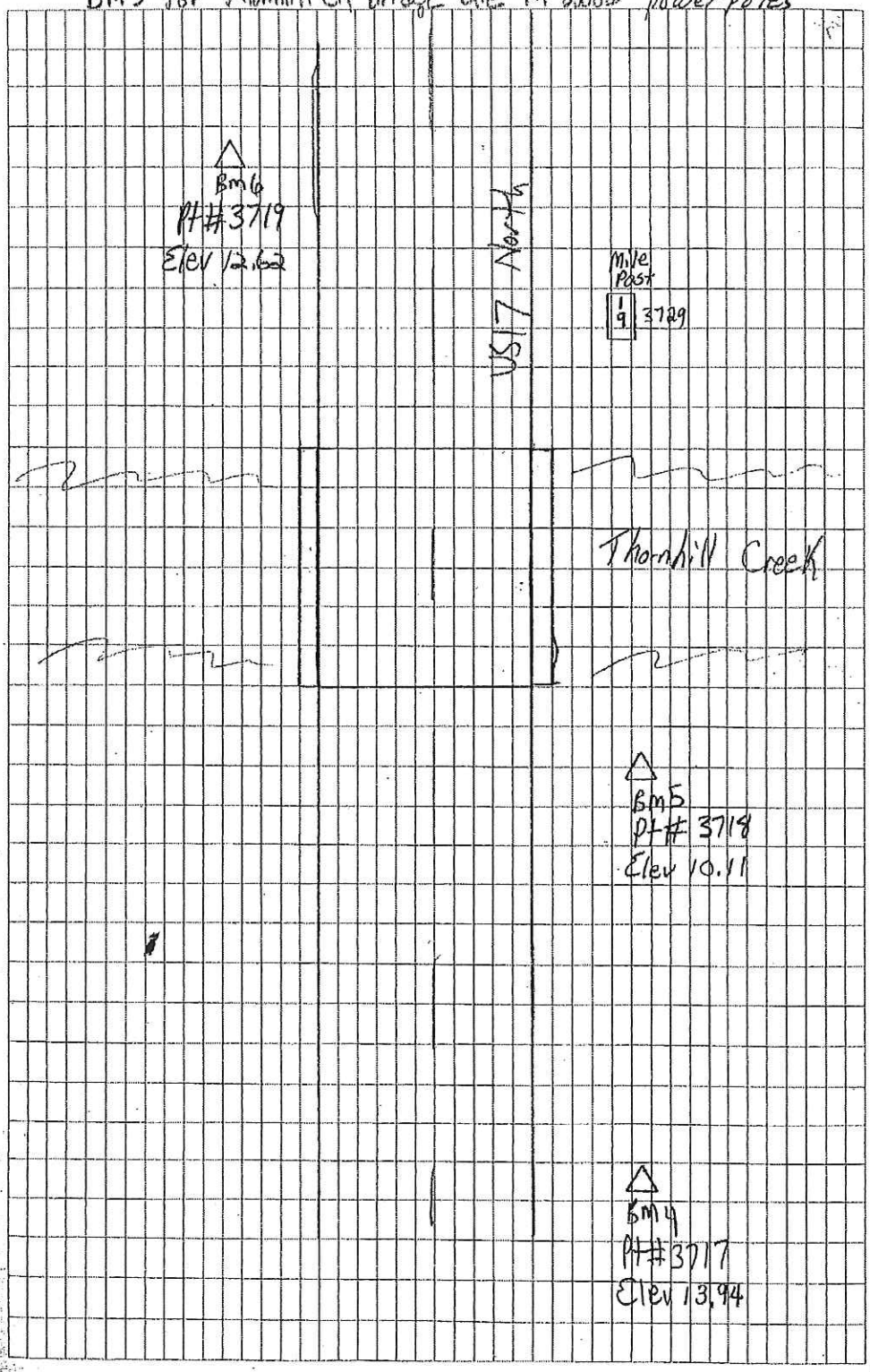
Bridge Column's Pts 3660-3664 North side
3665-3669 South side

Bridge Caps North 3670-3671
South 3672-3673

No Approach Slab

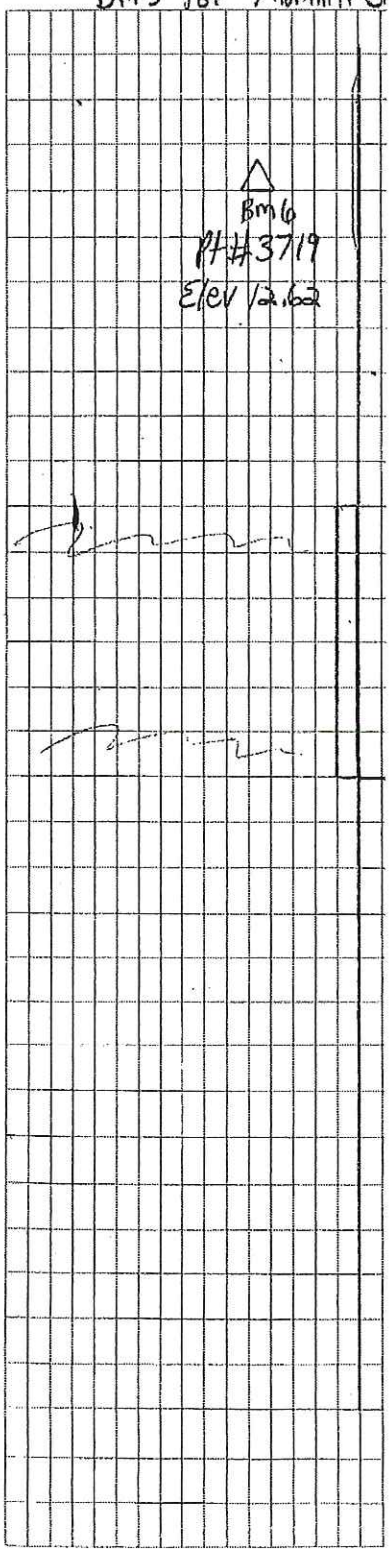
Elev	Delta/BM
3.87	D10
10.11	BM5
13.94	BM4
13.94	BM4
10.11	BM5
13.86	D10
13.87	D10
12.62	BM6
12.62	BM6
13.87	D10

BM's for Thornhill Ck bridge are in wood power poles



BS+	HI		FS-		Elev	Delta/BM
4.51	18.38				13.87	D10
			8.27		10.11	Bm 5
			4.44		13.94	Bm 4
4.42	18.36				13.94	Bm 4
			8.25		10.11	Bm5
			4.50		13.86	D10
5.86	19.73				13.87	D10
			7.11		12.62	BM6
7.03	19.65				12.62	BM6
			5.78		13.87	D10

BM's For Thornhill Cl



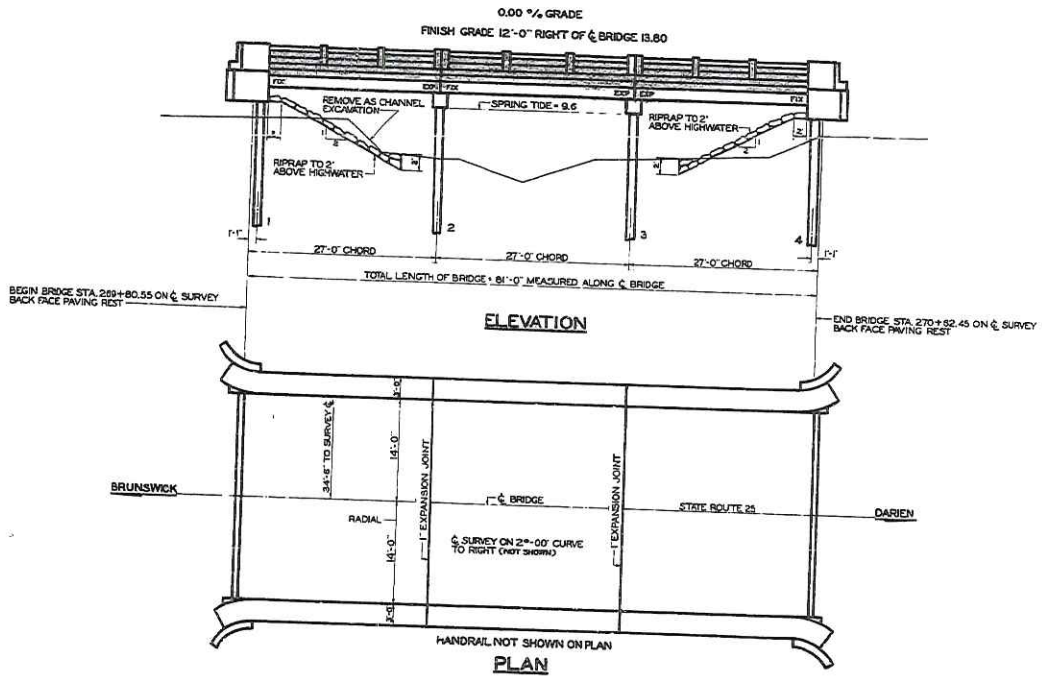
BM's 4,5 & 6 for Thornhill Creek

BS #	H.I.	FS	ELEV	CD #
4.51	14.38		13.87	D10
		8.27	10.11	BM5
		4.44	13.94	BM4
4.42	18.36		13.94	BM4
		8.25	10.11	BM5
		4.50	13.86	D10
5.86	19.73		13.87	D10
		7.11	12.62	BM6
7.03	19.65		12.62	BM6
		5.78	13.87	D10

West Side

BS +	HI	FS -	ELEV.	CD #
4.02	15.04		11.02	9
		9.39	5.65	3222
8.86	14.51		5.65	3222
		3.[illegible]	11.03	9
4.06	9.71		5.65	3222
		4.41	5.30	3228
		4.78	4.93	3229
		3.75	5.96	3230
		2.9[illegible]	6.75	32[illegible]
2.99	9.74		6.75	3[illegible]
		3.76	5.96	[illegible]
		4.81	4.93	[illegible]
		4.43	5.31	3228
		4.08	5.6[illegible]	3222
No Elev. were run on [illegible] side [illegible]				
we [illegible] [illegible] 2 CD[illegible]				

FED. ROAD DIV. No.	STATE	FED. AID PROJ. No.	STATE AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
3	GA.		BA(2) 1791-A(15)	54	20	54



BRIDGE CONSISTS OF

3-27'-0" CONCRETE BRIDGE DECKS ——— SPECIAL DESIGN
2-CONCRETE PILE END BENTS ——— SPECIAL DESIGN
2-CONCRETE PILE INTERMEDIATE BENTS ——— SPECIAL DESIGN
CONCRETE HANDRAILING ——— GEORGIA STANDARD NO. 3613

GENERAL NOTES

SPECIFICATIONS - GEORGIA STANDARD.
CONCRETE IN PILES SHALL BE CLASS "Y". ALL OTHER CONCRETE SHALL BE CLASS "A".
EXPANSION MATERIAL SHALL BE THE NON-EXTRUDING TYPE.
CHAMFER ALL EXPOSED EDGES ¾" UNLESS NOTED.
END FILLS SHALL BE IN PLACE AND COMPACTED TO BOTTOMS OF END BENT CAPS BEFORE DRIVING END BENT PILES. COST OF ANY EXCAVATION NECESSARY FOR END BENT CONSTRUCTION SHALL BE INCLUDED IN PRICE BID FOR CLASS "A" CONCRETE.
DRIVE A 40 FT. CONCRETE TEST PILE IN BENT 3 TO REMAIN IN PLACE AS A PERMANENT PILE.
COST OF EXPANSION MATERIAL, DRAIN PIPES, ASPHALT SATURATED FELT, ASBESTOS PACKING AND ANY OTHER INCIDENTAL ITEMS SHALL BE INCLUDED IN PRICES BID FOR CONTRACT ITEMS.
FOR OTHER GENERAL NOTES SEE GEORGIA STANDARD NO. 3613.

SUMMARY OF QUANTITIES

123 CU. YDS. CLASS "A" CONCRETE
31,000 LBS. BAR REINFORCEMENT STEEL
170 LIN. FT. CONCRETE HANDRAILING GA. STD. 3613
50 CU. YDS. CHANNEL EXCAVATION
665 LIN. FT. CONCRETE PRECAST PILING - 14" SQ.
1 EACH CONCRETE TEST PILES
1 EACH LOADING TESTS IF REQUIRED
.376 ACRES CLEARING AND GRUBBING - LUMP SUM
LUMP REMOVAL EXISTING BRIDGE - STA. 270+01
600 SQ. YDS. SAND CEMENT RIPRAP
OR
300 TONS PLAIN STONE RIPRAP

DESIGN DATA

SPECIFICATIONS - A.A.S.H.O. 1953
TYPICAL H 20-S16-44 LOADING - IMPACT ALLOWED
ALLOWANCE FOR FUTURE PAVING = 15 LBS. PER SQ. FT.

SEE SUPERSTRUCTURE DETAILS FOR CURVE DATA

BRIDGE NO. 5

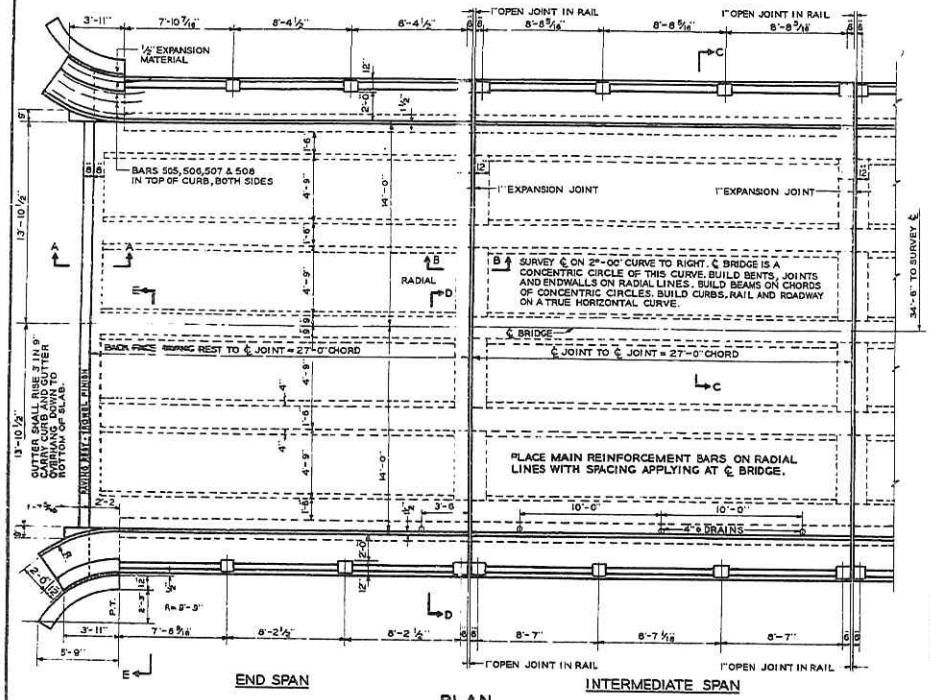
STATE HIGHWAY DEPARTMENT OF GEORGIA
BRIDGE DEPARTMENT

PLAN AND ELEVATION
BRIDGE OVER THORNHILL CREEK
STA. 269+80.55 TO STA. 270+62.45
GLYNN COUNTY B.A.(2) 1791-A(15)
SCALE: 1" = 8'-0"
MAY 1954

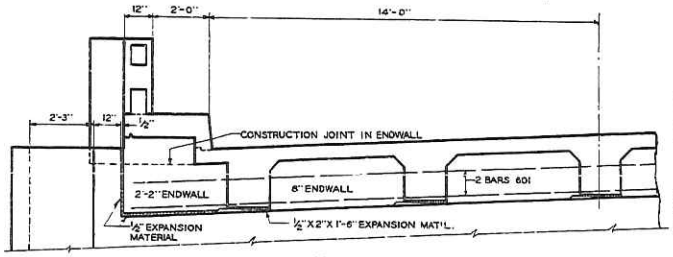
BY	REVISIONS	DATE
E.E.L.	STONE RIPRAP ADDED	5-18-54

DESIGNED E.E.L. TRACED B.J.S. REVIEWED C.A.M.
DRAWN E.E.L. CHECKED M.R.S. APPROVED

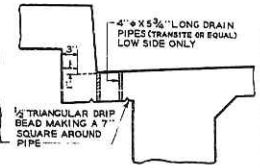
FED. ROAD DIV. No.	STATE	FED. AID PROJ. No.	STATE AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
3	GA.		BRZ-1791(8)	54	21	54



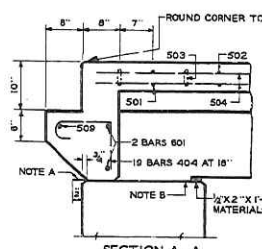
PLAN
SCALE 1"=4'-0"



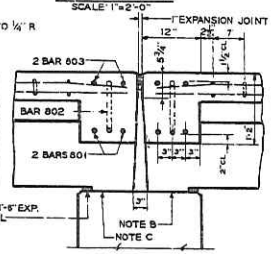
SECTION E-E
SCALE: 1"=2'-0"



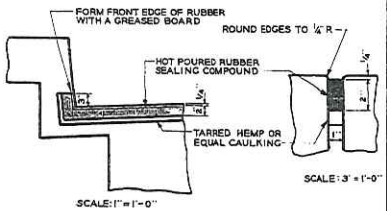
DECK DRAIN DETAILS
SCALE: 1"=1'-0"



SECTION A-A
SCALE: 1"=1'-0"

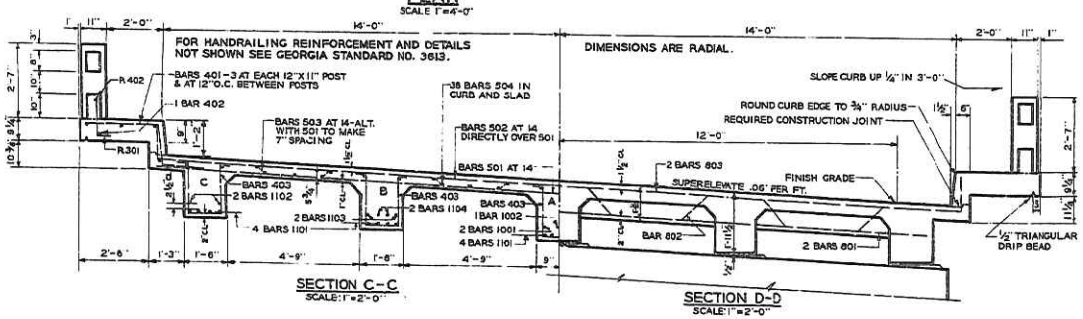


SECTION B-B
SCALE: 1"=1'-0"



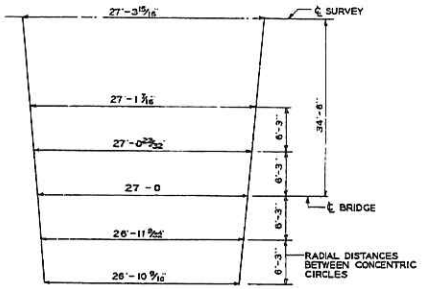
EXPANSION JOINT DETAILS

NOTE A- PLACE 2-12" WIDE LAYERS OF 65 LB. ASPHALT SATURATED FELT BETWEEN CAP AND 8" ENDWALL.
NOTE B- PLACE 2 LAYERS OF 65 LB. ASPHALT SATURATED FELT BETWEEN CAP AND BEAMS AT FIXED ENDS. EXTEND FELT 1" BEYOND EDGES OF BEAMS.
NOTE C- AT EXPANSION ENDS PLACE 2 PIECES OF ASBESTOS SHEET PACKING 1/16" X 1'-6" X 10 3/4" BETWEEN CAP AND BEAM. PACKING SHALL BE JOHNS-MANVILLE STYLE 60 OR EQUAL. TURN GRAPHITE SURFACES TOGETHER.

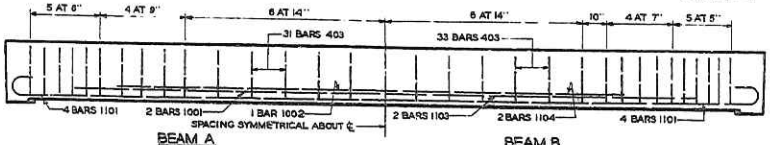


SECTION C-C
SCALE: 1"=2'-0"

SECTION D-D
SCALE: 1"=2'-0"

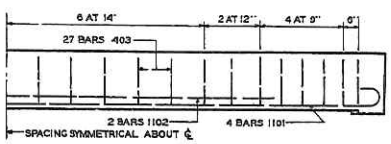


CHORD DIAGRAGM
NO SCALE



BEAM A
SCALE: 1"=2'-0"

BEAM B
SCALE: 1"=2'-0"



BEAM C
SCALE: 1"=2'-0"

CURVE DATA
P.I. STA. 272+27.60
Δ = 30°-25' RT
D = 2°-00' ON ℄ SURVEY
R = 2864.93' ON ℄ SURVEY
T = 778.83'
L = 1520.83'
S.E. = .06' PER FT.

BRIDGE NO. 5

STATE HIGHWAY DEPARTMENT OF GEORGIA
BRIDGE DEPARTMENT

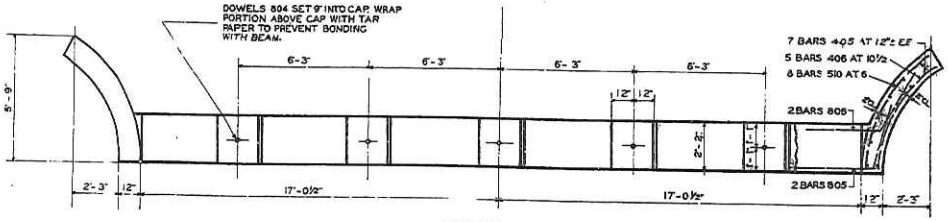
SUPERSTRUCTURE DETAILS
BRIDGE OVER THORNHILL CREEK
STA. 269+80.55 TO STA. 270+62.45
GLYNN COUNTY B.A. (2) 1791-A (5)

SCALE: AS NOTED MAY 1954

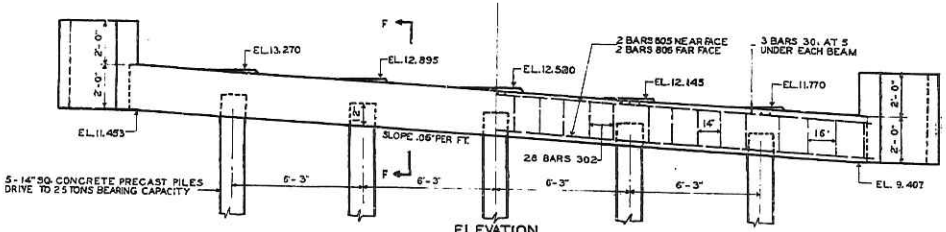
BY	REVISIONS	DATE
E.E.L.	SUPERELEVATION	7-8-54

DESIGNED S.E.L. DRAWN S.E.L. TRACED J.A.B. CHECKED M.R.B. REVIEWED C.A.M. APPROVED

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	STATE AID PROJ. NO.	FISCAL YEAR	SHEET NO	TOTAL SHEETS
3	GA.		BRC-(2)179(A)(5)	54	22	54



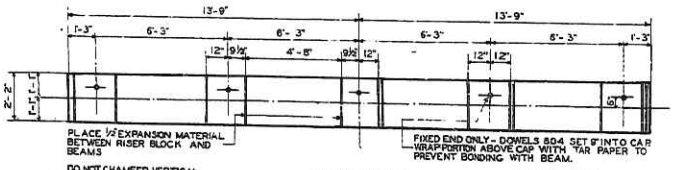
PLAN OF CAP



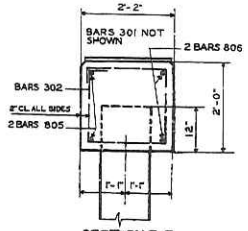
ELEVATION

BENT 4 SHOWN - BENT 1 SIMILAR

DETAILS OF END BENTS

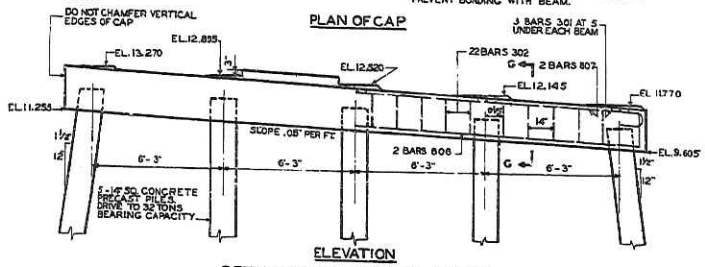


PLAN OF CAP



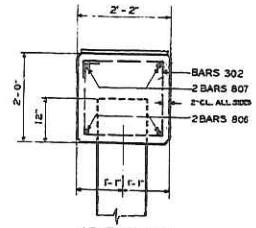
SECTION F-F

SCALE: 3/8" = 1'-0"



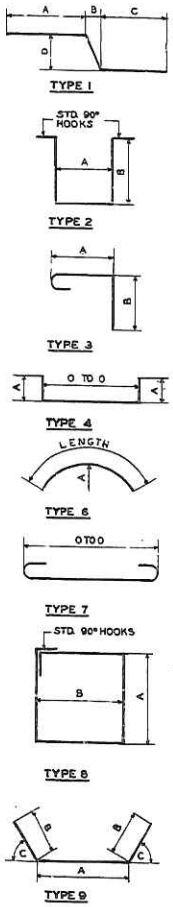
ELEVATION

DETAILS OF INTERMEDIATE BENTS



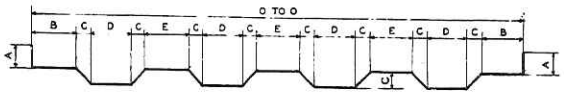
SECTION G-G

SCALE: 3/8" = 1'-0"



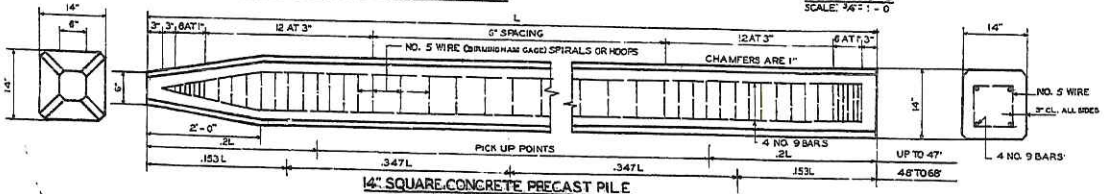
BAR	TYPE	END SPAN	INT. SPAN	END BENT	INT. BENT	TOTAL	LENGTH	O TO O	A	B	C	D	E
301	7			15	15	60	2'-8"	1'-10"					
302	8			28	22	100	7'-6"		1'-8"	1'-10"			
401	1	62	62			186	5'-4"		2'-6"	2"	1'-3"	1'-5"	
402	S.T.	2	2			6	26'-6"						
403	2	151	151			453	3'-0"		1'-2"	1'-8"			
404	3	19				38	2'-3"		1'-0"	9"			
405	S.T.	28				56	3'-6"						
406	6	10				20	5'-7"		5'-11"				
501	S.T.	22	22			66	26'-6"						
502	4	22	22			66	30'-9"	28'-5"	1'-2"				
503	5	22	21			65	31'-7"	28'-5"	1'-2"	3'-7	3 14"	1'-11½"	3'-9"
504	S.T.	38	38			106	26'-6"						
505	6	2				4	6'-6"		9'-6"				
506	6	2				4	6'-2"		8'-9"				
507	6	2				4	5'-10"		8'-0"				
508	6	2				4	5'-6"		7'-3"				
509	S.T.	1				2	27'-3"						
510	6	16				32	6'-2"		6'-6"				
601	S.T.	2				4	33'-6"						
801	S.T.	2	4			8	26'-0"						
802	5	1	2			4	33'-9"	28'-5"	1'-2"	2'-8½"	10½"	2'-6	2'-0"
803	4	2	4			8	30'-9"	28'-5"	1'-2"				
804	S.T.			5	5	15	1'-3"						
805	9			2		4	41'-2"		35'-2"	3'-0"	75°		
806	9			2		4	41'-10"		35'-0"	3'-0"	60°		
807	7				2	4	29'-2"	27'-0"					
808	S.T.				2	4	27'-0"						
1001	S.T.	2	2			5	22'-0"						
1002	S.T.	1	1			3	17'-0"						
1101	7	20	20			80	29'-2"	26'-4"					
1102	S.T.	4	4			12	19'-0"						
1103	S.T.	4	4			12	22'-0"						
1104	S.T.	4	4			12	17'-0"						

BAR SCHEDULE



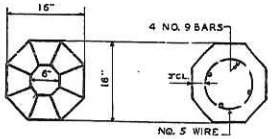
TYPE 5

BAR DIMENSIONS ARE OUT TO OUT. FIRST DIGIT OF 3 DIGIT NUMBERS AND FIRST 2 DIGITS OF 4 DIGIT NUMBERS DENOTE BAR SIZE. REINFORCEMENT STEEL SHALL BE INTERMEDIATE GRADE AND CONFORM TO A.S.T.M. SPECIFICATION A305-50T.



14" SQUARE CONCRETE PRECAST PILE

SCALE: 1" = 1'-0"



DETAILS NOT SHOWN SAME AS FOR 14" SQUARE PILE

ALTERNATE PILE SECTION

SCALE: 1" = 1'-0"

BRIDGE NO. 5

STATE HIGHWAY DEPARTMENT OF GEORGIA

BRIDGE DEPARTMENT

SUBSTRUCTURE DETAILS

BRIDGE OVER THORNHILL CREEK

STA. 269+80.55 TO STA. 270+62.45

GLYNN COUNTY B.A.(2)179(A)(5)

SCALE 3/8" = 1'-0" UNLESS NOTED APRIL 1954

REVISIONS: DATE — BY — ELEVATIONS — E.E.L.

DESIGNED E.E.L. TRACED J.A.K. REVIEWED C.A.M.

DRAWN E.E.L. CHECKED M.R.S. APPROVED

HEC-RAS RUNS

1	NATURAL CONDITION DAILY TIDE
2	NATURAL CONDITION STORM TIDES + BASE FLOW
3	NATURAL CONDITION STORM TIDES + CREEK FLOODS
4	EXISTING 81' BRIDGE DAILY TIDE
5	EXISTING 81' BRIDGE STORM TIDES + BASE FLOW
6	EXISTING 81' BRIDGE STORM TIDES + CREEK FLOODS
7	PROPOSED 280' BRIDGE DAILY TIDE
8	PROPOSED 280' BRIDGE STORM TIDES + BASE FLOW
9	PROPOSED 280' BRIDGE STORM TIDES + CREEK FLOODS
10	

AVERY® READY INDEX® 600085

Natural Condition

(Daily Tide)

HEC-RAS Output

HEC-RAS Plan: Nat- Tidal River: Thornhill Creek Reach: Bridge Area

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Bridge Area	4700	Max WS	300.00	14.00	15.55		15.66	0.002750	2.63	118.53	130.21	0.46
Bridge Area	4700	28SEP2008 1912	300.00	14.00	15.54		15.65	0.002835	2.66	117.33	129.91	0.47
Bridge Area	4266.66*	Max WS	303.64	13.17	14.44		14.52	0.002492	2.32	131.90	154.32	0.43
Bridge Area	4266.66*	28SEP2008 1912	299.91	13.17	14.43		14.51	0.002496	2.31	130.79	154.06	0.43
Bridge Area	3833.33*	Max WS	299.87	12.33	13.40		13.46	0.002362	2.10	143.00	177.66	0.41
Bridge Area	3833.33*	28SEP2008 1912	300.09	12.33	13.39		13.46	0.002441	2.12	141.65	177.41	0.42
Bridge Area	3400.*	Max WS	303.09	11.50	12.43		12.49	0.002142	1.94	156.17	200.45	0.39
Bridge Area	3400.*	28SEP2008 1912	299.47	11.50	12.43		12.49	0.002139	1.93	154.90	199.74	0.39
Bridge Area	2966.66*	Max WS	300.01	10.67	11.46		11.51	0.002313	1.89	158.71	224.46	0.40
Bridge Area	2966.66*	28SEP2008 1912	300.30	10.67	11.45		11.51	0.002431	1.92	156.21	223.63	0.41
Bridge Area	2533.33*	Max WS	305.69	9.83	10.74		10.77	0.001021	1.39	242.36	617.80	0.27
Bridge Area	2533.33*	28SEP2008 1912	294.76	9.83	10.64		10.67	0.001435	1.53	192.81	262.08	0.31
Bridge Area	2100	Max WS	299.97	9.00	9.49		9.53	0.003458	1.74	268.50	580.57	0.45
Bridge Area	2100	28SEP2008 1912	298.40	9.00	9.45		9.49	0.004777	1.91	242.26	575.59	0.52
Bridge Area	1682.5*	Max WS	325.18	6.34	6.91		7.03	0.007593	2.88	113.04	207.64	0.69
Bridge Area	1682.5*	28SEP2008 1912	306.85	6.34	6.87		7.00	0.008309	2.89	106.21	207.38	0.71
Bridge Area	1265.*	Max WS	300.07	3.68	5.09		5.12	0.000633	1.52	197.45	146.05	0.23
Bridge Area	1265.*	28SEP2008 1912	311.06	3.68	4.54		4.64	0.003684	2.64	117.87	143.10	0.51
Bridge Area	847.5*	Max WS	300.03	1.03	4.97		4.98	0.000074	0.86	349.90	121.74	0.09
Bridge Area	847.5*	28SEP2008 1912	332.29	1.03	3.83		3.87	0.000294	1.48	224.01	95.95	0.17
Bridge Area	430	Max WS	299.92	-1.63	4.90		4.93	0.000146	1.36	225.91	66.79	0.13
Bridge Area	430	28SEP2008 1912	366.44	-1.63	3.43		3.56	0.001206	2.80	131.14	62.09	0.34
Bridge Area	155	Max WS	299.73	-2.60	4.88		4.90	0.000071	1.17	274.43	64.81	0.09
Bridge Area	155	28SEP2008 1912	393.75	-2.60	3.22		3.31	0.000509	2.37	171.22	59.34	0.23
Bridge Area	125	Max WS	299.66	-2.68	4.88		4.90	0.000078	1.20	276.58	66.83	0.10
Bridge Area	125	28SEP2008 1912	397.03	-2.68	3.20		3.29	0.000605	2.49	169.01	61.07	0.25
Bridge Area	0	Max WS	299.55	-2.54	4.88		4.89	0.000059	1.03	488.40	186.78	0.08
Bridge Area	0	28SEP2008 1912	418.85	-2.54	3.14		3.22	0.000460	2.37	254.54	122.47	0.22

HEC-RAS Plan: Nat- Tidal River: Thornhill Creek Reach: Bridge Area (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Bridge Area	-125	Max WS	299.26	-2.54	4.87		4.88	0.000055	1.00	487.14	186.29	0.08
Bridge Area	-125	28SEP2008 1912	450.13	-2.54	3.05		3.15	0.000573	2.63	244.28	120.75	0.25
Bridge Area	-450.*	Max WS	298.95	-3.96	4.85		4.87	0.000034	0.92	360.67	90.77	0.06
Bridge Area	-450.*	28SEP2008 1912	512.19	-3.96	2.90		2.98	0.000320	2.30	223.46	54.30	0.19
Bridge Area	-710	Max WS	298.34	-3.78	4.85		4.86	0.000020	0.80	542.06	205.89	0.05
Bridge Area	-710	28SEP2008 1912	551.75	-3.78	2.84		2.91	0.000202	2.10	263.32	44.76	0.15
Bridge Area	-1170.*	Max WS	296.78	-4.47	4.83		4.85	0.000034	1.01	464.02	232.91	0.06
Bridge Area	-1170.*	28SEP2008 1912	608.65	-4.47	2.62		2.76	0.000437	3.01	202.52	33.88	0.22
Bridge Area	-1630	Max WS	293.34	-5.16	4.81		4.83	0.000071	1.31	606.06	552.67	0.08
Bridge Area	-1630	28SEP2008 1912	624.00	-5.16	1.88		2.30	0.001720	5.24	119.12	22.21	0.40
Bridge Area	-1990.*	Max WS	290.73	-5.70	4.79		4.80	0.000026	0.90	814.05	710.57	0.05
Bridge Area	-1990.*	28SEP2008 1912	623.65	-5.70	1.75		1.93	0.000542	3.33	187.35	30.73	0.24
Bridge Area	-2350.*	Max WS	287.84	-6.24	4.79		4.79	0.000012	0.66	1086.79	974.00	0.04
Bridge Area	-2350.*	28SEP2008 1912	620.71	-6.24	1.73		1.82	0.000221	2.33	266.45	39.39	0.16
Bridge Area	-2710	Max WS	284.81	-6.78	4.78		4.79	0.000005	0.45	2575.43	2646.15	0.02
Bridge Area	-2710	28SEP2008 1912	618.64	-6.78	1.73		1.78	0.000107	1.74	354.98	48.10	0.11
Bridge Area	-3152.5*	Max WS	275.65	-7.44	4.78		4.78	0.000004	0.40	2898.15	2845.30	0.02
Bridge Area	-3152.5*	28SEP2008 1912	619.19	-7.44	1.72		1.76	0.000089	1.64	377.61	48.08	0.10
Bridge Area	-3595.*	Max WS	260.86	-8.10	4.78		4.78	0.000003	0.36	3252.70	3077.06	0.02
Bridge Area	-3595.*	28SEP2008 1912	623.18	-8.10	1.72		1.75	0.000075	1.56	399.61	48.07	0.10
Bridge Area	-4037.5*	Max WS	232.69	-8.77	4.77		4.77	0.000002	0.30	3629.66	3247.58	0.02
Bridge Area	-4037.5*	28SEP2008 1912	630.92	-8.77	1.72		1.75	0.000066	1.50	421.78	48.08	0.09
Bridge Area	-4480.*	Max WS	206.37	-9.43	4.77		4.77	0.000001	0.25	4009.02	3394.71	0.01
Bridge Area	-4480.*	28SEP2008 1912	642.26	-9.43	1.73		1.76	0.000059	1.45	443.14	48.09	0.08
Bridge Area	-4922.5*	Max WS	186.68	-10.09	4.76		4.77	0.000001	0.21	4407.51	3525.46	0.01
Bridge Area	-4922.5*	28SEP2008 1912	656.23	-10.09	1.74		1.77	0.000053	1.41	463.97	48.10	0.08
Bridge Area	-5365.*	Max WS	186.29	-10.76	4.76		4.76	0.000001	0.20	4847.58	3590.95	0.01
Bridge Area	-5365.*	28SEP2008 1912	671.65	-10.76	1.75		1.78	0.000049	1.39	484.90	48.13	0.08

HEC-RAS Plan: Nat- Tidal River: Thornhill Creek Reach: Bridge Area (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Bridge Area	-5807.5*	Max WS	203.91	-11.42	4.76		4.76	0.000001	0.20	5314.12	3757.84	0.01
Bridge Area	-5807.5*	28SEP2008 1912	687.26	-11.42	1.78		1.81	0.000045	1.36	505.00	48.17	0.07
Bridge Area	-6250	Max WS	487.24	-12.09	4.75		4.75	0.000004	0.46	5782.96	3930.99	0.02
Bridge Area	-6250	28SEP2008 1912	702.21	-12.09	1.80		1.83	0.000042	1.34	524.73	48.20	0.07
Bridge Area	-6555.*	Max WS	478.06	-12.54	4.75		4.75	0.000002	0.37	7661.74	4327.35	0.02
Bridge Area	-6555.*	28SEP2008 1912	739.23	-12.54	1.81		1.84	0.000043	1.36	542.26	48.88	0.07
Bridge Area	-6860	Max WS	483.16	-13.00	4.75	-10.85	4.75	0.000002	0.30	9641.06	4419.10	0.01
Bridge Area	-6860	28SEP2008 1912	800.47	-13.00	1.82	-10.02	1.85	0.000046	1.43	559.94	49.58	0.07

532650-ThornhillC.rep

HEC-RAS Version 4.1.0 Jan 2010
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X      X   X     X  X    X
X     X  X        X           X   X    X    X   X
XXXXXXX  XXXX     X       XXX XXXX     XXXXXX    XXXX
X     X  X        X           X  X     X    X        X
X     X  X        X    X      X   X    X    X        X
X     X  XXXXXX    XXXX       X    X   X    X   XXXXX
```

PROJECT DATA
Project Title: 532650- Thornhill Creek
Project File : 532650-ThornhillC.prj
Run Date and Time: 3/1/2016 11:50:29 AM

Project in English units

Project Description:Natural Condition - Tides + Base Flow

PLAN DATA

Plan Title: Natura Tidal (W.base Flow)
Plan File : z:\Bridge Hydraulics\Projects\532650-Glynn\HEC-RAS\532650-ThornhillC.p59

Geometry Title: Thorn Hill unsteady natural
Geometry File : z:\Bridge Hydraulics\Projects\532650-Glynn\HEC-RAS\532650-ThornhillC.g02

Flow Title :
Flow File :

Plan Summary Information:

Number of:	Cross Sections =	32	Multiple Openings =	0
	Culverts =	0	Inline Structures =	0
	Bridges =	0	Lateral Structures =	0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 20
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

GEOMETRY DATA

Geometry Title: Thorn Hill unsteady natural
Geometry File : z:\Bridge Hydraulics\Projects\532650-Glynn\HEC-RAS\532650-ThornhillC.g02

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: 4700

INPUT
Description:
Station Elevation Data num= 93

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
55865.48		2056335.82		2056337.78	19.6	456341.61	19.4	356346.07	19
56416	19	56464		1956483.96		1956488.53	18.8	456491.01	18.76
56499.41		1956513.34		1956519.58	18.7	956522.97	18.6	756538.97	18.13
56540.1	18.09	56540.3	18.08	56542.76		1856631.19		1856635.14	17.87
56644.15		1756675.36		1756683.32	16.2	356685.77		1656699.39	16
56710.27	15.3	256711.99	15.2	656715.46	15.15	56717		1556731.54	15
56733.52	14.8	856747.61		1456779.77		1456780.75	14.0	656795.85	14.57
56800.31	15	56828		1556828.01		1556844.08		1656876.22	16
56883.61	16.4	656884.22	16.55	6892.29		1756956.49		17 56970.2	17.85
56972.53	18	57116.4		1857122.11	18.3	657132.33	18.0	157132.42	18.01
57132.6	18.02	57161.85	18.86	57162.66	18.91	57163.33	18.95	57164.13	19
58240.08		1958307.14	18.52	58310.82	18.55	8380.32		1860139.81	18
60171.13	18.84	60195.29	18.49	60196.17	18.51	60214.42		1960228.71	19
60243.62	18.78	60251.72		1961370.75		1961379.25	19.23	61394.88	19
61408.06		1961445.02	19.99	61445.36		2061596.71		2061600.67	19.84
61631.86		1962340.59		1962344.19	19.16	2369.91	19.79	62394.08	19.43
62394.14	19.43	62415.19	19.13	62418.24	19.08	62423.85		1966905.19	19
66920.46	18.51	66940.47	18.86	66966.97		1867499.51		1867550.35	17
68804.41		1768830.81		1868946.02	18				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
55865.48	.1	56717	.03	56828	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
56717	56828	433.33	433.33	433.33	.1	.3

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: 4266.66*

INPUT
Description:
Station Elevation Data num= 157

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
55836.07	18.55	6124.84	18.55	6180.08	18.37	56189.02	18.33	56271.29	18.33
56273.11	18.03	56276.65	17.86	56280.78	17.55	6345.49	17.5	56389.9	17.5
56408.38	17.5	56412.6	17.37	56414.9	17.35	6422.67	17.55	6435.56	17.5
56441.33	17.33	56444.47	17.23	56459.27	16.77	56460.32	16.74	56460.51	16.73
56462.79	16.67	56544.61	16.67	56548.27	16.56	56556.6	15.83	56585.48	15.83
56592.85	15.19	56595.12		1556607.72		1556617.79	14.43	56619.38	14.38
56622.59	14.29	56624.02	14.17	56636.85	14.07	56637.64	14.07	56639.49	13.96
56652.7	13.17	56716.68	13.17	56718.7	13.22	56722.49	13.17	56723.14	13.17
56724.04	13.22	56737.88	13.75	6741.96	14.07	56767.33	14.17	56767.34	14.17
56767.43	14.17	56781.67		1556810.33		1556816.92	15.38	56817.46	15.42
56824.66	15.83	56881.91	15.83	56894.13	16.54	56896.21	16.67	57024.5	16.67
57029.59	16.97	57038.7	16.68	57038.79	16.68	57038.95	16.68	57065.03	17.38

57065.75	17.4257066.34	17.4657067.06	17.557145.51	17.5 57164.1	17.42
57197.21	17.3357870.22	17.3357874.33	17.35 57946.6	17.45 57950.6	17.46
57978.63	17.558026.47	17.558086.27	17.158089.55	17.0858151.52	16.67
58281.73	16.6758297.54	16.6958303.32	16.6758304.27	16.758311.14	16.67
58316.17	16.7258325.95	16.7358354.79	16.7758359.07	16.8258364.32	16.83
58377.18	16.8158379.78	16.8158397.09	16.83 58523.1	16.83 58543.7	16.88
58546.86	16.8358559.62	16.958620.26	16.9958625.42	1758626.86	17
58741.22	1758855.05	17.1759168.39	17.1759261.52	17.3359313.95	17.33
59340.59	17.3159354.67	17.3359720.45	17.3359748.37	18.0359769.91	17.74
59770.7	17.7659786.98	18.1759799.72	18.1759813.01	17.9859820.23	18.17
60006.63	18.1760010.71	18.17 60018.4	18.1960099.77	18.3360802.17	18.33
60818.06	18.360825.64	18.4760839.58	18.2560851.33	18.2360884.29	18.98
60884.59	18.9960958.58	18.8361019.55	18.8361023.08	18.761050.89	18
61682.86	1861686.07	18.0861686.13	18.0861709.01	18.6761730.55	18.39
61730.61	18.3961749.38	18.15 61752.1	18.1161757.11	18.0561869.81	18.13
61877.61	18.1461897.17	18.1561914.61	18.1762260.57	18.1762372.95	18.32
62378.84	18.3362458.29	18.3362537.79	18.1765753.07	18.17 65766.7	17.76
65784.53	18.0565808.16	17.3366283.02	17.3366328.36	16.566799.84	16.5
66978.41	16.6767316.66	16.6767335.57	16.7267401.07	16.8367446.59	16.83
67470.13	17.6767572.87	17.67			

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
55836.07	.156624.02	.0356767.33	.1		

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
56624.0	256767.33	433.33	433.33	433.33	.1	.3

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: 3833.33*

INPUT
Description:
Station Elevation Data num= 157

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
55806.65	1756072.13		1756122.91	16.7456131.13		16.6756206.77		16.67	
56208.43	16.4356211.69	16.2956215.48		1656274.97		16 56315.8		16	
56332.79	1656336.68	15.8956338.79		15.8456345.93		1656357.78		16	
56363.09	15.8656365.97	15.7856379.58		15.4256380.54		15.3956380.71		15.39	
56382.81	15.3356458.04	15.3356461.39		15.2556469.05		14.6756495.61		14.67	
56502.38	14.1556504.46		1456516.05		14 56525.3		13.5556526.77		13.51
56529.72	13.4356531.03	13.33	56543	13.1556543.74		13.1456545.47		13.04	
56557.78	12.3356656.55	12.3356656.56		12.3356659.65		12.4456665.51		12.33	
56666.52	12.3356667.34	12.3856679.91		12.8256683.62		13.1456706.67		13.33	
56706.75	13.3456719.26		1456744.44		1456750.23		14.3156750.71		14.33
56757.03	14.6756807.32	14.6756818.06		15.2356819.89		15.3356932.59		15.33	
56937.07	15.5756945.07	15.3456945.14		15.3456945.29		15.35 56968.2		15.91	
56968.83	15.9456969.36	15.9756969.98		1657038.91		1657055.24		15.85	
57084.32	15.6757675.59	15.67 57679.2		15.757742.69		15.9157746.21		15.92	
57770.83	1657812.86		16 57865.4	15.6857868.28		15.6757922.73		15.33	
58037.12	15.3358051.01	15.3858056.09		15.3358056.92		15.458062.96		15.33	
58067.37	15.4358075.96	15.46 58101.3		15.5458105.06		15.6458109.68		15.67	
58120.97	15.6158123.26	15.6258138.46		15.6758249.17		15.6758267.27		15.76	
58270.05	15.6758281.25	15.858334.53		15.9858339.06		1658340.32		16	
58440.8	16 58540.8	16.3358816.08		16.33 58897.9		16.6758943.96		16.67	
58967.37	16.6258979.73	16.6759301.08		16.6759325.61		17.2359344.54		16.99	
59345.23	17.0159359.53	17.3359370.72		17.33 59382.4		17.1959388.75		17.33	
59552.5	17.3359556.09	17.3559562.84		17.3859634.32		17.6760251.42		17.67	
60265.38	17.660272.04	17.7260284.28		17.5160294.61		17.4660323.56		17.98	
60323.82	17.9860388.83	17.6760442.39		17.6760445.49		17.5660469.93		17	

```
61025.13      1761027.95   17.07   61028   17.07 61048.1   17.5661067.04   17.35
61067.08   17.3561083.57   17.1861085.96   17.1561090.36    17.161189.38   17.27
61196.23   17.2861213.41   17.3161228.73   17.3361532.67   17.33 61631.4   17.64
61636.57   17.6761706.38   17.6761776.22   17.3364600.96   17.3364612.92   17.01
 64628.6   17.2464649.36   16.6765066.54   16.6765106.37      1665520.58      16
65677.46   16.3365974.62   16.3365991.24   16.4466048.78   16.6766088.77   16.67
66109.46   17.3366199.71   17.33

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
55806.65      .156531.03     .0356706.67      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      56531.0356706.67           433.33  433.33  433.33             .1       .3

CROSS SECTION


RIVER: Thornhill Creek
REACH: Bridge Area          RS: 3400.*

INPUT
Description:
Station Elevation Data      num=     157
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
55777.24    15.556019.41   15.556065.74   15.1156073.24      1556142.24      15
56143.76   14.8256146.73   14.7256150.19    14.556204.46   14.556241.71    14.5
 56257.2    14.556260.75   14.4256262.67   14.3856269.19   14.5   56280    14.5
56284.84    14.456287.47   14.3456299.89   14.0656300.77   14.0556300.92   14.04
56302.83      1456371.45      1456374.52   13.9456381.51    13.556405.73    13.5
56411.91   13.1156413.81      1356424.38      1356432.82   12.6656434.16   12.63
56436.85   12.5756438.05    12.556449.15   12.2356449.84   12.2156451.44   12.13
56462.87    11.556596.41    11.556596.43    11.556600.61   11.6656608.53    11.5
56609.89    11.556610.63   11.5456621.93   11.9556625.27   12.21   56646    12.5
56646.08    12.556656.85      1356678.55      1356683.54   13.2356683.95   13.25
 56689.4    13.556732.74    13.556741.99   13.9356743.57      1456840.69      14
56844.55   14.1856851.45   14.0156851.51   14.0156851.63   14.0156871.38   14.43
56871.92   14.4556872.37   14.4856872.91    14.5 56932.3    14.556946.38   14.27
56971.45      1457480.96      1457484.07   14.0557538.79   14.3657541.81   14.38
57563.04    14.557599.26    14.557644.53   14.2657647.02   14.2557693.93      14
57792.51      1457804.48   14.0757808.85      1457809.57    14.157814.77      14
57818.58   14.1557825.98   14.1857847.82   14.3257851.05   14.4557855.03    14.5
57864.77   14.4157866.74   14.4357879.84    14.557975.24    14.557990.84   14.64
57993.23    14.558002.88    14.7 58048.8   14.97 58052.7   14.9958053.79      15
58140.38      1558226.55    15.558463.77    15.558534.27      1658573.97      16
58594.14   15.93 58604.8      1658881.71      1658902.86   16.4258919.17   16.24
58919.77   16.2658932.09    16.558941.73    16.5 58951.8   16.3958957.26    16.5
59098.38    16.559101.47   16.5259107.29   16.5759168.89      1759700.66      17
59712.69    16.959718.43   16.9659728.98   16.7659737.88   16.6959762.83   16.97
59763.05   16.9759819.07    16.559865.23    16.559867.91   16.4259888.96      16
60367.41      1660369.84   16.0560369.88   16.05 60387.2   16.4460403.51   16.31
60403.55   16.3160417.77    16.260419.82   16.1860423.61   16.1560508.94    16.4
60514.84   16.4260529.65   16.4660542.85    16.560804.77    16.560889.85   16.97
60894.31      1760954.46      1761014.65    16.563448.84    16.563459.15   16.26
63472.66   16.4363490.55      1663850.05      1663884.38    15.564241.32    15.5
64376.51      1664632.59      1664646.91   16.1664696.49    16.564730.95    16.5
64748.78      1764826.55      17

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
55777.24      .156438.05     .03   56646      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
```

```
      56438.05   56646          433.33  433.33  433.33              .1       .3
```

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: 2966.66*

INPUT
Description:
Station Elevation Data num= 157

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
55747.83	14	55966.7	1456008.57	13.4956015.35	13.3356077.71	13.33			
56079.09	13.2156081.77	13.14	56084.9	1356133.95	1356167.61	13			
56181.61	1356184.82	12.9556186.56	12.9256192.45	1356202.22	13				
56206.59	12.9356208.97	12.8956220.19	12.7156220.99	12.756221.13	12.69				
56222.85	12.6756284.88	12.6756287.64	12.6256293.96	12.3356315.86	12.33				
56321.44	12.0856323.16	1256332.71	1256340.34	11.7756341.55	11.75				
56343.98	11.7256345.06	11.67	56355.3	11.356355.93	11.2956357.41	11.21			
56367.96	10.6756536.27	10.67	56536.3	10.6756541.57	10.8756551.55	10.67			
56553.27	10.6756553.92	10.756563.96	11.0856566.92	11.2856585.33	11.67				
56585.4	11.6756594.45	1256612.66	1256616.85	12.15	56617.2	12.17			
56621.77	12.3356658.16	12.3356665.93	12.6256667.25	12.6756748.79	12.67				
56752.02	12.7956757.82	12.6756757.87	12.6756757.97	12.6756774.55	12.95				
56775.01	12.9756775.39	12.9856775.84	13	56825.7	1356837.52	12.69			
56858.56	12.3357286.34	12.3357288.95	12.457334.88	12.8157337.42	12.84				
57355.24	1357385.65	1357423.66	12.8457425.75	12.8357465.13	12.67				
57547.9	12.6757557.95	12.7657561.62	12.6757562.22	12.857566.59	12.67				
57569.78	12.87	57576	12.9157594.33	13.0957597.05	13.2757600.39	13.33			
57608.56	13.2257610.21	13.2357621.22	13.3357701.31	13.33	57714.4	13.51			
57716.41	13.3357724.52	13.6157763.06	13.9657766.34	13.9957767.26	14				
57839.95	14	57912.3	14.6758111.46	14.6758170.65	15.3358203.98	15.33			
58220.91	15.2358229.86	15.3358462.35	15.33	58480.1	15.6158493.79	15.5			
58494.29	15.558504.64	15.6758512.74	15.6758521.19	15.5958525.78	15.67				
58644.25	15.6758646.84	15.6958651.73	15.7558703.45	16.33	59149.9	16.33			
59160	16.259164.82	16.2159173.68	16.0159181.15	15.91	59202.1	15.96			
59202.29	15.9659249.32	15.3359288.07	15.3359290.32	15.2859307.99	15				
59709.68	1559711.71	15.0359711.75	15.0359726.29	15.3359739.99	15.27				
59740.03	15.2759751.96	15.2359753.68	15.2259756.86	15.21	59828.5	15.53			
59833.46	15.5659845.89	15.6159856.97	15.6760076.87	15.67	60148.3	16.29			
60152.04	16.3360202.54	16.3360253.07	15.6762296.73	15.6762305.38	15.5				
62316.72	15.6262331.74	15.3362633.57	15.3362662.38	1562962.06	15				
63075.56	15.6763290.55	15.6763302.57	15.8763344.21	16.3363373.14	16.33				
63388.11	16.67	63453.4	16.67						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
55747.83	.156345.06	.0356585.33	.1		

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      56345.0656585.33           433.33  433.33  433.33              .1       .3
```

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: 2533.33*

INPUT
Description:
Station Elevation Data num= 157

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
55718.41	12.555913.99	12.555951.41	11.8655957.46	11.6756013.18	11.67				

```
56014.41   11.6156016.81   11.5756019.61    11.556063.43    11.556093.52    11.5
56106.02    11.556108.89   11.4756110.45   11.4656115.71    11.556124.44    11.5
56128.35   11.4756130.47   11.45 56140.5   11.3656141.21   11.3556141.34   11.35
56142.88   11.33 56198.3   11.3356200.77   11.3156206.42   11.1756225.98   11.17
56230.97   11.04 56232.5      1156241.04      1156247.86   10.8956248.93   10.88
56251.11   10.8656252.07   10.8356261.46   10.3856262.04   10.3656263.39   10.29
56273.04    9.8356476.14    9.8356476.16    9.8356482.52   10.0956494.57    9.83
56496.64    9.8356497.21    9.8656505.99   10.2156508.58   10.3556524.67   10.83
56524.72   10.8356532.04      1156546.77      1156550.16   11.0856550.44   11.08
56554.14   11.1756583.57   11.1756589.86   11.3156590.93   11.3356656.88   11.33
 56659.5   11.3956664.19   11.3456664.23   11.3456664.31   11.3456677.72   11.48
56678.09   11.49 56678.4   11.4956678.77    11.5 56719.1    11.556728.66   11.12
56745.68   10.6757091.71   10.6757093.82   10.7557130.98   11.2757133.03    11.3
57147.45    11.557172.04    11.557202.79   11.4257204.48   11.4257236.34   11.33
57303.29   11.3357311.41   11.4557314.38   11.3357314.87    11.5 57318.4   11.33
57320.99   11.5857326.02   11.6457340.85   11.8657343.05   12.0957345.75   12.17
57352.36   12.03 57353.7   12.0457362.59   12.1757427.38   12.1757437.97   12.39
 57439.6   12.1757446.16   12.5157477.33   12.9557479.99   12.9957480.72      13
57539.53      1357598.05   13.8357759.15   13.8357807.03   14.6757833.99   14.67
57847.69   14.5457854.93   14.6758042.98   14.6758057.34   14.8158068.42   14.75
58068.82   14.7558077.19   14.8358083.74   14.8358090.58    14.858094.29   14.83
58190.12   14.8358192.22   14.8758196.18   14.9458238.01   15.6758599.15   15.67
58607.32    15.558611.21   15.4558618.38   15.2758624.42   15.1458641.37   14.96
58641.52   14.9658679.56   14.1758710.91   14.1758712.73   14.1458727.03      14
59051.95      14 59053.6   14.0259053.62   14.0259065.39   14.2159076.47   14.23
 59076.5   14.2359086.15   14.2559087.55   14.2559090.12   14.2659148.07   14.67
59152.07    14.759162.13   14.77 59171.1   14.8359348.97   14.8359406.75   15.61
59409.78   15.6759450.63   15.67 59491.5   14.8361144.61   14.8361151.61   14.75
61160.79   14.8161172.94   14.6761417.08   14.6761440.39    14.5 61682.8    14.5
61774.61   15.3361948.52   15.3361958.24   15.5961991.92   16.1762015.32   16.17
62027.43   16.3362080.25   16.33

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
55718.41      .156252.07     .0356524.67      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      56252.0756524.67            433.33  433.33  433.33              .1       .3

CROSS SECTION


RIVER: Thornhill Creek
REACH: Bridge Area          RS: 2100

INPUT
Description:
Station Elevation Data      num=      71
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   55689      1155861.28      1155894.24   10.2355899.57      1056159.09      10
56167.61   9.4556178.13       9   56416       956416.03       956423.48    9.31
56437.59       956440.02       9   56464   9.99856464.04      10 56612.5      10
 56619.8   9.54 56632.8       956897.08       956898.69     9.156927.07    9.72
56928.64   9.7656939.65      1057058.67      1057064.88   10.1457067.15      10
57067.52   10.257070.22      1057072.19    10.357076.03   10.3757087.36   10.63
57089.04   10.91 57091.1     1157096.15   10.8357097.17   10.8557103.97      11
57153.45      1157161.54   11.2757162.78      1157167.79   11.41 57191.6   11.94
57193.63   11.9957194.19      12 57239.1      12 57283.8      1357406.84      13
57443.41      14   57464      1457474.46   13.8557479.99      14   57736      14
 57737.6   14.0457740.62   14.1357772.57      1558048.39      1558109.81      13
 58395.5      1358467.63    13.858470.69   13.8458478.37   13.9258485.22      14
58621.07      14 58665.2   14.9358667.51      1558698.71      1558729.93      14
60403.54      1460473.66      1560606.48      1560613.91   15.3160639.63      16
```

60707.09 16

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
55689	.15	6159.09	.03	56464	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
56159.09	56464	417.5	417.51	417.51	.1	.3

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: 1682.5*

INPUT
Description:
Station Elevation Data num= 440

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
55203.8	11.35	55213.85	11.35	55214.99	11.36	55216.21	11.35	55227.87	11.36
55229.89	11.35	55242.46	11.37	55245.27	11.38	55261.8	11.31	55262.27	11.31
55264.98	11.32	55268.75	11.35	55270.12	11.35	55271.15	11.26	55272.8	11.27
55277.7	11.28	55279.57	11.28	55285.13	11.24	55288.52	11.24	55294.43	11.27
55320.21	11.29	55326.8	11.27	55339.88	11.28	55343.71	11.27	55349.03	11.27
55350.34	11.26	55352.48	11.25	55353.2	11.26	55355.8	11.29	55356.49	11.27
55357.98	11.28	55358.46	11.28	55361.09	11.29	55362.12	11.28	55364.2	11.22
55366.14	11.09	55367.09	11.04	55368.48	10.97	55369.88	10.82	55372.88	10.63
55373.14	10.61	55373.68	10.59	55385.79	10.59	55386.15	10.61	55386.82	10.65
55389.35	10.82	55433.47	11.05	55434.39	11.07	55439.71	11.22	55440.85	11.23
55450.64	11.38	55451.05	11.38	55461.07	11.43	55464.02	11.55	55465.11	11.52
55466.26	11.52	55467.81	11.54	55468.07	11.56	55473.91	11.54	55495.52	11.43
55498.64	11.43	55504.02	11.47	55511.38	11.47	55512.5	11.48	55514.94	11.45
55523.16	11.39	55559.77	11.52	55560.74	11.52	55565.58	11.45	55566.35	11.45
55569.1	11.44	55609.88	11.04	55610.88	11.02	55613.22	11.03	55614.15	11.06
55614.74	11.06	55616.53	11.02	55638.98	10.71	55650.29	10.48	55675.01	10.35
55723.53	10.55	55727.19	10.43	55737.39	10.02	55738.98	10.06	55742.83	10.1
55743.3	10.11	55747.16	9.98	55747.54	9.96	55748.14	9.94	55748.37	9.93
55749.01	9.88	55749.51	9.86	55750.7	9.95	55752.9	10.01	55754.87	10.07
55755.37	10.08	55762.59	10.18	55766.43	10.18	55768.86	10.19	55775.31	10.17
55777.2	10.15	55780.98	10.15	55781.89	10.13	55782.56	10.12	55815.07	10.04
55816.01	10.04	55818.94	10.05	55820.66	10.05	55821.71	10.04	55822.61	10.04
55824.19	10.05	55825.71	10.07	55826.67	10.08	55829.51	10.12	55830.54	10.11
55833.21	10.08	55834.41	10.07	55835.25	10.07	55836.85	10.03	55899.54	10.14
55899.89	10.14	55903.01	10.15	55904.25	10.16	55908.6	10.18	55909.95	10.19
55911.65	10.18	55915.01	10.18	55915.81	10.19	55916.88	10.18	55917.3	10.18
55918.68	10.16	55928	10.54	55928.36	10.44	55931.47	10.45	55932.4	10.45
55934.71	10.44	55935.6	10.43	55935.91	10.51	55935.96	10.52	55938.4	10.49
55941.86	10.44	55948.8	9.93	55949.12	9.9	55949.7	9.87	55950.49	9.77
55952.27	9.56	55974.3	9.56	55975.56	9.85	55976.74	9.95	55985.49	10.04
56007.07	10.14	56009.41	10.15	56011.57	10.09	56014	10.15	56018.93	10.1
56020.02	10.11	56020.94	10.11	56038.27	10.21	56040.8	10.21	56043.16	10.19
56045.21	10.19	56045.66	10.18	56047.88	10.2	56049	10.25	56055.41	10.1
56059.08	10.02	56059.5	10.01	56060.68	9.94	56060.93	9.93	56062.32	9.83
56062.91	9.85	56064.26	9.95	56065.21	9.95	56065.62	9.89	56067.96	9.89
56069.01	9.95	56069.64	9.89	56071.34	9.87	56071.74	9.86	56072.21	9.87
56072.95	9.85	56073.99	9.84	56074.45	9.82	56074.74	9.84	56076.34	9.93
56104.45	9.93	56107.01	9.92	56112.09	9.89	56113.16	9.88	56113.66	9.87
56116.33	9.64	56117.41	9.53	56119.08	9.65	56120.27	9.67	56124.15	9.77
56193.21	8.96	56195.86	8.89	56196.68	8.87	56198.19	8.82	56198.47	8.73
56200.14	8.32	56200.21	8.31	56200.56	8.22	56205.48	7.97	56207.01	7.89
56211.23	7.68	56212.26	7.64	56218.89	7.23	56219.5	6.85	56220.29	6.62
56221.06	6.57	56222.26	6.55	56223.42	6.42	56224.39	6.34	56402.81	6.34
56408.4	6.58	56418.98	6.34	56420.8	6.34	56422.21	6.45	56425.85	6.7

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 56426.1    6.7556426.57    6.8456428.69    7.1756441.76    8.0556443.16    8.78
56445.19    9.1356448.42    9.2756451.28    9.2956586.44    9.8156593.39    9.49
56594.09    9.4756605.75    9.1256634.32    9.2256648.02    9.2656834.77    9.34
 56839.3    9.3256841.13     9.356843.73    9.2856856.77    9.2956857.12     9.3
56857.87    9.3556858.66     9.456860.76    9.4656885.65    9.8556887.15    9.88
56897.62   10.04   56921      1056924.71   10.01 56927.3      10   56939    9.98
 56942.2    9.9756943.95    9.9656952.79    9.97 56953.9    9.9857010.83   10.05
57016.73   10.1657018.89   10.0657019.25   10.2157021.81   10.0757023.69   10.29
57027.34   10.3557038.12   10.5657039.71   10.7757041.68   10.8457046.48   10.72
57047.45   10.7457053.91   10.8657100.98   10.9257108.68   11.1357109.86   10.93
57114.62   11.2557137.27   11.67 57139.2   11.7157139.73   11.7257182.45   11.78
57224.97   12.5957324.23   12.72   57342   12.7157376.79   13.4457396.37   13.42
57406.32    13.357411.58   13.4157498.74   13.3657500.62   13.3757507.93   13.39
57539.09   13.4157550.02   13.4657551.71   13.4757566.19   13.5157576.92   13.51
57579.86    13.557581.02    13.557586.05   13.5257600.45   13.5257603.76   13.54
57621.13    13.657622.32   13.6157655.09    13.657656.61   13.6257659.48   13.69
57689.88   14.3357845.86   14.2757849.22   14.2957854.39   14.3157860.09   14.29
57904.64   14.3557910.16   14.3557933.02    14.357952.23    14.357974.77   13.77
57998.62   13.0858010.64   12.7658027.39   12.7658029.23   12.7558054.26   12.77
 58065.3   12.7458070.78   12.7858076.51   12.7858080.68   12.7958089.63   12.77
58092.31   12.75 58099.3   12.72 58104.7   12.7158110.14   12.6758124.23   12.68
 58128.6   12.6958154.43   12.6758167.31   12.6858171.58   12.6558282.39   12.46
   58351   13.0658353.91   13.0958367.73   13.2158496.95    13.258520.11   13.59
58528.68   13.6958537.32   13.8658538.92   13.8858539.54   13.8958541.12   13.89
58542.25   13.8558563.42   13.82 58570.8   13.9458573.11   13.9258576.75   13.92
58580.43   13.8458581.73   13.8258583.46   13.7758600.49   13.4158612.42    13.4
58628.67   13.4558630.58   13.4658632.16   13.4658634.32   13.4458647.97    13.4
58655.38   13.3658663.18   13.2758666.14   13.26 58864.7   13.3758868.14   13.38
58894.66   13.3558897.45   13.3858900.27   13.42 58903.1   13.4959021.91   13.38
59050.98   13.4259057.82   13.42 59064.6   13.3859069.51   13.4259091.41   13.38
 59107.1   13.3859135.09    13.359138.31    13.359142.88   13.3159155.02   13.36
 59171.3   13.3459183.58   13.3859187.11   13.3859197.38    13.3 59277.5   13.27
59281.47    13.359297.18   13.3259299.26   13.3259308.15   13.3559311.02    13.3
59323.05   13.2859392.28   13.2759416.14   13.3959425.32   13.3759437.81   13.32
59461.86   13.2859473.92   13.3559479.03   13.3759518.41   13.2759791.02   13.54
59804.32    13.6 59809.3   13.6159821.44    13.759838.69   13.7959845.27   13.85
59909.88   13.8659992.09   13.7860192.39   13.7660237.24   14.2560255.08   14.39
60259.09   14.4460303.77   14.4660329.88   14.3760338.89   14.3660345.26   14.38
60353.33   14.3760356.97   14.3860358.84   14.4260359.68   14.4460366.31   14.45
60370.94   14.5360382.64   14.6160384.62   14.6260385.42   14.6260387.17   14.67
60392.49   14.83 60397.5   14.9260399.51   14.9460405.59   14.9360406.83   14.92
60407.69    14.960409.89   14.8760410.57   14.81 60414.1   14.9160414.71   14.96
 60416.4   15.0560416.95   15.0760428.53   15.16 60435.4   15.1760445.06   15.15
60449.63   15.1760468.71    15.260471.12   15.2160473.89   15.2460481.12   15.23

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
 55203.8      .156200.56     .0356445.19      .1

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.    Expan.
      56200.5656445.19              417.5  417.51  417.51              .1        .3

CROSS SECTION


RIVER: Thornhill Creek
REACH: Bridge Area          RS: 1265.*

INPUT
Description:
Station Elevation Data      num=     493
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
 54718.6   11.754733.96   11.71 54735.7   11.7254737.56   11.7154755.39   11.72
```

54758.48	11.6954766.85	11.73 54777.7	11.7454781.97	11.7554807.24	11.62
54807.96	11.61 54812.1	11.6354817.87	11.654819.97	11.654821.53	11.52
54824.05	11.5554831.55	11.5754832.48	11.5754833.16	11.56 54834.4	11.56
54842.91	11.4954844.48	11.4854848.08	11.4854857.12	11.5354871.85	11.57
54884	11.5654895.77	11.5954896.52	11.5954906.59	11.5554914.54	11.55
54916.25	11.5354925.43	11.5654926.58	11.5754932.44	11.5554936.46	11.55
54938.36	11.5354940.56	11.5354942.57	11.5154946.94	11.5154949.52	11.56
54950.92	11.5754951.97	11.5454954.25	11.5754954.98	11.5754959.01	11.58
54960.57	11.5754963.74	11.4354966.72	11.1854968.17	11.0854970.29	10.94
54972.43	10.6554977.02	10.2654977.41	10.2354978.25	10.1854996.76	10.18
54997.3	10.22 55002.2	10.6555069.63	11.0955079.16	11.4455080.91	11.45
55095.87	11.7555096.49	11.75 55111.8	11.86 55116.3	12.0155117.98	12.03
55119.73	12.0355122.11	12.0955122.52	12.1155131.42	12.0855164.46	11.87
55169.23	11.8755177.45	11.9455182.28	11.9355187.81	11.94 55188.7	11.94
55190.41	11.9755194.14	11.9155202.76	11.8255206.71	11.7755252.71	12
55262.66	12.0355264.14	12.0455271.54	11.9155272.71	11.955276.92	11.89
55339.25	11.5455340.77	11.4955344.36	11.5455345.77	11.6155346.67	11.62
55349.41	11.5555383.73	11.19 55401	10.95 55438.8	10.6955512.95	11.1
55516.16	10.9555518.55	10.8555534.12	10.0555536.56	10.1155542.45	10.21
55543.17	10.2255549.06	9.9555549.65	9.9255550.57	9.8955550.91	9.85
55551.88	9.7655552.65	9.7355554.48	9.9155557.84	10.0255560.85	10.14
55561.62	10.1655572.64	10.3555578.52	10.3655582.23	10.3855587.44	10.37
55592.09	10.3455594.98	10.3155600.75	10.2955602.14	10.2655603.17	10.25
55652.86	10.0955658.77	10.09 55661.4	10.155663.02	10.0955664.38	10.07
55666.8	10.0955669.12	10.1455670.59	10.1655674.92	10.2455676.49	10.22
55680.58	10.1655682.41	10.15 55683.7	10.1455686.15	10.0655781.96	10.27
55782.5	10.28 55795.8	10.3655797.86	10.3855800.46	10.37 55805.6	10.37
55806.82	10.3855808.46	10.3655811.21	10.3255825.45	11.0855826.01	10.88
55830.75	10.9155832.18	10.9155835.71	10.8855837.07	10.8655837.54	11.01
55837.62	11.0555838.87	11.0255841.35	10.9855842.37	10.9755846.65	10.89
55857.25	9.8555857.73	9.855858.62	9.7455859.84	9.5555862.55	9.11
55896.21	9.1155898.15	9.5955899.95	9.955913.32	10.09 55946.3	10.28
55949.89	10.1955953.18	10.1855958.67	10.2155962.11	10.255964.42	10.2
55966.09	10.22 55967.5	10.23 55972.8	10.2655995.37	10.4255997.87	10.43
56001.47	10.3956002.02	10.3956004.59	10.3856005.28	10.3756008.67	10.4
56009.53	10.4156010.38	10.4156020.19	10.1956025.79	10.0356026.44	10.01
56028.23	9.8956028.63	9.8556030.75	9.6656031.65	9.756033.71	9.81
56035.16	9.79 56035.8	9.7756036.39	9.7756039.38	9.7856040.97	9.81
56041.93	9.7856044.54	9.7456045.15	9.7256045.86	9.7456046.98	9.71
56048.58	9.6756049.28	9.6556049.73	9.6856051.62	9.8256052.17	9.87
56095.15	9.8656099.05	9.8456106.82	9.7856108.45	9.7656109.22	9.74
56113.3	9.2856114.95	9.0756117.49	9.256119.31	9.3456125.25	9.53
56230.8	7.9256234.84	7.78 56236.1	7.7456238.41	7.6456238.84	7.45
56241.39	6.64 56241.5	6.6156242.04	6.4456247.94	6.1956249.78	6.12
56254.84	5.9156256.09	5.8656261.38	5.4756264.05	5.2656264.77	4.43
56265.72	4.1156266.65	4.0356268.09	3.9256269.48	3.8156270.64	3.68
56389.59	3.6856393.32	3.8456400.38	3.6856401.59	3.6856403.02	3.84
56406.72	4.1956406.97	4.2856407.45	4.4556409.61	5.0356418.21	5.81
56422.89	6.2356424.32	7.6556426.38	8.2656429.45	8.5356432.16	8.58
56560.38	9.6156566.97	9.43 56578.7	9.2556615.85	9.51 56618.8	9.52
56795.96	9.6856800.27	9.63 56802	9.5956804.47	9.5756808.05	9.57
56809.52	9.5656815.54	9.5856816.84	9.5956817.17	9.656817.88	9.65
56818.63	9.756820.62	9.7856844.23	9.9856845.66	1056855.59	10.08
56877.77	10.0156881.29	10.0156894.85	9.9556897.88	9.9356907.92	9.94
56908.98	9.9556962.99	10.156968.59	10.1956970.64	10.1256970.97	10.22
56973.41	10.1356975.19	10.2956978.65	10.3356988.88	10.4956990.39	10.63
56992.25	10.68 56996.8	10.6156997.73	10.6257003.86	10.7257048.51	10.84
57055.81	1157056.93	10.8657061.45	11.0857084.77	11.4457085.27	11.44
57125.8	11.5657166.13	12.17 57260.3	12.4357277.16	12.4157310.16	12.87
57328.73	12.8557338.18	12.7657343.16	12.8357425.85	12.7257427.64	12.74
57445.73	12.8157464.13	12.8357466.05	12.84 57474.5	12.9257486.26	13
57494.81	13.0257497.47	13.0257500.02	13.0157502.81	12.9957503.91	13
57511.39	13.0557517.98	13.04 57519.9	13.0357522.34	13.0357525.48	13.08

57541.96	13.257543.09	13.2257574.18	13.1957607.18	13.6657755.16	13.55
57758.34	13.5957763.24	13.6157768.65	13.5957785.21	13.5957800.93	13.67
57810.92	13.6957816.16	13.6957820.91	13.6857837.84	13.5957854.76	13.6
57856.06	13.6157877.45	13.357900.08	12.7557911.48	12.5357917.74	12.51
57952.86	12.5357963.34	12.4957968.53	12.5757973.97	12.5657977.93	12.57
57986.41	12.5357988.96	12.4957995.59	12.4358000.71	12.4158005.87	12.34
58016.12	12.3758019.23	12.3658023.38	12.3858047.89	12.3458056.74	12.36
58060.11	12.3658064.16	12.3158160.39	11.9358169.28	11.9358234.36	12.32
58237.12	12.3458250.23	12.4258372.82	12.41 58394.8	12.6658402.93	12.68
58411.12	12.8358413.23	12.8358414.73	12.77 58415.8	12.7158428.73	12.66
58435.88	12.6558442.88	12.8858445.08	12.9258448.53	13.0558452.02	13.01
58453.25	13 58454.9	12.9858471.05	12.81 58472.2	12.8258473.26	12.82
58482.37	12.7958497.78	12.91 58499.6	12.92 58501.1	12.9258503.14	12.89
58509.34	12.8458516.09	12.8158523.12	12.7358527.12	12.6158530.52	12.55
58533.33	12.5258719.82	12.74 58721.7	12.7458724.97	12.75 58739.6	12.74
58750.12	12.7158752.77	12.7658755.45	12.8458758.12	12.9958870.84	12.76
58881.99	12.7858898.41	12.8458904.91	12.8458911.34	12.76 58916	12.84
58936.78	12.7658945.45	12.7558951.66	12.7658978.21	12.5958981.27	12.59
58985.6	12.6158988.09	12.6458997.12	12.7259012.55	12.6759024.21	12.75
59027.56	12.75 59037.3	12.5959039.88	12.6 59056.4	12.5759095.36	12.57
59097.58	12.5659113.31	12.5559117.08	12.5959131.98	12.6459133.95	12.63
59142.39	12.69 59145.1	12.5959156.52	12.5659178.56	12.5659192.34	12.53
59201.09	12.55 59222.2	12.5359244.83	12.7859253.55	12.7459265.39	12.64
59288.21	12.5759304.49	12.7459307.18	12.7359341.85	12.5459600.47	13.09
59613.09	13.259617.82	13.2359629.32	13.4 59645.7	13.5959651.93	13.69
59662.05	13.759669.78	13.7359713.23	13.73 59729.7	13.6659772.58	13.59
59779.2	13.5959781.09	13.5859791.22	13.5659981.23	13.5160023.79	13.84
60040.71	13.8560044.51	13.88 60086.9	13.9260104.04	13.8160111.67	13.74
60120.21	13.7260126.26	13.7560133.91	13.7460137.38	13.7660139.14	13.84
60139.94	13.8960146.23	13.960150.62	14.0660161.73	14.22 60163.6	14.24
60164.36	14.2360171.06	14.3560175.82	14.3960177.73	14.3760183.49	14.18
60184.67	14.1360185.48	14.0660187.57	13.9460188.22	13.8160191.56	13.9
60192.15	13.9760193.75	14.1160194.27	14.1360196.43	14.1860205.26	14.33
60211.77	14.3460220.94	14.360225.27	14.3460232.94	14.3860243.37	14.41
60245.66	14.4360248.29	14.4960255.14	14.47		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
54718.6	.156242.04		.0356426.38		.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
56242.0	456426.38	417.5	417.51	417.51	.1	.3

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: 847.5*

INPUT
Description:
Station Elevation Data num= 500

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
54233.4	12.0654282.91	12.0754287.06	12.0454298.33	12.0954318.68	12.12
54352.68	11.9354353.65	11.9254359.23	11.9454366.99	11.954369.82	11.9
54371.91	11.7954375.31	11.83 54385.4	11.8654386.65	11.8554387.57	11.83
54389.23	11.8354400.69	11.73 54402.8	11.7254407.65	11.71 54419.8	11.8
54439.63	11.8654455.98	11.8454471.83	11.8854472.82	11.8854486.37	11.83
54497.08	11.8254499.38	11.854511.73	11.8454513.28	11.8554521.17	11.82
54523.94	11.8354526.58	11.8254529.14	11.854532.09	11.8 54534.8	11.77
54539.21	11.7654540.68	11.7754546.04	11.8654547.45	11.8154550.52	11.85
54551.49	11.8554556.92	11.8754559.02	11.8654563.29	11.6554567.29	11.28
54569.25	11.1254572.11	10.9154574.98	10.4854581.15	9.8854581.69	9.85

54582.81	9.7854607.72	9.7854608.45	9.8254609.84	9.9754615.04	10.47
54705.79	11.1454707.66	11.254718.61	11.6754720.96	11.6754741.09	12.12
54741.94	12.1254762.54	12.3 54768.6	12.5154770.86	12.5554773.21	12.55
54776.41	12.6354776.95	12.6754788.94	12.62 54833.4	12.3154839.81	12.31
54850.87	12.4154857.39	12.454864.83	12.4254866.02	12.4254868.33	12.45
54873.34	12.3654884.94	12.2454890.26	12.1554952.16	12.554965.56	12.55
54967.55	12.56 54977.5	12.3654979.08	12.3454984.73	12.3355068.61	12.03
55070.66	11.9755075.49	12.0555077.39	12.1655078.61	12.1855082.29	12.09
55202.58	11.0355302.37	11.6555306.69	11.42 55309.9	11.2755330.86	10.08
55334.14	10.1755342.06	10.3255343.03	10.3355351.75	9.8855352.99	9.83
55353.46	9.7755354.76	9.64 55355.8	9.655358.26	9.8655366.82	10.2
55367.86	10.25 55382.7	10.5255390.61	10.5455395.61	10.5755402.61	10.56
55408.86	10.5255412.76	10.4755420.53	10.4355422.39	10.455423.78	10.38
55490.64	10.1355492.57	10.1355498.59	10.1455502.14	10.1655504.31	10.13
55506.14	10.1155509.41	10.1455512.54	10.255514.51	10.2555520.34	10.36
55522.45	10.3255527.95	10.2355530.41	10.2255532.15	10.255535.45	10.08
55664.38	10.4155665.11	10.4255683.01	10.5555685.77	10.56 55696.2	10.56
55697.84	10.5755700.04	10.5555700.91	10.5355703.75	10.4755722.91	11.62
55723.66	11.3155730.04	11.3655731.96	11.3655738.55	11.2955739.18	11.52
55739.29	11.5755740.96	11.54 55744.3	11.4755745.67	11.4555751.43	11.34
55765.7	9.7755766.35	9.755767.54	9.6155769.18	9.3255772.82	8.67
55818.13	8.6755820.73	9.3955823.17	9.8455841.16	10.1355885.54	10.42
55890.37	10.29 55894.8	10.28 55899.8	10.355902.18	10.32 55906.8	10.31
55909.92	10.3155912.17	10.3355914.06	10.34 55921.2	10.4 55924.7	10.42
55949.72	10.6255951.56	10.6355954.93	10.6455959.77	10.5855960.52	10.58
55963.98	10.5655964.91	10.5655969.46	10.5955970.62	10.6155971.77	10.61
55984.96	10.28 55992.5	10.0555993.38	10.0255995.79	9.8355996.32	9.77
55999.17	9.4856000.39	9.5656003.17	9.7156005.12	9.6856005.97	9.65
56006.77	9.6556010.79	9.6856012.93	9.7156017.73	9.656018.56	9.58
56019.51	9.6156023.18	9.5156024.11	9.4856024.72	9.5256027.27	9.74
56028.01	9.8156083.97	9.7956085.84	9.8 56091.1	9.7556098.23	9.7
56101.55	9.6756103.75	9.6356104.77	9.6256110.27	8.9256112.49	8.6
56115.91	8.8156118.35	956126.35	9.356268.39	6.8856273.83	6.68
56275.52	6.6156278.62	6.4756279.21	6.1856282.65	4.9756282.78	4.92
56283.52	4.66 56290.4	4.4256292.55	4.3456298.45	4.1356299.91	4.09
56306.08	3.57 56309.2	3.356310.05	2.0756311.16	1.5956312.24	1.49
56313.92	1.3556315.55	1.2 56316.9	1.0356376.37	1.0356378.24	1.11
56381.77	1.0356382.38	1.0356383.83	1.2356387.59	1.6856387.84	1.81
56388.34	2.0556390.52	2.8856404.02	4.4256405.48	6.5156407.58	7.39
56410.47	7.856413.04	7.8756534.33	9.4256540.56	9.3856551.66	9.37
56577.29	9.6656581.73	9.756589.58	9.7956757.16	10.0356761.23	9.94
56762.87	9.8956765.21	9.8656766.66	9.8556768.59	9.8556769.99	9.84
56775.67	9.87 56776.9	9.8856777.22	9.956777.89	9.95 56778.6	10
56780.48	10.0956802.82	10.1156804.16	10.1256813.56	10.1256834.54	10.01
56837.87	10.02 56850.7	9.9256853.56	9.8956855.13	9.8956863.06	9.92
56864.06	9.9256915.15	10.1556920.45	10.2156922.38	10.18 56922.7	10.24
56925	10.256926.69	10.2856929.96	10.3156939.63	10.4256941.07	10.49
56942.83	10.5356947.13	10.556953.81	10.5756996.04	10.7657002.95	10.86
57004.01	10.857008.28	10.9257030.34	11.1657030.81	11.1757069.15	11.34
57107.3	11.7657196.38	12.1557212.32	12.1257243.53	12.3157261.11	12.27
57270.03	12.2157274.75	12.2457352.96	12.0857354.66	12.157371.76	12.22
57389.18	12.2457390.99	12.2757398.98	12.38 57400.5	12.3957410.11	12.5
57418.2	12.5457423.12	12.5257425.76	12.49 57426.8	12.557431.32	12.55
57433.88	12.5757440.11	12.5657441.92	12.5557444.23	12.5557447.21	12.62
57462.79	12.8157463.86	12.8257494.63	12.7957524.48	1357664.45	12.82
57667.47	12.88 57672.1	12.9157677.21	12.8857692.88	12.8957707.75	13.01
57722.15	13.0457742.67	12.8957758.66	12.91 57759.9	12.9157780.12	12.84
57801.54	12.4257812.32	12.2957818.24	12.2757827.35	12.27 57829	12.26
57851.46	12.357861.37	12.2357866.28	12.3657871.42	12.3457875.17	12.36
57883.2	12.357885.61	12.2457891.88	12.1457896.72	12.12 57901.6	12.01
57911.29	12.0657914.24	12.0457918.17	12.0757941.34	12.0157949.72	12.05
57952.9	12.0457956.73	11.9658047.76	11.3958056.16	11.3958132.74	11.63
58248.7	11.6158269.48	11.7458277.18	11.6758284.93	11.858286.36	11.78

58286.92	11.7858288.34	11.6658289.35	11.5758301.58	11.4958308.34	11.47
58314.96	11.8258317.05	11.9158320.31	12.1758323.61	12.1758324.78	12.19
58326.34	12.1858341.61	12.22 58343.7	12.2458352.31	12.1858368.61	12.38
58370.04	12.3858371.96	12.3458377.83	12.2758384.22	12.2258390.87	12.1
58394.64	11.9158397.87	11.8258400.52	11.7858576.92	12.1158578.69	12.11
58581.79	12.1258595.63	12.1258605.58	12.0758608.08	12.1358610.62	12.26
58613.15	12.4858719.77	12.1558730.32	12.1858745.85	12.2758751.99	12.27
58758.07	12.1458762.48	12.2658782.14	12.1558790.35	12.1258796.21	12.13
58802.95	12.0858821.33	11.8958824.22	11.8958828.32	11.9158830.68	11.95
58839.21	12.0758853.82	12.0158864.84	12.1258868.01	12.1258877.23	11.89
58879.66	11.958895.29	11.8658922.62	11.8458932.14	11.8658934.24	11.83
58940.77	11.8258949.12	11.8358952.68	11.8958966.78	11.9558968.65	11.94
58976.62	12.0458979.19	11.8958992.12	11.8359010.84	11.8359023.88	11.8
59032.15	11.8359052.11	11.859073.52	12.1759081.77	12.1259092.97	11.95
59107.37	11.9159114.55	11.8559125.38	12.0459129.96	12.11 59132.5	12.1
59165.3	11.8159409.92	12.6359421.85	12.8159426.33	12.8559437.21	13.1
59452.7	13.3859458.59	13.5459464.83	13.5559468.16	13.5559475.48	13.59
59516.58	13.5959532.15	13.4859548.77	13.4659572.71	13.3959574.46	13.39
59578.98	13.3859580.77	13.3759590.35	13.3459770.08	13.2759810.33	13.42
59826.34	13.359827.71	13.3159829.93	13.3259870.03	13.3859886.24	13.22
59893.46	13.1159901.54	13.0759907.26	13.12 59914.5	13.1259917.77	13.15
59919.45	13.26 59920.2	13.3459926.15	13.34 59930.3	13.5959940.81	13.82
59942.58	13.85 59943.3	13.8559944.87	13.8659949.64	13.8659954.14	13.85
59955.95	13.81 59961.4	13.4359962.51	13.3459963.28	13.2259965.26	13.01
59965.87	12.859969.03	12.959969.59	12.99 59971.1	13.1859971.59	13.2
59973.64	13.2859981.98	13.4959988.14	13.559996.81	13.4560000.91	13.51
60008.17	13.5760018.04	13.61 60020.2	13.6460022.69	13.7360029.17	13.7

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
54233.4	.156	283.52	.035	6407.58	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
56283.5	256407.58	417.5	417.51	417.51	.1	.3

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: 430

INPUT
Description: 395 US of proposed 440 US from existing
Station Elevation Data num= 482

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
53748.2	12.4	153774.18	12.4	253777.13	12.4	353780.27	12.4	253810.43	12.43
53815.65	12.3	953829.81	12.4	553848.16	12.4	853855.39	12.5	53898.13	12.24
53899.34	12.2	353906.35	12.2	653916.11	12.2	53919.66	12.2	53922.3	12.05
53926.57	12.1	53939.25	12.1	453940.82	12.1	353941.98	12.1	153944.07	12.11
53958.46	11.9	753961.12	11.9	653967.21	11.9	553982.49	12.0	654007.41	12.14
54027.97	12.1	254047.88	12.1	754049.13	12.1	754066.16	12.1	54079.62	12.09
54082.51	12.0	754098.03	12.1	254099.98	12.13	54109.9	12.0	954113.38	12.1
54116.7	12.0	954119.91	12.0	754123.63	12.0	654127.03	12.0	354132.57	12.01
54134.42	12.0	254138.79	12.1	154141.16	12.1	554142.92	12.0	854146.79	12.13
54148.01	12.1	354154.83	12.1	654157.47	12.1	454162.84	11.8	754167.87	11.37
54170.33	11.1	654173.92	10.8	854177.53	10.3	54185.29	9.5	154185.96	9.46
54187.37	9.3	754218.68	9.37	54219.6	9.4	354221.34	9.6	254227.88	10.29
54341.94	11.18	54344.3	11.2	754358.06	11.8	954361.02	11.9	54386.32	12.5
54387.38	12.5	54413.27	12.7	354420.89	13.0	154423.73	13.0	754426.69	13.07
54430.71	13.1	754431.39	13.2	354446.46	13.1	654502.34	12.74	54510.4	12.74
54524.3	12.8	854532.49	12.8	754541.84	12.8	954543.34	12.8	954546.24	12.93
54552.54	12.8	154567.12	12.6	554573.81	12.5	454651.61		1354668.45	13.06
54670.95	13.0	854683.46	12.8	254685.44	12.7	954797.98	12.5	254800.56	12.45

54806.62	12.5654809.01	12.7154810.54	12.7454815.17	12.6354966.36	11.38
55091.79	12.255097.22	11.955101.25	11.7 55127.6	10.155131.72	10.23
55141.68	10.42 55142.9	10.4455152.87	9.955153.86	9.8455155.41	9.77
55156	9.755157.64	9.5255158.94	9.4655162.03	9.8155167.72	10.05
55172.8	10.27 55174.1	10.3355192.75	10.755202.69	10.7255208.98	10.76
55217.78	10.7455225.64	10.6955230.54	10.62 55240.3	10.5855242.65	10.53
55244.39	10.555328.43	10.1755330.85	10.1755338.42	10.1955342.88	10.21
55345.61	10.1755347.91	10.1555352.01	10.1955355.95	10.2755358.42	10.33
55365.75	10.4855368.41	10.4355375.32	10.3155378.41	10.29 55380.6	10.27
55384.74	10.11 55546.8	10.5555547.71	10.5655555.77	10.6255558.96	10.65
55570.21	10.7355573.69	10.7555578.09	10.7455586.79	10.7455588.85	10.76
55591.62	10.7355592.71	10.7155596.28	10.6355620.36	12.16 55621.3	11.75
55629.33	11.8155630.45	11.8255631.74	11.8155637.72	11.7555640.02	11.72
55640.81	12.0255640.95	12.0955643.05	12.0555647.25	11.9655648.97	11.93
55656.21	11.7855674.14	9.755674.97	9.655676.46	9.4855678.52	9.09
55683.1	8.2355740.05	8.2355743.32	9.1855746.38	9.7955768.99	10.17
55824.77	10.5655830.84	10.3955836.41	10.37 55842.7	10.455845.69	10.42
55851.5	10.4155855.42	10.4155858.25	10.4455860.62	10.4555869.59	10.53
55874	10.5655905.44	10.8355907.76	10.8455911.99	10.8555918.08	10.77
55919.01	10.7755923.37	10.7555924.53	10.7455930.26	10.7955931.71	10.81
55933.16	10.8255941.29	10.655949.74	10.3855959.22	10.0655960.32	10.02
55963.35	9.7755964.02	9.7 55967.6	9.3155969.13	9.4155972.62	9.61
55975.07	9.5855976.15	9.5455977.14	9.54 55982.2	9.5755984.89	9.61
55986.52	9.5755990.93	9.4755991.97	9.4455993.16	9.4855995.07	9.42
55997.77	9.3455998.95	9.355999.71	9.3656002.91	9.6556003.84	9.74
56074.18	9.7256076.53	9.7356083.14	9.6756092.11	9.656096.28	9.56
56099.04	9.5156100.33	9.4956107.23	8.5656110.03	8.1356114.33	8.41
56117.4	8.6756127.45	9.0656305.98	5.8456312.82	5.5756314.94	5.48
56318.84	5.2956319.58	4.91 56323.9	3.2956324.07	3.2356324.99	2.88
56332.86	2.6456335.32	2.5756343.73	2.3156350.79	1.6756354.36	1.34
56355.33	-.356356.59	-.9356357.83	-1.0556359.75	-1.2356361.61	-1.41
56363.16	-1.6356364.64	-1.3856368.46	-.8356368.72	-.6656369.22	-.34
56371.44	.7356377.68	1.5956380.33	1.9556382.64	2.2756385.16	2.61
56386.64	5.3856388.77	6.52 56391.5	7.0656393.92	7.1656514.74	9.34
56548.77	9.8856552.96	9.9356555.36	9.9856557.73	10.0156560.36	10.05
56718.35	10.3756722.19	10.2656723.74	10.1856725.94	10.1456727.31	10.13
56729.13	10.1356730.45	10.1256735.81	10.1656736.97	10.17 56737.9	10.25
56740.34	10.4156791.31	10.0156794.45	10.0356796.64	1056806.54	9.9
56809.24	9.8656810.72	9.85 56818.2	9.8956819.14	9.957132.45	11.87
57280.08	11.4457281.67	11.4757287.85	11.54 57297.8	11.6257314.22	11.66
57315.93	11.6957323.46	11.84 57324.9	11.8657333.95	1257337.14	12.03
57341.58	12.0557343.95	12.0457346.22	12.0257348.71	11.9957349.69	12
57353.95	12.0657356.36	12.0957362.24	12.0857363.95	12.0757366.13	12.07
57368.93	12.1657373.95	12.2557383.62	12.4157384.63	12.4357573.75	12.09
57576.59	12.1757580.96	12.2257585.78	12.1757588.03	12.1757600.55	12.19
57614.57	12.3457623.48	12.3857628.15	12.3957632.39	12.3557647.49	12.18
57662.57	12.21 57682.8	12.3857702.99	12.0957718.74	12.0357726.24	12.02
57727.33	12.0257728.88	12.0157750.06	12.06 57756.4	12 57759.4	11.98
57764.03	12.1457768.88	12.1257772.41	12.1557779.98	12.0657782.25	11.99
57788.16	11.8657792.73	11.8357797.33	11.6857806.47	11.7457809.25	11.72
57812.95	11.76 57834.8	11.68 57842.7	11.73 57845.7	11.7257849.31	11.61
57935.13	10.8658144.17	10.8158151.42	10.6658158.73	10.7758160.61	10.72
58162.9	10.4258174.43	10.3258180.81	10.2958189.01	10.9158192.09	11.3
58195.2	11.34 58196.3	11.3758197.77	11.3858213.19	11.6458214.14	11.65
58222.26	11.5858236.01	11.8258237.63	11.8458238.97	11.8458240.79	11.78
58246.32	11.6958252.34	11.6258258.61	11.4658262.17	11.2258265.21	11.09
58267.71	11.0458434.02	11.4858435.69	11.4858438.61	11.558451.66	11.49
58461.04	11.42 58463.4	11.5158465.79	11.6858468.18	11.97 58568.7	11.53
58578.64	11.5758593.29	11.6958599.08	11.6958604.81	11.5258608.97	11.68
58627.5	11.5358635.24	11.558640.77	11.5158647.12	11.4458664.45	11.19
58667.17	11.1958671.04	11.2258673.26	11.2758681.31	11.4358695.08	11.34
58705.47	11.558708.46	11.558717.15	11.1958719.44	11.258734.18	11.15
58743.11	11.1558759.95	11.1258768.92	11.14 58770.9	11.1158777.05	11.09

58784.93	11.158788.29	11.1858801.58	11.2758803.34	11.2658810.86	11.39
58813.28	11.1958823.46	11.1258825.47	11.1158843.12	11.1158855.41	11.07
58863.21	11.158872.32	11.0958882.03	11.0658902.22	11.5658909.99	11.49
58920.55	11.2758934.13	11.21 58940.9	11.13 58951.1	11.3958955.42	11.48
58957.82	11.4658988.74	11.0859219.37	12.1759230.62	12.4159234.84	12.46
59245.1	12.8 59259.7	13.1759265.26	13.3959271.14	13.459274.28	13.4
59281.18	13.45 59292.5	13.4759319.93	13.4559334.61	13.3159350.28	13.28
59372.85	13.19 59374.5	13.1859378.76	13.1759380.44	13.1659389.48	13.12
59596.88	1359611.97	12.7659613.26	12.7659653.16	12.8459668.44	12.62
59675.25	12.4859682.87	12.4359688.26	12.559695.09	12.4959698.17	12.53
59699.75	12.6859700.46	12.7859706.07	12.7959709.99	13.1259719.89	13.43
59721.56	13.4759723.72	13.4559732.46	13.3259734.16	13.24 59739.3	12.68
59740.35	12.5559741.08	12.3859742.94	12.0859743.52	11.79 59746.5	11.89
59747.02	12.0159748.45	12.2459750.84	12.3759758.71	12.6659764.52	12.67
59772.69	12.659776.56	12.68 59783.4	12.76 59792.7	12.8159794.74	12.85
59797.09	12.97 59803.2	12.94			

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
53748.2	.156324.99		.0356388.77		.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
56324.9	956388.77	275	275	275	.1	.3

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: 155

INPUT
Description: 120' US of proposed 165' US from Exisiting face
Station Elevation Data num= 466

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
53748.2	12.4153774.18	12.4253777.13	12.4353780.27	12.4253810.43	12.43				
53815.65	12.3953829.81	12.4553848.16	12.4853855.39	12.553898.13	12.24				
53899.34	12.2353906.35	12.2653916.11	12.253919.66	12.2 53922.3	12.05				
53926.57	12.153939.25	12.1453940.82	12.1353941.98	12.1153944.07	12.11				
53958.46	11.9753961.12	11.9653967.21	11.9553982.49	12.0654007.41	12.14				
54027.97	12.1254047.88	12.1754049.13	12.1754066.16	12.154079.62	12.09				
54082.51	12.0754098.03	12.1254099.98	12.13 54109.9	12.0954113.38	12.1				
54116.7	12.0954119.91	12.0754123.63	12.0654127.03	12.0354132.57	12.01				
54134.42	12.0254138.79	12.1154141.16	12.1554142.92	12.0854146.79	12.13				
54148.01	12.1354154.83	12.1654157.47	12.1454162.84	11.8754167.87	11.37				
54170.33	11.1654173.92	10.8854177.53	10.354185.29	9.5154185.96	9.46				
54187.37	9.3754218.68	9.37 54219.6	9.4354221.34	9.6254227.88	10.29				
54341.94	11.18 54344.3	11.2754358.06	11.8954361.02	11.954386.32	12.5				
54387.38	12.554413.27	12.7354420.89	13.0154423.73	13.0754426.69	13.07				
54430.71	13.1754431.39	13.2354446.46	13.1654502.34	12.74 54510.4	12.74				
54524.3	12.8854532.49	12.8754541.84	12.8954543.34	12.8954546.24	12.93				
54552.54	12.8154567.12	12.6554573.81	12.5454651.61	1354668.45	13.06				
54670.95	13.0854683.46	12.8254685.44	12.7954797.98	12.5254800.56	12.45				
54806.62	12.5654809.01	12.7154810.54	12.7454815.17	12.6354966.36	11.38				
55091.79	12.255097.22	11.955101.25	11.7 55127.6	10.155131.72	10.23				
55141.68	10.4255837.66	9.8555841.54	9.7955842.69	9.7355852.26	9.21				
55853.65	9.1355859.22	8.8355862.47	8.8355867.33	8.8155870.56	8.76				
55873.38	8.7255876.69	8.7855880.99	8.8455882.18	8.8655886.21	8.84				
55888.6	8.8555890.58	8.8555898.93	8.8755900.59	8.8755909.69	8.6				
55911.9	8.5455914.83	8.4555919.03	8.2955928.63	6.8455929.59	6.72				
55931.61	6.9155943.39	8.15 55946.8	855949.37	7.8955952.73	7.84				
55959.33	7.9955962.51	8.0755966.69	855970.14	7.955972.25	7.99				
55973.35	8.0355975.83	7.7955976.75	7.6955981.79	7.1855984.06	6.94				
55986.32	6.9755990.67	7.0255993.44	7.13 55995.8	7.2355999.07	7.34				

56005.09	7.5156008.22	7.656213.03	6.0156214.78	5.9856216.15	5.95
56220.42	5.8556238.08	5.3556240.68	5.2856243.87	5.1856247.17	4.95
56249.73	3.5656250.75	356255.45	1.5456258.97	-.0256261.38	-.59
56263.01	-.9756264.03	-1.1356264.49	-1.256266.49	-1.9356269.52	-2.53
56270.7	-2.656273.03	-2.21 56273.6	-2.1156274.39	-1.9856274.94	-1.93
56277.08	-.5256280.54	.2356283.18	.3856284.67	.4656292.75	.92
56294.22	1.0156302.33	1.6656307.94	2.1256311.87	4.656314.06	7.18
56319.62	8.3156321.48	8.6856322.05	8.856322.53	8.956331.06	8.76
56335.29	8.6956340.63	8.7256342.92	8.7456377.87	8.9556378.94	8.96
56388	9.0856389.52	9.0856401.17	9.1256407.64	9.1356412.82	9.15
56417.24	9.1556424.47	9.1356426.82	9.1256436.12	9.156445.97	9.07
56447.76	9.0656471.06	8.9956473.07	8.98 56474.7	956482.71	9.07
56484.27	9.0856493.85	9.1656512.48	9.3156570.46	9.3256575.91	9.33
56589.61	9.33 56592.4	9.3256606.41	9.31 56645.8	9.5156647.06	9.52
56656.64	9.5756680.75	9.7256681.98	9.7356694.14	10.34 56698.7	10.33
56700.73	10.3356704.05	10.1556705.45	10.0856706.28	1056706.72	9.75
56710.73	7.1556711.69	7.22 56715.7	9.156716.33	9.4156717.07	9.71
56781.14	9.6456785.59	9.6356788.53	9.6356808.89	9.7256809.85	9.73
56816.27	9.7656867.14	10.7456875.27	10.8956876.89	10.9356878.79	10.96
56896.04	11.3156924.76	11.556934.33	11.5656937.03	11.5756948.68	11.65
56953.47	11.6756960.33	11.7256963.05	11.7356971.98	11.7956995.28	11.93
57006.25	11.9757009.31	11.9857010.95	11.9757039.68	11.9357042.85	11.93
57049.25	11.9157053.53	11.9157058.83	11.957065.18	11.8857068.45	11.88
57076.83	11.8657077.99	11.8657087.56	11.8457088.48	11.8457097.13	11.82
57100.34	11.8257103.49	11.8457116.24	11.8757119.06	11.8757123.42	11.88
57154.59	11.9157158.37	11.9257202.47	11.9657204.97	11.9757212.04	11.97
57216.62	11.9857229.25	11.9957231.19	11.9757239.92	11.92 57241.8	11.9
57242.96	11.7657244.54	11.9557250.35	1257251.57	1257252.58	12.01
57260.62	11.957261.22	11.8357263.21	11.5957264.51	11.4457268.06	11.45
57269.5	11.4457274.86	11.4457276.75	11.4557280.49	12.06 57307.8	12.07
57309.81	12.0857317.38	12.0857321.46	12.0957592.83	12.18 57598.4	12.29
57623.48	12.3857628.15	12.3957632.39	12.3557647.49	12.1857662.57	12.21
57682.8	12.3857702.99	12.0957718.74	12.0357726.24	12.0257727.33	12.02
57728.88	12.0157750.06	12.06 57756.4	12 57759.4	11.9857764.03	12.14
57768.88	12.1257772.41	12.1557779.98	12.0657782.25	11.9957788.16	11.86
57792.73	11.8357797.33	11.6857806.47	11.7457809.25	11.7257812.95	11.76
57834.8	11.68 57842.7	11.73 57845.7	11.7257849.31	11.6157935.13	10.86
58144.17	10.8158151.42	10.6658158.73	10.7758160.61	10.72 58162.9	10.42
58174.43	10.3258180.81	10.2958189.01	10.9158192.09	11.3 58195.2	11.34
58196.3	11.3758197.77	11.3858213.19	11.6458214.14	11.6558222.26	11.58
58236.01	11.8258237.63	11.8458238.97	11.8458240.79	11.7858246.32	11.69
58252.34	11.6258258.61	11.4658262.17	11.2258265.21	11.0958267.71	11.04
58434.02	11.4858435.69	11.4858438.61	11.558451.66	11.4958461.04	11.42
58463.4	11.5158465.79	11.6858468.18	11.97 58568.7	11.5358578.64	11.57
58593.29	11.6958599.08	11.6958604.81	11.5258608.97	11.68 58627.5	11.53
58635.24	11.558640.77	11.5158647.12	11.4458664.45	11.1958667.17	11.19
58671.04	11.2258673.26	11.2758681.31	11.4358695.08	11.3458705.47	11.5
58708.46	11.558717.15	11.1958719.44	11.258734.18	11.1558743.11	11.15
58759.95	11.1258768.92	11.14 58770.9	11.1158777.05	11.0958784.93	11.1
58788.29	11.1858801.58	11.2758803.34	11.2658810.86	11.3958813.28	11.19
58823.46	11.1258825.47	11.1158843.12	11.1158855.41	11.0758863.21	11.1
58872.32	11.0958882.03	11.0658902.22	11.5658909.99	11.4958920.55	11.27
58934.13	11.21 58940.9	11.13 58951.1	11.3958955.42	11.4858957.82	11.46
58988.74	11.0859219.37	12.1759230.62	12.4159234.84	12.46 59245.1	12.8
59259.7	13.1759265.26	13.3959271.14	13.459274.28	13.459281.18	13.45
59292.5	13.4759319.93	13.4559334.61	13.3159350.28	13.2859372.85	13.19
59374.5	13.1859378.76	13.1759380.44	13.1659389.48	13.1259596.88	13
59611.97	12.7659613.26	12.7659653.16	12.8459668.44	12.6259675.25	12.48
59682.87	12.4359688.26	12.559695.09	12.4959698.17	12.5359699.75	12.68
59700.46	12.7859706.07	12.7959709.99	13.1259719.89	13.4359721.56	13.47
59723.72	13.4559732.46	13.3259734.16	13.24 59739.3	12.6859740.35	12.55
59741.08	12.3859742.94	12.0859743.52	11.79 59746.5	11.8959747.02	12.01
59748.45	12.2459750.84	12.3759758.71	12.6659764.52	12.6759772.69	12.6

59776.56	12.68	59783.4	12.76	59792.7	12.81	59794.74	12.85	59797.09	12.97
59803.2	12.94								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
53748.2	.15	6255.45	.03	56307.94	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
56255.45	56307.94	30	30	30	.1	.3

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: 125

INPUT
Description:
Station Elevation Data num= 498

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
53748.2	12.41	53774.18	12.42	53777.13	12.43	53780.27	12.42	53810.43	12.43
53815.65	12.39	53829.81	12.45	53855.39	12.55	53898.13	12.24	53899.34	12.23
53906.35	12.26	53916.11	12.25	53919.66	12.2	53922.3	12.05	53926.57	12.1
53939.25	12.14	53940.82	12.13	54113.38	12.1	54116.7	12.09	54119.91	12.07
54123.63	12.06	54127.03	12.03	54132.57	12.01	54134.42	12.02	54138.79	12.11
54141.16	12.15	54142.92	12.08	54146.79	12.13	54148.01	12.13	54154.83	12.16
54157.47	12.14	54162.84	11.87	54167.87	11.37	54170.33	11.16	54173.92	10.88
54177.53	10.35	54185.29	9.51	54185.96	9.46	54187.37	9.37	54218.68	9.37
54219.6	9.43	54221.34	9.62	54227.88	10.29	54341.94	11.18	54344.3	11.27
54358.06	11.89	54361.02	11.95	54386.32	12.55	54413.27	12.73	54420.89	13.01
54423.73	13.07	54426.69	13.07	54430.71	13.17	54431.39	13.23	54446.46	13.16
54502.34	12.74	54510.4	12.74	54524.3	12.88	54532.49	12.87	54541.84	12.89
54543.34	12.89	54546.24	12.93	54552.54	12.81	54567.12	12.65	54573.81	12.54
54651.61		54668.45	13.06	54670.95	13.08	54683.46	12.82	54685.44	12.79
54797.98	12.52	54800.56	12.45	54806.62	12.56	54809.01	12.71	54810.54	12.74
54815.17	12.63	54966.36	11.38	55091.79	12.2	55097.22	11.9	55101.25	11.7
55127.6	10.15	55131.72	10.23	55141.68	10.42	55469.22	11.76	55478.88	11.67
55480.86	11.66	55491.65	11.56	55523.71	12.17	55546.47	11.97	55550.77	11.94
55555.84	11.89	55556.97	12.01	55559.94	12.87	55575.18	12.88	55578.95	12.99
55585.09	13.13	55588.12	13.19	55594.88	13.19	55597.37	13.13	55615.6	12.76
55620.66	12.64	55623.71	12.56	55636.68	12.26	55652.67	12.19	55665.12	12.1
55666.99	12.05	55671.98	11.93	55680.82	11.59	55700.95	12.21	55705.57	12.36
55710.04	12.54	55713.8	12.58	55715.77	12.26	55718.25	12.31	55725.51	12.49
55729.91	12.4	55735.12	12.26	55735.85	12.38	55736.69	12.58	55741.22	12.39
55744.26	12.31	55745.44	12.23	55759.82	11.33	55760.46	11.28	55764.37	11.04
55771.13	11.19	55780.47	11.52	55783.48	11.62	55789.53	11.9	55791.11	11.82
55795.31	10.87	55797.5	10.37	55799.14		55801.22	9.42	55804.33	9.01
55805.95	8.85	55807.16	8.88	55816.81	9.15	55818.7	9.21	55842	9.86
55844.25	9.92	55845.78	10.03	55853.65	9.98	55855.43	9.96	55857.77	9.94
55862.71	9.89	55865.08	9.88	55874.74	9.81	55882.22	9.85	55884.4	9.81
55888.51	9.64	55898.41	9.32	55900.23	9.22	55907.19	8.51	55910.37	8.48
55913.02	8.41	55913.36	8.36	55915.91	7.95	55923.02	6.75	55923.37	6.64
55930.29	7.6	55935.2	8.36	55936.38	8.55	55942.33	8.41	55943.65	8.46
55946.85	8.54	55954.23	8.74	55958.27	8.53	55961.64	8.34	55964.11	8.21
55967.67	8.19	55968.94	8.19	55970.14	8.04	55971.29	7.89	55979.25	6.81
55980.95	6.81	55986.27	6.82	55990.6	6.91	55992.71	6.95	55997.85	6.88
56001.84	6.93	56004.71	7.02	56115.46	7.66	56125.12	7.56	56129.86	7.52
56132.9	7.42	56135.43	7.33	56140.77	7.15	56144.43	7.08	56145.81	7.06
56154.73	6.74	56156.52	6.69	56174.05	6.61	56175.27	6.6	56178.78	6.55
56190.55	6.61	56195.82	6.65	56200.45	6.71	56205.92	6.53	56212.67	6.37
56217.32	6.34	56219.74	6.31	56224.24	5.79	56236.54	5.15	56238.08	5.08
56240.67		56241.64	3.55	56244.69	2.14	56246.64	1.08	56246.77	1.04
56249.61	.36	56254.52	-.78	56257.35	-1.21	56258.3	-1.55	56260.95	-2.07

56261.38	-2.1556264.04	-2.6856266.33	-2.42 56267.4	-2.32 56270.6	-.24
56271.59	.456273.01	.756273.26	.7656295.94	2.0456296.32	1.83
56298.17	.78 56298.7	1.1456299.57	1.2156301.44	1.3756304.09	3.74
56307.38	6.6156307.97	6.8956308.34	7.0756309.22	7.4356309.66	7.61
56319.95	7.9956324.03	8.1556327.87	8.1556331.05	8.1956365.88	8.58
56367.16	8.5956374.32	8.6756376.16	8.6756377.87	8.6856384.46	8.71
56386.46	8.6956389.52	8.6556401.17	8.5356405.11	8.4856444.07	8.05
56471.06	7.9756475.39	7.9556540.95	8.4956545.73	8.5256598.22	8.96
56608.53	9.0756618.19	9.15 56622.2	9.1956668.74	9.5456672.88	9.58
56675.46	9.8556676.12	9.9156681.31	10.2356683.27	10.2556685.77	10.26
56699.09	10.2556700.63	10.3156703.92	8.8156704.05	8.7256704.14	8.67
56705.09	8.0256705.96	7.4356706.82	6.8756711.84	7.0156712.76	9.39
56713.9	9.9456772.68	9.9356773.94	9.94 56797.5	9.9556801.64	9.96
56811.29	9.9656813.83	9.9756820.54	10.0956855.49	10.76 56856.8	10.78
56859.57	10.8156888.53	11.0856890.23	11.156896.93	11.1656898.19	11.16
56913.52	11.19 56917.5	11.1956925.39	11.2156927.16	11.2156936.81	11.23
56983.1	11.3956985.09	11.456994.74	11.43 56996.2	11.4457018.58	11.52
57023.7	11.5357041.27	11.5957043.02	11.5957052.67	11.6357065.35	11.62
57071.98	11.657076.83	11.657096.82	11.5657100.11	11.5757120.26	11.58
57123.42	11.5957135.07	11.5957139.56	11.657168.53	11.6157170.02	11.62
57229.55	11.6657232.24	11.6457237.06	11.0757243.54	11.8457244.15	12
57245.78	1257248.72	12.0157251.57	1257259.77	11.9157263.12	11.51
57263.58	11.45 57266.6	11.43 57270.6	12.05 57274.6	12.06 57284.4	12.12
57286.51	12.1457300.69	12.2457333.11	12.2757592.83	12.18 57598.4	12.29
57623.48	12.3857628.15	12.3957632.39	12.3557647.49	12.1857662.57	12.21
57682.8	12.3857702.99	12.0957718.74	12.0357726.24	12.0257728.88	12.01
57750.06	12.06 57756.4	12 57759.4	11.9857764.03	12.1457768.88	12.12
57772.41	12.1557779.98	12.0657782.25	11.9957788.16	11.8657792.73	11.83
57797.33	11.6857806.47	11.7457809.25	11.7257812.95	11.76 57834.8	11.68
57842.7	11.73 57845.7	11.7257849.31	11.6157935.13	10.8658144.17	10.81
58151.42	10.6658158.73	10.7758160.61	10.72 58162.9	10.4258174.43	10.32
58180.81	10.2958189.01	10.9158192.09	11.3 58195.2	11.3458197.77	11.38
58213.19	11.6458222.26	11.5858236.01	11.8258237.63	11.8458238.97	11.84
58240.79	11.7858246.32	11.6958252.34	11.6258258.61	11.4658262.17	11.22
58265.21	11.0958267.71	11.0458434.02	11.4858435.69	11.4858438.61	11.5
58451.66	11.4958461.04	11.42 58463.4	11.5158465.79	11.6858468.18	11.97
58568.7	11.5358578.64	11.5758593.29	11.6958599.08	11.6958604.81	11.52
58608.97	11.68 58627.5	11.5358635.24	11.558640.77	11.5158647.12	11.44
58664.45	11.1958667.17	11.1958671.04	11.2258673.26	11.2758681.31	11.43
58695.08	11.3458705.47	11.558708.46	11.558717.15	11.1958719.44	11.2
58734.18	11.1558743.11	11.1558759.95	11.1258768.92	11.14 58770.9	11.11
58777.05	11.0958784.93	11.158788.29	11.1858801.58	11.2758803.34	11.26
58810.86	11.3958813.28	11.1958823.46	11.1258825.47	11.1158843.12	11.11
58855.41	11.0758863.21	11.158872.32	11.0958882.03	11.0658902.22	11.56
58909.99	11.4958920.55	11.2758934.13	11.21 58940.9	11.13 58951.1	11.39
58955.42	11.4858957.82	11.4658988.74	11.0859219.37	12.1759230.62	12.41
59234.84	12.46 59245.1	12.8 59259.7	13.1759265.26	13.3959271.14	13.4
59274.28	13.459281.18	13.45 59292.5	13.4759319.93	13.4559334.61	13.31
59350.28	13.2859372.85	13.19 59374.5	13.1859378.76	13.1759380.44	13.16
59389.48	13.1259596.88	1359611.97	12.7659613.26	12.7659653.16	12.84
59668.44	12.6259675.25	12.4859682.87	12.4359688.26	12.559695.09	12.49
59698.17	12.5359699.75	12.6859700.46	12.7859706.07	12.7959709.99	13.12
59719.89	13.4359721.56	13.4759723.72	13.4559732.46	13.3259734.16	13.24
59739.3	12.6859740.35	12.5559741.08	12.3859742.94	12.0859743.52	11.79
59746.5	11.8959747.02	12.0159748.45	12.2459750.84	12.3759758.71	12.66
59764.52	12.6759772.69	12.659776.56	12.68 59783.4	12.76 59792.7	12.81
59794.74	12.8559797.09	12.97 59803.2	12.94		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
53748.2	.156246.77		.03 56298.7		.1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

56246.77 56298.7 125 125 125 .1 .3

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: 0

INPUT
Description:
Station Elevation Data num= 330

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
53749.72	12.41	55471.54	12.89	55474.85	12.76	55485.16	12.34	55489.97	12.19
55492.71	12.15	55493.43	12.08	55499.38	11.93	55500.34	11.94	55500.62	11.94
55503.49	11.96	55517.46	12.37	55517.64	12.38	55518.58	12.45	55518.71	12.44
55519.12	12.65	55519.69	12.73	55521.08	12.77	55526.14	12.95	55529.36	13.03
55529.74	13.03	55531.45	13.07	55533.54	13.11	55541.55	12.97	55541.82	12.96
55546.41	12.82	55547.46	12.49	55547.91	12.31	55548.47	12.35	55552.19	12.29
55562.28	12.24	55562.56	12.23	55563.39	12.21	55563.52	12.21	55572.93	12.17
55573.49	12.17	55574.32	12.45	55575.27	12.25	55576.29	11.72	55576.59	11.7
55577.6	11.74	55578.15	11.83	55583.3	12.72	55583.67	12.78	55585.25	13.03
55585.57	13.05	55602.36	13.28	55604.04	13.31	55614.41	13.45	55614.46	13.46
55615.26	13.47	55624.78	13.36	55626.57	13.35	55626.97	13.34	55656.38	13.35
55662.87	13.32	55666.26	13.31	55674.98	13.27	55676.63	13.27	55687	13.23
55687.08	13.23	55697.37	13.19	55698.64	13.18	55699.18	13.19	55718.11	13.3
55723.39	13.34	55727.16	13.36	55728.48	13.35	55746.62	13.25	55747.6	13.23
55748.26	13.22	55749.22	13.22	55754.1	13.24	55759.59	13.2	55759.7	13.2
55769.97	13.12	55771.8	13.15	55778.26	13.05	55780.34	13.04	55783.91	13.03
55797.89	12.96	55801.08	12.92	55808.11	12.82	55811.45	12.78	55816.92	12.7
55820.22	12.71	55821.82	12.71	55832.19	12.73	55834.74	12.73	55860.56	12.92
55861.41	12.91	55863.3	12.92	55863.68	12.92	55868.63	12.94	55877.33	12.96
55891.34	12.87	55892.26	12.87	55892.83	12.86	55893.29	12.85	55902.92	13.03
55904.78	13.19	55904.94	13.25	55907.36	13.41	55915.15	13.27	55915.44	13.26
55917.04	13.25	55920.31	13.22	55925.52	13.25	55926.42	13.25	55929.14	13.03
55935.89	12.62	55937.79	12.5	55940.4	12.26	55941.25	12.25	55941.9	12.24
55947.42	12.33	55947.7	12.33	55953.35	12.19	55956.63	12.15	55956.79	12.1
55963.2	12.81	55965.45	13.01	55966.37	13.1	55967	13.15	55970.97	13.08
55996.86	13.05	56004.95	12.54	56008.48	12.29	56008.83	12.27	56009.01	12.27
56018.85	12.04	56018.97	12.04	56025.97	11.95	56029.22	11.83	56049.97	11.42
56050.18	11.41	56059.34	11.23	56060.34	11.13	56061.75	10.98	56062.28	10.95
56070.71	10.45	56074.38	10.17	56086.49	9.38	56086.69	9.37	56106.64	9.57
56120.51	9.29	56122.56	9.23	56122.79	9.22	56147	8.48	56158.88	8.17
56159.1	8.16	56164.04	7.99	56166.72	7.89	56184.54	7.44	56184.78	7.44
56186.64	7.43	56195.15	7.04	56195.41	7.02	56198.56	6.88	56219.44	5.6
56219.62	5.57	56219.91	5.53	56221.54	5.06	56231.72	2.55	56233.81	2.04
56236.63	1.72	56239.9	1.34	56240.24	1.31	56240.34	1.26	56243.31	.35
56243.83	.11	56247	-1.36	56248.25	-1.93	56251.43	-1.6	56255.93	-2.08
56260.36	-2.54	56262.24	-2.46	56267.16	-1.87	56267.58	-1.46	56267.58	-1.32
56268.2	-1.25	56275.41	2.02	56276.13	2.01	56278.11	1.99	56279.3	1.98
56280.14	1.97	56288.48	1.89	56292.24	1.86	56304.14	1.74	56304.34	1.74
56307.46	1.64	56312.39	1.16	56316.45	1.45	56316.74	1.42	56326.56	1.67
56329.97	1.86	56331.15	1.92	56333.68	1.96	56340.34	2.41	56340.65	2.43
56345.41	2.75	56350.71	3.07	56355.01	3.34	56359.61	3.97	56361.08	4.53
56361.4	4.65	56362.08	4.82	56362.61	4.82	56363.41	4.87	56371.45	4.82
56376.96	4.82	56381.82	4.81	56402.77	4.85	56403.77	4.95	56412.93	5.12
56413.27	5.13	56418.5	5.22	56433.04	4.74	56433.67	4.79	56444.04	5.69
56444.48	5.73	56449.58	5.88	56454.41	6.01	56475.15	6.61	56481.73	6.79
56485.52	6.95	56485.89	6.91	56489.82	7.03	56495.89	7.01	56497.99	7.01
56534.3	6.91	56537.37	6.91	56545.02	6.88	56546.41	6.89	56547.74	6.89
56558.11	6.92	56558.51	6.92	56568.48	6.94	56570.61	6.94	56606.92	7.02
56609.34	7.02	56609.97	7.01	56611.21		56614.51	7.03	56749.96	8.03
56752.16	8.03	56755.15	8.02	56766.54	8.01	56772.04	8.04	56772.83	7.98
56775.89		56776.37		56786.26	8.06	56788.47	8.07	56792.99	8.1

56796.54	8.1356796.63	8.1356799.04	8.1856836.88	7.9456838.11	7.94
56848.48	7.8756848.98	7.8656858.85	7.856861.09	7.7956869.05	7.73
56869.22	7.7356873.19	7.6756874.63	7.6456917.94	8.68 56921.6	8.75
56923.22	8.7956923.88	8.7856926.94	8.7856931.45	8.15 56932.2	8.04
56933.71	8.1756939.58	8.64 56940.2	8.5856940.33	8.5856941.82	8.61
56957.91	8.9756961.22	9.0456962.56	9.0856963.03	9.0956964.28	9.08
56965.48	9.0957017.25	9.0757018.43	9.0857023.53	9.1157024.78	9.12
57042.63	9.1557045.52	9.1557054.74	9.1757055.89	9.1757066.26	9.19
57066.84	9.1957076.63	9.2157078.94	9.2157080.71	9.2257082.73	9.21
57087	9.2157091.05	9.2357127.36	9.3657128.48	9.3657136.26	9.39
57138.85	9.4157139.46	9.41 57179.6	9.7257180.34	9.7257199.98	9.85
57201.08	9.8657202.68	9.8757211.45	9.8857212.08	9.8857219.93	9.89
57221.82	9.9157224.18	9.9257228.81	9.9557252.93	9.957257.93	9.88
57260.49	9.9 57263.3	9.9157272.59	9.9657273.67	9.9757283.62	10.02
57284.7	10.02 57308.9	10.1957311.55	10.257333.59	10.2857966.98	10.96

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
53749.72	.156219.91		.0356276.13		.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
56219.9	156276.13	125	125	125	.1	.3

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: -125

INPUT
Description:
Station Elevation Data num= 332

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
53748.2	12.4155469.22		12.8855474.66		12.7855476.26		12.6955485.16		12.34
55489.97	12.1955492.71		12.155493.43		12.0855499.38		11.9355500.34		11.94
55500.62	11.9455503.49		11.9655517.46		12.3755517.64		12.3855518.58		12.4
55518.71	12.4455519.12		12.655519.69		12.7355521.08		12.7755526.14		12.95
55529.36	13.0355529.74		13.0355531.45		13.0755533.54		13.1155541.55		12.97
55541.82	12.9655546.41		12.8255547.46		12.4955547.91		12.3155548.47		12.3
55552.19	12.2955562.28		12.2455562.56		12.2355563.39		12.2155563.52		12.21
55572.93	12.1755573.49		12.1755574.32		12.455575.27		12.2555576.29		11.72
55576.59	11.7 55577.6		11.7455578.15		11.83 55583.3		12.7255583.67		12.78
55585.25	13.0355585.57		13.0555602.36		13.2855604.04		13.3155614.41		13.45
55614.46	13.4655615.26		13.4755624.78		13.3655626.57		13.3555626.97		13.34
55656.38	13.3555662.87		13.3255666.26		13.3155674.98		13.2755676.63		13.27
55687	13.2355687.08		13.2355697.37		13.1955698.64		13.1855699.18		13.19
55718.11	13.355723.39		13.3455727.16		13.3655728.48		13.3555746.62		13.25
55747.6	13.2355748.26		13.2255749.22		13.22 55754.1		13.2455759.59		13.2
55759.7	13.255769.97		13.12 55771.8		13.155778.26		13.0555780.34		13.04
55783.91	13.0355797.89		12.9655801.08		12.9255808.11		12.8255811.45		12.78
55816.92	12.755820.22		12.7155821.82		12.7155832.19		12.7355834.74		12.73
55860.56	12.9255861.41		12.91 55863.3		12.9255863.68		12.9255868.63		12.94
55877.33	12.9655891.34		12.8755892.26		12.8755892.83		12.8655893.29		12.85
55902.92	13.0355904.78		13.1955904.94		13.255907.36		13.4155915.15		13.27
55915.44	13.2655917.04		13.2555920.31		13.2255925.52		13.255926.42		13.2
55929.14	13.0355935.89		12.6255937.79		12.5 55940.4		12.2655941.25		12.25
55941.9	12.2455947.42		12.33 55947.7		12.3355953.35		12.1955956.63		12.1
55956.79	12.1 55963.2		12.8155965.45		13.0155966.37		13.1 55967		13.1
55970.97	13.0855996.86		13.0556004.95		12.5456008.48		12.2956008.83		12.27
56009.01	12.2756018.85		12.0456018.97		12.0456025.97		11.956029.22		11.83
56049.97	11.4256050.18		11.4156059.34		11.2356060.34		11.1356061.75		10.98
56062.28	10.9556070.71		10.456074.38		10.1756086.49		9.3856086.69		9.37
56106.64	9.5756120.51		9.2956122.56		9.2356122.79		9.22 56147		8.48

56158.88	8.17 56159.1	8.1656164.04	7.9956166.72	7.8956184.54	7.44
56184.78	7.4456186.64	7.4356195.15	7.0456195.41	7.0256198.56	6.88
56219.44	5.656219.62	5.5756219.91	5.5356221.54	5.0656231.72	2.55
56233.81	2.0456236.63	1.72 56239.9	1.3456240.24	1.3156240.34	1.26
56243.31	.3556243.83	.11 56247	-1.3656248.25	-1.9356251.43	-1.6
56255.93	-2.0856260.36	-2.5456262.24	-2.4656267.04	-1.8656267.45	-1.44
56267.74	-1.3156268.03	-1.1956275.69	1.9956276.13	2.0156278.11	1.99
56279.3	1.9856280.14	1.9756288.48	1.8956292.24	1.8656304.14	1.74
56304.34	1.7456307.46	1.6456312.39	1.1656316.45	1.456316.74	1.42
56326.56	1.6756329.97	1.8656331.15	1.9256333.68	1.9656340.34	2.41
56340.65	2.4356345.41	2.7556350.71	3.0756355.01	3.3456359.61	3.97
56361.08	4.53 56361.4	4.6556362.08	4.8256362.61	4.8256363.41	4.87
56371.45	4.8256376.96	4.8256381.82	4.8156402.77	4.856403.77	4.95
56412.93	5.1256413.27	5.13 56418.5	5.2256433.04	4.7456433.67	4.79
56444.04	5.6956444.48	5.7356449.58	5.8856454.41	6.0156475.15	6.61
56481.73	6.7956485.52	6.956485.89	6.9156489.82	7.0356495.89	7.01
56497.99	7.01 56534.3	6.9156537.37	6.9156545.02	6.8856546.41	6.89
56547.74	6.8956558.11	6.9256558.51	6.9256568.48	6.9456570.61	6.94
56606.92	7.0256609.34	7.0256609.97	7.0156611.21	756614.51	7.03
56749.96	8.0356752.16	8.0356755.15	8.0256766.54	8.0156772.04	8.04
56772.83	7.9856775.89	856776.37	856786.26	8.0656788.47	8.07
56792.99	8.156796.54	8.1356796.63	8.1356799.04	8.1856836.88	7.94
56838.11	7.9456848.48	7.8756848.98	7.8656858.85	7.856861.09	7.79
56869.05	7.7356869.22	7.7356873.19	7.6756874.63	7.6456917.94	8.68
56921.6	8.7556923.22	8.7956923.88	8.7856926.94	8.7856931.45	8.15
56932.2	8.0456933.71	8.1756939.58	8.64 56940.2	8.5856940.33	8.58
56941.82	8.6156957.91	8.9756961.22	9.0456962.56	9.0856963.03	9.09
56964.28	9.0856965.48	9.0957017.25	9.0757018.43	9.0857023.53	9.11
57024.78	9.1257042.63	9.1557045.52	9.1557054.74	9.1757055.89	9.17
57066.26	9.1957066.84	9.1957076.63	9.2157078.94	9.2157080.71	9.22
57082.73	9.21 57087	9.2157091.05	9.2357127.36	9.3657128.48	9.36
57136.26	9.3957138.85	9.4157139.46	9.41 57179.6	9.7257180.34	9.72
57199.98	9.8557201.08	9.8657202.68	9.8757211.45	9.8857212.08	9.88
57219.93	9.8957221.82	9.9157224.18	9.9257228.81	9.9557252.93	9.9
57257.93	9.8857260.49	9.9 57263.3	9.9157272.59	9.9657273.67	9.97
57283.62	10.02 57284.7	10.02 57308.9	10.1957311.55	10.257315.15	10.22
57333.11	10.28 59803.2	12.94			

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
53748.2	.156219.91		.0356275.69		.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
56219.9	56275.69	325	325	325	.1	.3

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: -450.*

INPUT
Description:
Station Elevation Data num= 213

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
54350.52	12.555497.42	11.0855511.67	11.1455513.03	11.1555525.93	11.2				
55528.34	11.2155533.49	11.2355540.19	11.2655543.82	11.2755554.45	11.26				
55568.7	11.2655580.56	11.2555582.96	11.2555597.21	11.2455611.47	11.23				
55616.89	11.2355625.73	11.2255632.79	11.2255639.98	11.2155648.87	11.21				
55654.24	11.2 55668.5	11.2 55673	11.1955682.75	11.1955685.01	11.19				
55697.01	11.1855707.89	11.1755711.27	11.1755725.52	11.1655737.23	11.15				
55739.78	11.1555753.91	11.1455754.04	11.14 55768.3	11.1355782.55	11.13				
55789.45	11.1255796.81	11.1255811.06	11.1155824.61	11.155825.32	11.09				

55839.58	11.0255841.68	11.0155853.84	10.9455858.95	10.9155868.09	10.82
55882.29	10.6755882.35	10.67 55893.9	10.5655896.61	10.5655910.86	10.55
55917.18	10.5455925.12	10.5455939.38	10.5355946.12	10.5355952.05	10.52
55953.63	10.5255963.98	10.5155967.89	10.5155982.15	10.555986.94	10.5
55996.4	10.4955998.34	10.4956010.66	10.3756024.91	10.2256032.32	10.15
56039.17	10.0856050.57	9.9656053.43	9.94 56056.7	9.956067.69	9.79
56069.03	9.7856081.95	9.64 56096.2	9.556102.79	9.4356110.46	9.35
56124.71	9.2156136.18	9.0956138.97	9.0656153.23	8.9156155.01	8.9
56167.48	8.7756174.07	8.7156181.74	8.59 56196	8.3856196.23	8.37
56207.23	8.2156210.25	8.1656224.51	7.95 56231.1	7.8556238.77	7.74
56253.02	7.5256259.45	7.4356267.28	7.3856279.12	7.3256279.21	7.32
56281.54	7.3156295.79	7.2156307.34	7.1456310.05	7.0556313.96	6.92
56315.05	6.8856315.26	6.8856322.38	6.61 56324.3	6.5156338.56	5.76
56352.82	5.0256355.67	4.8756360.85	5.256361.22	5.1556361.25	5.14
56364.57	4.9956367.08	4.8856367.75	4.8556367.85	4.8556367.89	4.81
56367.98	4.7356368.82	3.9556375.59	-2.3156377.23	-3.8356377.58	-3.96
56395	-3.9656396.06	-3.6756398.38	-2.5856398.94	-2.3356400.25	-1.73
56402.73	-.65 56404.3	-.7756404.52	-.7156404.97	-.5956407.88	.06
56410.09	.5856412.18	1.0556415.53	1.756415.68	1.7456419.43	2.53
56419.65	2.5456419.69	2.54 56419.8	2.55 56421.6	2.756424.13	2.89
56428.24	3.2256428.47	3.2356432.34	3.5456434.88	3.956435.28	3.96
56441.51	4.1456445.06	4.2456446.18	4.2756448.14	4.3356448.76	4.35
56454.13	4.556454.42	4.5156454.66	4.5156454.78	4.5256457.02	4.72
56461.41	5.1456468.05	5.7656469.05	5.8556471.67	6.156474.68	6.42
56481.32	7.1156487.95	7.8156488.27	7.8456489.34	7.89 56490.3	7.93
56492.78	8.1256499.98	8.1956509.62	8.356518.75	8.3956529.91	8.51
56536.21	8.58 56550.2	8.7356570.49	8.9456590.78	9.1656597.74	9.24
56611.07	9.3856627.06	9.5556631.36	9.5956651.65	9.8156671.94	10.02
56692.23	10.2456695.48	10.28 56707.1	10.456712.52	10.4656717.91	10.52
56732.8	10.5956753.09	10.756773.38	10.856793.23	10.9156793.67	10.91
56808.77	10.9156813.96	10.9156834.25	10.9156848.37	10.9156854.54	10.91
56874.83	10.9156890.98	10.9156895.12	10.9156895.46	10.9156899.64	10.91
56915.41	10.91 56935.7	10.9156942.55	10.9156955.98	10.9156976.27	10.91
56988.71	10.9256989.64	10.92 56990.5	10.9256996.56	10.9557013.87	11.05
57016.85	11.0657037.14	11.1758660.25	12.5		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
54350.52	.156367.85	.0356419.43	.1		

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
56367.8	556419.43	260	260	260	.1	.3

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: -710

INPUT
Description:
Station Elevation Data num= 164

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
54952.85	1255757.31	10.5655767.31	10.6955768.26	10.7155777.31	10.83				
55779	10.8555782.61	10.955787.31	10.9755789.86	1155797.31	11				
55807.31	1155815.63	1155817.31	1155827.31	1155837.31	11				
55841.11	1155847.31	1155852.26	1155857.31	1155863.54	11				
55867.31	1155877.31	1155880.47	1155887.31	1155888.89	11				
55897.31	1155904.94	1155907.31	1155917.31	1155925.52	11				
55927.31	1155937.22	1155937.31	1155947.31	1155957.31	11				
55962.15	1155967.31	1155977.31	1155986.81	1155987.31	10.99				
55997.31	10.8655998.78	10.8456007.31	10.72 56010.9	10.6756017.31	10.49				
56027.27	10.2256027.31	10.2256035.41	1056037.31	1056047.31	10				

56051.74	1056057.31	1056067.31	1056072.04	10 56076.2	10
56077.31	1056084.57	1056087.31	1056097.31	1056100.67	10
56107.31	1056108.67	1056117.31	9.7656127.31	9.49 56132.5	9.35
56137.31	9.22 56145.3	956147.31	8.95 56149.6	8.8856157.31	8.67
56158.25	8.6556167.31	8.456177.31	8.1356181.93	856187.31	7.85
56197.31	7.5856205.35	7.3656207.31	7.3156217.31	7.0356218.56	7
56227.31	6.7656231.93	6.6456237.31	6.4256247.31	6.0156247.47	6
56255.19	5.6856257.31	5.656267.31	5.1956271.93	556277.31	4.78
56287.31	4.3756291.82	4.1956297.31	4.1156305.61	456305.68	4
56307.31	3.9756317.31	3.856327.31	3.6456330.05	3.5956337.31	3.47
56347.31	3.356357.31	3.1456365.55	356367.31	356367.78	3
56367.85	356372.93	-3.77556407.77	-3.77556412.85	356415.17	3
56417.31	356425.49	356426.04	356427.31	356437.31	3
56438.6	356447.31	3.3856452.56	3.656457.31	3.8156461.81	4
56467.31	4.2456470.41	4.3756477.31	4.6756487.31	5.156497.31	5.53
56500.74	5.6856507.31	5.9656515.19	6.356517.31	6.3956527.31	6.82
56537.31	7.2556547.31	7.6856548.91	7.7556554.64	856557.31	8.11
56559.97	8.2356567.31	8.3856577.31	8.5956587.31	8.856597.09	9
56597.31	956604.75	956607.31	956617.31	956624.27	9
56627.31	956637.31	956645.27	956647.31	956647.48	9
56649.54	956657.31	956667.31	956670.69	956677.31	9
56687.31	956693.44	9 56693.9	956694.32	956697.31	9.07
56705.84	9.2656707.31	9.2956717.31	9.557517.31	12	

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
54952.85	.156367.85	.0356412.85	.1		

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
56367.85	56412.85	460	460	460	.1	.3

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: -1170.*

INPUT
Description:
Station Elevation Data num= 377

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
55032.85	9.5	55671.1	8.8955676.11		8.8955683.07		8.8855686.74		8.88
55697.38	8.8755699.21		8.8755708.02		8.8655718.66		8.8555721.94		8.85
55729.29	8.84	55734.6	8.8355739.93		8.8355750.57		8.82	55761.2	8.81
55764.56	8.8155769.99		8.855771.84		8.855782.48		8.7955791.83		8.78
55793.12	8.7955796.59		8.8155801.26		8.8455802.16		8.8455803.76		8.85
55804.11	8.8555805.38		8.86	55810.7	8.8855812.29		8.8955814.39		8.9
55815.7	8.955820.13		8.9355822.54		8.9455825.03		8.9355829.57		8.92
55834.36	8.9155835.67		8.9	55839	8.955840.77		8.9	55846.3	8.88
55846.85	8.8855848.44		8.8755856.94		8.8555857.87		8.8555864.62		8.84
55867.3	8.8355867.58		8.8355870.89		8.8255876.16		8.8155876.74		8.8
55878.22	8.7755881.41		8.7255886.17		8.6455888.86		8.655892.05		8.55
55894.88	8.555895.61		8.555899.49		8.555905.04		8.555908.02		8.5
55910.13	8.555911.55		8.555914.48		8.555915.97		8.555920.77		8.5
55923.91	8.555925.14		8.555931.11		8.555931.41		8.555933.34		8.5
55942.04	8.555942.78		8.555946.94		8.555950.53		8.555952.21		8.5
55952.68	8.555955.39		8.555961.57		8.555961.65		8.555963.32		8.5
55971.09	8.555973.95		8.555980.52		8.555982.33		8.555984.59		8.5
55985.09	8.555985.66		8.555989.95		8.4355995.23		8.3455999.39		8.27
56005.26	8.1856005.87		8.1656008.35		8.1356008.82		8.12	56016.5	7.96
56017.72	7.9356018.26		7.9356019.65		7.9256027.14		7.86	56027.7	7.86
56031.08	7.8456037.12		7.7456037.78		7.7456046.16		7.6256046.52		7.61
56046.56	7.6156048.41		7.5856053.11		7.52	56054.2	7.5	56056	7.5

56059.05	7.556062.88	7.556065.43	7.556069.61	7.556069.69	7.5
56074.87	7.556080.33	7.5 56084.3	7.556088.49	7.556088.77	7.5
56090.97	7.4756092.69	7.4456093.73	7.4356100.59	7.33 56101.6	7.32
56103.17	7.2956105.49	7.2656112.24	7.24 56112.6	7.2456115.78	7.24
56122.04	7.2256122.88	7.2256123.32	7.2256123.88	7.2156131.47	7.08
56133.52	7.0556140.91	6.9256144.16	6.86 56145.8	6.8456148.11	6.8
56150.34	6.7656154.79	6.6956157.88	6.6356159.27	6.6156159.78	6.6
56161.94	6.5656165.43	6.556169.21	6.44 56170.1	6.4356176.07	6.33
56178.65	6.28 56186.7	6.1556188.08	6.1356190.73	6.0856192.44	6.03
56194.66	5.9756197.34	5.9356197.46	5.9356197.52	5.9356206.95	5.79
56207.98	5.7856213.92	5.6956214.54	5.6856216.38	5.6556218.62	5.62
56225.82	5.52 56227	5.556227.71	5.4956229.25	5.4756230.05	5.46
56233.34	5.4156235.25	5.3856239.62	5.3256239.89	5.3156244.69	5.21
56250.53	5.0856254.12	5.0156254.27	556261.16	4.8556261.56	4.84
56263.56	4.856265.44	4.76 56271.8	4.6256272.99	4.656275.96	4.53
56277.35	4.556282.43	4.3956291.86	4.1856293.08	4.1656296.12	4.1
56300.82	4.06 56301.3	4.0556303.71	456309.13	3.88 56309.2	3.88
56310.73	3.8556314.35	3.7656318.58	3.6656320.16	3.6356324.99	3.52
56329.6	3.4156332.19	3.3556335.62	3.2756336.21	3.2656339.04	3.27
56346.27	3.3156348.47	3.32 56356.9	3.3756357.91	3.3856361.19	3.4
56365.68	3.3756367.34	3.3756367.54	3.3756367.79	3.3756367.85	3.37
56373.73	-4.4756380.37	-4.4756396.98	-4.4756402.85	3.3756405.29	3.44
56407.34	3.556407.53	3.556414.11	3.556416.12	3.5 56416.7	3.5
56416.89	3.556418.03	3.556426.44	3.5 56428.1	3.556428.53	3.5
56429.89	3.556435.98	3.6356439.03	3.69 56443.3	3.7856444.54	3.8
56445.53	3.8256445.88	3.8356449.53	3.956454.25	456455.08	4.02
56460.03	4.1256463.28	4.1856464.62	4.2156470.45	4.3356470.52	4.34
56474.17	4.4156477.64	4.4856481.02	4.5556483.71	4.6156491.52	4.77
56493.26	4.856495.12	4.8456497.61	4.8956502.02	4.98 56502.8	5
56509.38	5.13 56510.3	5.1556512.35	5.1956512.52	5.19 56521.9	5.39
56523.02	5.4156524.76	5.4556531.45	5.5856533.52	5.6256540.99	5.78
56541.14	5.7856544.02	5.84 56545.7	5.8856550.54	5.9856551.72	6
56551.91	656554.52	6.0556557.31	6.1156560.09	6.1456565.02	6.19
56569.63	6.2456572.91	6.2756575.52	6.356579.06	6.3356579.18	6.33
56586.02	6.456588.72	6.4356596.29	6.556596.52	6.556598.27	6.5
56604.33	6.556604.67	6.556606.21	6.556607.02	6.556607.81	6.5
56615.36	6.556617.36	6.556617.52	6.556624.82	6.556626.91	6.5
56628.01	6.556636.43	6.556636.45	6.556638.51	6.5356640.73	6.57
56646	6.6556646.87	6.6656649.01	6.756649.19	6.756651.35	6.73
56655.55	6.856659.51	6.8656665.09	6.9556668.19	756670.01	7
56673.56	756674.64	756678.98	756680.51	7.0256684.18	7.07
56691.01	7.1656693.73	7.1956697.45	7.2456697.93	7.2556698.37	7.25
56699.95	7.2956701.51	7.3356703.28	7.3756710.46	7.5456712.01	7.58
56712.82	7.656714.83	7.6456722.37	7.81 56722.5	7.82 56731.7	7.95
56731.91	7.9556741.46	8.0956751.01	8.2356755.46	8.356760.55	8.37
56763.46	8.42 56770.1	8.5156779.65	8.65 56789.2	8.7956793.71	8.86
56795.22	8.8656798.74	8.9256802.62	8.9856808.29	9.0856817.83	9.25
56823.45	9.3556826.98	9.3456827.38	9.3456836.92	9.3356846.47	9.32
56850.59	9.3156856.02	9.456858.74	9.4556865.56	9.4656875.11	9.48
56877.75	9.4856884.66	9.49 56890.5	9.5 56894.2	9.5156903.75	9.52
56904.9	9.5256913.29	9.5356922.25	9.5556922.84	9.5556932.05	9.56
56932.38	9.5656941.93	9.5856951.48	9.5956954.01	9.5956959.21	9.6
56961.02	9.656970.57	9.6256980.12	9.6356985.77	9.6456986.36	9.65
56989.66	9.6557562.43	10.5			

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
55032.85	.156367.85	.0356402.85	.1		

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
56367.8	556402.85	460	460	460	.1	.3

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: -1630

INPUT
Description:
Station Elevation Data num= 220

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
55112.85		755712.85		755717.56		755724.11		755727.56	7
55737.56		755739.28		755747.56		755757.56		755760.65	7
55767.56		755772.55		755777.56		755787.56		755797.56	7
55800.71		755805.82		755807.56		755817.56		755827.56	7
55830.83		755837.56	6.9	755837.89	6.96	755839.09	6.96	755847.56	6.91
55857.56	6.86	755866.33	6.82	755867.56	6.81	755872.36	6.79	755877.56	6.76
55887.56	6.71	755894.78	6.67	755897.56	6.66	755905.62	6.62	755907.56	6.55
55917.56	6.2	55923.22		655927.56		655937.56		655938.89	6
55947.56		655951.67		655957.56		655967.56		655972.16	6
55977.56		655980.11		655987.56		655997.56		656005.43	6
56007.56		656008.56		656017.56	5.68	56026.99	5.35	56027.56	5.33
56037.56	5.03	56038.7		556047.56		556057.56		556065.44	5
56067.56		556071.97		556077.56		556081.15		556087.56	5
56097.56		556105.23		556107.56	4.93	56117.56	4.63	56121.21	4.52
56127.56	4.49	56137.56	4.44	56138.5	4.43	56147.56	4.39	56157.56	4.33
56161.28	4.32	56167.56	4.28	56171.77	4.26	56177.56	4.23	56187.56	4.18
56197.56	4.13	56201.34	4.11	56205.04		456207.56		456207.67	4
56217.56		456223.15		456227.56		456236.11		456237.56	4
56238.31		4 56241.4		456247.56		456257.56		456267.56	4
56271.58		456277.56		456281.47		456287.56		456297.56	4
56304.84		456307.56	3.92	56317.56	3.62	56321.53	3.5	56327.56	3.32
56337.56	3.02	56338.11		356347.56	3.28	56357.56	3.58	56361.59	3.71
56367.56	3.74	56367.85	3.74	56374.52	-5.15	556377.85	-5.15	556386.18	-5.155
56392.85	3.74	56397.56		456404.65		456407.56		456417.56	4
56419.3		456427.56		456435.22		456437.56		456437.92	4
56447.56		456457.56		456463.66		456467.56		456471.19	4
56477.56		456487.56		456492.11		456497.56		456504.45	4
56507.56		456517.56		456520.55		456527.56		456537.56	4
56537.72		456547.56		4 56549		456557.56		456567.56	4
56570.99		456577.44		456577.56		456587.56		456597.56	4
56604.26		456605.88		456607.56		456615.46		456617.56	4
56627.56		456637.53		456637.56		456642.04	4.14	56647.56	4.3
56657.56	4.6	56667.56	4.9	56670.8		556677.56		5 56682.1	5
56687.56	5.14	56697.56	5.39	56704.07	5.55	56707.56	5.64	56717.56	5.89
56719.66	5.94	56727.56	6.13	56737.33	6.38	56737.56	6.38	56747.56	6.63
56757.56	6.88	56762.22		756767.56	7.13	56770.6	7.21	56777.56	7.38
56787.56	7.63	56797.56	7.88	56802.29		856803.87		856807.56	8.11
56811.62	8.23	56817.56	8.41	56827.56	8.71	56833.44	8.89	56837.14	8.87
56837.56	8.87	56847.56	8.82	56857.56	8.77	56861.88	8.74	56867.56	8.91
56870.41		956877.56		956887.56		956890.33		956897.56	9
56903.68		956907.56		956917.56		956918.77		956927.56	9
56936.94		956937.56		956947.21		956947.56		956957.56	9
56967.56		956970.21		956975.66		956977.56		956987.56	9
56997.56		957003.48		9 57004.1	9.02	57007.56		957607.56	9

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
55112.85	.15	6367.85	.03	56392.85	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
56367.85	56392.85	360	360	360	.1	.3

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: -1990.*

INPUT
Description:
Station Elevation Data num= 274

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
54842.85	7.55	4917.73	6.38	54924.09	6.33	54936.89	6.21	54938.86	6.22
54944.2	6.24	54961.01	6.02	54962.19		655571.93		655577.66	6
55585.61	6	55589.8		655601.96		655604.05		655614.11	6
55626.26		655630.02		655638.41		655644.48		655650.56	6
55662.71		655674.87		6 55678.7		655684.91		655687.02	6
55699.17		655711.32		655715.29		655723.47	5.98	55723.88	5.97
55725.33	5.97	55735.62	5.94	55747.77	5.91	55758.43	5.88	55759.93	5.87
55765.76	5.86	55772.08	5.84	55784.23	5.81	55793	5.78	55796.38	5.77
55806.18	5.75	55808.53	5.75	5820.68	5.47	55827.56	5.33	55832.84	5.33
55844.98	5.33	55846.61	5.33	55857.14	5.33	55862.14	5.33	55869.29	5.33
55881.44	5.33	55887.03	5.33	55893.59	5.33	55896.69	5.33	55905.74	5.33
55917.89	5.33	55927.46	5.33	55930.05	5.33	55931.26	5.33	55942.2	5.12
55953.66	4.95	5954.35	4.89	55966.5	4.69	55967.89	4.67	55978.65	4.67
55990.8	4.67	56000.38	4.67	56002.95	4.67	56008.31	4.67	56015.11	4.67
56019.47	4.67	56027.26	4.67	56039.41	4.67	56048.73	4.67	56051.56	4.62
56063.71	4.42	56068.15	4.35	56075.86	4.33	56088.01	4.29	56089.16	4.29
56100.16	4.26	56112.32	4.22	56116.84	4.21	56124.47	4.19	56129.59	4.17
56136.62	4.15	56148.77	4.12	56160.92	4.09	56165.52	4.07	56170.01	4
56173.07		456173.21		456185.23		456192.02		456197.38	4
56207.77		456209.53		456210.44		4 56214.2		456221.68	4
56233.83		456245.98		456250.87		456258.13		456262.88	4
56270.29		456282.44		456291.29		456294.59	3.95	56306.74	3.75
56311.57	3.67	56318.89	3.55	56331.04	3.35	56331.71	3.33	56333.06	3.36
56334.62	3.37	56343.19	3.43	56355.34	3.51	56360.24	3.56	56364.16	3.53
56367.5	3.55	6367.85	3.49	56374.74	-5.75	6380.33	-5.75	6394.29	-5.7
56401.18	3.49	56405.46	3.69	56407.43	3.75	6411.91	3.71	56414.56	3.72
56423.66	3.74	56425.24	3.74	56431	3.75	56432.39	3.74	56432.75	3.74
56439.72	3.69	56441.85	3.67	56442.18	3.67	56442.29	3.67	56450.94	3.67
56460.04	3.67	56465.59	3.67	56469.13	3.67	56472.44	3.67	56478.23	3.67
56487.32	3.67	56491.46	3.67	56496.42	3.67	56502.69	3.67	56505.51	3.67
56514.61	3.67	56517.33	3.67	56523.7	3.67	56532.8	3.67	56532.95	3.67
56541.89	3.67	56543.21	3.67	56550.99	3.67	56560.09	3.67	56563.2	3.67
56569.07	3.67	56569.18	3.67	56578.28	3.67	56587.37	3.67	56593.47	3.67
56594.94	3.67	56595.4	3.67	56596.46	3.68	56603.65	3.75	56605.56	3.77
56607.17	3.79	56613.3	3.85	56614.66	3.85	56623.73	3.87	56623.75	3.87
56627.83	3.97	56632.85	4.09	56641.94	4.31	56644.62	4.38	56646.59	4.43
56651.04	4.56	56653.98	4.65	56656.06	4.67	56660.13	4.67	56664.27	4.67
56669.23	4.76	56678.32	4.93	56684.25	5.03	56687.42	5.09	56696.51	5.26
56698.43	5.29	56705.61	5.42	56714.5	5.59	56714.7	5.59	56723.8	5.75
56732.89	5.92	56737.13		656741.99	6.09	56744.76	6.14	56751.09	6.25
56760.18	6.42	56769.28	6.59	56773.58	6.67	56775.02	6.67	56778.37	6.74
56782.07	6.82	56787.46	6.94	56796.56	7.14	56801.91	7.26	56805.28	7.25
56805.66	7.25	56814.75	7.21	56820.48	7.19	56823.85	7.19	56825.55	7.18
56827.78	7.18	56829.9	7.23	56831.87	7.28	56832.94	7.35	6835.54	7.37
56842.04	7.38	56851.13	7.45	6853.65	7.41	56860.23	7.43	56865.8	7.44
56869.32	7.45	56869.82	7.45	56878.42	7.47	56879.52	7.47	56887.51	7.49
56891	7.55	6894.29	7.51	56896.05	7.51	56896.61	7.51	56905.39	7.53
56905.7	7.53	56912.57	7.55	56914.8	7.56	56923.89	7.58	56926.31	7.58
56931.26	7.59	56932.99	7.65	6942.09	7.62	56951.18	7.64	56952.1	7.64
56955.33	7.65	56956.57	7.65	56957.13	7.67	56960.28	7.66	56962.85	7.67
56998.09	7.67	57019.13	7.55	7022.82	7.47	57040.83	7.52	57044.09	7.52
57069.06	7.58	57081.54	7.61	57083.59	7.62	57105.2	7.67	57126.34	7.67
57154.34	7.45	57156.45	7.45	57168.93	7.48	57169.09	7.48	57187.21	7.53
57218.86	7.6	57220.1	7.65	7247.55	7.39	57252.98	7.35	57256.32	7.35
57293.77	7.44	57297.36	7.45	57318.73	7.33	57505.99	8.67		

```
Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
54842.85      .156367.85     .0356401.18      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      56367.8556401.18              360     360     360             .1       .3

CROSS SECTION


RIVER: Thornhill Creek
REACH: Bridge Area          RS: -2350.*

INPUT
Description:
Station Elevation Data      num=     274
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
54572.85       854660.98   5.7754668.47   5.6554683.54   5.4154685.86    5.43
54692.14   5.4754711.93   5.0354713.31      555431.02      555437.75       5
55447.12      555452.05      555466.36      555468.82      555480.66       5
55494.96      555499.38      555509.27      555516.41      555523.57       5
55537.87      555552.17      555556.68      555563.99      555566.48       5
55580.78      555595.08      555599.76      555609.38   4.9955609.86    4.99
55611.57   4.9955623.69   4.9755637.99   4.9555650.54   4.9455652.29    4.94
55659.16   4.9355666.59   4.92 55680.9    4.955691.23   4.89 55695.2    4.89
55706.73   4.87 55709.5   4.85 55723.8   4.73 55731.9   4.6755738.11    4.67
55752.41   4.6755754.32   4.6755766.71   4.67 55772.6   4.6755781.02    4.67
55795.32   4.67 55801.9   4.6755809.62   4.6755813.27   4.6755823.93    4.67
55838.23   4.6755849.49   4.6755852.53   4.6755853.96   4.6755866.84    4.56
55880.32   4.4555881.14   4.4455895.44   4.3455897.07   4.3355909.74    4.33
55924.05   4.3355935.32   4.3355938.35   4.3355944.66   4.3355952.65    4.33
55957.79   4.3355966.95   4.3355981.26   4.3355992.23   4.3355995.56    4.31
56009.86   4.2156015.09   4.1756024.16   4.1656038.47   4.1556039.82    4.14
56052.77   4.1356067.07   4.11 56072.4   4.1156081.38   4.09 56087.4    4.09
56095.68   4.0856109.98   4.0656124.29   4.04 56129.7   4.0456134.98       4
56138.59      456138.75      456152.89      456160.89      4 56167.2       4
56179.43      4 56181.5      456182.57      456186.99      4 56195.8       4
 56210.1      456224.41      456230.15      456238.71      4 56244.3       4
56253.01      456267.31      456277.73      456281.62   3.9756295.92    3.87
 56301.6   3.8356310.22   3.7756324.52   3.6756325.31   3.67 56326.9    3.68
56328.73   3.6656338.83   3.5756353.13   3.4556358.89    3.4 56363.5    3.34
56367.43   3.2656367.85   3.2556374.96  -6.24 56382.8  -6.2456402.41   -6.24
56409.52   3.2556413.38   3.3856415.14    3.456419.18   3.4256421.56    3.43
56429.75   3.4756431.18   3.4856436.37   3.5156437.62   3.4956437.95    3.48
56444.22   3.3756446.13   3.3456446.43   3.3456446.54   3.3356454.33    3.33
56462.52   3.3356467.52   3.3356470.71   3.3356473.68   3.33 56478.9    3.33
56487.09   3.3356490.82   3.3356495.28   3.3356500.92   3.3356503.47    3.33
56511.66   3.3356514.11   3.3356519.85   3.3356528.04   3.3356528.17    3.33
56536.23   3.3356537.41   3.3356544.42   3.3356552.61   3.3356555.42    3.33
56560.71   3.33 56560.8   3.3356568.99   3.3356577.18   3.3356582.67    3.33
   56584   3.3356584.42   3.3356585.38   3.3656591.85    3.556593.56    3.54
56595.01   3.5756600.54   3.6956601.75    3.756609.92   3.7456609.95    3.74
56613.61   3.8156618.13   3.8856626.33   4.0356628.73   4.0756630.51     4.1
56634.52   4.2256637.17    4.356639.04   4.3356642.71   4.3356646.43    4.33
 56650.9   4.3856659.09   4.4656664.42   4.5256667.28   4.5556675.47    4.63
56677.19   4.6556683.66   4.7156691.66   4.7956691.85   4.7956700.04    4.88
56708.23   4.9656712.05      556716.42   5.0456718.91   5.0756724.61    5.13
 56732.8   5.2156740.99   5.2956744.87   5.3356746.16   5.3356749.18    5.37
56752.51   5.4156757.38   5.4756765.56   5.5756770.38   5.6356773.41    5.62
56773.75   5.6256781.95   5.6156787.11    5.656790.13   5.6156791.67    5.61
56793.67   5.6256795.58   5.6556797.36   5.6856798.33   5.6956800.66    5.74
56806.52   5.7756814.71   5.8156816.97   5.82 56822.9   5.8556827.91    5.88
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56831.09	5.8956831.54	5.956839.28	5.9456840.27	5.9556847.47	5.98
56850.61	656853.57	6.0156855.15	6.0256855.66	6.0256863.57	6.07
56863.85	6.0756870.04	6.156872.04	6.1156880.23	6.15 56882.4	6.16
56886.87	6.1956888.42	6.1956896.61	6.23 56904.8	6.2856905.63	6.28
56908.54	6.356909.65	6.3156910.16	6.3156912.99	6.3256915.31	6.33
56947.04	6.3356965.99	6.0156969.31	5.9556985.54	6.0356988.47	6.05
57010.96	6.17 57022.2	6.2257024.04	6.23 57043.5	6.3357062.54	6.33
57087.75	5.957089.65	5.9157100.89	5.9757101.04	5.9757117.36	6.05
57145.86	6.257146.97	6.2157171.69	5.7757176.58	5.6957179.58	5.71
57213.31	5.8857216.55	5.957235.79	5.6757404.42	8.33	

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
54572.85	.156367.85	.0356409.52	.1		

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
56367.8	556409.52	360	360	360	.1	.3

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: -2710

INPUT
Description:
Station Elevation Data num= 61

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
54302.85	8.554404.24	5.1554412.85	4.9854430.19	4.6254432.85	4.65				
54440.09	4.7154462.85	4.0554464.44	456320.74	456322.85	3.96				
56362.85	3.1456367.85	356375.18	-6.77556410.52	-6.77556417.85	3				
56422.85	3.156441.74	3.2656442.85	3.2356450.78	356573.43	3				
56582.85	3.3656587.77	3.5456612.85	3.7656614.43	3.7856622.02	4				
56753.73	456757.79	4.0456761.27	4.0756762.85	4.0856792.85	4.34				
56793.25	4.3556810.22	4.556812.85	4.52 56827.5	4.6556859.16	4.92				
56861.75	4.9556867.77	5 56896	556912.85	4.5156915.81	4.42				
56930.24	4.5556932.85	4.5756952.85	4.7556962.85	4.8356964.49	4.85				
56981.8	556998.74	557021.16	4.3557022.85	4.3657032.85	4.45				
57032.98	4.45 57047.5	4.5857072.85	4.857073.84	4.8157095.83	4.16				
57100.18	4.0457102.85	4.0657132.85	4.3257135.73	4.3557152.85	4				
57302.85	8								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
54302.85	.156367.85	.0356417.85	.1		

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
56367.8	556417.85	442.5	442.5	442.5	.1	.3

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: -3152.5*

INPUT
Description:
Station Elevation Data num= 102

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-18.75	8.44	88.01	5.05	92.19	4.96	97.08	4.89	102.84	4.8
110.66	4.62	115.33	4.54	118.14	4.57	125.76	4.62	149.72	4.04
151.4	4	641.89	4	646.88	3.97	649.52	3.96	667.18	3.99
669.06	3.98	675.3	3.96	676.46	3.95	691.25	3.88	692.48	3.88

2106.02	3.88	2108.24	3.84	2150.36	3.12	2155.62	3	2163.45	-7.44
2197.8	-7.44	2205.62	3	2211.2	3.09	2232.26	3.23	2233.5	3.2
2242.34	3	2320.4	3	2321.76	3.01	2339.18	3.12	2339.45	3.12
2379.1	3.12	2389.6	3.44	2395.09	3.6	2423.05	3.79	2424.82	3.81
2433.28	4	2580.14	4	2584.66	4.03	2588.54	4.06	2590.31	4.07
2623.76	4.3	2624.2	4.31	2643.13	4.44	2646.06	4.45	2662.39	4.57
2697.69	4.81	2700.58	4.83	2707.29	4.88	2738.77	4.88	2757.56	4.45
2760.86	4.37	2776.95	4.48	2779.86	4.5	2802.16	4.66	2810.62	4.71
2813.31	4.74	2814.77	4.77	2815.14	4.77	2815.35	4.77	2831.18	4.98
2834.44	5	2853.33	5	2878.33	4.43	2880.21	4.44	2891.36	4.52
2891.51	4.52	2907.7	4.63	2935.96	4.83	2937.07	4.83	2954.58	4.43
2954.72	4.43	2955.01	4.42	2956.05	4.39	2961.59	4.26	2966.44	4.16
2969.41	4.18	3002.86	4.41	3006.08	4.43	3022.97	4.16	3025.16	4.13
3036.01	4.4	3036.84	4.42	3041.82	4.51	3042.69	4.53	3057.04	4.79
3057.41	4.8	3070.86	5.16	3071.92	5.19	3076.66	5.28	3077.97	5.3
3086.53	5.46	3088.28	5.51	3098.54	5.79	3119.11	6.22	3139.67	6.77
3188.83	7.8	3192.42	7.91						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-18.75	.1	2155.62	.03	2205.62	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
2155.62	2205.62	442.5	442.5	442.5	.1	.3

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: -3595.*

INPUT
Description:
Station Elevation Data num= 102

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-37.5	8.38	74.63	4.94	79.02	4.85	84.15	4.79	90.2	4.73
98.42	4.53	103.33	4.47	106.27	4.49	114.28	4.53	139.45	4.04
141.21	4	656.37	4	661.61	3.95	664.38	3.92	682.94	3.98
684.91	3.96	691.46	3.92	692.68	3.91	708.21	3.76	709.5	3.75
2194.15	3.75	2196.48	3.72	2240.72	3.11	2246.25	3	2254.58	-8.1
2287.92	-8.1	2296.25	3	2302.4	3.07	2325.64	3.19	2327	3.17
2336.76	3	2422.86	3	2424.37	3.02	2443.59	3.25	2443.87	3.25
2487.62	3.25	2499.21	3.52	2505.26	3.65	2536.11	3.82	2538.05	3.84
2547.39	4	2709.4	4	2714.39	4.03	2718.67	4.05	2720.61	4.06
2757.51	4.26	2758.01	4.26	2778.88	4.38	2782.12	4.39	2800.14	4.49
2839.08	4.69	2842.26	4.71	2849.67	4.75	2884.39	4.75	2905.12	4.38
2908.76	4.32	2926.51	4.41	2929.72	4.43	2954.32	4.56	2963.65	4.61
2966.62	4.65	2968.23	4.68	2968.64	4.69	2968.87	4.7	2986.34	4.98
2989.93	5	3010.77	5	3038.35	4.51	3040.42	4.52	3052.72	4.59
3052.88	4.59	3070.74	4.68	3101.93	4.85	3103.14	4.86	3122.46	4.51
3122.61	4.51	3122.94	4.51	3124.09	4.48	3130.19	4.37	3135.54	4.28
3138.83	4.3	3175.73	4.49	3179.27	4.51	3197.9	4.28	3200.33	4.27
3212.3	4.54	3213.21	4.56	3218.7	4.62	3219.66	4.63	3235.49	4.82
3235.9	4.83	3250.73	5.23	3251.91	5.27	3257.14	5.33	3258.59	5.34
3268.02	5.46	3269.95	5.51	3281.28	5.82	3303.96	6.19	3326.65	6.8
3380.88	7.69	3384.83	7.81						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-37.5	.1	2246.25	.03	2296.25	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
2246.25	2296.25	442.5	442.5	442.5	.1	.3

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: -4037.5*

INPUT
Description:
Station Elevation Data num= 102

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-56.25	8.31	61.25	4.84	65.85	4.74	71.23	4.7	77.57	4.66
86.18	4.45	91.32	4.39	94.41	4.41	102.8	4.44	129.17	4.03
131.02	4	670.85	4	676.34	3.92	679.25	3.89	698.69	3.97
700.76	3.94	707.62	3.88	708.9	3.86	725.18	3.64	726.53	3.62
2282.28	3.62	2284.72	3.6	2331.08	3.09	2336.88	3	2345.7	-8.77
2378.05	-8.77	2386.88	3	2393.6	3.06	2419.01	3.16	2420.5	3.14
2431.17	3	2525.33	3	2526.97	3.03	2547.99	3.37	2548.3	3.38
2596.14	3.38	2608.81	3.6	2615.43	3.71	2649.16	3.85	2651.29	3.86
2661.5	4	2838.65	4	2844.11	4.03	2848.8	4.04	2850.92	4.05
2891.27	4.21	2891.81	4.22	2914.64	4.31	2918.17	4.32	2937.88	4.41
2980.46	4.57	2983.95	4.59	2992.04	4.62	3030.01	4.62	3052.68	4.32
3056.66	4.26	3076.07	4.34	3079.58	4.36	3106.48	4.47	3116.68	4.51
3119.93	4.57	3121.69	4.6	3122.14	4.61	3122.39	4.62	3141.49	4.98
3145.42	5	3168.21	5	3198.36	4.59	3200.64	4.6	3214.09	4.66
3214.26	4.66	3233.79	4.74	3267.89	4.88	3269.22	4.88	3290.34	4.59
3290.51	4.59	3290.86	4.59	3292.12	4.57	3298.8	4.47	3304.65	4.4
3308.24	4.41	3348.59	4.58	3352.47	4.59	3372.84	4.4	3375.49	4.4
3388.58	4.68	3389.58	4.7	3395.59	4.74	3396.64	4.74	3413.95	4.85
3414.39	4.86	3430.61	5.3	3431.89	5.34	3437.62	5.37	3439.2	5.39
3449.52	5.45	3451.63	5.51	3464.01	5.85	3488.82	6.15	3513.63	6.84
3572.92	7.57	3577.25	7.72						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-56.25	.1	2336.88	.03	2386.88	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
2336.88	2386.88	442.5	442.5	442.5	.1	.3

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: -4480.*

INPUT
Description:
Station Elevation Data num= 102

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-75	8.25	47.87	4.74	52.68	4.63	58.31	4.61	64.94	4.59
73.94	4.36	79.32	4.31	82.54	4.32	91.32	4.36	118.9	4.03
120.83	4	685.33	4	691.07	3.9	694.11	3.85	714.45	3.95
716.61	3.92	723.78	3.84	725.12	3.82	742.14	3.53	743.56	3.5
2370.41	3.5	2372.97	3.48	2421.44	3.07	2427.5	3	2436.82	-9.43
2468.18	-9.43	2477.5	3	2484.8	3.05	2512.38	3.13	2514	3.12
2525.58	3	2627.79	3	2629.58	3.03	2652.39	3.49	2652.73	3.5
2704.66	3.5	2718.41	3.68	2725.6	3.77	2762.22	3.88	2764.52	3.89
2775.6	4	2967.91	4	2973.84	4.02	2978.92	4.03	2981.23	4.04
3025.03	4.17	3025.61	4.18	3050.39	4.25	3054.23	4.26	3075.62	4.32
3121.85	4.46	3125.63	4.47	3134.42	4.5	3175.64	4.5	3200.24	4.26
3204.56	4.21	3225.63	4.28	3229.44	4.28	3258.64	4.38	3269.72	4.41
3273.24	4.48	3275.15	4.52	3275.64	4.53	3275.92	4.54	3296.64	4.99

3300.91	5	3325.65	5	3358.38	4.68	3360.85	4.68	3375.45	4.72
3375.64	4.72	3396.84	4.79	3433.85	4.9	3435.3	4.9	3458.23	4.67
3458.41	4.68	3458.79	4.68	3460.16	4.65	3467.4	4.58	3473.76	4.52
3477.65	4.53	3521.46	4.66	3525.66	4.68	3547.78	4.52	3550.66	4.53
3564.87	4.82	3565.95	4.84	3572.47	4.85	3573.61	4.85	3592.4	4.88
3592.89	4.89	3610.49	5.37	3611.88	5.41	3618.09	5.42	3619.81	5.43
3631.01	5.44	3633.3	5.5	3646.74	5.88	3673.67	6.12	3700.6	6.87
3764.97	7.46	3769.67	7.62						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-75	.1	2427.5	.03	2477.5	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
2427.5	2477.5	442.5	442.5	442.5	.1	.3

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: -4922.5*

INPUT
Description:
Station Elevation Data num= 102

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-93.75	8.19	34.49	4.63	39.51	4.51	45.38	4.52	52.3	4.52
61.7	4.27	67.31	4.23	70.68	4.24	79.84	4.27	108.62	4.02
110.63	4	699.82	4	705.8	3.88	708.98	3.81	730.2	3.94
732.46	3.91	739.94	3.8	741.34	3.77	759.11	3.41	760.58	3.38
2458.54	3.38	2461.21	3.36	2511.8	3.05	2518.12	3	2527.95	-10.09
2558.3	-10.09	2568.12	3	2576	3.04	2605.75	3.1	2607.5	3.09
2619.99	3	2730.26	3	2732.18	3.04	2756.79	3.62	2757.16	3.62
2813.18	3.62	2828.02	3.76	2835.77	3.83	2875.27	3.91	2877.76	3.92
2889.71	4	3097.17	4	3103.56	4.01	3109.05	4.03	3111.53	4.03
3158.79	4.13	3159.42	4.13	3186.15	4.19	3190.29	4.2	3213.36	4.24
3263.23	4.35	3267.31	4.36	3276.79	4.38	3321.26	4.38	3347.8	4.19
3352.46	4.16	3375.19	4.21	3379.3	4.21	3410.8	4.28	3422.75	4.3
3426.55	4.39	3428.62	4.44	3429.14	4.46	3429.44	4.46	3451.8	4.99
3456.4	5	3483.08	5	3518.4	4.76	3521.06	4.76	3536.81	4.79
3537.02	4.79	3559.89	4.84	3599.81	4.93	3601.37	4.93	3626.11	4.75
3626.31	4.76	3626.72	4.76	3628.19	4.74	3636.01	4.68	3642.86	4.64
3647.07	4.65	3694.32	4.74	3698.86	4.76	3722.72	4.64	3725.82	4.67
3741.15	4.96	3742.32	4.98	3749.35	4.96	3750.58	4.96	3770.85	4.91
3771.38	4.91	3790.37	5.44	3791.87	5.49	3798.57	5.47	3800.42	5.47
3812.51	5.44	3814.98	5.5	3829.48	5.91	3858.52	6.09	3887.58	6.9
3957.02	7.34	3962.09	7.53						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-93.75	.1	2518.12	.03	2568.12	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
2518.12	2568.12	442.5	442.5	442.5	.1	.3

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: -5365.*

INPUT
Description:

Station Elevation Data num= 102

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-112.5	8.12	21.11	4.53	26.34	4.4	32.46	4.42	39.67	4.45
49.46	4.18	55.31	4.15	58.81	4.16	68.35	4.18	98.35	4.01
100.44	4	714.3	4	720.54	3.85	723.84	3.78	745.95	3.93
748.3	3.89	756.11	3.76	757.56	3.72	776.07	3.29	777.61	3.25
2546.67	3.25	2549.45	3.24	2602.16	3.04	2608.75	3	2619.07	-10.76
2648.43	-10.76	2658.75	3	2667.2	3.03	2699.13	3.07	2701	3.06
2714.41	3	2832.72	3	2834.79	3.05	2861.2	3.74	2861.59	3.75
2921.7	3.75	2937.62	3.84	2945.93	3.88	2988.32	3.94	2990.99	3.94
3003.82	4	3226.43	4	3233.29	4.01	3239.17	4.02	3241.84	4.02
3292.54	4.09	3293.22	4.09	3321.9	4.12	3326.35	4.13	3351.11	4.16
3404.62	4.23	3408.99	4.24	3419.17	4.25	3466.88	4.25	3495.36	4.13
3500.36	4.11	3524.75	4.14	3529.16	4.14	3562.96	4.19	3575.78	4.2
3579.86	4.3	3582.08	4.36	3582.64	4.38	3582.96	4.39	3606.95	4.99
3611.89	5	3640.52	5	3678.42	4.84	3681.27	4.84	3698.17	4.86
3698.39	4.86	3722.93	4.89	3765.78	4.95	3767.45	4.95	3793.99	4.84
3794.21	4.84	3794.65	4.85	3796.23	4.83	3804.62	4.79	3811.97	4.76
3816.48	4.76	3867.18	4.83	3872.05	4.84	3897.65	4.76	3900.99	4.8
3917.43	5.1	3918.69	5.12	3926.23	5.07	3927.55	5.06	3949.3	4.94
3949.87	4.94	3970.24	5.51	3971.86	5.56	3979.05	5.52	3981.04	5.51
3994	5.43	3996.65	5.5	4012.21	5.94	4043.38	6.06	4074.56	6.93
4149.07	7.23	4154.5	7.44						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-112.5	.1	2608.75	.03	2658.75	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
2608.75	2658.75	442.5	442.5	442.5	.1	.3

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: -5807.5*

INPUT
Description:
Station Elevation Data num= 102

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-131.25	8.06	7.73	4.43	13.17	4.29	19.53	4.33	27.03	4.38
37.22	4.09	43.3	4.08	46.95	4.08	56.87	4.09	88.07	4.01
90.25	4	728.78	4	735.27	3.83	738.71	3.74	761.71	3.92
764.15	3.87	772.27	3.72	773.78	3.68	793.04	3.17	794.63	3.12
2634.8	3.12	2637.69	3.12	2692.52	3.02	2699.38	3	2710.19	-11.42
2738.56	-11.42	2749.38	3	2758.4	3.01	2792.5	3.03	2794.5	3.03
2808.82	3	2935.19	3	2937.39	3.06	2965.6	3.87	2966.02	3.88
3030.22	3.88	3047.22	3.92	3056.1	3.94	3101.38	3.97	3104.23	3.97
3117.93	4	3355.68	4	3363.01	4.01	3369.3	4.01	3372.15	4.01
3426.3	4.04	3427.02	4.04	3457.66	4.06	3462.4	4.07	3488.85	4.08
3546	4.11	3550.68	4.12	3561.54	4.12	3612.5	4.12	3642.92	4.06
3648.26	4.05	3674.31	4.07	3679.02	4.07	3715.12	4.09	3728.82	4.1
3733.18	4.22	3735.54	4.28	3736.14	4.3	3736.48	4.31	3762.11	5
3767.38	5	3797.96	5	3838.43	4.92	3841.48	4.92	3859.54	4.93
3859.77	4.93	3885.98	4.95	3931.74	4.97	3933.53	4.98	3961.88	4.92
3962.1	4.93	3962.57	4.93	3964.26	4.91	3973.22	4.89	3981.08	4.88
3985.89	4.88	4040.05	4.91	4045.25	4.92	4072.59	4.88	4076.15	4.93
4093.72	5.24	4095.06	5.26	4103.12	5.19	4104.53	5.17	4127.76	4.97
4128.36	4.97	4150.12	5.58	4151.84	5.64	4159.52	5.56	4161.65	5.55
4175.5	5.43	4178.33	5.5	4194.95	5.97	4228.23	6.03	4261.53	6.97
4341.11	7.11	4346.92	7.34						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-131.25	.1	2699.38	.03	2749.38	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
2699.38	2749.38	442.5	442.5	442.5	.1	.3

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: -6250

INPUT
Description:
Station Elevation Data num= 47

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-150	8	0	4.18	14.4	4.31	24.98	4	743.26	4
750	3.8	753.57	3.7	777.46	3.91	780	3.85	788.43	3.68
790	3.63	810	3.05	811.66	3	2790	3	2801.314	-12.085
2828.686	-12.085	2840	3	3037.65	3	3040	3.07	3070	3.99
3070.45	4	3881.85	4	3889	4.2	3890	4.23	3917.26	5
4129.76	5	4130	5.01	4130.5	5.02	4132.3	5	4247.53	5
4270	5.38	4271.43	5.4	4280	5.3	4281.5	5.28	4306.21	5
4306.85	5	4330	5.65	4331.83	5.71	4340	5.61	4342.26	5.59
4356.99	5.42	4360	5.5	4377.68	6	4413.09	6	4448.51	7
4533.16	7	4539.34	7.25						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-150	.1	2790	.03	2840	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
2790	2840	305	305	305	.1	.3

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: -6555.*

INPUT
Description:
Station Elevation Data num= 47

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-150	7.54	0	3.72	14.4	3.85	24.98	3.54	743.26	3.54
750	3.34	753.57	3.24	777.46	3.45	780	3.39	788.43	3.22
790	3.17	810	2.59	811.66	2.54	2790	2.54	2801.66	-12.54
2828.34	-12.54	2840	2.54	3037.65	2.54	3040	2.61	3070	3.53
3070.45	3.54	3881.85	3.54	3889	3.74	3890	3.77	3917.26	4.54
4129.76	4.54	4130	4.55	4130.5	4.56	4132.3	4.54	4247.53	4.54
4270	4.92	4271.43	4.94	4280	4.84	4281.5	4.82	4306.21	4.54
4306.85	4.54	4330	5.19	4331.83	5.25	4340	5.15	4342.26	5.13
4356.99	4.96	4360	5.04	4377.68	5.54	4413.09	5.54	4448.51	6.54
4533.16	6.54	4539.34	6.79						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-150	.1	2790	.03	2840	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
2790	2840	305	305	305	.1	.3

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: -6860

INPUT
Description:
Station Elevation Data num= 47

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-150	7.085	0	3.265	14.4	3.395	24.98	3.085	743.26	3.085
750	2.885	753.57	2.785	777.46	2.995	780	2.935	788.43	2.765
790	2.715	810	2.135	811.66	2.085	2790	2.085	2802	-13
2828	-13	2840	2.085	3037.65	2.085	3040	2.155	3070	3.075
3070.45	3.085	3881.85	3.085	3889	3.285	3890	3.315	3917.26	4.085
4129.76	4.085	4130	4.095	4130.5	4.105	4132.3	4.085	4247.53	4.085
4270	4.465	4271.43	4.485	4280	4.385	4281.5	4.365	4306.21	4.085
4306.85	4.085	4330	4.735	4331.83	4.795	4340	4.695	4342.26	4.675
4356.99	4.505	4360	4.585	4377.68	5.085	4413.09	5.085	4448.51	6.085
4533.16	6.085	4539.34	6.335						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-150	.1	2790	.03	2840	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
2790	2840	0	0	0	.1	.3

SUMMARY OF MANNING'S N VALUES

River:Thornhill Creek

Reach	River Sta.	n1	n2	n3
Bridge Area	4700	.1	.03	.1
Bridge Area	4266.66*	.1	.03	.1
Bridge Area	3833.33*	.1	.03	.1
Bridge Area	3400.*	.1	.03	.1
Bridge Area	2966.66*	.1	.03	.1
Bridge Area	2533.33*	.1	.03	.1
Bridge Area	2100	.1	.03	.1
Bridge Area	1682.5*	.1	.03	.1
Bridge Area	1265.*	.1	.03	.1
Bridge Area	847.5*	.1	.03	.1
Bridge Area	430	.1	.03	.1
Bridge Area	155	.1	.03	.1
Bridge Area	125	.1	.03	.1
Bridge Area	0	.1	.03	.1
Bridge Area	-125	.1	.03	.1
Bridge Area	-450.*	.1	.03	.1
Bridge Area	-710	.1	.03	.1
Bridge Area	-1170.*	.1	.03	.1
Bridge Area	-1630	.1	.03	.1
Bridge Area	-1990.*	.1	.03	.1
Bridge Area	-2350.*	.1	.03	.1
Bridge Area	-2710	.1	.03	.1
Bridge Area	-3152.5*	.1	.03	.1
Bridge Area	-3595.*	.1	.03	.1
Bridge Area	-4037.5*	.1	.03	.1
Bridge Area	-4480.*	.1	.03	.1
Bridge Area	-4922.5*	.1	.03	.1

Bridge Area	-5365.*	.1	.03	.1
Bridge Area	-5807.5*	.1	.03	.1
Bridge Area	-6250	.1	.03	.1
Bridge Area	-6555.*	.1	.03	.1
Bridge Area	-6860	.1	.03	.1

SUMMARY OF REACH LENGTHS

River: Thornhill Creek

Reach	River Sta.	Left	Channel	Right
Bridge Area	4700	433.33	433.33	433.33
Bridge Area	4266.66*	433.33	433.33	433.33
Bridge Area	3833.33*	433.33	433.33	433.33
Bridge Area	3400.*	433.33	433.33	433.33
Bridge Area	2966.66*	433.33	433.33	433.33
Bridge Area	2533.33*	433.33	433.33	433.33
Bridge Area	2100	417.5	417.51	417.51
Bridge Area	1682.5*	417.5	417.51	417.51
Bridge Area	1265.*	417.5	417.51	417.51
Bridge Area	847.5*	417.5	417.51	417.51
Bridge Area	430	275	275	275
Bridge Area	155	30	30	30
Bridge Area	125	125	125	125
Bridge Area	0	125	125	125
Bridge Area	-125	325	325	325
Bridge Area	-450.*	260	260	260
Bridge Area	-710	460	460	460
Bridge Area	-1170.*	460	460	460
Bridge Area	-1630	360	360	360
Bridge Area	-1990.*	360	360	360
Bridge Area	-2350.*	360	360	360
Bridge Area	-2710	442.5	442.5	442.5
Bridge Area	-3152.5*	442.5	442.5	442.5
Bridge Area	-3595.*	442.5	442.5	442.5
Bridge Area	-4037.5*	442.5	442.5	442.5
Bridge Area	-4480.*	442.5	442.5	442.5
Bridge Area	-4922.5*	442.5	442.5	442.5
Bridge Area	-5365.*	442.5	442.5	442.5
Bridge Area	-5807.5*	442.5	442.5	442.5
Bridge Area	-6250	305	305	305
Bridge Area	-6555.*	305	305	305
Bridge Area	-6860	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Thornhill Creek

Reach	River Sta.	Contr.	Expan.
Bridge Area	4700	.1	.3
Bridge Area	4266.66*	.1	.3
Bridge Area	3833.33*	.1	.3
Bridge Area	3400.*	.1	.3
Bridge Area	2966.66*	.1	.3
Bridge Area	2533.33*	.1	.3

Bridge Area	2100	.1	.3
Bridge Area	1682.5*	.1	.3
Bridge Area	1265.*	.1	.3
Bridge Area	847.5*	.1	.3
Bridge Area	430	.1	.3
Bridge Area	155	.1	.3
Bridge Area	125	.1	.3
Bridge Area	0	.1	.3
Bridge Area	-125	.1	.3
Bridge Area	-450.*	.1	.3
Bridge Area	-710	.1	.3
Bridge Area	-1170.*	.1	.3
Bridge Area	-1630	.1	.3
Bridge Area	-1990.*	.1	.3
Bridge Area	-2350.*	.1	.3
Bridge Area	-2710	.1	.3
Bridge Area	-3152.5*	.1	.3
Bridge Area	-3595.*	.1	.3
Bridge Area	-4037.5*	.1	.3
Bridge Area	-4480.*	.1	.3
Bridge Area	-4922.5*	.1	.3
Bridge Area	-5365.*	.1	.3
Bridge Area	-5807.5*	.1	.3
Bridge Area	-6250	.1	.3
Bridge Area	-6555.*	.1	.3
Bridge Area	-6860	.1	.3

25 Year Natural Condition

(Storm Tide + Base Flow)

HEC-RAS Output

HEC-RAS Plan: Nat 25 SSNo US F River: Thornhill Creek Reach: Bridge Area

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Bridge Area	4700	28SEP2008 0918	350.00	14.00	15.64		15.76	0.002812	2.82	130.41	133.11	0.47
Bridge Area	4700	28SEP2008 1448	350.00	14.00	15.64		15.76	0.002808	2.82	130.47	133.12	0.47
Bridge Area	4266.66*	28SEP2008 0918	350.00	13.17	14.51		14.60	0.002552	2.48	143.34	156.88	0.44
Bridge Area	4266.66*	28SEP2008 1448	350.06	13.17	14.51		14.60	0.002561	2.48	143.21	156.85	0.44
Bridge Area	3833.33*	28SEP2008 0918	350.00	12.33	13.47		13.55	0.002395	2.24	156.49	181.06	0.42
Bridge Area	3833.33*	28SEP2008 1448	349.85	12.33	13.47		13.55	0.002377	2.24	156.82	181.16	0.42
Bridge Area	3400.*	28SEP2008 0918	350.00	11.50	12.51		12.58	0.002164	2.03	172.24	208.49	0.39
Bridge Area	3400.*	28SEP2008 1448	350.50	11.50	12.51		12.57	0.002196	2.04	171.65	208.38	0.40
Bridge Area	2966.66*	28SEP2008 0918	350.00	10.67	11.51		11.58	0.002542	2.05	170.37	228.32	0.42
Bridge Area	2966.66*	28SEP2008 1448	349.36	10.67	11.52		11.58	0.002486	2.04	171.45	228.68	0.41
Bridge Area	2533.33*	28SEP2008 0918	350.04	9.83	10.76		10.80	0.001211	1.53	257.75	621.25	0.30
Bridge Area	2533.33*	28SEP2008 1448	338.24	9.83	10.88		10.90	0.000706	1.27	333.09	643.46	0.23
Bridge Area	2100	28SEP2008 0918	350.08	9.00	9.49		9.54	0.004911	2.05	265.04	579.93	0.54
Bridge Area	2100	28SEP2008 1448	328.76	9.00	10.73		10.73	0.000044	0.46	1443.71	1215.11	0.06
Bridge Area	1682.5*	28SEP2008 0918	350.08	6.34	6.92		7.06	0.007879	3.00	116.89	207.79	0.70
Bridge Area	1682.5*	28SEP2008 1448	337.07	6.34	10.71		10.72	0.000005	0.30	2092.40	1416.91	0.03
Bridge Area	1265.*	28SEP2008 0918	350.08	3.68	4.54		4.67	0.004661	2.97	117.91	143.10	0.58
Bridge Area	1265.*	28SEP2008 1448	354.07	3.68	10.71		10.71	0.000002	0.27	2461.16	1495.83	0.02
Bridge Area	847.5*	28SEP2008 0918	350.05	1.03	3.66		3.70	0.000403	1.69	207.10	92.24	0.20
Bridge Area	847.5*	28SEP2008 1448	367.02	1.03	10.70		10.70	0.000002	0.31	2583.09	1684.38	0.02
Bridge Area	430	28SEP2008 0918	350.05	-1.63	2.63		2.91	0.004014	4.20	83.33	52.04	0.59
Bridge Area	430	28SEP2008 1448	380.60	-1.63	10.68		10.69	0.000006	0.50	2447.79	1772.86	0.03
Bridge Area	155	28SEP2008 0918	350.14	-2.60	1.89		2.10	0.002302	3.63	96.58	50.88	0.46
Bridge Area	155	28SEP2008 1448	392.95	-2.60	10.67		10.67	0.000005	0.51	3208.89	1873.18	0.03
Bridge Area	125	28SEP2008 0918	350.17	-2.68	1.74		2.01	0.003534	4.24	84.24	50.48	0.56
Bridge Area	125	28SEP2008 1448	394.10	-2.68	10.67		10.67	0.000004	0.48	2947.03	1266.82	0.03
Bridge Area	0	28SEP2008 0918	350.29	-2.54	1.46		1.69	0.001801	3.84	92.40	44.23	0.42
Bridge Area	0	28SEP2008 1448	397.59	-2.54	10.67		10.67	0.000003	0.40	4221.22	1626.89	0.02

HEC-RAS Plan: Nat 25 SSNo US F River: Thornhill Creek Reach: Bridge Area (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Bridge Area	-125	28SEP2008 0918	350.49	-2.54	1.11		1.41	0.002595	4.42	79.24	32.73	0.50
Bridge Area	-125	28SEP2008 1448	400.74	-2.54	10.66		10.66	0.000003	0.41	4214.38	1621.53	0.02
Bridge Area	-450.*	28SEP2008 0918	351.17	-3.96	0.74		0.86	0.000712	2.79	126.08	38.54	0.27
Bridge Area	-450.*	28SEP2008 1448	406.49	-3.96	10.65		10.65	0.000005	0.53	2195.51	858.59	0.03
Bridge Area	-710	28SEP2008 0918	351.80	-3.78	0.66		0.73	0.000308	2.08	169.45	41.50	0.18
Bridge Area	-710	28SEP2008 1448	404.65	-3.78	10.63		10.64	0.000003	0.46	3079.26	1114.06	0.02
Bridge Area	-1170.*	28SEP2008 0918	352.90	-4.47	0.43		0.55	0.000505	2.67	132.05	30.60	0.23
Bridge Area	-1170.*	28SEP2008 1448	383.07	-4.47	10.62		10.62	0.000002	0.37	6008.12	2529.58	0.02
Bridge Area	-1630	28SEP2008 0918	354.15	-5.16	-0.44		-0.06	0.002250	4.95	71.59	18.73	0.45
Bridge Area	-1630	28SEP2008 1448	348.32	-5.16	10.61		10.61	0.000001	0.19	9635.48	2494.71	0.01
Bridge Area	-1990.*	28SEP2008 0918	355.82	-5.70	-0.76		-0.61	0.000707	3.09	114.97	26.96	0.26
Bridge Area	-1990.*	28SEP2008 1448	309.52	-5.70	10.60		10.60	0.000000	0.12	12819.84	2663.14	0.01
Bridge Area	-2350.*	28SEP2008 0918	358.45	-6.24	-0.86		-0.79	0.000274	2.12	169.45	35.51	0.17
Bridge Area	-2350.*	28SEP2008 1448	258.41	-6.24	10.60		10.60	0.000000	0.08	16147.13	2831.57	0.00
Bridge Area	-2710	28SEP2008 0918	361.98	-6.78	-0.90		-0.86	0.000126	1.55	233.55	44.15	0.12
Bridge Area	-2710	28SEP2008 1448	200.75	-6.78	10.60		10.60	0.000000	0.05	19610.65	3000.00	0.00
Bridge Area	-3152.5*	28SEP2008 0918	366.91	-7.44	-0.94		-0.91	0.000098	1.44	254.74	44.09	0.11
Bridge Area	-3152.5*	28SEP2008 1448	122.22	-7.44	10.60		10.60	0.000000	0.03	21152.26	3211.17	0.00
Bridge Area	-3595.*	28SEP2008 0918	371.91	-8.10	-0.98		-0.95	0.000079	1.35	275.39	44.03	0.10
Bridge Area	-3595.*	28SEP2008 1448	38.42	-8.10	10.60		10.60	0.000000	0.01	22728.78	3422.33	0.00
Bridge Area	-4037.5*	28SEP2008 0918	376.97	-8.77	-1.01		-0.99	0.000064	1.27	296.18	43.99	0.09
Bridge Area	-4037.5*	28SEP2008 1448	-48.80	-8.77	10.60		10.60	0.000000	-0.01	24326.28	3633.50	0.00
Bridge Area	-4480.*	28SEP2008 0918	382.07	-9.43	-1.04		-1.01	0.000054	1.21	316.11	43.95	0.08
Bridge Area	-4480.*	28SEP2008 1448	-136.93	-9.43	10.60		10.60	0.000000	-0.03	25925.96	3844.67	0.00
Bridge Area	-4922.5*	28SEP2008 0918	387.19	-10.09	-1.06		-1.04	0.000046	1.15	335.43	43.91	0.07
Bridge Area	-4922.5*	28SEP2008 1448	-224.81	-10.09	10.60		10.60	0.000000	-0.04	27544.82	4055.84	0.00
Bridge Area	-5365.*	28SEP2008 0918	392.23	-10.76	-1.07		-1.06	0.000040	1.11	354.72	43.89	0.07
Bridge Area	-5365.*	28SEP2008 1448	-311.97	-10.76	10.60		10.60	0.000000	-0.05	29200.30	4267.00	0.00

HEC-RAS Plan: Nat 25 SSNo US F River: Thornhill Creek Reach: Bridge Area (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Bridge Area	-5807.5*	28SEP2008 0918	397.29	-11.42	-1.09		-1.07	0.000035	1.06	373.06	43.86	0.06
Bridge Area	-5807.5*	28SEP2008 1448	-399.53	-11.42	10.60		10.60	0.000000	-0.06	30874.77	4478.17	0.00
Bridge Area	-6250	28SEP2008 0918	402.39	-12.09	-1.11		-1.09	0.000031	1.03	390.96	43.84	0.06
Bridge Area	-6250	28SEP2008 1448	-490.02	-12.09	10.61		10.61	0.000000	-0.07	32549.77	4689.34	0.00
Bridge Area	-6555.*	28SEP2008 0918	405.93	-12.54	-1.11		-1.10	0.000029	1.00	405.79	44.35	0.06
Bridge Area	-6555.*	28SEP2008 1448	-553.13	-12.54	10.61		10.61	0.000000	-0.08	34705.72	4689.34	0.00
Bridge Area	-6860	28SEP2008 0918	409.52	-13.00	-1.12	-11.07	-1.11	0.000026	0.97	421.06	44.90	0.06
Bridge Area	-6860	28SEP2008 1448	-616.38	-13.00	10.61	-10.48	10.61	0.000000	-0.08	36838.61	4689.34	0.00

100 Year Natural Condition

(Storm Tide + Base Flow)

HEC-RAS Output

HEC-RAS Plan: Nat 100 SS N River: Thornhill Creek Reach: Bridge Area

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Bridge Area	4700	28SEP2008 1336	400.00	14.00	15.72		15.86	0.002869	2.99	141.73	135.81	0.48
Bridge Area	4700	28SEP2008 1354	400.00	14.00	15.73		15.86	0.002846	2.98	142.13	135.90	0.48
Bridge Area	4266.66*	28SEP2008 1336	399.62	13.17	14.58		14.69	0.002601	2.63	155.22	159.50	0.45
Bridge Area	4266.66*	28SEP2008 1354	400.92	13.17	14.58		14.69	0.002643	2.64	154.74	159.39	0.45
Bridge Area	3833.33*	28SEP2008 1336	401.24	12.33	13.56		13.64	0.002318	2.34	172.15	185.71	0.42
Bridge Area	3833.33*	28SEP2008 1354	397.78	12.33	13.56		13.64	0.002288	2.33	171.91	185.66	0.42
Bridge Area	3400.*	28SEP2008 1336	399.14	11.50	12.55		12.62	0.002453	2.22	179.54	209.84	0.42
Bridge Area	3400.*	28SEP2008 1354	350.24	11.50	13.05		13.08	0.000404	1.23	294.11	266.80	0.18
Bridge Area	2966.66*	28SEP2008 1336	322.60	10.67	12.02		12.04	0.000379	1.10	297.71	290.70	0.18
Bridge Area	2966.66*	28SEP2008 1354	48.95	10.67	12.99		12.99	0.000001	0.08	1056.84	1308.15	0.01
Bridge Area	2533.33*	28SEP2008 1336	-110.74	9.83	11.95		11.95	0.000004	-0.16	1452.83	1395.75	0.02
Bridge Area	2533.33*	28SEP2008 1354	-531.46	9.83	13.00		13.00	0.000016	-0.42	3127.35	1762.15	0.04
Bridge Area	2100	28SEP2008 1336	-869.96	9.00	11.95		11.96	0.000038	-0.61	3191.56	1503.20	0.06
Bridge Area	2100	28SEP2008 1354	-1146.34	9.00	13.01		13.01	0.000021	-0.57	4845.80	2004.62	0.05
Bridge Area	1682.5*	28SEP2008 1336	-1754.74	6.34	11.97		11.98	0.000044	-1.01	4260.21	1988.40	0.08
Bridge Area	1682.5*	28SEP2008 1354	-1869.15	6.34	13.01		13.02	0.000021	-0.79	6530.43	2497.51	0.05
Bridge Area	1265.*	28SEP2008 1336	-2741.90	3.68	11.97		12.00	0.000061	-1.51	4867.48	2408.84	0.10
Bridge Area	1265.*	28SEP2008 1354	-3009.29	3.68	13.02		13.04	0.000036	-1.26	8258.35	4464.69	0.08
Bridge Area	847.5*	28SEP2008 1336	-3827.28	1.03	11.99		12.05	0.000113	-2.38	5320.77	3247.41	0.13
Bridge Area	847.5*	28SEP2008 1354	-4670.34	1.03	13.03		13.08	0.000081	-2.16	10056.98	5201.81	0.12
Bridge Area	430	28SEP2008 1336	-5480.03	-1.63	12.05		12.22	0.000376	-4.46	6454.27	4151.52	0.24
Bridge Area	430	28SEP2008 1354	-6683.25	-1.63	13.08		13.17	0.000227	-3.68	11705.45	5801.34	0.19
Bridge Area	155	28SEP2008 1336	-6834.97	-2.60	12.14		12.37	0.000435	-5.35	7490.46	4545.53	0.27
Bridge Area	155	28SEP2008 1354	-8033.10	-2.60	13.14		13.25	0.000265	-4.41	12690.08	5883.38	0.21
Bridge Area	125	28SEP2008 1336	-6974.63	-2.68	12.15		12.40	0.000494	-5.64	6778.22	4216.80	0.29
Bridge Area	125	28SEP2008 1354	-8174.95	-2.68	13.14		13.27	0.000302	-4.65	11896.56	5873.76	0.23
Bridge Area	0	28SEP2008 1336	-7413.39	-2.54	12.22		12.38	0.000371	-4.81	7171.54	2000.47	0.25

HEC-RAS Plan: Nat 100 SS N River: Thornhill Creek Reach: Bridge Area (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Bridge Area	0	28SEP2008 1354	-8667.94	-2.54	13.18		13.29	0.000272	-4.34	10116.64	4027.75	0.21
Bridge Area	-125	28SEP2008 1336	-7830.49	-2.54	12.26		12.47	0.000472	-5.45	8025.64	3215.84	0.28
Bridge Area	-125	28SEP2008 1354	-9156.91	-2.54	13.21		13.34	0.000313	-4.67	12569.19	5887.82	0.23
Bridge Area	-450.*	28SEP2008 1336	-8862.71	-3.96	12.34	8.85	13.05	0.000954	-8.29	6024.33	3992.60	0.39
Bridge Area	-450.*	28SEP2008 1354	-10147.00	-3.96	13.29		13.59	0.000518	-6.39	10070.60	4309.73	0.29
Bridge Area	-710	28SEP2008 1336	-9339.40	-3.78	12.64		13.02	0.000583	-6.81	7325.80	2564.46	0.30
Bridge Area	-710	28SEP2008 1354	-10468.80	-3.78	13.57		13.79	0.000390	-5.79	9720.52	2564.46	0.25
Bridge Area	-1170.*	28SEP2008 1336	-10144.10	-4.47	13.18		13.25	0.000236	-4.28	12481.59	2529.58	0.19
Bridge Area	-1170.*	28SEP2008 1354	-10984.60	-4.47	14.12		14.17	0.000167	-3.73	14861.84	2529.58	0.16
Bridge Area	-1630	28SEP2008 1336	-11081.00	-5.16	13.54		13.56	0.000127	-2.94	16943.60	2494.71	0.13
Bridge Area	-1630	28SEP2008 1354	-11566.70	-5.16	14.45		14.46	0.000093	-2.61	19219.59	2494.71	0.11
Bridge Area	-1990.*	28SEP2008 1336	-11994.20	-5.70	13.63		13.65	0.000080	-2.53	20884.33	2663.14	0.11
Bridge Area	-1990.*	28SEP2008 1354	-12148.20	-5.70	14.53		14.54	0.000058	-2.23	23281.07	2663.14	0.09
Bridge Area	-2350.*	28SEP2008 1336	-13115.70	-6.24	13.68		13.70	0.000057	-2.27	24870.41	2831.57	0.09
Bridge Area	-2350.*	28SEP2008 1354	-12873.10	-6.24	14.58		14.59	0.000041	-1.97	27396.70	2831.57	0.08
Bridge Area	-2710	28SEP2008 1336	-14297.10	-6.78	13.72		13.73	0.000044	-2.08	28952.23	3000.00	0.08
Bridge Area	-2710	28SEP2008 1354	-13647.90	-6.78	14.60		14.61	0.000030	-1.78	31613.23	3000.00	0.07
Bridge Area	-3152.5*	28SEP2008 1336	-15827.00	-7.44	13.74		13.76	0.000046	-2.15	31242.82	3211.17	0.09
Bridge Area	-3152.5*	28SEP2008 1354	-14664.30	-7.44	14.63		14.63	0.000030	-1.79	34075.96	3211.17	0.07
Bridge Area	-3595.*	28SEP2008 1336	-17419.70	-8.10	13.78		13.79	0.000048	-2.22	33592.66	3422.33	0.09
Bridge Area	-3595.*	28SEP2008 1354	-15738.90	-8.10	14.65		14.66	0.000030	-1.80	36589.08	3422.33	0.07
Bridge Area	-4037.5*	28SEP2008 1336	-19072.00	-8.77	13.81		13.82	0.000050	-2.28	35989.60	3633.50	0.09
Bridge Area	-4037.5*	28SEP2008 1354	-16882.00	-8.77	14.68		14.69	0.000030	-1.81	39139.66	3633.50	0.07
Bridge Area	-4480.*	28SEP2008 1336	-20757.50	-9.43	13.85		13.86	0.000052	-2.34	38402.95	3844.67	0.09
Bridge Area	-4480.*	28SEP2008 1354	-18089.80	-9.43	14.70		14.71	0.000030	-1.83	41699.84	3844.67	0.07
Bridge Area	-4922.5*	28SEP2008 1336	-22451.20	-10.09	13.89		13.90	0.000053	-2.38	40869.46	4055.84	0.09
Bridge Area	-4922.5*	28SEP2008 1354	-19366.00	-10.09	14.73		14.74	0.000031	-1.86	44299.82	4055.84	0.07

HEC-RAS Plan: Nat 100 SS N River: Thornhill Creek Reach: Bridge Area (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Bridge Area	-5365.*	28SEP2008 1336	-24128.20	-10.76	13.93		13.94	0.000054	-2.42	43387.10	4267.00	0.09
Bridge Area	-5365.*	28SEP2008 1354	-20705.10	-10.76	14.76		14.77	0.000031	-1.88	46944.38	4267.00	0.07
Bridge Area	-5807.5*	28SEP2008 1336	-25780.90	-11.42	13.97		13.99	0.000055	-2.45	45963.20	4478.17	0.09
Bridge Area	-5807.5*	28SEP2008 1354	-22110.50	-11.42	14.79		14.80	0.000032	-1.90	49632.61	4478.17	0.07
Bridge Area	-6250	28SEP2008 1336	-27431.80	-12.09	14.01		14.03	0.000055	-2.47	48523.81	4689.34	0.09
Bridge Area	-6250	28SEP2008 1354	-23599.10	-12.09	14.82		14.83	0.000032	-1.93	52311.59	4689.34	0.07
Bridge Area	-6555.*	28SEP2008 1336	-28541.80	-12.54	14.04		14.05	0.000052	-2.43	50801.70	4689.34	0.09
Bridge Area	-6555.*	28SEP2008 1354	-24646.50	-12.54	14.84		14.85	0.000031	-1.91	54551.56	4689.34	0.07
Bridge Area	-6860	28SEP2008 1336	-29608.00	-13.00	14.07	5.53	14.08	0.000048	-2.38	53054.34	4689.34	0.09
Bridge Area	-6860	28SEP2008 1354	-25691.90	-13.00	14.86	5.29	14.87	0.000029	-1.90	56768.30	4689.34	0.07

25 Year Natural Condition

(Storm Tide + Creek Flood)

HEC-RAS Output

HEC-RAS Plan: 25 NAT ST+RF River: Thornhill Creek Reach: Bridge Area

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Bridge Area	4700	28SEP2008 0918	834.00	14.00	16.33		16.58	0.003027	4.04	245.71	199.35	0.53
Bridge Area	4700	28SEP2008 1448	834.00	14.00	16.33		16.58	0.003027	4.04	245.71	199.35	0.53
Bridge Area	4266.66*	28SEP2008 0918	834.00	13.17	15.14		15.34	0.002715	3.56	255.75	219.43	0.49
Bridge Area	4266.66*	28SEP2008 1448	833.99	13.17	15.14		15.34	0.002715	3.56	255.72	219.43	0.49
Bridge Area	3833.33*	28SEP2008 0918	834.00	12.33	14.06		14.21	0.002508	3.21	271.67	241.79	0.47
Bridge Area	3833.33*	28SEP2008 1448	833.91	12.33	14.06		14.22	0.002507	3.21	271.72	241.80	0.47
Bridge Area	3400.*	28SEP2008 0918	834.00	11.50	13.06		13.19	0.002268	2.91	295.09	266.95	0.44
Bridge Area	3400.*	28SEP2008 1448	834.72	11.50	13.06		13.19	0.002262	2.91	295.59	267.02	0.44
Bridge Area	2966.66*	28SEP2008 0918	834.00	10.67	12.02		12.15	0.002560	2.85	296.70	290.52	0.46
Bridge Area	2966.66*	28SEP2008 1448	833.18	10.67	12.02		12.14	0.002594	2.86	295.09	290.25	0.46
Bridge Area	2533.33*	28SEP2008 0918	834.01	9.83	11.13		11.21	0.001792	2.36	503.56	717.64	0.38
Bridge Area	2533.33*	28SEP2008 1448	826.29	9.83	11.17		11.25	0.001543	2.25	534.61	774.18	0.36
Bridge Area	2100	28SEP2008 0918	834.02	9.00	9.84		9.93	0.004191	2.72	478.49	616.20	0.54
Bridge Area	2100	28SEP2008 1448	838.65	9.00	10.82		10.83	0.000233	1.10	1555.14	1219.57	0.15
Bridge Area	1682.5*	28SEP2008 0918	834.01	6.34	7.33		7.60	0.007396	4.11	202.95	213.92	0.74
Bridge Area	1682.5*	28SEP2008 1448	888.11	6.34	10.76		10.77	0.000036	0.77	2160.80	1426.16	0.07
Bridge Area	1265.*	28SEP2008 0918	834.06	3.68	5.51		5.67	0.002090	3.20	260.31	154.03	0.43
Bridge Area	1265.*	28SEP2008 1448	955.09	3.68	10.75		10.75	0.000017	0.72	2522.47	1528.44	0.05
Bridge Area	847.5*	28SEP2008 0918	834.17	1.03	5.05		5.13	0.000522	2.32	359.76	122.03	0.24
Bridge Area	847.5*	28SEP2008 1448	1017.95	1.03	10.73		10.74	0.000018	0.86	2643.40	1698.92	0.05
Bridge Area	430	28SEP2008 0918	834.30	-1.63	4.32		4.63	0.002018	4.51	187.27	64.92	0.46
Bridge Area	430	28SEP2008 1448	1091.11	-1.63	10.71		10.73	0.000046	1.43	2491.67	1800.23	0.08
Bridge Area	155	28SEP2008 0918	834.41	-2.60	3.95		4.20	0.001135	4.06	215.41	61.83	0.36
Bridge Area	155	28SEP2008 1448	1148.40	-2.60	10.69		10.71	0.000039	1.47	3244.27	1879.56	0.08
Bridge Area	125	28SEP2008 0918	834.42	-2.68	3.90		4.17	0.001325	4.24	212.60	63.38	0.39
Bridge Area	125	28SEP2008 1448	1153.50	-2.68	10.69		10.71	0.000037	1.41	2971.41	1278.09	0.08
Bridge Area	0	28SEP2008 0918	834.51	-2.54	3.83		4.02	0.000969	3.75	343.06	132.07	0.33
Bridge Area	0	28SEP2008 1448	1171.66	-2.54	10.69		10.70	0.000027	1.18	4253.85	1645.77	0.06

HEC-RAS Plan: 25 NAT ST+RF River: Thornhill Creek Reach: Bridge Area (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Bridge Area	-125	28SEP2008 0918	834.65	-2.54	3.69		3.90	0.001090	3.93	324.67	130.46	0.35
Bridge Area	-125	28SEP2008 1448	1191.27	-2.54	10.68		10.69	0.000028	1.20	4244.67	1639.07	0.07
Bridge Area	-450.*	28SEP2008 0918	834.91	-3.96	3.44		3.61	0.000593	3.34	254.65	61.70	0.26
Bridge Area	-450.*	28SEP2008 1448	1229.74	-3.96	10.66		10.69	0.000042	1.60	2203.42	861.25	0.08
Bridge Area	-710	28SEP2008 0918	835.08	-3.78	3.36		3.49	0.000352	2.91	301.86	102.85	0.20
Bridge Area	-710	28SEP2008 1448	1250.79	-3.78	10.64		10.67	0.000030	1.42	3091.63	1125.01	0.07
Bridge Area	-1170.*	28SEP2008 0918	835.32	-4.47	3.02		3.26	0.000683	3.86	216.35	34.48	0.27
Bridge Area	-1170.*	28SEP2008 1448	1283.91	-4.47	10.62		10.64	0.000024	1.22	6027.42	2529.58	0.06
Bridge Area	-1630	28SEP2008 0918	835.76	-5.16	0.99		2.07	0.004988	8.37	99.90	20.87	0.67
Bridge Area	-1630	28SEP2008 1448	1305.17	-5.16	10.61		10.62	0.000010	0.71	9648.87	2494.71	0.03
Bridge Area	-1990.*	28SEP2008 0918	836.72	-5.70	0.25		0.78	0.002098	5.86	142.83	28.47	0.46
Bridge Area	-1990.*	28SEP2008 1448	1312.61	-5.70	10.61		10.61	0.000004	0.51	12831.78	2663.14	0.02
Bridge Area	-2350.*	28SEP2008 0918	838.49	-6.24	-0.05		0.23	0.000941	4.22	198.65	36.72	0.32
Bridge Area	-2350.*	28SEP2008 1448	1309.01	-6.24	10.61		10.61	0.000002	0.39	16159.39	2831.57	0.02
Bridge Area	-2710	28SEP2008 0918	841.07	-6.78	-0.19		-0.03	0.000463	3.17	265.45	45.22	0.23
Bridge Area	-2710	28SEP2008 1448	1289.97	-6.78	10.61		10.61	0.000001	0.30	19623.91	3000.00	0.01
Bridge Area	-3152.5*	28SEP2008 0918	844.85	-7.44	-0.36		-0.22	0.000390	3.01	280.79	44.96	0.21
Bridge Area	-3152.5*	28SEP2008 1448	1243.94	-7.44	10.61		10.61	0.000001	0.27	21166.61	3211.17	0.01
Bridge Area	-3595.*	28SEP2008 0918	848.88	-8.10	-0.51		-0.38	0.000331	2.86	296.43	44.74	0.20
Bridge Area	-3595.*	28SEP2008 1448	1173.69	-8.10	10.61		10.61	0.000001	0.24	22743.56	3422.33	0.01
Bridge Area	-4037.5*	28SEP2008 0918	853.14	-8.77	-0.63		-0.52	0.000282	2.73	312.95	44.55	0.18
Bridge Area	-4037.5*	28SEP2008 1448	1080.95	-8.77	10.61		10.61	0.000001	0.21	24341.32	3633.50	0.01
Bridge Area	-4480.*	28SEP2008 0918	857.62	-9.43	-0.74		-0.63	0.000243	2.61	329.22	44.39	0.17
Bridge Area	-4480.*	28SEP2008 1448	971.77	-9.43	10.61		10.61	0.000000	0.18	25941.11	3844.67	0.01
Bridge Area	-4922.5*	28SEP2008 0918	862.20	-10.09	-0.83		-0.73	0.000211	2.50	345.36	44.25	0.16
Bridge Area	-4922.5*	28SEP2008 1448	852.82	-10.09	10.61		10.61	0.000000	0.15	27559.70	4055.84	0.01
Bridge Area	-5365.*	28SEP2008 0918	866.94	-10.76	-0.91		-0.82	0.000185	2.40	361.87	44.13	0.15
Bridge Area	-5365.*	28SEP2008 1448	731.68	-10.76	10.61		10.61	0.000000	0.12	29213.96	4267.00	0.00

HEC-RAS Plan: 25 NAT ST+RF River: Thornhill Creek Reach: Bridge Area (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Bridge Area	-5807.5*	28SEP2008 0918	871.81	-11.42	-0.98		-0.90	0.000164	2.31	377.77	44.02	0.14
Bridge Area	-5807.5*	28SEP2008 1448	613.48	-11.42	10.61		10.61	0.000000	0.10	30885.83	4478.17	0.00
Bridge Area	-6250	28SEP2008 0918	876.72	-12.09	-1.05		-0.97	0.000147	2.23	393.49	43.93	0.13
Bridge Area	-6250	28SEP2008 1448	500.08	-12.09	10.61		10.61	0.000000	0.08	32556.90	4689.34	0.00
Bridge Area	-6555.*	28SEP2008 0918	880.19	-12.54	-1.09		-1.01	0.000134	2.16	407.01	44.39	0.13
Bridge Area	-6555.*	28SEP2008 1448	427.65	-12.54	10.61		10.61	0.000000	0.06	34709.28	4689.34	0.00
Bridge Area	-6860	28SEP2008 0918	883.74	-13.00	-1.12	-9.82	-1.05	0.000123	2.10	421.06	44.90	0.12
Bridge Area	-6860	28SEP2008 1448	361.30	-13.00	10.61	-11.22	10.61	0.000000	0.05	36838.61	4689.34	0.00

100 Year Natural Condition

(Storm Tide +Creek Flood)

HEC-RAS Output

HEC-RAS Plan: Nat 100 ST + RF River: Thornhill Creek Reach: Bridge Area

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Bridge Area	4700	28SEP2008 1336	1200.00	14.00	16.73		17.05	0.003107	4.67	326.16	209.71	0.55
Bridge Area	4700	28SEP2008 1354	1200.00	14.00	16.73		17.05	0.003111	4.67	326.00	209.70	0.55
Bridge Area	4266.66*	28SEP2008 1336	1199.44	13.17	15.51		15.76	0.002780	4.12	337.06	229.76	0.52
Bridge Area	4266.66*	28SEP2008 1354	1198.59	13.17	15.51		15.77	0.002747	4.10	338.46	229.94	0.51
Bridge Area	3833.33*	28SEP2008 1336	1201.34	12.33	14.41		14.62	0.002486	3.69	359.17	253.17	0.48
Bridge Area	3833.33*	28SEP2008 1354	1201.80	12.33	14.37		14.59	0.002667	3.77	349.93	252.02	0.50
Bridge Area	3400.*	28SEP2008 1336	1199.56	11.50	13.29		13.49	0.002738	3.56	358.97	275.84	0.49
Bridge Area	3400.*	28SEP2008 1354	1164.60	11.50	13.55		13.68	0.001573	2.97	433.51	352.96	0.38
Bridge Area	2966.66*	28SEP2008 1336	1100.32	10.67	12.50		12.61	0.001398	2.64	528.75	824.71	0.36
Bridge Area	2966.66*	28SEP2008 1354	873.46	10.67	13.25		13.27	0.000195	1.26	1441.26	1523.72	0.14
Bridge Area	2533.33*	28SEP2008 1336	742.33	9.83	12.24		12.25	0.000104	0.88	1860.63	1503.14	0.10
Bridge Area	2533.33*	28SEP2008 1354	301.91	9.83	13.22		13.22	0.000004	0.21	3526.53	1836.36	0.02
Bridge Area	2100	28SEP2008 1336	168.58	9.00	12.22		12.22	0.000001	0.11	3597.30	1559.81	0.01
Bridge Area	2100	28SEP2008 1354	-383.73	9.00	13.22		13.22	0.000002	-0.18	5271.69	2037.80	0.02
Bridge Area	1682.5*	28SEP2008 1336	-541.02	6.34	12.22		12.22	0.000003	-0.29	4760.05	2001.55	0.02
Bridge Area	1682.5*	28SEP2008 1354	-1323.18	6.34	13.22		13.22	0.000009	-0.53	7048.32	2666.84	0.04
Bridge Area	1265.*	28SEP2008 1336	-1536.35	3.68	12.22		12.22	0.000016	-0.80	5473.15	2592.88	0.05
Bridge Area	1265.*	28SEP2008 1354	-2702.31	3.68	13.22		13.24	0.000025	-1.07	9173.31	4594.14	0.06
Bridge Area	847.5*	28SEP2008 1336	-3121.29	1.03	12.22		12.25	0.000065	-1.83	6161.61	4077.25	0.10
Bridge Area	847.5*	28SEP2008 1354	-4358.81	1.03	13.23		13.27	0.000060	-1.89	11106.50	5254.76	0.10
Bridge Area	430	28SEP2008 1336	-5204.82	-1.63	12.26		12.39	0.000299	-4.03	7369.45	4686.13	0.22
Bridge Area	430	28SEP2008 1354	-6212.21	-1.63	13.27		13.33	0.000163	-3.16	12829.53	5946.71	0.16
Bridge Area	155	28SEP2008 1336	-6594.95	-2.60	12.33		12.51	0.000367	-4.97	8352.59	4841.67	0.25
Bridge Area	155	28SEP2008 1354	-7520.97	-2.60	13.31		13.40	0.000200	-3.86	13737.69	5967.83	0.19
Bridge Area	125	28SEP2008 1336	-6737.66	-2.68	12.33		12.54	0.000420	-5.25	7591.16	4734.87	0.27
Bridge Area	125	28SEP2008 1354	-7662.96	-2.68	13.32		13.42	0.000244	-4.22	12940.31	5968.34	0.20
Bridge Area	0	28SEP2008 1336	-7174.87	-2.54	12.39		12.52	0.000311	-4.45	7509.07	2047.52	0.23

HEC-RAS Plan: Nat 100 ST + RF River: Thornhill Creek Reach: Bridge Area (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Bridge Area	0	28SEP2008 1354	-8161.06	-2.54	13.35		13.43	0.000215	-3.90	10797.90	4173.40	0.19
Bridge Area	-125	28SEP2008 1336	-7563.74	-2.54	12.42		12.60	0.000395	-5.03	8560.93	3434.75	0.26
Bridge Area	-125	28SEP2008 1354	-8660.57	-2.54	13.37		13.47	0.000242	-4.14	13525.12	6037.28	0.20
Bridge Area	-450.*	28SEP2008 1336	-8512.48	-3.96	12.50		13.06	0.000782	-7.56	6656.88	4301.92	0.36
Bridge Area	-450.*	28SEP2008 1354	-9671.33	-3.96	13.44		13.67	0.000412	-5.74	10709.17	4309.73	0.26
Bridge Area	-710	28SEP2008 1336	-8976.61	-3.78	12.76		13.07	0.000496	-6.32	7618.69	2564.46	0.28
Bridge Area	-710	28SEP2008 1354	-10001.50	-3.78	13.68		13.87	0.000332	-5.37	10001.74	2564.46	0.23
Bridge Area	-1170.*	28SEP2008 1336	-9793.61	-4.47	13.24		13.30	0.000212	-4.07	12639.53	2529.58	0.18
Bridge Area	-1170.*	28SEP2008 1354	-10534.80	-4.47	14.17		14.21	0.000149	-3.54	14996.29	2529.58	0.15
Bridge Area	-1630	28SEP2008 1336	-10717.40	-5.16	13.57		13.59	0.000117	-2.82	17025.32	2494.71	0.12
Bridge Area	-1630	28SEP2008 1354	-11129.00	-5.16	14.47		14.49	0.000086	-2.50	19277.09	2494.71	0.11
Bridge Area	-1990.*	28SEP2008 1336	-11611.60	-5.70	13.66		13.67	0.000074	-2.44	20952.94	2663.14	0.10
Bridge Area	-1990.*	28SEP2008 1354	-11716.40	-5.70	14.55		14.56	0.000054	-2.15	23324.91	2663.14	0.09
Bridge Area	-2350.*	28SEP2008 1336	-12711.10	-6.24	13.71		13.72	0.000053	-2.19	24933.09	2831.57	0.09
Bridge Area	-2350.*	28SEP2008 1354	-12448.40	-6.24	14.59		14.60	0.000038	-1.90	27434.29	2831.57	0.08
Bridge Area	-2710	28SEP2008 1336	-13873.50	-6.78	13.74		13.75	0.000041	-2.01	29011.66	3000.00	0.08
Bridge Area	-2710	28SEP2008 1354	-13230.00	-6.78	14.61		14.62	0.000028	-1.72	31647.46	3000.00	0.07
Bridge Area	-3152.5*	28SEP2008 1336	-15380.60	-7.44	13.76		13.77	0.000043	-2.08	31299.91	3211.17	0.08
Bridge Area	-3152.5*	28SEP2008 1354	-14253.80	-7.44	14.64		14.64	0.000028	-1.74	34107.82	3211.17	0.07
Bridge Area	-3595.*	28SEP2008 1336	-16944.20	-8.10	13.79		13.80	0.000045	-2.15	33646.36	3422.33	0.08
Bridge Area	-3595.*	28SEP2008 1354	-15334.90	-8.10	14.66		14.67	0.000028	-1.75	36618.04	3422.33	0.07
Bridge Area	-4037.5*	28SEP2008 1336	-18559.60	-8.77	13.82		13.84	0.000047	-2.21	36038.97	3633.50	0.09
Bridge Area	-4037.5*	28SEP2008 1354	-16483.50	-8.77	14.69		14.69	0.000029	-1.77	39165.13	3633.50	0.07
Bridge Area	-4480.*	28SEP2008 1336	-20207.10	-9.43	13.86		13.87	0.000049	-2.27	38447.55	3844.67	0.09
Bridge Area	-4480.*	28SEP2008 1354	-17695.40	-9.43	14.71		14.72	0.000029	-1.79	41721.86	3844.67	0.07
Bridge Area	-4922.5*	28SEP2008 1336	-21872.10	-10.09	13.90		13.91	0.000050	-2.32	40907.35	4055.84	0.09
Bridge Area	-4922.5*	28SEP2008 1354	-18974.00	-10.09	14.74		14.75	0.000029	-1.82	44317.86	4055.84	0.07

HEC-RAS Plan: Nat 100 ST + RF River: Thornhill Creek Reach: Bridge Area (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Bridge Area	-5365.*	28SEP2008 1336	-23533.30	-10.76	13.94		13.95	0.000051	-2.36	43417.31	4267.00	0.09
Bridge Area	-5365.*	28SEP2008 1354	-20314.10	-10.76	14.77		14.77	0.000030	-1.84	46958.50	4267.00	0.07
Bridge Area	-5807.5*	28SEP2008 1336	-25177.60	-11.42	13.98		13.99	0.000052	-2.39	45983.75	4478.17	0.09
Bridge Area	-5807.5*	28SEP2008 1354	-21719.60	-11.42	14.80		14.80	0.000030	-1.87	49642.19	4478.17	0.07
Bridge Area	-6250	28SEP2008 1336	-26821.30	-12.09	14.02		14.03	0.000053	-2.42	48535.91	4689.34	0.09
Bridge Area	-6250	28SEP2008 1354	-23208.20	-12.09	14.82		14.83	0.000031	-1.90	52317.30	4689.34	0.07
Bridge Area	-6555.*	28SEP2008 1336	-27927.10	-12.54	14.04		14.05	0.000049	-2.38	50807.55	4689.34	0.09
Bridge Area	-6555.*	28SEP2008 1354	-24255.70	-12.54	14.84		14.85	0.000030	-1.88	54554.39	4689.34	0.07
Bridge Area	-6860	28SEP2008 1336	-28991.60	-13.00	14.07	5.49	14.08	0.000046	-2.33	53054.34	4689.34	0.08
Bridge Area	-6860	28SEP2008 1354	-25301.10	-13.00	14.86	5.31	14.87	0.000029	-1.87	56768.30	4689.34	0.07

Existing Bridge

(Daily Tide)

HEC-RAS Output

HEC-RAS Plan: Exist- Tidal River: Thornhill Creek Reach: Bridge Area

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Bridge Area	4700	Max WS	300.00	14.00	15.55		15.66	0.002754	2.63	118.47	130.20	0.46
Bridge Area	4700	28SEP2008 1642	300.00	14.00	15.54		15.65	0.002831	2.66	117.39	129.93	0.47
Bridge Area	4700	28SEP2008 1912	300.00	14.00	15.54		15.65	0.002833	2.66	117.37	129.93	0.47
Bridge Area	4266.66*	Max WS	303.87	13.17	14.44		14.52	0.002501	2.33	131.81	154.30	0.43
Bridge Area	4266.66*	28SEP2008 1642	299.99	13.17	14.43		14.51	0.002506	2.32	130.65	154.01	0.43
Bridge Area	4266.66*	28SEP2008 1912	300.04	13.17	14.43		14.51	0.002500	2.31	130.76	154.05	0.43
Bridge Area	3833.33*	Max WS	304.06	12.33	13.40		13.47	0.002431	2.13	142.96	177.65	0.42
Bridge Area	3833.33*	28SEP2008 1642	300.01	12.33	13.39		13.46	0.002423	2.11	141.94	177.47	0.41
Bridge Area	3833.33*	28SEP2008 1912	299.94	12.33	13.39		13.46	0.002436	2.12	141.69	177.42	0.42
Bridge Area	3400.*	Max WS	302.83	11.50	12.43		12.49	0.002131	1.94	156.37	200.57	0.39
Bridge Area	3400.*	28SEP2008 1642	299.94	11.50	12.42		12.48	0.002185	1.95	153.87	199.16	0.39
Bridge Area	3400.*	28SEP2008 1912	299.82	11.50	12.43		12.49	0.002137	1.93	155.08	199.84	0.39
Bridge Area	2966.66*	Max WS	300.01	10.67	11.46		11.51	0.002313	1.89	158.71	224.46	0.40
Bridge Area	2966.66*	28SEP2008 1642	300.01	10.67	11.46		11.51	0.002347	1.90	157.95	224.21	0.40
Bridge Area	2966.66*	28SEP2008 1912	300.00	10.67	11.45		11.50	0.002451	1.93	155.68	223.46	0.41
Bridge Area	2533.33*	Max WS	305.21	9.83	10.73		10.76	0.001024	1.39	241.41	617.62	0.27
Bridge Area	2533.33*	28SEP2008 1642	299.25	9.83	10.61		10.65	0.001657	1.61	185.92	260.64	0.34
Bridge Area	2533.33*	28SEP2008 1912	294.04	9.83	10.64		10.68	0.001385	1.51	194.68	262.47	0.31
Bridge Area	2100	Max WS	299.96	9.00	9.49		9.53	0.003457	1.74	268.51	580.58	0.45
Bridge Area	2100	28SEP2008 1642	300.25	9.00	9.48		9.52	0.003881	1.80	259.24	578.83	0.48
Bridge Area	2100	28SEP2008 1912	295.79	9.00	9.44		9.48	0.005110	1.95	236.01	574.31	0.54
Bridge Area	1682.5*	Max WS	327.77	6.34	6.91		7.04	0.007527	2.88	113.88	207.68	0.68
Bridge Area	1682.5*	28SEP2008 1642	301.80	6.34	6.86		6.99	0.008824	2.92	103.25	207.27	0.73
Bridge Area	1682.5*	28SEP2008 1912	304.58	6.34	6.87		7.00	0.008143	2.86	106.38	207.39	0.70
Bridge Area	1265.*	Max WS	299.95	3.68	5.08		5.11	0.000649	1.53	195.81	145.91	0.23
Bridge Area	1265.*	28SEP2008 1642	297.82	3.68	5.00		5.04	0.000772	1.61	184.77	145.22	0.25
Bridge Area	1265.*	28SEP2008 1912	310.54	3.68	4.51		4.63	0.004013	2.71	114.73	143.00	0.53
Bridge Area	847.5*	Max WS	299.76	1.03	4.95		4.96	0.000075	0.86	348.09	121.71	0.09
Bridge Area	847.5*	28SEP2008 1642	290.21	1.03	4.86		4.87	0.000079	0.86	336.48	121.37	0.09
Bridge Area	847.5*	28SEP2008 1912	327.87	1.03	3.76		3.80	0.000312	1.51	216.88	94.41	0.18
Bridge Area	430	Max WS	299.55	-1.63	4.89		4.92	0.000147	1.36	224.90	66.75	0.13
Bridge Area	430	28SEP2008 1642	283.74	-1.63	4.80		4.82	0.000144	1.32	218.70	66.45	0.12

HEC-RAS Plan: Exist- Tidal River: Thornhill Creek Reach: Bridge Area (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Bridge Area	430	28SEP2008 1912	366.03	-1.63	3.24		3.38	0.001652	3.08	118.89	61.44	0.39
Bridge Area	155	Max WS	299.35	-2.60	4.86	0.58	4.88	0.000071	1.17	273.25	64.76	0.09
Bridge Area	155	28SEP2008 1642	280.37	-2.60	4.77	0.48	4.79	0.000067	1.12	267.41	64.52	0.09
Bridge Area	155	28SEP2008 1912	406.27	-2.60	2.87	1.00	2.99	0.000801	2.75	150.83	57.98	0.29
Bridge Area	125	Max WS	299.34	-2.68	4.86	0.45	4.89	0.000078	1.20	276.07	67.95	0.10
Bridge Area	125	28SEP2008 1642	279.98	-2.68	4.77	0.35	4.79	0.000073	1.15	269.95	67.51	0.09
Bridge Area	125	28SEP2008 1912	411.47	-2.68	2.87	1.04	3.00	0.000948	2.90	149.57	60.02	0.31
Bridge Area	-47		Bridge									
Bridge Area	-125	Max WS	299.34	-2.54	4.90	-0.19	4.88	0.000058	1.03	492.68	188.10	0.08
Bridge Area	-125	28SEP2008 1642	279.98	-2.54	4.81	-0.27	4.79	0.000050	0.95	475.83	154.91	0.08
Bridge Area	-125	28SEP2008 1912	411.47	-2.54	3.14	0.22	3.00	0.000442	2.34	254.29	122.41	0.22
Bridge Area	-450.*	Max WS	298.95	-3.96	4.85		4.87	0.000034	0.92	360.72	90.79	0.06
Bridge Area	-450.*	28SEP2008 1642	272.49	-3.96	4.77		4.78	0.000029	0.85	352.78	89.57	0.06
Bridge Area	-450.*	28SEP2008 1912	494.00	-3.96	2.76		2.84	0.000330	2.29	215.82	52.25	0.19
Bridge Area	-710	Max WS	298.52	-3.78	4.85		4.86	0.000020	0.80	542.18	205.92	0.05
Bridge Area	-710	28SEP2008 1642	264.73	-3.78	4.76		4.77	0.000017	0.72	524.65	201.82	0.05
Bridge Area	-710	28SEP2008 1912	531.28	-3.78	2.70		2.77	0.000202	2.07	257.07	44.55	0.15
Bridge Area	-1170.*	Max WS	298.11	-4.47	4.83		4.85	0.000034	1.01	464.16	232.97	0.06
Bridge Area	-1170.*	28SEP2008 1642	245.46	-4.47	4.75		4.77	0.000024	0.85	446.06	225.11	0.05
Bridge Area	-1170.*	28SEP2008 1912	576.57	-4.47	2.50		2.63	0.000415	2.90	198.50	33.70	0.21
Bridge Area	-1630	Max WS	295.08	-5.16	4.81		4.83	0.000071	1.32	606.27	552.70	0.08
Bridge Area	-1630	28SEP2008 1642	216.69	-5.16	4.74		4.75	0.000041	1.00	570.25	548.34	0.06
Bridge Area	-1630	28SEP2008 1912	593.28	-5.16	1.82		2.22	0.001600	5.03	117.86	22.13	0.38
Bridge Area	-1990.*	Max WS	292.32	-5.70	4.79		4.80	0.000026	0.90	814.30	710.61	0.05
Bridge Area	-1990.*	28SEP2008 1642	182.97	-5.70	4.73		4.74	0.000011	0.57	773.07	703.91	0.03
Bridge Area	-1990.*	28SEP2008 1912	593.15	-5.70	1.71		1.87	0.000500	3.19	186.03	30.66	0.23
Bridge Area	-2350.*	Max WS	289.85	-6.24	4.79		4.79	0.000012	0.66	1087.19	974.09	0.04
Bridge Area	-2350.*	28SEP2008 1642	140.38	-6.24	4.73		4.73	0.000003	0.33	1033.67	961.97	0.02
Bridge Area	-2350.*	28SEP2008 1912	591.64	-6.24	1.69		1.77	0.000204	2.23	264.87	39.33	0.15
Bridge Area	-2710	Max WS	287.33	-6.78	4.78		4.79	0.000005	0.45	2576.91	2646.46	0.02
Bridge Area	-2710	28SEP2008 1642	57.68	-6.78	4.73		4.73	0.000000	0.09	2433.89	2617.09	0.01

HEC-RAS Plan: Exist- Tidal River: Thornhill Creek Reach: Bridge Area (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Bridge Area	-2710	28SEP2008 1912	592.87	-6.78	1.70		1.74	0.000100	1.68	353.15	48.04	0.11
Bridge Area	-3152.5*	Max WS	280.76	-7.44	4.78		4.78	0.000004	0.41	2900.13	2845.71	0.02
Bridge Area	-3152.5*	28SEP2008 1642	-99.98	-7.44	4.73		4.73	0.000001	-0.15	2747.94	2813.80	0.01
Bridge Area	-3152.5*	28SEP2008 1912	599.53	-7.44	1.69		1.73	0.000084	1.59	376.09	48.04	0.10
Bridge Area	-3595.*	Max WS	267.44	-8.10	4.78		4.78	0.000003	0.37	3255.24	3077.51	0.02
Bridge Area	-3595.*	28SEP2008 1642	-273.46	-8.10	4.72		4.72	0.000003	-0.38	3092.03	3007.69	0.02
Bridge Area	-3595.*	28SEP2008 1912	610.08	-8.10	1.69		1.73	0.000073	1.53	398.54	48.04	0.09
Bridge Area	-4037.5*	Max WS	248.53	-8.77	4.77		4.77	0.000002	0.32	3632.55	3248.16	0.02
Bridge Area	-4037.5*	28SEP2008 1642	-445.18	-8.77	4.72		4.72	0.000007	-0.59	3462.86	3211.58	0.03
Bridge Area	-4037.5*	28SEP2008 1912	622.19	-8.77	1.71		1.74	0.000064	1.48	421.17	48.06	0.09
Bridge Area	-4480.*	Max WS	228.75	-9.43	4.77		4.77	0.000002	0.27	4012.00	3395.27	0.01
Bridge Area	-4480.*	28SEP2008 1642	-602.34	-9.43	4.72		4.73	0.000011	-0.74	3844.36	3363.60	0.04
Bridge Area	-4480.*	28SEP2008 1912	634.06	-9.43	1.72		1.75	0.000057	1.43	442.92	48.08	0.08
Bridge Area	-4922.5*	Max WS	216.23	-10.09	4.77		4.77	0.000001	0.24	4410.26	3526.19	0.01
Bridge Area	-4922.5*	28SEP2008 1642	-748.82	-10.09	4.72		4.73	0.000015	-0.86	4254.09	3485.00	0.04
Bridge Area	-4922.5*	28SEP2008 1912	645.08	-10.09	1.74		1.77	0.000051	1.39	464.02	48.11	0.08
Bridge Area	-5365.*	Max WS	215.73	-10.76	4.76		4.76	0.000001	0.23	4849.59	3591.77	0.01
Bridge Area	-5365.*	28SEP2008 1642	-880.14	-10.76	4.72		4.73	0.000017	-0.95	4715.48	3582.42	0.05
Bridge Area	-5365.*	28SEP2008 1912	655.91	-10.76	1.76		1.79	0.000047	1.35	485.10	48.14	0.08
Bridge Area	-5807.5*	Max WS	243.10	-11.42	4.76		4.76	0.000001	0.24	5315.25	3757.86	0.01
Bridge Area	-5807.5*	28SEP2008 1642	-981.18	-11.42	4.73		4.74	0.000018	-0.99	5206.60	3755.68	0.05
Bridge Area	-5807.5*	28SEP2008 1912	667.18	-11.42	1.78		1.81	0.000043	1.32	505.22	48.17	0.07
Bridge Area	-6250	Max WS	508.29	-12.09	4.75		4.75	0.000004	0.48	5783.29	3931.00	0.02
Bridge Area	-6250	28SEP2008 1642	-1050.89	-12.09	4.73		4.74	0.000018	-0.99	5703.07	3929.47	0.05
Bridge Area	-6250	28SEP2008 1912	679.17	-12.09	1.80		1.83	0.000040	1.29	524.89	48.20	0.07
Bridge Area	-6555.*	Max WS	500.62	-12.54	4.75		4.75	0.000003	0.38	7661.91	4327.36	0.02
Bridge Area	-6555.*	28SEP2008 1642	-1082.01	-12.54	4.74		4.74	0.000012	-0.83	7594.53	4323.90	0.04
Bridge Area	-6555.*	28SEP2008 1912	713.09	-12.54	1.81		1.84	0.000040	1.31	542.30	48.88	0.07
Bridge Area	-6860	Max WS	506.24	-13.00	4.75	-10.78	4.75	0.000002	0.32	9641.06	4419.10	0.01
Bridge Area	-6860	28SEP2008 1642	-1101.98	-13.00	4.74	-9.34	4.74	0.000008	-0.69	9588.05	4416.86	0.03
Bridge Area	-6860	28SEP2008 1912	771.94	-13.00	1.82	-10.09	1.85	0.000043	1.38	559.95	49.58	0.07

HEC-RAS Plan: Exist- Tidal River: Thornhill Creek Reach: Bridge Area

Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Crit W.S.	Frctn Loss	C & E Loss	Top Width	Q Left	Q Channel	Q Right	Vel Chnl
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft/s)
Bridge Area	155	Max WS	4.88	4.86	0.58	0.00	0.00	64.76	3.19	295.29	0.87	1.17
Bridge Area	155	28SEP2008 1642	4.79	4.77	0.48	0.00	0.00	64.52	2.88	276.73	0.76	1.12
Bridge Area	155	28SEP2008 1912	2.99	2.87	1.00	0.03	0.00	57.98	0.89	405.29	0.09	2.75
Bridge Area	125	Max WS	4.89	4.86	0.45	0.02	0.00	67.95	2.69	293.06	3.59	1.20
Bridge Area	125	28SEP2008 1642	4.79	4.77	0.35	0.02	0.00	67.51	2.43	274.25	3.31	1.15
Bridge Area	125	28SEP2008 1912	3.00	2.87	1.04	0.19	0.00	60.02	1.29	407.32	2.85	2.90
Bridge Area	-47 BR U	Max WS	4.92	4.88	0.61	0.01	0.00	43.73	4.64	294.70		1.67
Bridge Area	-47 BR U	28SEP2008 1642	4.82	4.78	0.51	0.01	0.00	43.41	4.13	275.85		1.60
Bridge Area	-47 BR U	28SEP2008 1912	3.26	3.07	1.15	0.04	0.00	36.73	2.14	409.33		3.55
Bridge Area	-47 BR D	Max WS	4.91	4.89	0.20	0.01	0.00	56.94		289.57	9.77	1.40
Bridge Area	-47 BR D	28SEP2008 1642	4.82	4.79	0.11	0.01	0.00	56.66		271.08	8.90	1.34
Bridge Area	-47 BR D	28SEP2008 1912	3.22	3.09	0.68	0.05	0.00	48.89		406.47	5.00	3.15
Bridge Area	-125	Max WS	4.88	4.90	-0.19	0.02	0.00	188.10		257.36	41.98	1.03
Bridge Area	-125	28SEP2008 1642	4.79	4.81	-0.27	0.02	0.00	154.91		233.18	46.80	0.95
Bridge Area	-125	28SEP2008 1912	3.00	3.14	0.22	0.16	0.01	122.41		378.69	32.78	2.34
Bridge Area	-450.*	Max WS	4.87	4.85		0.01		90.79	0.00	295.54	3.41	0.92
Bridge Area	-450.*	28SEP2008 1642	4.78	4.77		0.01		89.57		269.71	2.78	0.85
Bridge Area	-450.*	28SEP2008 1912	2.84	2.76		0.07		52.25		493.97	0.02	2.29

Plan: Exist- Tidal Thornhill Creek Bridge Area RS: -47 Profile: Max WS

E.G. US. (ft)	4.89	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	4.86	E.G. Elev (ft)	4.92	4.91
Q Total (cfs)	299.34	W.S. Elev (ft)	4.88	4.89
Q Bridge (cfs)	299.34	Crit W.S. (ft)	0.61	0.20
Q Weir (cfs)		Max Chl Dpth (ft)	7.50	7.43
Weir Sta Lft (ft)		Vel Total (ft/s)	1.56	1.27
Weir Sta Rgt (ft)		Flow Area (sq ft)	191.71	235.03
Weir Submerg		Froude # Chl	0.13	0.12
Weir Max Depth (ft)		Specif Force (cu ft)	531.95	623.70
Min El Weir Flow (ft)	13.91	Hydr Depth (ft)	4.38	4.13
Min El Prs (ft)	11.65	W.P. Total (ft)	62.36	78.62
Delta EG (ft)	0.00	Conv. Total (cfs)	19919.9	22584.7
Delta WS (ft)	-0.04	Top Width (ft)	43.73	56.94
BR Open Area (sq ft)	642.60	Frctn Loss (ft)	0.01	0.01
BR Open Vel (ft/s)	1.56	C & E Loss (ft)	0.00	0.00
Coef of Q	1.00	Shear Total (lb/sq ft)	0.04	0.03
Br Sel Method	WSPRO	Power Total (lb/ft s)	53748.20	53748.20

Plan: Exist- Tidal Thornhill Creek Bridge Area RS: -47 Profile: 28SEP2008 1642

E.G. US. (ft)	4.79	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	4.77	E.G. Elev (ft)	4.82	4.82
Q Total (cfs)	279.98	W.S. Elev (ft)	4.78	4.79
Q Bridge (cfs)	279.98	Crit W.S. (ft)	0.51	0.11
Q Weir (cfs)		Max Chl Dpth (ft)	7.41	7.33
Weir Sta Lft (ft)		Vel Total (ft/s)	1.49	1.22
Weir Sta Rgt (ft)		Flow Area (sq ft)	187.64	229.65
Weir Submerg		Froude # Chl	0.13	0.11
Weir Max Depth (ft)		Specif Force (cu ft)	512.56	600.43
Min El Weir Flow (ft)	13.91	Hydr Depth (ft)	4.32	4.05
Min El Prs (ft)	11.65	W.P. Total (ft)	61.78	77.90
Delta EG (ft)	0.00	Conv. Total (cfs)	19381.5	21914.6
Delta WS (ft)	-0.03	Top Width (ft)	43.41	56.66
BR Open Area (sq ft)	642.60	Frctn Loss (ft)	0.01	0.01
BR Open Vel (ft/s)	1.49	C & E Loss (ft)	0.00	0.00
Coef of Q	1.00	Shear Total (lb/sq ft)	0.04	0.03
Br Sel Method	WSPRO	Power Total (lb/ft s)	53748.20	53748.20

Plan: Exist- Tidal Thornhill Creek Bridge Area RS: -47 Profile: 28SEP2008 1912

E.G. US. (ft)	3.00	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	2.87	E.G. Elev (ft)	3.26	3.22
Q Total (cfs)	411.47	W.S. Elev (ft)	3.07	3.09
Q Bridge (cfs)	411.47	Crit W.S. (ft)	1.15	0.68
Q Weir (cfs)		Max Chl Dpth (ft)	5.69	5.63
Weir Sta Lft (ft)		Vel Total (ft/s)	3.45	2.96
Weir Sta Rgt (ft)		Flow Area (sq ft)	119.41	138.98
Weir Submerg		Froude # Chl	0.33	0.31
Weir Max Depth (ft)		Specif Force (cu ft)	281.97	314.92
Min El Weir Flow (ft)	13.91	Hydr Depth (ft)	3.25	2.84
Min El Prs (ft)	11.65	W.P. Total (ft)	50.64	62.34
Delta EG (ft)	0.00	Conv. Total (cfs)	10594.0	11828.5
Delta WS (ft)	-0.26	Top Width (ft)	36.73	48.89
BR Open Area (sq ft)	642.60	Frctn Loss (ft)	0.04	0.05
BR Open Vel (ft/s)	3.45	C & E Loss (ft)	0.00	0.00

Plan: Exist- Tidal Thornhill Creek Bridge Area RS: -47 Profile: 28SEP2008 1912 (Continued)

Coef of Q	1.00	Shear Total (lb/sq ft)	0.22	0.17
Br Sel Method	WSPRO	Power Total (lb/ft s)	53748.20	53748.20

532650-ThornhillC.rep

HEC-RAS Version 4.1.0 Jan 2010
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

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X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X      X   X     X  X    X
X     X  X        X           X   X    X    X   X
XXXXXXX  XXXX     X       XXX XXXX     XXXXXX    XXXX
X     X  X        X           X  X     X    X        X
X     X  X        X    X      X   X    X    X        X
X     X  XXXXXX    XXXX       X    X   X    X   XXXXX
```

PROJECT DATA
Project Title: 532650- Thornhill Creek
Project File : 532650-ThornhillC.prj
Run Date and Time: 3/1/2016 12:47:24 PM

Project in English units

Project Description: Existing Bridge - Tidal Flows + Base Flow

PLAN DATA

Plan Title: Existing Tidal (W.base Flow)
Plan File : z:\Bridge Hydraulics\Projects\532650-Glynn\HEC-RAS\532650-ThornhillC.p60

Geometry Title: Thorn Hill unsteady existing
Geometry File : z:\Bridge Hydraulics\Projects\532650-Glynn\HEC-RAS\532650-ThornhillC.g03

Flow Title :
Flow File :

Plan Summary Information:

Number of:	Cross Sections =	31	Multiple Openings =	0
	Culverts =	0	Inline Structures =	0
	Bridges =	1	Lateral Structures =	0

Computational Information

Water surface calculation tolerance	=	0.01
Critical depth calculation tolerance	=	0.01
Maximum number of iterations	=	20
Maximum difference tolerance	=	0.3
Flow tolerance factor	=	0.001

Computation Options

Critical depth computed only where necessary	
Conveyance Calculation Method:	At breaks in n values only
Friction Slope Method:	Average Conveyance
Computational Flow Regime:	Subcritical Flow

GEOMETRY DATA

Geometry Title: Thorn Hill unsteady existing
Geometry File : z:\Bridge Hydraulics\Projects\532650-Glynn\HEC-RAS\532650-ThornhillC.g03

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: 4700

INPUT
Description:
Station Elevation Data num= 93

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
55865.48		2056335.82		2056337.78	19.6	456341.61	19.4	356346.07	19
56416	19	56464		1956483.96		1956488.53	18.8	456491.01	18.76
56499.41		1956513.34		1956519.58	18.7	956522.97	18.6	756538.97	18.13
56540.1	18.09	56540.3	18.08	56542.76		1856631.19		1856635.14	17.87
56644.15		1756675.36		1756683.32	16.2	356685.77		1656699.39	16
56710.27	15.3	256711.99	15.2	656715.46	15.15	56717		1556731.54	15
56733.52	14.8	856747.61		1456779.77		1456780.75	14.0	656795.85	14.57
56800.31	15	56828		1556828.01		1556844.08		1656876.22	16
56883.61	16.4	656884.22	16.55	6892.29		1756956.49		17 56970.2	17.85
56972.53	18	57116.4		1857122.11	18.3	657132.33	18.0	157132.42	18.01
57132.6	18.02	57161.85	18.86	57162.66	18.91	57163.33	18.9	557164.13	19
58240.08		1958307.14	18.52	58310.82	18.55	8380.32		1860139.81	18
60171.13	18.84	60195.29	18.49	60196.17	18.51	60214.42		1960228.71	19
60243.62	18.78	60251.72		1961370.75		1961379.25	19.2	361394.88	19
61408.06		1961445.02	19.99	61445.36		2061596.71		2061600.67	19.84
61631.86		1962340.59		1962344.19	19.16	2369.91	19.7	962394.08	19.43
62394.14	19.43	62415.19	19.13	62418.24	19.08	62423.85		1966905.19	19
66920.46	18.51	66940.47	18.86	66966.97		1867499.51		1867550.35	17
68804.41		1768830.81		1868946.02		18			

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
55865.48	.1	56717	.03	56828	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
56717	56828	433.33	433.33	433.33	.1	.3

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: 4266.66*

INPUT
Description:
Station Elevation Data num= 157

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
55836.07	18.55	6124.84	18.55	6180.08	18.37	56189.02	18.33	56271.29	18.33
56273.11	18.03	56276.65	17.86	56280.78	17.55	6345.49	17.5	56389.9	17.5
56408.38	17.5	56412.6	17.37	56414.9	17.35	6422.67	17.55	6435.56	17.5
56441.33	17.33	56444.47	17.23	56459.27	16.77	56460.32	16.74	56460.51	16.73
56462.79	16.67	56544.61	16.67	56548.27	16.56	56556.6	15.83	56585.48	15.83
56592.85	15.19	56595.12		1556607.72		1556617.79	14.43	56619.38	14.38
56622.59	14.29	56624.02	14.17	56636.85	14.07	56637.64	14.07	56639.49	13.96
56652.7	13.17	56716.68	13.17	56718.7	13.22	56722.49	13.17	56723.14	13.17
56724.04	13.22	56737.88	13.75	6741.96	14.07	56767.33	14.17	56767.34	14.17
56767.43	14.17	56781.67		1556810.33		1556816.92	15.38	56817.46	15.42
56824.66	15.83	56881.91	15.83	56894.13	16.54	56896.21	16.67	57024.5	16.67

57029.59	16.97 57038.7	16.6857038.79	16.6857038.95	16.6857065.03	17.38
57065.75	17.4257066.34	17.4657067.06	17.557145.51	17.5 57164.1	17.42
57197.21	17.3357870.22	17.3357874.33	17.35 57946.6	17.45 57950.6	17.46
57978.63	17.558026.47	17.558086.27	17.158089.55	17.0858151.52	16.67
58281.73	16.6758297.54	16.6958303.32	16.6758304.27	16.758311.14	16.67
58316.17	16.7258325.95	16.7358354.79	16.7758359.07	16.8258364.32	16.83
58377.18	16.8158379.78	16.8158397.09	16.83 58523.1	16.83 58543.7	16.88
58546.86	16.8358559.62	16.958620.26	16.9958625.42	1758626.86	17
58741.22	1758855.05	17.1759168.39	17.1759261.52	17.3359313.95	17.33
59340.59	17.3159354.67	17.3359720.45	17.3359748.37	18.0359769.91	17.74
59770.7	17.7659786.98	18.1759799.72	18.1759813.01	17.9859820.23	18.17
60006.63	18.1760010.71	18.17 60018.4	18.1960099.77	18.3360802.17	18.33
60818.06	18.360825.64	18.4760839.58	18.2560851.33	18.2360884.29	18.98
60884.59	18.9960958.58	18.8361019.55	18.8361023.08	18.761050.89	18
61682.86	1861686.07	18.0861686.13	18.0861709.01	18.6761730.55	18.39
61730.61	18.3961749.38	18.15 61752.1	18.1161757.11	18.0561869.81	18.13
61877.61	18.1461897.17	18.1561914.61	18.1762260.57	18.1762372.95	18.32
62378.84	18.3362458.29	18.3362537.79	18.1765753.07	18.17 65766.7	17.76
65784.53	18.0565808.16	17.3366283.02	17.3366328.36	16.566799.84	16.5
66978.41	16.6767316.66	16.6767335.57	16.7267401.07	16.8367446.59	16.83
67470.13	17.6767572.87	17.67			

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
55836.07	.156624.02		.0356767.33		.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
56624.0	256767.33	433.33	433.33	433.33	.1	.3

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: 3833.33*

INPUT
Description:
Station Elevation Data num= 157

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
55806.65	1756072.13		1756122.91	16.7456131.13		16.6756206.77		16.67	
56208.43	16.4356211.69	16.2956215.48		1656274.97		16 56315.8		16	
56332.79	1656336.68	15.8956338.79		15.8456345.93		1656357.78		16	
56363.09	15.8656365.97	15.7856379.58		15.4256380.54		15.3956380.71		15.39	
56382.81	15.3356458.04	15.3356461.39		15.2556469.05		14.6756495.61		14.67	
56502.38	14.1556504.46		1456516.05		14 56525.3		13.5556526.77		13.51
56529.72	13.4356531.03	13.33	56543	13.1556543.74		13.1456545.47		13.04	
56557.78	12.3356656.55	12.3356656.56		12.3356659.65		12.4456665.51		12.33	
56666.52	12.3356667.34	12.3856679.91		12.8256683.62		13.1456706.67		13.33	
56706.75	13.3456719.26		1456744.44		1456750.23		14.3156750.71		14.33
56757.03	14.6756807.32	14.6756818.06		15.2356819.89		15.3356932.59		15.33	
56937.07	15.5756945.07	15.3456945.14		15.3456945.29		15.35 56968.2		15.91	
56968.83	15.9456969.36	15.9756969.98		1657038.91		1657055.24		15.85	
57084.32	15.6757675.59	15.67 57679.2		15.757742.69		15.9157746.21		15.92	
57770.83	1657812.86		16 57865.4	15.6857868.28		15.6757922.73		15.33	
58037.12	15.3358051.01	15.3858056.09		15.3358056.92		15.458062.96		15.33	
58067.37	15.4358075.96	15.46 58101.3		15.5458105.06		15.6458109.68		15.67	
58120.97	15.6158123.26	15.6258138.46		15.6758249.17		15.6758267.27		15.76	
58270.05	15.6758281.25	15.858334.53		15.9858339.06		1658340.32		16	
58440.8	16 58540.8	16.3358816.08		16.33 58897.9		16.6758943.96		16.67	
58967.37	16.6258979.73	16.6759301.08		16.6759325.61		17.2359344.54		16.99	
59345.23	17.0159359.53	17.3359370.72		17.33 59382.4		17.1959388.75		17.33	
59552.5	17.3359556.09	17.3559562.84		17.3859634.32		17.6760251.42		17.67	
60265.38	17.660272.04	17.7260284.28		17.5160294.61		17.4660323.56		17.98	

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60323.82   17.9860388.83   17.6760442.39   17.6760445.49   17.5660469.93      17
61025.13      1761027.95   17.07   61028   17.07 61048.1   17.5661067.04   17.35
61067.08   17.3561083.57   17.1861085.96   17.1561090.36    17.161189.38   17.27
61196.23   17.2861213.41   17.3161228.73   17.3361532.67   17.33 61631.4   17.64
61636.57   17.6761706.38   17.6761776.22   17.3364600.96   17.3364612.92   17.01
 64628.6   17.2464649.36   16.6765066.54   16.6765106.37      1665520.58      16
65677.46   16.3365974.62   16.3365991.24   16.4466048.78   16.6766088.77   16.67
66109.46   17.3366199.71   17.33

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
55806.65      .156531.03     .0356706.67      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      56531.0356706.67           433.33  433.33  433.33             .1       .3

CROSS SECTION


RIVER: Thornhill Creek
REACH: Bridge Area          RS: 3400.*

INPUT
Description:
Station Elevation Data      num=     157
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
55777.24    15.556019.41    15.556065.74   15.1156073.24      1556142.24      15
56143.76   14.8256146.73   14.7256150.19    14.556204.46   14.556241.71    14.5
 56257.2    14.556260.75   14.4256262.67   14.3856269.19   14.5   56280    14.5
56284.84    14.456287.47   14.3456299.89   14.0656300.77   14.0556300.92   14.04
56302.83      1456371.45      1456374.52   13.9456381.51    13.556405.73    13.5
56411.91   13.1156413.81      1356424.38      1356432.82   12.6656434.16   12.63
56436.85   12.5756438.05    12.556449.15   12.2356449.84   12.2156451.44   12.13
56462.87    11.556596.41    11.556596.43    11.556600.61   11.6656608.53    11.5
56609.89    11.556610.63   11.5456621.93   11.9556625.27   12.21   56646    12.5
56646.08    12.556656.85      1356678.55      1356683.54   13.2356683.95   13.25
 56689.4    13.556732.74    13.556741.99   13.9356743.57      1456840.69      14
56844.55   14.1856851.45   14.0156851.51   14.0156851.63   14.0156871.38   14.43
56871.92   14.4556872.37   14.4856872.91    14.5 56932.3    14.556946.38   14.27
56971.45      1457480.96      1457484.07   14.0557538.79   14.3657541.81   14.38
57563.04    14.557599.26    14.557644.53   14.2657647.02   14.2557693.93      14
57792.51      1457804.48   14.0757808.85      1457809.57    14.157814.77      14
57818.58   14.1557825.98   14.1857847.82   14.3257851.05   14.4557855.03    14.5
57864.77   14.4157866.74   14.4357879.84    14.557975.24    14.557990.84   14.64
57993.23    14.558002.88    14.7 58048.8   14.97 58052.7   14.9958053.79      15
58140.38      1558226.55    15.558463.77    15.558534.27      1658573.97      16
58594.14   15.93 58604.8      1658881.71      1658902.86   16.4258919.17   16.24
58919.77   16.2658932.09    16.558941.73    16.5 58951.8   16.3958957.26    16.5
59098.38    16.559101.47   16.5259107.29   16.5759168.89      1759700.66      17
59712.69    16.959718.43   16.9659728.98   16.7659737.88   16.6959762.83   16.97
59763.05   16.9759819.07    16.559865.23    16.559867.91   16.4259888.96      16
60367.41      1660369.84   16.0560369.88   16.05 60387.2   16.4460403.51   16.31
60403.55   16.3160417.77    16.260419.82   16.1860423.61   16.1560508.94    16.4
60514.84   16.4260529.65   16.4660542.85    16.560804.77    16.560889.85   16.97
60894.31      1760954.46      1761014.65    16.563448.84    16.563459.15   16.26
63472.66   16.4363490.55      1663850.05      1663884.38    15.564241.32    15.5
64376.51      1664632.59      1664646.91   16.1664696.49    16.564730.95    16.5
64748.78      1764826.55      17

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
55777.24      .156438.05     .03   56646      .1
```

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
56438.05	56646	433.33	433.33	433.33	.1	.3

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: 2966.66*

INPUT
Description:
Station Elevation Data num= 157

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
55747.83	14	55966.7	1456008.57	13.4956015.35	13.3356077.71	13.33			
56079.09	13.2156081.77	13.14	56084.9	1356133.95	1356167.61	13			
56181.61	1356184.82	12.9556186.56	12.9256192.45	1356202.22	13				
56206.59	12.9356208.97	12.8956220.19	12.7156220.99	12.756221.13	12.69				
56222.85	12.6756284.88	12.6756287.64	12.6256293.96	12.3356315.86	12.33				
56321.44	12.0856323.16	1256332.71	1256340.34	11.7756341.55	11.75				
56343.98	11.7256345.06	11.67	56355.3	11.356355.93	11.2956357.41	11.21			
56367.96	10.6756536.27	10.67	56536.3	10.6756541.57	10.8756551.55	10.67			
56553.27	10.6756553.92	10.756563.96	11.0856566.92	11.2856585.33	11.67				
56585.4	11.6756594.45	1256612.66	1256616.85	12.15	56617.2	12.17			
56621.77	12.3356658.16	12.3356665.93	12.6256667.25	12.6756748.79	12.67				
56752.02	12.7956757.82	12.6756757.87	12.6756757.97	12.6756774.55	12.95				
56775.01	12.9756775.39	12.9856775.84	13	56825.7	1356837.52	12.69			
56858.56	12.3357286.34	12.3357288.95	12.457334.88	12.8157337.42	12.84				
57355.24	1357385.65	1357423.66	12.8457425.75	12.8357465.13	12.67				
57547.9	12.6757557.95	12.7657561.62	12.6757562.22	12.857566.59	12.67				
57569.78	12.87	57576	12.9157594.33	13.0957597.05	13.2757600.39	13.33			
57608.56	13.2257610.21	13.2357621.22	13.3357701.31	13.33	57714.4	13.51			
57716.41	13.3357724.52	13.6157763.06	13.9657766.34	13.9957767.26	14				
57839.95	14	57912.3	14.6758111.46	14.6758170.65	15.3358203.98	15.33			
58220.91	15.2358229.86	15.3358462.35	15.33	58480.1	15.6158493.79	15.5			
58494.29	15.558504.64	15.6758512.74	15.6758521.19	15.5958525.78	15.67				
58644.25	15.6758646.84	15.6958651.73	15.7558703.45	16.33	59149.9	16.33			
59160	16.259164.82	16.2159173.68	16.0159181.15	15.91	59202.1	15.96			
59202.29	15.9659249.32	15.3359288.07	15.3359290.32	15.2859307.99	15				
59709.68	1559711.71	15.0359711.75	15.0359726.29	15.3359739.99	15.27				
59740.03	15.2759751.96	15.2359753.68	15.2259756.86	15.21	59828.5	15.53			
59833.46	15.5659845.89	15.6159856.97	15.6760076.87	15.67	60148.3	16.29			
60152.04	16.3360202.54	16.3360253.07	15.6762296.73	15.6762305.38	15.5				
62316.72	15.6262331.74	15.3362633.57	15.3362662.38	1562962.06	15				
63075.56	15.6763290.55	15.6763302.57	15.8763344.21	16.3363373.14	16.33				
63388.11	16.67	63453.4	16.67						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
55747.83	.156345.06	.0356585.33	.1		

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
56345.0	656585.33	433.33	433.33	433.33	.1	.3

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: 2533.33*

INPUT
Description:
Station Elevation Data num= 157

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

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55718.41    12.555913.99    12.555951.41   11.8655957.46   11.6756013.18   11.67
56014.41   11.6156016.81   11.5756019.61    11.556063.43    11.556093.52    11.5
56106.02    11.556108.89   11.4756110.45   11.4656115.71    11.556124.44    11.5
56128.35   11.4756130.47   11.45 56140.5   11.3656141.21   11.3556141.34   11.35
56142.88   11.33 56198.3   11.3356200.77   11.3156206.42   11.1756225.98   11.17
56230.97   11.04 56232.5      1156241.04      1156247.86   10.8956248.93   10.88
56251.11   10.8656252.07   10.8356261.46   10.3856262.04   10.3656263.39   10.29
56273.04    9.8356476.14    9.8356476.16    9.8356482.52   10.0956494.57    9.83
56496.64    9.8356497.21    9.8656505.99   10.2156508.58   10.3556524.67   10.83
56524.72   10.8356532.04      1156546.77      1156550.16   11.0856550.44   11.08
56554.14   11.1756583.57   11.1756589.86   11.3156590.93   11.3356656.88   11.33
 56659.5   11.3956664.19   11.3456664.23   11.3456664.31   11.3456677.72   11.48
56678.09   11.49 56678.4   11.4956678.77    11.5 56719.1    11.556728.66   11.12
56745.68   10.6757091.71   10.6757093.82   10.7557130.98   11.2757133.03    11.3
57147.45    11.557172.04    11.557202.79   11.4257204.48   11.4257236.34   11.33
57303.29   11.3357311.41   11.4557314.38   11.3357314.87    11.5 57318.4   11.33
57320.99   11.5857326.02   11.6457340.85   11.8657343.05   12.0957345.75   12.17
57352.36   12.03 57353.7   12.0457362.59   12.1757427.38   12.1757437.97   12.39
 57439.6   12.1757446.16   12.5157477.33   12.9557479.99   12.9957480.72      13
57539.53      1357598.05   13.8357759.15   13.8357807.03   14.6757833.99   14.67
57847.69   14.5457854.93   14.6758042.98   14.6758057.34   14.8158068.42   14.75
58068.82   14.7558077.19   14.8358083.74   14.8358090.58    14.858094.29   14.83
58190.12   14.8358192.22   14.8758196.18   14.9458238.01   15.6758599.15   15.67
58607.32    15.558611.21   15.4558618.38   15.2758624.42   15.1458641.37   14.96
58641.52   14.9658679.56   14.1758710.91   14.1758712.73   14.1458727.03      14
59051.95      14 59053.6   14.0259053.62   14.0259065.39   14.2159076.47   14.23
 59076.5   14.2359086.15   14.2559087.55   14.2559090.12   14.2659148.07   14.67
59152.07    14.759162.13   14.77 59171.1   14.8359348.97   14.8359406.75   15.61
59409.78   15.6759450.63   15.67 59491.5   14.8361144.61   14.8361151.61   14.75
61160.79   14.8161172.94   14.6761417.08   14.6761440.39    14.5 61682.8    14.5
61774.61   15.3361948.52   15.3361958.24   15.5961991.92   16.1762015.32   16.17
62027.43   16.3362080.25   16.33

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
55718.41      .156252.07     .0356524.67      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      56252.0756524.67            433.33  433.33  433.33              .1       .3

CROSS SECTION


RIVER: Thornhill Creek
REACH: Bridge Area          RS: 2100

INPUT
Description:
Station Elevation Data      num=      71
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   55689      1155861.28      1155894.24   10.2355899.57      1056159.09      10
56167.61    9.4556178.13       9   56416       956416.03       956423.48    9.31
56437.59       956440.02       9   56464   9.99856464.04      10 56612.5      10
 56619.8    9.54 56632.8       956897.08       956898.69     9.156927.07    9.72
56928.64    9.7656939.65      1057058.67      1057064.88   10.1457067.15      10
57067.52    10.257070.22      1057072.19    10.357076.03   10.3757087.36   10.63
57089.04   10.91 57091.1      1157096.15   10.8357097.17   10.8557103.97      11
57153.45      1157161.54   11.2757162.78      1157167.79   11.41 57191.6   11.94
57193.63   11.9957194.19      12 57239.1      12 57283.8      1357406.84      13
57443.41      14   57464      1457474.46   13.8557479.99      14   57736      14
 57737.6   14.0457740.62   14.1357772.57      1558048.39      1558109.81      13
 58395.5      1358467.63    13.858470.69   13.8458478.37   13.9258485.22      14
58621.07      14 58665.2   14.9358667.51      1558698.71      1558729.93      14
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60403.54      1460473.66      1560606.48      1560613.91   15.3160639.63      16
60707.09      16

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   55689      .156159.09     .03   56464      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      56159.09   56464           417.52  417.52  417.52             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
   55689   53045    13.9       T
   5945660707.09    14.3       T

CROSS SECTION


RIVER: Thornhill Creek
REACH: Bridge Area          RS: 1682.5*

INPUT
Description:
Station Elevation Data      num=     440
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
 55203.8   11.3555213.85   11.3555214.99   11.3655216.21   11.3555227.87   11.36
55229.89   11.3555242.46   11.3755245.27   11.38 55261.8   11.3155262.27   11.31
55264.98   11.3255268.75    11.355270.12    11.355271.15   11.26 55272.8   11.27
 55277.7   11.2855279.57   11.2855285.13   11.2455288.52   11.2455294.43   11.27
55320.21   11.29 55326.8   11.2755339.88   11.2855343.71   11.2755349.03   11.27
55350.34   11.2655352.48   11.25 55353.2   11.26 55355.8   11.2955356.49   11.27
55357.98   11.2855358.46   11.2855361.09   11.2955362.12   11.28 55364.2   11.22
55366.14   11.0955367.09   11.0455368.48   10.9755369.88   10.8255372.88   10.63
55373.14   10.6155373.68   10.5955385.79   10.5955386.15   10.6155386.82   10.65
55389.35   10.8255433.47   11.0555434.39   11.0755439.71   11.2255440.85   11.23
55450.64   11.3855451.05   11.3855461.07   11.4355464.02    11.555465.11   11.52
55466.26   11.5255467.81   11.5455468.07   11.5655473.91   11.5455495.52   11.43
55498.64   11.4355504.02   11.4755511.38   11.47 55512.5   11.4855514.94   11.45
55523.16   11.3955559.77   11.5255560.74   11.5255565.58   11.4555566.35   11.45
 55569.1   11.4455609.88   11.0455610.88   11.0255613.22   11.0355614.15   11.06
55614.74   11.0655616.53   11.0255638.98   10.7155650.29   10.4855675.01   10.35
55723.53   10.5555727.19   10.4355737.39   10.0255738.98   10.0655742.83    10.1
 55743.3   10.1155747.16    9.9855747.54    9.9655748.14    9.9455748.37    9.93
55749.01    9.8855749.51    9.86 55750.7    9.95 55752.9   10.0155754.87   10.07
55755.37   10.0855762.59   10.1855766.43   10.1855768.86   10.1955775.31   10.17
 55777.2   10.1555780.98   10.1555781.89   10.1355782.56   10.1255815.07   10.04
55816.01   10.0455818.94   10.0555820.66   10.0555821.71   10.0455822.61   10.04
55824.19   10.0555825.71   10.0755826.67   10.0855829.51   10.1255830.54   10.11
55833.21   10.0855834.41   10.0755835.25   10.0755836.85   10.0355899.54   10.14
55899.89   10.1455903.01   10.1555904.25   10.16 55908.6   10.1855909.95   10.19
55911.65   10.1855915.01   10.1855915.81   10.1955916.88   10.18 55917.3   10.18
55918.68   10.16   55928   10.5455928.36   10.4455931.47   10.45 55932.4   10.45
55934.71   10.44 55935.6   10.4355935.91   10.5155935.96   10.52 55938.4   10.49
55941.86   10.44 55948.8    9.9355949.12     9.9 55949.7    9.8755950.49    9.77
55952.27    9.56 55974.3    9.5655975.56     9.855976.74    9.9555985.49   10.04
56007.07   10.1456009.41    10.156011.57   10.09   56014    10.156018.93    10.1
56020.02   10.1156020.94   10.1156038.27   10.21 56040.8   10.2156043.16   10.19
56045.21   10.1956045.66   10.1856047.88    10.2   56049    10.256055.41    10.1
56059.08   10.02 56059.5   10.0156060.68    9.9456060.93    9.9356062.32    9.83
56062.91    9.8556064.26     9.956065.21     9.956065.62    9.8956067.96    9.89
56069.01     9.956069.64    9.8956071.34    9.8756071.74    9.8656072.21    9.87
56072.95    9.8556073.99    9.8456074.45    9.8256074.74    9.8456076.34    9.93
56104.45    9.9356107.01    9.9256112.09    9.8956113.16    9.8856113.66    9.87
56116.33    9.6456117.41    9.5356119.08     9.656120.27    9.6756124.15    9.77
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56193.21	8.9656195.86	8.8956196.68	8.8756198.19	8.8256198.47	8.73
56200.14	8.3256200.21	8.3156200.56	8.2256205.48	7.9756207.01	7.89
56211.23	7.6856212.26	7.6456218.89	7.23 56219.5	6.856220.29	6.62
56221.06	6.5756222.26	6.556223.42	6.4256224.39	6.3456402.81	6.34
56408.4	6.5856418.98	6.34 56420.8	6.3456422.21	6.4556425.85	6.7
56426.1	6.7556426.57	6.8456428.69	7.1756441.76	8.0556443.16	8.78
56445.19	9.1356448.42	9.2756451.28	9.2956586.44	9.8156593.39	9.49
56594.09	9.4756605.75	9.1256634.32	9.2256648.02	9.2656834.77	9.34
56839.3	9.3256841.13	9.356843.73	9.2856856.77	9.2956857.12	9.3
56857.87	9.3556858.66	9.456860.76	9.4656885.65	9.8556887.15	9.88
56897.62	10.04 56921	1056924.71	10.01 56927.3	10 56939	9.98
56942.2	9.9756943.95	9.9656952.79	9.97 56953.9	9.9857010.83	10.05
57016.73	10.1657018.89	10.0657019.25	10.2157021.81	10.0757023.69	10.29
57027.34	10.3557038.12	10.5657039.71	10.7757041.68	10.8457046.48	10.72
57047.45	10.7457053.91	10.8657100.98	10.9257108.68	11.1357109.86	10.93
57114.62	11.2557137.27	11.67 57139.2	11.7157139.73	11.7257182.45	11.78
57224.97	12.5957324.23	12.72 57342	12.7157376.79	13.4457396.37	13.42
57406.32	13.357411.58	13.4157498.74	13.3657500.62	13.3757507.93	13.39
57539.09	13.4157550.02	13.4657551.71	13.4757566.19	13.5157576.92	13.51
57579.86	13.557581.02	13.557586.05	13.5257600.45	13.5257603.76	13.54
57621.13	13.657622.32	13.6157655.09	13.657656.61	13.6257659.48	13.69
57689.88	14.3357845.86	14.2757849.22	14.2957854.39	14.3157860.09	14.29
57904.64	14.3557910.16	14.3557933.02	14.357952.23	14.357974.77	13.77
57998.62	13.0858010.64	12.7658027.39	12.7658029.23	12.7558054.26	12.77
58065.3	12.7458070.78	12.7858076.51	12.7858080.68	12.7958089.63	12.77
58092.31	12.75 58099.3	12.72 58104.7	12.7158110.14	12.6758124.23	12.68
58128.6	12.6958154.43	12.6758167.31	12.6858171.58	12.6558282.39	12.46
58351	13.0658353.91	13.0958367.73	13.2158496.95	13.258520.11	13.59
58528.68	13.6958537.32	13.8658538.92	13.8858539.54	13.8958541.12	13.89
58542.25	13.8558563.42	13.82 58570.8	13.9458573.11	13.9258576.75	13.92
58580.43	13.8458581.73	13.8258583.46	13.7758600.49	13.4158612.42	13.4
58628.67	13.4558630.58	13.4658632.16	13.4658634.32	13.4458647.97	13.4
58655.38	13.3658663.18	13.2758666.14	13.26 58864.7	13.3758868.14	13.38
58894.66	13.3558897.45	13.3858900.27	13.42 58903.1	13.4959021.91	13.38
59050.98	13.4259057.82	13.42 59064.6	13.3859069.51	13.4259091.41	13.38
59107.1	13.3859135.09	13.359138.31	13.359142.88	13.3159155.02	13.36
59171.3	13.3459183.58	13.3859187.11	13.3859197.38	13.3 59277.5	13.27
59281.47	13.359297.18	13.3259299.26	13.3259308.15	13.3559311.02	13.3
59323.05	13.2859392.28	13.2759416.14	13.3959425.32	13.3759437.81	13.32
59461.86	13.2859473.92	13.3559479.03	13.3759518.41	13.2759791.02	13.54
59804.32	13.6 59809.3	13.6159821.44	13.759838.69	13.7959845.27	13.85
59909.88	13.8659992.09	13.7860192.39	13.7660237.24	14.2560255.08	14.39
60259.09	14.4460303.77	14.4660329.88	14.3760338.89	14.3660345.26	14.38
60353.33	14.3760356.97	14.3860358.84	14.4260359.68	14.4460366.31	14.45
60370.94	14.5360382.64	14.6160384.62	14.6260385.42	14.6260387.17	14.67
60392.49	14.83 60397.5	14.9260399.51	14.9460405.59	14.9360406.83	14.92
60407.69	14.960409.89	14.8760410.57	14.81 60414.1	14.9160414.71	14.96
60416.4	15.0560416.95	15.0760428.53	15.16 60435.4	15.1760445.06	15.15
60449.63	15.1760468.71	15.260471.12	15.2160473.89	15.2460481.12	15.23

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
55203.8	.156200.56	.0356445.19	.1		

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
56200.5	656445.19	417.52	417.52	417.52	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
55203.85	3671.25	13.9	T
58829.75	60481.12	14.3	T

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: 1265.*

INPUT
Description:
Station Elevation Data num= 493

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
54718.6	11.75	4733.96	11.71	54735.7	11.72	54737.56	11.71	54755.39	11.72
54758.48	11.69	54766.85	11.73	54777.7	11.74	54781.97	11.75	54807.24	11.62
54807.96	11.61	54812.1	11.63	54817.87	11.65	4819.97	11.65	4821.53	11.52
54824.05	11.55	54831.55	11.57	54832.48	11.57	54833.16	11.56	54834.4	11.56
54842.91	11.49	54844.48	11.48	54848.08	11.48	54857.12	11.53	54871.85	11.57
54884	11.56	54895.77	11.59	54896.52	11.59	54906.59	11.55	54914.54	11.55
54916.25	11.53	54925.43	11.56	54926.58	11.57	54932.44	11.55	54936.46	11.55
54938.36	11.53	54940.56	11.53	54942.57	11.51	54946.94	11.51	54949.52	11.56
54950.92	11.57	54951.97	11.54	54954.25	11.57	54954.98	11.57	54959.01	11.58
54960.57	11.57	54963.74	11.43	54966.72	11.18	54968.17	11.08	54970.29	10.94
54972.43	10.65	54977.02	10.26	54977.41	10.23	54978.25	10.18	54996.76	10.18
54997.3	10.22	55002.2	10.65	55069.63	11.09	55079.16	11.44	55080.91	11.45
55095.87	11.75	55096.49	11.75	55111.8	11.86	55116.3	12.01	55117.98	12.03
55119.73	12.03	55122.11	12.09	55122.52	12.11	55131.42	12.08	55164.46	11.87
55169.23	11.87	55177.45	11.94	55182.28	11.93	55187.81	11.94	55188.7	11.94
55190.41	11.97	55194.14	11.91	55202.76	11.82	55206.71	11.77	55252.71	12
55262.66	12.03	55264.14	12.04	55271.54	11.91	55272.71	11.95	5276.92	11.89
55339.25	11.54	55340.77	11.49	55344.36	11.54	55345.77	11.61	55346.67	11.62
55349.41	11.55	55383.73	11.19	55401	10.95	55438.8	10.69	55512.95	11.1
55516.16	10.95	55518.55	10.85	55534.12	10.05	55536.56	10.11	55542.45	10.21
55543.17	10.22	55549.06	9.95	55549.65	9.92	55550.57	9.89	55550.91	9.85
55551.88	9.76	55552.65	9.73	55554.48	9.91	55557.84	10.02	55560.85	10.14
55561.62	10.16	55572.64	10.35	55578.52	10.36	55582.23	10.38	55587.44	10.37
55592.09	10.34	55594.98	10.31	55600.75	10.29	55602.14	10.26	55603.17	10.25
55652.86	10.09	55658.77	10.09	55661.4	10.1	55663.02	10.09	55664.38	10.07
55666.8	10.09	55669.12	10.14	55670.59	10.16	55674.92	10.24	55676.49	10.22
55680.58	10.16	55682.41	10.15	55683.7	10.14	55686.15	10.06	55781.96	10.27
55782.5	10.28	55795.8	10.36	55797.86	10.38	55800.46	10.37	55805.6	10.37
55806.82	10.38	55808.46	10.36	55811.21	10.32	55825.45	11.08	55826.01	10.88
55830.75	10.91	55832.18	10.91	55835.71	10.88	55837.07	10.86	55837.54	11.01
55837.62	11.05	55838.87	11.02	55841.35	10.98	55842.37	10.97	55846.65	10.89
55857.25	9.85	55857.73	9.85	55858.62	9.74	55859.84	9.55	55862.55	9.11
55896.21	9.11	55898.15	9.59	55899.95	9.95	55913.32	10.09	55946.3	10.28
55949.89	10.19	55953.18	10.18	55958.67	10.21	55962.11	10.25	5964.42	10.2
55966.09	10.22	55967.5	10.23	55972.8	10.26	55995.37	10.42	55997.87	10.43
56001.47	10.39	56002.02	10.39	56004.59	10.38	56005.28	10.37	56008.67	10.4
56009.53	10.41	56010.38	10.41	56020.19	10.19	56025.79	10.03	56026.44	10.01
56028.23	9.89	56028.63	9.85	56030.75	9.66	56031.65	9.75	6033.71	9.81
56035.16	9.79	56035.8	9.77	56036.39	9.77	56039.38	9.78	56040.97	9.81
56041.93	9.78	56044.54	9.74	56045.15	9.72	56045.86	9.74	56046.98	9.71
56048.58	9.67	56049.28	9.65	56049.73	9.68	56051.62	9.82	56052.17	9.87
56095.15	9.86	56099.05	9.84	56106.82	9.78	56108.45	9.76	56109.22	9.74
56113.3	9.28	56114.95	9.07	56117.49	9.2	56119.31	9.34	56125.25	9.53
56230.8	7.92	56234.84	7.78	56236.1	7.74	56238.41	7.64	56238.84	7.45
56241.39	6.64	56241.5	6.61	56242.04	6.44	56247.94	6.19	56249.78	6.12
56254.84	5.91	56256.09	5.86	56261.38	5.47	56264.05	5.26	56264.77	4.43
56265.72	4.11	56266.65	4.03	56268.09	3.92	56269.48	3.81	56270.64	3.68
56389.59	3.68	56393.32	3.84	56400.38	3.68	56401.59	3.68	56403.02	3.84
56406.72	4.19	56406.97	4.28	56407.45	4.45	56409.61	5.03	56418.21	5.81
56422.89	6.23	56424.32	7.65	56426.38	8.26	56429.45	8.53	56432.16	8.58
56560.38	9.61	56566.97	9.43	56578.7	9.25	56615.85	9.51	56618.8	9.52
56795.96	9.68	56800.27	9.63	56802	9.59	56804.47	9.57	56808.05	9.57
56809.52	9.56	56815.54	9.58	56816.84	9.59	56817.17	9.65	6817.88	9.65
56818.63	9.75	6820.62	9.78	56844.23	9.98	56845.66	10	5855.59	10.08
56877.77	10.01	56881.29	10.01	56894.85	9.95	56897.88	9.93	56907.92	9.94

56908.98	9.9556962.99	10.156968.59	10.1956970.64	10.1256970.97	10.22
56973.41	10.1356975.19	10.2956978.65	10.3356988.88	10.4956990.39	10.63
56992.25	10.68 56996.8	10.6156997.73	10.6257003.86	10.7257048.51	10.84
57055.81	1157056.93	10.8657061.45	11.0857084.77	11.4457085.27	11.44
57125.8	11.5657166.13	12.17 57260.3	12.4357277.16	12.4157310.16	12.87
57328.73	12.8557338.18	12.7657343.16	12.8357425.85	12.7257427.64	12.74
57445.73	12.8157464.13	12.8357466.05	12.84 57474.5	12.9257486.26	13
57494.81	13.0257497.47	13.0257500.02	13.0157502.81	12.9957503.91	13
57511.39	13.0557517.98	13.04 57519.9	13.0357522.34	13.0357525.48	13.08
57541.96	13.257543.09	13.2257574.18	13.1957607.18	13.6657755.16	13.55
57758.34	13.5957763.24	13.6157768.65	13.5957785.21	13.5957800.93	13.67
57810.92	13.6957816.16	13.6957820.91	13.6857837.84	13.5957854.76	13.6
57856.06	13.6157877.45	13.357900.08	12.7557911.48	12.5357917.74	12.51
57952.86	12.5357963.34	12.4957968.53	12.5757973.97	12.5657977.93	12.57
57986.41	12.5357988.96	12.4957995.59	12.4358000.71	12.4158005.87	12.34
58016.12	12.3758019.23	12.3658023.38	12.3858047.89	12.3458056.74	12.36
58060.11	12.3658064.16	12.3158160.39	11.9358169.28	11.9358234.36	12.32
58237.12	12.3458250.23	12.4258372.82	12.41 58394.8	12.6658402.93	12.68
58411.12	12.8358413.23	12.8358414.73	12.77 58415.8	12.7158428.73	12.66
58435.88	12.6558442.88	12.8858445.08	12.9258448.53	13.0558452.02	13.01
58453.25	13 58454.9	12.9858471.05	12.81 58472.2	12.8258473.26	12.82
58482.37	12.7958497.78	12.91 58499.6	12.92 58501.1	12.9258503.14	12.89
58509.34	12.8458516.09	12.8158523.12	12.7358527.12	12.6158530.52	12.55
58533.33	12.5258719.82	12.74 58721.7	12.7458724.97	12.75 58739.6	12.74
58750.12	12.7158752.77	12.7658755.45	12.8458758.12	12.9958870.84	12.76
58881.99	12.7858898.41	12.8458904.91	12.8458911.34	12.76 58916	12.84
58936.78	12.7658945.45	12.7558951.66	12.7658978.21	12.5958981.27	12.59
58985.6	12.6158988.09	12.6458997.12	12.7259012.55	12.6759024.21	12.75
59027.56	12.75 59037.3	12.5959039.88	12.6 59056.4	12.5759095.36	12.57
59097.58	12.5659113.31	12.5559117.08	12.5959131.98	12.6459133.95	12.63
59142.39	12.69 59145.1	12.5959156.52	12.5659178.56	12.5659192.34	12.53
59201.09	12.55 59222.2	12.5359244.83	12.7859253.55	12.7459265.39	12.64
59288.21	12.5759304.49	12.7459307.18	12.7359341.85	12.5459600.47	13.09
59613.09	13.259617.82	13.2359629.32	13.4 59645.7	13.5959651.93	13.69
59662.05	13.759669.78	13.7359713.23	13.73 59729.7	13.6659772.58	13.59
59779.2	13.5959781.09	13.5859791.22	13.5659981.23	13.5160023.79	13.84
60040.71	13.8560044.51	13.88 60086.9	13.9260104.04	13.8160111.67	13.74
60120.21	13.7260126.26	13.7560133.91	13.7460137.38	13.7660139.14	13.84
60139.94	13.8960146.23	13.960150.62	14.0660161.73	14.22 60163.6	14.24
60164.36	14.2360171.06	14.3560175.82	14.3960177.73	14.3760183.49	14.18
60184.67	14.1360185.48	14.0660187.57	13.9460188.22	13.8160191.56	13.9
60192.15	13.9760193.75	14.1160194.27	14.1360196.43	14.1860205.26	14.33
60211.77	14.3460220.94	14.360225.27	14.3460232.94	14.3860243.37	14.41
60245.66	14.4360248.29	14.4960255.14	14.47		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
54718.6	.156242.04		.0356426.38		.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
56242.0	456426.38	417.52	417.52	417.52	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
54718.6	54297.5	13.9	T
58203.5	60255.14	14.3	T

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: 847.5*

INPUT

Description:
Station Elevation Data num= 476

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
54233.4	12.06	54254.07	12.06	54256.42	12.07	54258.91	12.06	54282.91	12.07
54287.06	12.04	54298.33	12.09	54318.68	12.12	54352.68	11.93	54359.23	11.94
54366.99	11.95	54369.82	11.95	54371.92	11.79	54375.31	11.82	54385.4	11.86
54386.65	11.85	54400.69	11.73	54402.8	11.72	54407.65	11.71	54419.8	11.8
54439.63	11.86	54455.99	11.84	54471.83	11.88	54486.37	11.82	54497.08	11.82
54499.38	11.85	54511.73	11.84	54513.28	11.85	54521.17	11.82	54526.58	11.82
54529.14	11.85	54532.09	11.8	54534.8	11.77	54539.21	11.76	54540.68	11.77
54546.04	11.86	54547.45	11.81	54550.52	11.85	54556.92	11.87	54559.02	11.86
54563.29	11.65	54567.29	11.28	54569.25	11.12	54572.11	10.91	54574.98	10.48
54581.15	9.88	54582.81	9.78	54607.72	9.78	54609.84	9.97	54615.04	10.47
54705.79	11.14	54707.66	11.25	54718.61	11.67	54720.96	11.67	54741.09	12.12
54762.54	12.3	54768.6	12.51	54770.86	12.55	54773.21	12.55	54776.41	12.63
54788.94	12.62	54833.4	12.35	54839.81	12.35	54850.87	12.41	54857.39	12.4
54864.83	12.42	54866.02	12.42	54868.33	12.45	54873.34	12.36	54884.94	12.24
54890.26	12.15	54952.16	12.55	54965.56	12.55	54967.55	12.56	54977.5	12.36
54979.08	12.34	54984.74	12.33	55068.61	12.03	55070.66	11.97	55075.49	12.05
55077.39	12.16	55078.61	12.18	55082.29	12.09	55202.58	11.03	55302.37	11.65
55306.69	11.42	55309.9	11.27	55330.86	10.07	55334.14	10.17	55342.06	10.31
55350.97	9.93	55351.75	9.88	55352.99	9.83	55353.46	9.77	55354.76	9.64
55355.8	9.65	55358.26	9.86	55366.82	10.25	55367.86	10.25	55382.7	10.52
55390.61	10.54	55395.61	10.57	55402.61	10.55	55408.86	10.52	55412.76	10.47
55420.53	10.43	55422.39	10.45	55423.78	10.38	55490.64	10.13	55492.57	10.13
55498.59	10.14	55502.14	10.16	55504.31	10.13	55506.14	10.11	55509.41	10.14
55512.54	10.25	55514.51	10.25	55520.34	10.36	55522.45	10.32	55527.95	10.23
55530.41	10.22	55532.15	10.25	55535.45	10.08	55664.38	10.41	55683.01	10.55
55685.78	10.56	55689.28	10.55	55696.2	10.55	55697.84	10.57	55700.04	10.55
55703.75	10.47	55722.91	11.62	55723.66	11.31	55730.04	11.36	55731.96	11.36
55738.55	11.29	55739.18	11.52	55740.96	11.54	55744.3	11.47	55745.67	11.45
55751.43	11.34	55765.7	9.77	55766.35	9.75	55767.54	9.61	55769.18	9.32
55772.82	8.67	55818.13	8.67	55820.73	9.39	55823.17	9.84	55841.16	10.13
55885.54	10.42	55890.37	10.29	55894.8	10.28	55902.18	10.31	55909.92	10.31
55912.17	10.33	55914.06	10.34	55921.2	10.4	55924.7	10.42	55949.72	10.62
55951.57	10.63	55954.93	10.64	55959.77	10.58	55963.98	10.56	55969.46	10.59
55970.62	10.61	55971.77	10.61	55984.96	10.28	55992.5	10.05	55995.79	9.83
55996.32	9.77	55999.18	9.48	56000.39	9.56	56003.17	9.71	56005.12	9.69
56006.77	9.65	56010.79	9.68	56012.93	9.71	56017.73	9.65	56019.51	9.61
56023.18	9.51	56024.72	9.52	56027.27	9.74	56028.01	9.81	56083.97	9.79
56085.84	9.8	56091.1	9.75	56098.23	9.75	56101.55	9.67	56103.75	9.63
56104.77	9.62	56110.27	8.92	56112.49	8.65	56115.91	8.81	56118.36	9
56126.35	9.35	6268.39	6.88	56273.83	6.68	56275.52	6.61	56278.62	6.47
56279.21	6.18	56282.64	4.97	56283.51	4.66	56290.4	4.42	56292.55	4.34
56298.45	4.13	56299.91	4.09	56306.08	3.57	56309.2	3.35	56310.05	2.07
56311.16	1.59	56312.24	1.49	56313.92	1.35	56315.55	1.2	56316.9	1.03
56376.37	1.03	56378.24	1.11	56381.77	1.03	56383.83	1.23	56387.59	1.68
56387.84	1.81	56388.34	2.05	56390.52	2.88	56401.55	4.14	56404.03	4.42
56405.48	6.51	56407.58	7.39	56410.47	7.85	56413.04	7.87	56534.33	9.42
56540.56	9.38	56551.66	9.37	56577.29	9.66	56581.73	9.75	56589.58	9.79
56757.16	10.03	56761.23	9.94	56762.87	9.89	56765.21	9.86	56766.66	9.85
56768.59	9.85	56769.99	9.84	56775.67	9.87	56776.9	9.88	56778.6	10
56780.48	10.09	56802.82	10.11	56804.16	10.12	56813.56	10.12	56834.54	10.01
56837.87	10.02	56840.2	10	56850.7	9.93	56853.56	9.89	56855.13	9.89
56863.06	9.92	56915.15	10.15	56920.45	10.21	56922.38	10.18	56922.7	10.24
56925	10.25	6926.69	10.28	56929.96	10.31	56939.63	10.42	56941.07	10.49
56942.83	10.53	56947.13	10.55	56953.81	10.57	56996.04	10.76	57002.95	10.86
57004.01	10.85	57008.28	10.92	57030.34	11.16	57069.15	11.34	57107.3	11.76
57196.38	12.15	57212.32	12.12	57243.53	12.31	57261.11	12.27	57270.04	12.21
57274.75	12.24	57352.96	12.08	57354.66	12.15	57371.76	12.22	57389.18	12.24
57390.99	12.27	57398.98	12.38	57400.5	12.39	57410.11	12.5	57418.2	12.54
57423.12	12.52	57425.76	12.49	57426.8	12.55	57431.32	12.55	57433.88	12.57
57440.11	12.56	57441.93	12.55	57444.24	12.55	57447.21	12.62	57462.79	12.81

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57463.86   12.8257494.63   12.7957524.48      1357664.45   12.8257667.47   12.88
 57672.1   12.9157677.21   12.8857692.88   12.8957707.75   13.0157722.15   13.04
57742.67   12.8957758.66   12.91 57759.9   12.9157780.12   12.8457801.54   12.42
57812.32   12.2957818.24   12.2757827.35   12.27   57829   12.2657851.46    12.3
57861.37   12.2357866.28   12.3657871.42   12.3457875.17   12.36 57883.2    12.3
57885.61   12.2457891.88   12.1457896.72   12.12 57901.6   12.0157911.29   12.06
57914.24   12.0457918.17   12.0757941.34   12.0157949.72   12.05 57952.9   12.04
57956.73   11.9658047.76   11.3958056.17   11.3958132.74   11.63 58248.7   11.61
58269.48   11.7458277.18   11.6758284.93    11.858286.36   11.7858288.34   11.66
58289.35   11.5758301.58   11.4958308.35   11.4758314.96   11.8258317.05   11.91
58320.31   12.1758323.61   12.1758324.78   12.1958326.34   12.1858341.61   12.22
 58343.7   12.2458352.31   12.1958368.61   12.3858370.04   12.3858371.96   12.34
58377.83   12.2758384.22   12.2258390.87    12.158394.64   11.9158397.87   11.82
58400.52   11.7858576.92   12.1158578.69   12.1158581.79   12.1258595.63   12.12
58605.58   12.0758608.08   12.1358610.62   12.2658613.15   12.4858719.77   12.15
58730.32   12.1858745.85   12.2758751.99   12.2758758.07   12.1458762.48   12.26
58782.14   12.1558790.35   12.1258796.21   12.1358802.95   12.0858821.33   11.89
58824.22   11.8958828.32   11.9158830.68   11.9558839.21   12.0758853.82   12.01
58864.84   12.1258868.01   12.1258877.23   11.8958879.66    11.958895.29   11.86
58922.62   11.8458932.14   11.8658934.24   11.8358940.77   11.8258949.12   11.83
58952.68   11.8958966.78   11.9558968.65   11.9558976.62   12.0458979.19   11.89
58992.12   11.8359010.84   11.8359023.88    11.859032.15   11.8359052.11    11.8
59073.53   12.1759081.77   12.1259092.97   11.9559107.37   11.9159114.55   11.85
59125.38   12.0459129.96   12.11 59132.5    12.1 59165.3   11.8159409.92   12.63
59421.86   12.8159426.33   12.8559437.21    13.1 59452.7   13.38 59458.6   13.54
59464.83   13.5559468.16   13.5559475.48   13.5959516.58   13.5959532.15   13.48
59548.77   13.4659572.71   13.3959574.46   13.3959578.98   13.3859580.77   13.37
59590.35   13.3459770.08   13.2759810.33   13.4259826.34    13.359827.71   13.31
59829.93   13.3259870.03   13.3859886.24   13.2259893.46   13.1159901.54   13.07
59907.26   13.12 59914.5   13.1259917.77   13.1559919.45   13.26 59920.2   13.34
59926.15   13.34 59930.3   13.5959940.81   13.8259942.58   13.8559944.87   13.86
59949.64   13.8659954.14   13.8559955.95   13.81 59961.4   13.4359962.51   13.34
59963.28   13.2259965.26   13.0159965.87    12.859969.03    12.959969.59   12.99
 59971.1   13.1859973.64   13.2859981.98   13.4959988.14    13.559996.81   13.45
60000.91   13.5160008.17   13.5760018.04   13.61 60020.2   13.6460022.69   13.73
60029.17    13.7

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 54233.4      .156283.51     .0356407.58      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
      56283.5156407.58           417.52  417.52  417.52              .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 54233.4 54297.5    13.9       T
57577.2560029.17    14.3       T

CROSS SECTION


RIVER: Thornhill Creek
REACH: Bridge Area          RS: 430

INPUT
Description:
Station Elevation Data      num=     482
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 53748.2   12.4153774.18   12.4253777.13   12.4353780.27   12.4253810.43   12.43
53815.65   12.3953829.81   12.4553848.16   12.4853855.39    12.553898.13   12.24
53899.34   12.2353906.35   12.2653916.11    12.253919.66    12.2 53922.3   12.05
53926.57    12.153939.25   12.1453940.82   12.1353941.98   12.1153944.07   12.11
53958.46   11.9753961.12   11.9653967.21   11.9553982.49   12.0654007.41   12.14
```

54027.97	12.1254047.88	12.1754049.13	12.1754066.16	12.154079.62	12.09
54082.51	12.0754098.03	12.1254099.98	12.13 54109.9	12.0954113.38	12.1
54116.7	12.0954119.91	12.0754123.63	12.0654127.03	12.0354132.57	12.01
54134.42	12.0254138.79	12.1154141.16	12.1554142.92	12.0854146.79	12.13
54148.01	12.1354154.83	12.1654157.47	12.1454162.84	11.8754167.87	11.37
54170.33	11.1654173.92	10.8854177.53	10.354185.29	9.5154185.96	9.46
54187.37	9.3754218.68	9.37 54219.6	9.4354221.34	9.6254227.88	10.29
54341.94	11.18 54344.3	11.2754358.06	11.8954361.02	11.954386.32	12.5
54387.38	12.554413.27	12.7354420.89	13.0154423.73	13.0754426.69	13.07
54430.71	13.1754431.39	13.2354446.46	13.1654502.34	12.74 54510.4	12.74
54524.3	12.8854532.49	12.8754541.84	12.8954543.34	12.8954546.24	12.93
54552.54	12.8154567.12	12.6554573.81	12.5454651.61	1354668.45	13.06
54670.95	13.0854683.46	12.8254685.44	12.7954797.98	12.5254800.56	12.45
54806.62	12.5654809.01	12.7154810.54	12.7454815.17	12.6354966.36	11.38
55091.79	12.255097.22	11.955101.25	11.7 55127.6	10.155131.72	10.23
55141.68	10.42 55142.9	10.4455152.87	9.955153.86	9.8455155.41	9.77
55156	9.755157.64	9.5255158.94	9.4655162.03	9.8155167.72	10.05
55172.8	10.27 55174.1	10.3355192.75	10.755202.69	10.7255208.98	10.76
55217.78	10.7455225.64	10.6955230.54	10.62 55240.3	10.5855242.65	10.53
55244.39	10.555328.43	10.1755330.85	10.1755338.42	10.1955342.88	10.21
55345.61	10.1755347.91	10.1555352.01	10.1955355.95	10.2755358.42	10.33
55365.75	10.4855368.41	10.4355375.32	10.3155378.41	10.29 55380.6	10.27
55384.74	10.11 55546.8	10.5555547.71	10.5655555.77	10.6255558.96	10.65
55570.21	10.7355573.69	10.7555578.09	10.7455586.79	10.7455588.85	10.76
55591.62	10.7355592.71	10.7155596.28	10.6355620.36	12.16 55621.3	11.75
55629.33	11.8155630.45	11.8255631.74	11.8155637.72	11.7555640.02	11.72
55640.81	12.0255640.95	12.0955643.05	12.0555647.25	11.9655648.97	11.93
55656.21	11.7855674.14	9.755674.97	9.655676.46	9.4855678.52	9.09
55683.1	8.2355740.05	8.2355743.32	9.1855746.38	9.7955768.99	10.17
55824.77	10.5655830.84	10.3955836.41	10.37 55842.7	10.455845.69	10.42
55851.5	10.4155855.42	10.4155858.25	10.4455860.62	10.4555869.59	10.53
55874	10.5655905.44	10.8355907.76	10.8455911.99	10.8555918.08	10.77
55919.01	10.7755923.37	10.7555924.53	10.7455930.26	10.7955931.71	10.81
55933.16	10.8255941.29	10.655949.74	10.3855959.22	10.0655960.32	10.02
55963.35	9.7755964.02	9.7 55967.6	9.3155969.13	9.4155972.62	9.61
55975.07	9.5855976.15	9.5455977.14	9.54 55982.2	9.5755984.89	9.61
55986.52	9.5755990.93	9.4755991.97	9.4455993.16	9.4855995.07	9.42
55997.77	9.3455998.95	9.355999.71	9.3656002.91	9.6556003.84	9.74
56074.18	9.7256076.53	9.7356083.14	9.6756092.11	9.656096.28	9.56
56099.04	9.5156100.33	9.4956107.23	8.5656110.03	8.1356114.33	8.41
56117.4	8.6756127.45	9.0656305.98	5.8456312.82	5.5756314.94	5.48
56318.84	5.2956319.58	4.91 56323.9	3.2956324.07	3.2356324.99	2.88
56332.86	2.6456335.32	2.5756343.73	2.3156350.79	1.6756354.36	1.34
56355.33	-.356356.59	-.9356357.83	-1.0556359.75	-1.2356361.61	-1.41
56363.16	-1.6356364.64	-1.3856368.46	-.8356368.72	-.6656369.22	-.34
56371.44	.7356377.68	1.5956380.33	1.9556382.64	2.2756385.16	2.61
56386.64	5.3856388.77	6.52 56391.5	7.0656393.92	7.1656514.74	9.34
56548.77	9.8856552.96	9.9356555.36	9.9856557.73	10.0156560.36	10.05
56718.35	10.3756722.19	10.2656723.74	10.1856725.94	10.1456727.31	10.13
56729.13	10.1356730.45	10.1256735.81	10.1656736.97	10.17 56737.9	10.25
56740.34	10.4156791.31	10.0156794.45	10.0356796.64	1056806.54	9.9
56809.24	9.8656810.72	9.85 56818.2	9.8956819.14	9.957132.45	11.87
57280.08	11.4457281.67	11.4757287.85	11.54 57297.8	11.6257314.22	11.66
57315.93	11.6957323.46	11.84 57324.9	11.8657333.95	1257337.14	12.03
57341.58	12.0557343.95	12.0457346.22	12.0257348.71	11.9957349.69	12
57353.95	12.0657356.36	12.0957362.24	12.0857363.95	12.0757366.13	12.07
57368.93	12.1657373.95	12.2557383.62	12.4157384.63	12.4357573.75	12.09
57576.59	12.1757580.96	12.2257585.78	12.1757588.03	12.1757600.55	12.19
57614.57	12.3457623.48	12.3857628.15	12.3957632.39	12.3557647.49	12.18
57662.57	12.21 57682.8	12.3857702.99	12.0957718.74	12.0357726.24	12.02
57727.33	12.0257728.88	12.0157750.06	12.06 57756.4	12 57759.4	11.98
57764.03	12.1457768.88	12.1257772.41	12.1557779.98	12.0657782.25	11.99
57788.16	11.8657792.73	11.8357797.33	11.6857806.47	11.7457809.25	11.72

57812.95	11.76	57834.8	11.68	57842.7	11.73	57845.7	11.72	57849.31	11.61
57935.13	10.86	58144.17	10.81	58151.42	10.66	58158.73	10.77	58160.61	10.72
58162.9	10.42	58174.43	10.32	58180.81	10.29	58189.01	10.91	58192.09	11.3
58195.2	11.34	58196.3	11.37	58197.77	11.38	58213.19	11.64	58214.14	11.65
58222.26	11.58	58236.01	11.82	58237.63	11.84	58238.97	11.84	58240.79	11.78
58246.32	11.69	58252.34	11.62	58258.61	11.46	58262.17	11.22	58265.21	11.09
58267.71	11.04	58434.02	11.48	58435.69	11.48	58438.61	11.55	58451.66	11.49
58461.04	11.42	58463.4	11.51	58465.79	11.68	58468.18	11.97	58568.7	11.53
58578.64	11.57	58593.29	11.69	58599.08	11.69	58604.81	11.52	58608.97	11.68
58627.5	11.53	58635.24	11.55	58640.77	11.51	58647.12	11.44	58664.45	11.19
58667.17	11.19	58671.04	11.22	58673.26	11.27	58681.31	11.43	58695.08	11.34
58705.47	11.55	58708.46	11.55	58717.15	11.19	58719.44	11.25	58734.18	11.15
58743.11	11.15	58759.95	11.12	58768.92	11.14	58770.9	11.11	58777.05	11.09
58784.93	11.15	58788.29	11.18	58801.58	11.27	58803.34	11.26	58810.86	11.39
58813.28	11.19	58823.46	11.12	58825.47	11.11	58843.12	11.11	58855.41	11.07
58863.21	11.15	58872.32	11.09	58882.03	11.06	58902.22	11.56	58909.99	11.49
58920.55	11.27	58934.13	11.21	58940.9	11.13	58951.1	11.39	58955.42	11.48
58957.82	11.46	58988.74	11.08	59219.37	12.17	59230.62	12.41	59234.84	12.46
59245.1	12.8	59259.7	13.17	59265.26	13.39	59271.14	13.45	59274.28	13.4
59281.18	13.45	59292.5	13.47	59319.93	13.45	59334.61	13.31	59350.28	13.28
59372.85	13.19	59374.5	13.18	59378.76	13.17	59380.44	13.16	59389.48	13.12
59596.88		59611.97	12.76	59613.26	12.76	59653.16	12.84	59668.44	12.62
59675.25	12.48	59682.87	12.43	59688.26	12.55	59695.09	12.49	59698.17	12.53
59699.75	12.68	59700.46	12.78	59706.07	12.79	59709.99	13.12	59719.89	13.43
59721.56	13.47	59723.72	13.45	59732.46	13.32	59734.16	13.24	59739.3	12.68
59740.35	12.55	59741.08	12.38	59742.94	12.08	59743.52	11.79	59746.5	11.89
59747.02	12.01	59748.45	12.24	59750.84	12.37	59758.71	12.66	59764.52	12.67
59772.69	12.65	59776.56	12.68	59783.4	12.76	59792.7	12.81	59794.74	12.85
59797.09	12.97	59803.2	12.94						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
53748.2	.15	6324.99	.03	56388.77	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
56324.99	56388.77	275	275	275	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
53748.2	55550	13.9	T
56951	59803.2	14.3	T

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: 155

INPUT
Description: 120' US of proposed 165' US from Exisiting face
Station Elevation Data num= 496

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
53748.2	12.41	53774.18	12.42	53777.13	12.43	53780.27	12.42	53810.43	12.43
53815.65	12.39	53829.81	12.45	53848.16	12.48	53855.39	12.55	53898.13	12.24
53899.34	12.23	53906.35	12.26	53916.11	12.25	53919.66	12.2	53922.3	12.05
53926.57	12.15	53939.25	12.14	53940.82	12.13	53941.98	12.11	53944.07	12.11
53958.46	11.97	53961.12	11.96	53967.21	11.95	53982.49	12.06	54007.41	12.14
54027.97	12.12	54047.88	12.17	54049.13	12.17	54066.16	12.15	54079.62	12.09
54082.51	12.07	54098.03	12.12	54099.98	12.13	54109.9	12.09	54113.38	12.1
54116.7	12.09	54119.91	12.07	54123.63	12.06	54127.03	12.03	54132.57	12.01
54134.42	12.02	54138.79	12.11	54141.16	12.15	54142.92	12.08	54146.79	12.13
54148.01	12.13	54154.83	12.16	54157.47	12.14	54162.84	11.87	54167.87	11.37
54170.33	11.16	54173.92	10.88	54177.53	10.35	54185.29	9.51	54185.96	9.46
54187.37	9.37	54218.68	9.37	54219.6	9.43	54221.34	9.62	54227.88	10.29

54341.94	11.18 54344.3	11.2754358.06	11.8954361.02	11.954386.32	12.5
54387.38	12.554413.27	12.7354420.89	13.0154423.73	13.0754426.69	13.07
54430.71	13.1754431.39	13.2354446.46	13.1654502.34	12.74 54510.4	12.74
54524.3	12.8854532.49	12.8754541.84	12.8954543.34	12.8954546.24	12.93
54552.54	12.8154567.12	12.6554573.81	12.5454651.61	1354668.45	13.06
54670.95	13.0854683.46	12.8254685.44	12.7954797.98	12.5254800.56	12.45
54806.62	12.5654809.01	12.7154810.54	12.7454815.17	12.6354966.36	11.38
55091.79	12.255097.22	11.955101.25	11.7 55127.6	10.155131.72	10.23
55141.68	10.4255837.66	9.8555841.54	9.7955842.69	9.7355852.26	9.21
55853.65	9.1355859.22	8.8355862.47	8.8355867.33	8.8155870.56	8.76
55873.38	8.7255876.69	8.7855880.99	8.8455882.18	8.8655886.21	8.84
55888.6	8.8555890.58	8.8555898.93	8.8755900.59	8.8755909.69	8.6
55911.9	8.5455914.83	8.4555919.03	8.2955928.63	6.8455929.59	6.72
55931.61	6.9155938.44	7.6355943.39	8.15 55946.8	855948.02	7.95
55949.37	7.8955952.73	7.8455957.59	7.9555959.33	7.9955962.51	8.07
55966.69	855970.14	7.955972.25	7.9955973.35	8.0355975.83	7.79
55976.75	7.6955981.79	7.1855984.06	6.9455986.32	6.9755990.67	7.02
55993.44	7.13 55995.8	7.2355999.07	7.3456005.09	7.5156008.22	7.6
56213.03	6.0156214.78	5.9856216.15	5.9556220.42	5.8556238.08	5.35
56240.68	5.2856243.87	5.1856247.17	4.9556249.73	3.5656250.75	3
56255.45	1.5456258.97	-.0256261.38	-.5956263.01	-.9756264.03	-1.13
56264.49	-1.256266.49	-1.9356269.52	-2.53 56270.7	-2.656273.03	-2.21
56273.6	-2.1156274.39	-1.9856274.94	-1.9356277.08	-.5256280.54	.23
56283.18	.3856284.67	.4656292.75	.9256294.22	1.0156302.33	1.66
56307.94	2.1256311.87	4.656314.06	7.1856319.62	8.3156321.48	8.68
56322.05	8.856322.53	8.956331.06	8.7656335.29	8.6956340.63	8.72
56342.92	8.74 56350.2	8.7856359.77	8.8456369.36	8.956377.87	8.95
56378.94	8.96 56388	9.0856389.52	9.0856398.08	9.1156401.17	9.12
56407.64	9.1356412.82	9.1556417.24	9.1556424.47	9.1356426.82	9.12
56436.12	9.156445.97	9.0756447.76	9.0656455.54	9.0456471.06	8.99
56473.07	8.98 56474.7	956482.71	9.0756484.27	9.0856493.85	9.16
56512.48	9.3156570.46	9.3256575.91	9.3356589.61	9.33 56592.4	9.32
56606.41	9.3156618.33	9.37 56627.9	9.4256637.48	9.47 56645.8	9.51
56647.06	9.5256656.64	9.5756666.21	9.6256680.75	9.7256681.98	9.73
56694.14	10.34 56698.7	10.3356700.73	10.3356704.05	10.1556705.45	10.08
56706.28	1056706.72	9.7556710.73	7.1556711.69	7.2256714.09	8.33
56715.7	9.156716.33	9.4156717.07	9.7156723.66	9.756727.35	9.7
56733.23	9.69 56739	9.6856781.14	9.6456785.59	9.6356788.53	9.63
56790.7	9.6456808.89	9.7256809.85	9.7356816.27	9.76 56829	10
56832.19	10.0656838.57	10.1956848.15	10.3756857.73	10.5556867.14	10.74
56875.27	10.8956876.89	10.9356878.79	10.9656896.04	11.3156902.09	11.36
56924.76	11.556934.33	11.5656937.03	11.57 56943.9	11.6256948.68	11.65
56953.47	11.6756960.33	11.7256963.05	11.7356971.98	11.7956982.21	11.85
56991.77	11.9156993.75	11.9256995.28	11.9357006.25	11.9757009.31	11.98
57010.95	11.9757018.58	11.9657039.68	11.9357042.85	11.9357049.25	11.91
57053.53	11.9157058.83	11.957065.18	11.8857068.45	11.8857076.83	11.86
57077.99	11.8657087.56	11.8457088.48	11.8457097.13	11.8257100.34	11.82
57103.49	11.8457106.69	11.8557116.24	11.8757119.06	11.8757123.42	11.88
57154.59	11.9157158.37	11.9257202.47	11.9657204.97	11.9757212.04	11.97
57216.62	11.9857229.25	11.9957231.19	11.9757239.92	11.92 57241.8	11.9
57242.96	11.7657244.54	11.9557250.35	1257251.57	1257252.58	12.01
57260.62	11.957261.22	11.8357263.21	11.5957264.51	11.4457268.06	11.45
57269.5	11.4457274.86	11.4457276.75	11.4557280.49	12.06 57307.8	12.07
57309.81	12.0857317.38	12.0857321.46	12.0957592.83	12.18 57598.4	12.29
57623.48	12.3857628.15	12.3957632.39	12.3557647.49	12.1857662.57	12.21
57682.8	12.3857702.99	12.0957718.74	12.0357726.24	12.0257727.33	12.02
57728.88	12.0157750.06	12.06 57756.4	12 57759.4	11.9857764.03	12.14
57768.88	12.1257772.41	12.1557779.98	12.0657782.25	11.9957788.16	11.86
57792.73	11.8357797.33	11.6857806.47	11.7457809.25	11.7257812.95	11.76
57834.8	11.68 57842.7	11.73 57845.7	11.7257849.31	11.6157935.13	10.86
58144.17	10.8158151.42	10.6658158.73	10.7758160.61	10.72 58162.9	10.42
58174.43	10.3258180.81	10.2958189.01	10.9158192.09	11.3 58195.2	11.34
58196.3	11.3758197.77	11.3858213.19	11.6458214.14	11.6558222.26	11.58

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58236.01   11.8258237.63   11.8458238.97   11.8458240.79   11.7858246.32   11.69
58252.34   11.6258258.61   11.4658262.17   11.2258265.21   11.0958267.71   11.04
58434.02   11.4858435.69   11.4858438.61    11.558451.66   11.4958461.04   11.42
 58463.4   11.5158465.79   11.6858468.18   11.97 58568.7   11.5358578.64   11.57
58593.29   11.6958599.08   11.6958604.81   11.5258608.97   11.68 58627.5   11.53
58635.24    11.558640.77   11.5158647.12   11.4458664.45   11.1958667.17   11.19
58671.04   11.2258673.26   11.2758681.31   11.4358695.08   11.3458705.47    11.5
58708.46    11.558717.15   11.1958719.44    11.258734.18   11.1558743.11   11.15
58759.95   11.1258768.92   11.14 58770.9   11.1158777.05   11.0958784.93    11.1
58788.29   11.1858801.58   11.2758803.34   11.2658810.86   11.3958813.28   11.19
58823.46   11.1258825.47   11.1158843.12   11.1158855.41   11.0758863.21    11.1
58872.32   11.0958882.03   11.0658902.22   11.5658909.99   11.4958920.55   11.27
58934.13   11.21 58940.9   11.13 58951.1   11.3958955.42   11.4858957.82   11.46
58988.74   11.0859219.37   12.1759230.62   12.4159234.84   12.46 59245.1    12.8
 59259.7   13.1759265.26   13.3959271.14    13.459274.28    13.459281.18   13.45
 59292.5   13.4759319.93   13.4559334.61   13.3159350.28   13.2859372.85   13.19
 59374.5   13.1859378.76   13.1759380.44   13.1659389.48   13.1259596.88      13
59611.97   12.7659613.26   12.7659653.16   12.8459668.44   12.6259675.25   12.48
59682.87   12.4359688.26    12.559695.09   12.4959698.17   12.5359699.75   12.68
59700.46   12.7859706.07   12.7959709.99   13.1259719.89   13.4359721.56   13.47
59723.72   13.4559732.46   13.3259734.16   13.24 59739.3   12.6859740.35   12.55
59741.08   12.3859742.94   12.0859743.52   11.79 59746.5   11.8959747.02   12.01
59748.45   12.2459750.84   12.3759758.71   12.6659764.52   12.6759772.69    12.6
59776.56   12.68 59783.4   12.76 59792.7   12.8159794.74   12.8559797.09   12.97
 59803.2   12.94

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 53748.2      .156255.45     .0356307.94      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      56255.4556307.94              30      30      30             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 53748.2 55962.5    13.9       T
 56538.5 59803.2    14.3       T

CROSS SECTION


RIVER: Thornhill Creek
REACH: Bridge Area          RS: 125

INPUT
Description:
Station Elevation Data      num=     359
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 53748.2   12.4153774.18   12.4253810.43   12.4353855.39    12.553898.13   12.24
53916.11    12.2 53922.3   12.0553926.57    12.153939.25   12.1454113.38    12.1
54127.03   12.0354138.79   12.1154154.83   12.1654162.84   11.8754167.87   11.37
54170.33   11.1654173.92   10.8854177.53    10.354185.29    9.5154185.96    9.46
54187.37    9.3754218.68    9.37 54219.6    9.4354221.34    9.6254227.88   10.29
54341.94   11.18 54344.3   11.2754358.06   11.8954386.32    12.554413.27   12.73
54420.89   13.0154423.73   13.0754430.71   13.1754431.39   13.2354446.46   13.16
54502.34   12.74 54524.3   12.8854543.34   12.8954552.54   12.8154567.12   12.65
54573.81   12.5454651.61      1354668.45   13.0654685.44   12.7954797.98   12.52
54800.56   12.4554806.62   12.5654809.01   12.7154815.17   12.6354966.36   11.38
55091.79    12.255097.22    11.955101.25    11.7 55127.6    10.155131.72   10.23
55141.68   10.4255469.22   11.7655478.88   11.6755491.65   11.5655523.71   12.17
55546.47   11.9755555.84   11.8955556.97   12.0155559.94   12.8755575.18   12.88
55578.95   12.9955585.09   13.1355588.12   13.1955597.37   13.1355614.04   12.79
55620.66   12.6455623.71   12.5655632.31   12.3655636.68   12.2655652.67   12.19
55665.12    12.155666.99   12.0555671.98   11.9355680.82   11.5955700.95   12.21
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55705.57	12.3655709.54	12.52 55713.8	12.5855715.77	12.2655718.25	12.31
55725.51	12.4955728.15	12.4455735.12	12.2655735.85	12.3855736.69	12.58
55741.22	12.3955744.26	12.3155745.44	12.2355759.82	11.3355760.46	11.28
55764.37	11.0455771.13	11.1955780.47	11.5255783.48	11.6255789.53	11.9
55791.11	11.8255795.31	10.87 55797.5	10.3755799.14	1055801.22	9.42
55804.33	9.0155805.95	8.8555816.81	9.15 55818.7	9.21 55842	9.86
55844.25	9.9255845.78	10.0355853.65	9.9855862.71	9.8955874.74	9.81
55888.51	9.6455898.41	9.3255900.23	9.22 55903.7	8.8755907.19	8.51
55913.02	8.4155913.36	8.3655915.91	7.9555923.02	6.755923.37	6.64
55930.29	7.6 55935.2	8.3655936.38	8.5555942.33	8.4155943.65	8.46
55946.85	8.5455954.23	8.7455958.27	8.5355961.64	8.3455964.11	8.21
55970.14	8.0455971.29	7.8955979.25	6.81 55990.6	6.9156004.71	7.02
56115.46	7.6656125.12	7.56 56132.9	7.4256135.43	7.3356140.77	7.15
56144.43	7.0856154.73	6.7456174.05	6.6156178.78	6.5556190.55	6.61
56200.45	6.7156205.92	6.5356212.67	6.3756219.74	6.3156224.24	5.79
56236.54	5.156240.67	456241.64	3.5556244.69	2.1456246.64	1.08
56246.77	1.0456249.61	.3656249.82	.3156254.52	-.7856257.35	-1.21
56258.3	-1.5556260.95	-2.0756261.38	-2.1556264.04	-2.6856266.33	-2.42
56267.4	-2.32 56270.6	-.2456271.59	.456273.01	.756273.26	.76
56295.94	2.0456296.32	1.8356298.17	.78 56298.7	1.1456299.57	1.21
56301.44	1.3756304.09	3.7456307.38	6.6156307.97	6.8956308.34	7.07
56309.22	7.4356309.66	7.6156319.95	7.9956324.03	8.1556365.88	8.58
56374.32	8.6756386.46	8.6956401.17	8.5356405.11	8.4856444.07	8.05
56471.06	7.9756540.95	8.4956587.56	8.8756598.22	8.9656608.53	9.07
56618.19	9.1556668.74	9.5456675.46	9.8556676.12	9.9156681.31	10.23
56699.09	10.2556700.63	10.3156703.92	8.8156704.05	8.7256704.14	8.67
56705.09	8.0256705.96	7.4356706.82	6.8756711.84	7.0156712.76	9.39
56713.9	9.9456772.68	9.93 56797.5	9.9556811.29	9.9656820.54	10.09
56855.49	10.7656859.57	10.8156888.53	11.0856896.93	11.1656913.52	11.19
56927.16	11.2156971.36	11.3556994.74	11.4357018.58	11.5257041.27	11.59
57065.35	11.6257096.82	11.5657120.26	11.5857135.07	11.5957168.53	11.61
57229.55	11.6657237.06	11.0757243.54	11.8457244.15	1257259.77	11.91
57263.12	11.5157263.58	11.45 57270.6	12.05 57284.4	12.1257300.69	12.24
57333.11	12.2757592.83	12.18 57598.4	12.2957623.48	12.3857647.49	12.18
57662.57	12.21 57682.8	12.3857702.99	12.0957718.74	12.0357750.06	12.06
57756.4	1257764.03	12.1457779.98	12.0657782.25	11.9957788.16	11.86
57797.33	11.6857806.47	11.74 57834.8	11.6857849.31	11.6157935.13	10.86
58144.17	10.8158151.42	10.6658158.73	10.7758160.61	10.72 58162.9	10.42
58174.43	10.3258189.01	10.9158192.09	11.3 58196.3	11.3758213.19	11.64
58222.26	11.5858236.01	11.8258252.34	11.6258258.61	11.4658262.17	11.22
58265.21	11.0958267.71	11.0458434.02	11.4858451.66	11.4958461.04	11.42
58463.4	11.5158465.79	11.6858468.18	11.97 58568.7	11.5358593.29	11.69
58604.81	11.5258608.97	11.68 58627.5	11.5358640.77	11.5158647.12	11.44
58664.45	11.1958673.26	11.2758681.31	11.4358695.08	11.3458705.47	11.5
58717.15	11.1958734.18	11.1558759.95	11.1258777.05	11.0958801.58	11.27
58810.86	11.3958813.28	11.1958823.46	11.1258843.12	11.1158855.41	11.07
58872.32	11.0958902.22	11.5658909.99	11.4958920.55	11.2758934.13	11.21
58940.9	11.13 58951.1	11.3958955.42	11.4858988.74	11.0859219.37	12.17
59230.62	12.4159234.84	12.46 59245.1	12.8 59259.7	13.1759265.26	13.39
59281.18	13.4559319.93	13.4559334.61	13.3159350.28	13.2859372.85	13.19
59389.48	13.1259596.88	1359611.97	12.7659653.16	12.8459668.44	12.62
59675.25	12.4859688.26	12.559699.75	12.6859700.46	12.7859709.99	13.12
59719.89	13.4359732.46	13.3259734.16	13.24 59739.3	12.6859740.35	12.55
59741.08	12.3859742.94	12.0859743.52	11.79 59746.5	11.8959747.02	12.01
59748.45	12.2459750.84	12.3759758.71	12.6659772.69	12.659776.56	12.68
59783.4	12.76 59792.7	12.8159797.09	12.97 59803.2	12.94	

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
53748.2	.156246.77	.03 56298.7	.1		

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
56246.77	56298.7	250	250	250	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
53748.2	56007.5	13.9	T
56493.5	59803.2	14.3	T

BRIDGE

RIVER: Thornhill Creek
REACH: Bridge Area RS: -47

INPUT
Description:
Distance from Upstream XS = 158
Deck/Roadway Width = 28
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 34

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
5300	14.27	0	54300	14.9	0	54800	13.75	0
55300	14.44	0	55500	14	0	55550	14	0
55600	14	0	55650	14	0	55700	14	0
55750	14	0	55800	14	0	55850	14	0
55900	14	0	55950	14.1	0	56000	14.1	0
56050	14.2	0	56100	14.2	0	56150	14.3	0
56200	14.3	0	56210	14.3	0	56210	14.3	11.54
56237	14.34	11.58	56264	14.37	11.62	56291	14.41	11.65
56291	14.41	0	56300	14.41	0	56350	14.41	0
56400	14.27	0	56450	14.27	0	56500	14.27	0
56550	14.27	0	56600	14.05	0	56650	14.02	0
60000	14.6	0						

Upstream Bridge Cross Section Data
Station Elevation Data num= 359

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
53748.2	12.4	153774.18	12.42	53810.43	12.43	53855.39	12.55	3898.13	12.24
53916.11	12.2	53922.3	12.05	53926.57	12.15	3939.25	12.14	54113.38	12.1
54127.03	12.03	54138.79	12.11	54154.83	12.16	54162.84	11.87	54167.87	11.37
54170.33	11.16	54173.92	10.88	54177.53	10.35	4185.29	9.51	54185.96	9.46
54187.37	9.37	54218.68	9.37	54219.6	9.43	54221.34	9.62	54227.88	10.29
54341.94	11.18	54344.3	11.27	54358.06	11.89	54386.32	12.55	4413.27	12.73
54420.89	13.01	54423.73	13.07	54430.71	13.17	54431.39	13.23	54446.46	13.16
54502.34	12.74	54524.3	12.88	54543.34	12.89	54552.54	12.81	54567.12	12.65
54573.81	12.54	54651.61		1354668.45	13.06	54685.44	12.79	54797.98	12.52
54800.56	12.45	54806.62	12.56	54809.01	12.71	54815.17	12.63	54966.36	11.38
55091.79	12.2	55097.22	11.9	55101.25	11.7	55127.6	10.1	55131.72	10.23
55141.68	10.42	55469.22	11.76	55478.88	11.67	55491.65	11.56	55523.71	12.17
55546.47	11.97	55555.84	11.89	55556.97	12.01	55559.94	12.87	55575.18	12.88
55578.95	12.99	55585.09	13.13	55588.12	13.19	55597.37	13.13	55614.04	12.79
55620.66	12.64	55623.71	12.56	55632.31	12.36	55636.68	12.26	55652.67	12.19
55665.12	12.1	55666.99	12.05	55671.98	11.93	55680.82	11.59	55700.95	12.21
55705.57	12.36	55709.54	12.52	55713.8	12.58	55715.77	12.26	55718.25	12.31
55725.51	12.49	55728.15	12.44	55735.12	12.26	55735.85	12.38	55736.69	12.58
55741.22	12.39	55744.26	12.31	55745.44	12.23	55759.82	11.33	55760.46	11.28
55764.37	11.04	55771.13	11.19	55780.47	11.52	55783.48	11.62	55789.53	11.9
55791.11	11.82	55795.31	10.87	55797.5	10.37	55799.14		1055801.22	9.42
55804.33	9.01	55805.95	8.85	55816.81	9.15	55818.7	9.21	55842	9.86
55844.25	9.92	55845.78	10.03	55853.65	9.98	55862.71	9.89	55874.74	9.81
55888.51	9.64	55898.41	9.32	55900.23	9.22	55903.7	8.87	55907.19	8.51
55913.02	8.41	55913.36	8.36	55915.91	7.95	55923.02	6.75	5923.37	6.64
55930.29	7.6	55935.2	8.36	55936.38	8.55	55942.33	8.41	55943.65	8.46
55946.85	8.54	55954.23	8.74	55958.27	8.53	55961.64	8.34	55964.11	8.21
55970.14	8.04	55971.29	7.89	55979.25	6.81	55990.6	6.91	56004.71	7.02

56115.46	7.6656125.12	7.56 56132.9	7.4256135.43	7.3356140.77	7.15
56144.43	7.0856154.73	6.7456174.05	6.6156178.78	6.5556190.55	6.61
56200.45	6.7156205.92	6.5356212.67	6.3756219.74	6.3156224.24	5.79
56236.54	5.156240.67	456241.64	3.5556244.69	2.1456246.64	1.08
56246.77	1.0456249.61	.3656249.82	.3156254.52	-.7856257.35	-1.21
56258.3	-1.5556260.95	-2.0756261.38	-2.1556264.04	-2.6856266.33	-2.42
56267.4	-2.32 56270.6	-.2456271.59	.456273.01	.756273.26	.76
56295.94	2.0456296.32	1.8356298.17	.78 56298.7	1.1456299.57	1.21
56301.44	1.3756304.09	3.7456307.38	6.6156307.97	6.8956308.34	7.07
56309.22	7.4356309.66	7.6156319.95	7.9956324.03	8.1556365.88	8.58
56374.32	8.6756386.46	8.6956401.17	8.5356405.11	8.4856444.07	8.05
56471.06	7.9756540.95	8.4956587.56	8.8756598.22	8.9656608.53	9.07
56618.19	9.1556668.74	9.5456675.46	9.8556676.12	9.9156681.31	10.23
56699.09	10.2556700.63	10.3156703.92	8.8156704.05	8.7256704.14	8.67
56705.09	8.0256705.96	7.4356706.82	6.8756711.84	7.0156712.76	9.39
56713.9	9.9456772.68	9.93 56797.5	9.9556811.29	9.9656820.54	10.09
56855.49	10.7656859.57	10.8156888.53	11.0856896.93	11.1656913.52	11.19
56927.16	11.2156971.36	11.3556994.74	11.4357018.58	11.5257041.27	11.59
57065.35	11.6257096.82	11.5657120.26	11.5857135.07	11.5957168.53	11.61
57229.55	11.6657237.06	11.0757243.54	11.8457244.15	1257259.77	11.91
57263.12	11.5157263.58	11.45 57270.6	12.05 57284.4	12.1257300.69	12.24
57333.11	12.2757592.83	12.18 57598.4	12.2957623.48	12.3857647.49	12.18
57662.57	12.21 57682.8	12.3857702.99	12.0957718.74	12.0357750.06	12.06
57756.4	1257764.03	12.1457779.98	12.0657782.25	11.9957788.16	11.86
57797.33	11.6857806.47	11.74 57834.8	11.6857849.31	11.6157935.13	10.86
58144.17	10.8158151.42	10.6658158.73	10.7758160.61	10.72 58162.9	10.42
58174.43	10.3258189.01	10.9158192.09	11.3 58196.3	11.3758213.19	11.64
58222.26	11.5858236.01	11.8258252.34	11.6258258.61	11.4658262.17	11.22
58265.21	11.0958267.71	11.0458434.02	11.4858451.66	11.4958461.04	11.42
58463.4	11.5158465.79	11.6858468.18	11.97 58568.7	11.5358593.29	11.69
58604.81	11.5258608.97	11.68 58627.5	11.5358640.77	11.5158647.12	11.44
58664.45	11.1958673.26	11.2758681.31	11.4358695.08	11.3458705.47	11.5
58717.15	11.1958734.18	11.1558759.95	11.1258777.05	11.0958801.58	11.27
58810.86	11.3958813.28	11.1958823.46	11.1258843.12	11.1158855.41	11.07
58872.32	11.0958902.22	11.5658909.99	11.4958920.55	11.2758934.13	11.21
58940.9	11.13 58951.1	11.3958955.42	11.4858988.74	11.0859219.37	12.17
59230.62	12.4159234.84	12.46 59245.1	12.8 59259.7	13.1759265.26	13.39
59281.18	13.4559319.93	13.4559334.61	13.3159350.28	13.2859372.85	13.19
59389.48	13.1259596.88	1359611.97	12.7659653.16	12.8459668.44	12.62
59675.25	12.4859688.26	12.559699.75	12.6859700.46	12.7859709.99	13.12
59719.89	13.4359732.46	13.3259734.16	13.24 59739.3	12.6859740.35	12.55
59741.08	12.3859742.94	12.0859743.52	11.79 59746.5	11.8959747.02	12.01
59748.45	12.2459750.84	12.3759758.71	12.6659772.69	12.659776.56	12.68
59783.4	12.76 59792.7	12.8159797.09	12.97 59803.2	12.94	

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
53748.2	.156246.77		.03 56298.7		.1

Bank Sta: Left Right Coeff Contr. Expan.

56246.77	56298.7	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
53748.2	56007.5	13.9	T
56493.5	59803.2	14.3	T

Downstream Deck/Roadway Coordinates
num= 34

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
5300	14.27	0	54300	14.9	0	54800	13.75	0
55300	14.44	0	55500	14	0	55550	14	0
55600	14	0	55650	14	0	55700	14	0
55750	14	0	55800	14	0	55850	14	0

55900	14	0	55950	14.1	0	56000	14.1	0
56050	14.2	0	56100	14.2	0	56150	14.3	0
56200	14.3	0	56210	14.3	0	56210	14.3	11.54
56237	14.34	11.58	56264	14.37	11.62	56291	14.41	11.65
56291	14.41	0	56300	14.41	0	56350	14.41	0
56400	14.27	0	56450	14.27	0	56500	14.27	0
56550	14.27	0	56600	14.05	0	56650	14.02	0
60000	14.6	0						

Downstream Bridge Cross Section Data
Station Elevation Data num= 332

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
53748.2	12.4	55469.22	12.8	55474.66	12.78	55476.26	12.69	55485.16	12.34
55489.97	12.19	55492.71	12.1	55493.43	12.08	55499.38	11.93	55500.34	11.94
55500.62	11.94	55503.49	11.96	55517.46	12.37	55517.64	12.38	55518.58	12.4
55518.71	12.44	55519.12	12.6	55519.69	12.73	55521.08	12.77	55526.14	12.95
55529.36	13.03	55529.74	13.03	55531.45	13.07	55533.54	13.11	55541.55	12.97
55541.82	12.96	55546.41	12.82	55547.46	12.49	55547.91	12.31	55548.47	12.3
55552.19	12.29	55562.28	12.24	55562.56	12.23	55563.39	12.21	55563.52	12.21
55572.93	12.17	55573.49	12.17	55574.32	12.4	55575.27	12.25	55576.29	11.72
55576.59	11.7	55577.6	11.74	55578.15	11.83	55583.3	12.72	55583.67	12.78
55585.25	13.03	55585.57	13.05	55602.36	13.28	55604.04	13.31	55614.41	13.45
55614.46	13.46	55615.26	13.47	55624.78	13.36	55626.57	13.35	55626.97	13.34
55656.38	13.35	55662.87	13.32	55666.26	13.31	55674.98	13.27	55676.63	13.27
55687	13.23	55687.08	13.23	55697.37	13.19	55698.64	13.18	55699.18	13.19
55718.11	13.3	55723.39	13.34	55727.16	13.36	55728.48	13.35	55746.62	13.25
55747.6	13.23	55748.26	13.22	55749.22	13.22	55754.1	13.24	55759.59	13.2
55759.7	13.2	55769.97	13.12	55771.8	13.1	55778.26	13.05	55780.34	13.04
55783.91	13.03	55797.89	12.96	55801.08	12.92	55808.11	12.82	55811.45	12.78
55816.92	12.7	55820.22	12.71	55821.82	12.71	55832.19	12.73	55834.74	12.73
55860.56	12.92	55861.41	12.91	55863.3	12.92	55863.68	12.92	55868.63	12.94
55877.33	12.96	55891.34	12.87	55892.26	12.87	55892.83	12.86	55893.29	12.85
55902.92	13.03	55904.78	13.19	55904.94	13.2	55907.36	13.41	55915.15	13.27
55915.44	13.26	55917.04	13.25	55920.31	13.22	55925.52	13.2	55926.42	13.2
55929.14	13.03	55935.89	12.62	55937.79	12.5	55940.4	12.26	55941.25	12.25
55941.9	12.24	55947.42	12.33	55947.7	12.33	55953.35	12.19	55956.63	12.1
55956.79	12.1	55963.2	12.81	55965.45	13.01	55966.37	13.1	55967	13.1
55970.97	13.08	55996.86	13.05	56004.95	12.54	56008.48	12.29	56008.83	12.27
56009.01	12.27	56018.85	12.04	56018.97	12.04	56025.97	11.9	56029.22	11.83
56049.97	11.42	56050.18	11.41	56059.34	11.23	56060.34	11.13	56061.75	10.98
56062.28	10.95	56070.71	10.4	56074.38	10.17	56086.49	9.38	56086.69	9.37
56106.64	9.57	56120.51	9.29	56122.56	9.23	56122.79	9.22	56147	8.48
56158.88	8.17	56159.1	8.16	56164.04	7.99	56166.72	7.89	56184.54	7.44
56184.78	7.44	56186.64	7.43	56195.15	7.04	56195.41	7.02	56198.56	6.88
56219.44	5.6	56219.62	5.57	56219.91	5.53	56221.54	5.06	56231.72	2.55
56233.81	2.04	56236.63	1.72	56239.9	1.34	56240.24	1.31	56240.34	1.26
56243.31	.35	56243.83	.11	56247	-1.36	56248.25	-1.93	56251.43	-1.6
56255.93	-2.08	56260.36	-2.54	56262.24	-2.46	56262.24	-1.86	56262.65	-1.44
56262.94	-1.31	56263.23	-1.19	56270.89	1.99	56276.13	2.01	56278.11	1.99
56279.3	1.98	56280.14	1.97	56288.48	1.89	56292.24	1.86	56304.14	1.74
56304.34	1.74	56307.46	1.64	56312.39	1.16	56316.45	1.4	56316.74	1.42
56326.56	1.67	56329.97	1.86	56331.15	1.92	56333.68	1.96	56340.34	2.41
56340.65	2.43	56345.41	2.75	56350.71	3.07	56355.01	3.34	56359.61	3.97
56361.08	4.53	56361.4	4.65	56362.08	4.82	56362.61	4.82	56363.41	4.87
56371.45	4.82	56376.96	4.82	56381.82	4.81	56402.77	4.8	56403.77	4.95
56412.93	5.12	56413.27	5.13	56418.5	5.22	56433.04	4.74	56433.67	4.79
56444.04	5.69	56444.48	5.73	56449.58	5.88	56454.41	6.01	56475.15	6.61
56481.73	6.79	56485.52	6.9	56485.89	6.91	56489.82	7.03	56495.89	7.01
56497.99	7.01	56534.3	6.91	56537.37	6.91	56545.02	6.88	56546.41	6.89
56547.74	6.89	56558.11	6.92	56558.51	6.92	56568.48	6.94	56570.61	6.94
56606.92	7.02	56609.34	7.02	56609.97	7.01	56611.21	7	56614.51	7.03
56749.96	8.03	56752.16	8.03	56755.15	8.02	56766.54	8.01	56772.04	8.04
56772.83	7.98	56775.89	8	56776.37	8	56786.26	8.06	56788.47	8.07

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56792.99     8.156796.54    8.1356796.63    8.1356799.04    8.1856836.88    7.94
56838.11    7.9456848.48    7.8756848.98    7.8656858.85     7.856861.09    7.79
56869.05    7.7356869.22    7.7356873.19    7.6756874.63    7.6456917.94    8.68
 56921.6    8.7556923.22    8.7956923.88    8.7856926.94    8.7856931.45    8.15
 56932.2    8.0456933.71    8.1756939.58    8.64 56940.2    8.5856940.33    8.58
56941.82    8.6156957.91    8.9756961.22    9.0456962.56    9.0856963.03    9.09
56964.28    9.0856965.48    9.0957017.25    9.0757018.43    9.0857023.53    9.11
57024.78    9.1257042.63    9.1557045.52    9.1557054.74    9.1757055.89    9.17
57066.26    9.1957066.84    9.1957076.63    9.2157078.94    9.2157080.71    9.22
57082.73    9.21   57087    9.2157091.05    9.2357127.36    9.3657128.48    9.36
57136.26    9.3957138.85    9.4157139.46    9.41 57179.6    9.7257180.34    9.72
57199.98    9.8557201.08    9.8657202.68    9.8757211.45    9.8857212.08    9.88
57219.93    9.8957221.82    9.9157224.18    9.9257228.81    9.9557252.93     9.9
57257.93    9.8857260.49     9.9 57263.3    9.9157272.59    9.9657273.67    9.97
57283.62   10.02 57284.7   10.02 57308.9   10.1957311.55    10.257315.15   10.22
57333.11   10.28 59803.2   12.94

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
 53748.2      .156219.91     .0356270.89      .1

Bank Sta: Left   Right    Coeff Contr.   Expan.
      56219.9156270.89             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 53748.2   56075    13.9       T
   56426 59803.2    14.3       T

Upstream Embankment side slope                =       2 horiz. to 1.0 vertical
Downstream Embankment side slope              =       2 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins           =    12.6
Energy head used in spillway design           =
Spillway height used in design                =
Weir crest shape                              = Broad Crested

Number of Abutments =  2

Abutment Data
Upstream     num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   56210   11.54   56210    9.54   56214    9.5456233.08       0
Downstream     num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   56210   11.54   56210    9.54   56214    9.5456233.08       0

Abutment Data
Upstream     num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   56277    -.35   56287    9.65   56291    9.65   56291   11.65
Downstream     num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   56277    -.35   56287    9.65   56291    9.65   56291   11.65

Number of Piers =  2

Pier Data
Pier Station     Upstream=   56237    Downstream=   56237
Upstream     num=       2
    Width   Elev    Width   Elev
       1       0       1     14
Downstream     num=       2
    Width   Elev    Width   Elev
```

```
       1       0       1      14

Pier Data
Pier Station     Upstream=   56264    Downstream=   56264
Upstream     num=       2
    Width   Elev    Width   Elev
       1       0       1      14
Downstream     num=       2
    Width   Elev    Width   Elev
       1       0       1      14

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       W.S. Pro Method

  W.S.Pro Data
    Left Embankment
       El of the top of the embankment = 14
       El of the toe of the abutment   = 6.19
    Right Embankment
       El of the top of the embankment = 13.57
       El of the toe of the abutment   = 1.05
    Abtument Type                      = 3 Sloping abutments and sloping embankments
    Slope of abutments                 = 1.5
    Top with of embankment             = 36
    Centroid station of bridge opening =
    Wing Wall Type                     = No wing walls present
       Width                           =
       Angle                           =
       Radius                          =
    Guide Banks Type                   = No Guide Bank present
       Length                          =
       Offset                          =
       Angle                           =

Selected Low Flow Methods = W.S.Pro Method

High Flow Method
       Pressure and Weir flow
           Submerged Inlet Cd          =
           Submerged Inlet + Outlet Cd =      .8
           Max Low Cord                =

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION


RIVER: Thornhill Creek
REACH: Bridge Area        RS: -125

INPUT
Description:
Station Elevation Data    num=     332
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 53748.2   12.4155469.22   12.8855474.66   12.7855476.26   12.6955485.16   12.34
55489.97   12.1955492.71    12.155493.43   12.0855499.38   11.9355500.34   11.94
```

55500.62	11.9455503.49	11.9655517.46	12.3755517.64	12.3855518.58	12.4
55518.71	12.4455519.12	12.655519.69	12.7355521.08	12.7755526.14	12.95
55529.36	13.0355529.74	13.0355531.45	13.0755533.54	13.1155541.55	12.97
55541.82	12.9655546.41	12.8255547.46	12.4955547.91	12.3155548.47	12.3
55552.19	12.2955562.28	12.2455562.56	12.2355563.39	12.2155563.52	12.21
55572.93	12.1755573.49	12.1755574.32	12.455575.27	12.2555576.29	11.72
55576.59	11.7 55577.6	11.7455578.15	11.83 55583.3	12.7255583.67	12.78
55585.25	13.0355585.57	13.0555602.36	13.2855604.04	13.3155614.41	13.45
55614.46	13.4655615.26	13.4755624.78	13.3655626.57	13.3555626.97	13.34
55656.38	13.3555662.87	13.3255666.26	13.3155674.98	13.2755676.63	13.27
55687	13.2355687.08	13.2355697.37	13.1955698.64	13.1855699.18	13.19
55718.11	13.355723.39	13.3455727.16	13.3655728.48	13.3555746.62	13.25
55747.6	13.2355748.26	13.2255749.22	13.22 55754.1	13.2455759.59	13.2
55759.7	13.255769.97	13.12 55771.8	13.155778.26	13.0555780.34	13.04
55783.91	13.0355797.89	12.9655801.08	12.9255808.11	12.8255811.45	12.78
55816.92	12.755820.22	12.7155821.82	12.7155832.19	12.7355834.74	12.73
55860.56	12.9255861.41	12.91 55863.3	12.9255863.68	12.9255868.63	12.94
55877.33	12.9655891.34	12.8755892.26	12.8755892.83	12.8655893.29	12.85
55902.92	13.0355904.78	13.1955904.94	13.255907.36	13.4155915.15	13.27
55915.44	13.2655917.04	13.2555920.31	13.2255925.52	13.255926.42	13.2
55929.14	13.0355935.89	12.6255937.79	12.5 55940.4	12.2655941.25	12.25
55941.9	12.2455947.42	12.33 55947.7	12.3355953.35	12.1955956.63	12.1
55956.79	12.1 55963.2	12.8155965.45	13.0155966.37	13.1 55967	13.1
55970.97	13.0855996.86	13.0556004.95	12.5456008.48	12.2956008.83	12.27
56009.01	12.2756018.85	12.0456018.97	12.0456025.97	11.956029.22	11.83
56049.97	11.4256050.18	11.4156059.34	11.2356060.34	11.1356061.75	10.98
56062.28	10.9556070.71	10.456074.38	10.1756086.49	9.3856086.69	9.37
56106.64	9.5756120.51	9.2956122.56	9.2356122.79	9.22 56147	8.48
56158.88	8.17 56159.1	8.1656164.04	7.9956166.72	7.8956184.54	7.44
56184.78	7.4456186.64	7.4356195.15	7.0456195.41	7.0256198.56	6.88
56219.44	5.656219.62	5.5756219.91	5.5356221.54	5.0656231.72	2.55
56233.81	2.0456236.63	1.72 56239.9	1.3456240.24	1.3156240.34	1.26
56243.31	.3556243.83	.11 56247	-1.3656248.25	-1.9356251.43	-1.6
56255.93	-2.0856260.36	-2.5456262.24	-2.4656267.04	-1.8656267.45	-1.44
56267.74	-1.3156268.03	-1.1956275.69	1.9956276.13	2.0156278.11	1.99
56279.3	1.9856280.14	1.9756288.48	1.8956292.24	1.8656304.14	1.74
56304.34	1.7456307.46	1.6456312.39	1.1656316.45	1.456316.74	1.42
56326.56	1.6756329.97	1.8656331.15	1.9256333.68	1.9656340.34	2.41
56340.65	2.4356345.41	2.7556350.71	3.0756355.01	3.3456359.61	3.97
56361.08	4.53 56361.4	4.6556362.08	4.8256362.61	4.8256363.41	4.87
56371.45	4.8256376.96	4.8256381.82	4.8156402.77	4.856403.77	4.95
56412.93	5.1256413.27	5.13 56418.5	5.2256433.04	4.7456433.67	4.79
56444.04	5.6956444.48	5.7356449.58	5.8856454.41	6.0156475.15	6.61
56481.73	6.7956485.52	6.956485.89	6.9156489.82	7.0356495.89	7.01
56497.99	7.01 56534.3	6.9156537.37	6.9156545.02	6.8856546.41	6.89
56547.74	6.8956558.11	6.9256558.51	6.9256568.48	6.9456570.61	6.94
56606.92	7.0256609.34	7.0256609.97	7.0156611.21	756614.51	7.03
56749.96	8.0356752.16	8.0356755.15	8.0256766.54	8.0156772.04	8.04
56772.83	7.9856775.89	856776.37	856786.26	8.0656788.47	8.07
56792.99	8.156796.54	8.1356796.63	8.1356799.04	8.1856836.88	7.94
56838.11	7.9456848.48	7.8756848.98	7.8656858.85	7.856861.09	7.79
56869.05	7.7356869.22	7.7356873.19	7.6756874.63	7.6456917.94	8.68
56921.6	8.7556923.22	8.7956923.88	8.7856926.94	8.7856931.45	8.15
56932.2	8.0456933.71	8.1756939.58	8.64 56940.2	8.5856940.33	8.58
56941.82	8.6156957.91	8.9756961.22	9.0456962.56	9.0856963.03	9.09
56964.28	9.0856965.48	9.0957017.25	9.0757018.43	9.0857023.53	9.11
57024.78	9.1257042.63	9.1557045.52	9.1557054.74	9.1757055.89	9.17
57066.26	9.1957066.84	9.1957076.63	9.2157078.94	9.2157080.71	9.22
57082.73	9.21 57087	9.2157091.05	9.2357127.36	9.3657128.48	9.36
57136.26	9.3957138.85	9.4157139.46	9.41 57179.6	9.7257180.34	9.72
57199.98	9.8557201.08	9.8657202.68	9.8757211.45	9.8857212.08	9.88
57219.93	9.8957221.82	9.9157224.18	9.9257228.81	9.9557252.93	9.9
57257.93	9.8857260.49	9.9 57263.3	9.9157272.59	9.9657273.67	9.97

57283.62	10.02	57284.7	10.02	57308.9	10.195	7311.55	10.25	7315.15	10.22		
57333.11	10.28	59803.2	12.94								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
53748.2	.15	6219.91	.03	56275.69	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
56219.9	56275.69	325	325	325	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
53748.2	56075	13.9	T
56426	59803.2	14.3	T

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: -450.*

INPUT
Description:
Station Elevation Data num= 213

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
54350.52	12.55	5497.42	11.08	55511.67	11.14	55513.03	11.15	55525.93	11.2
55528.34	11.21	55533.49	11.23	55540.19	11.26	55543.82	11.27	55554.45	11.26
55568.7	11.26	55580.56	11.25	55582.96	11.25	55597.21	11.24	55611.47	11.23
55616.89	11.23	55625.73	11.22	55632.79	11.22	55639.98	11.21	55648.87	11.21
55654.24	11.2	55668.5	11.2	55673	11.19	55682.75	11.19	55685.01	11.19
55697.01	11.18	55707.89	11.17	55711.27	11.17	55725.52	11.16	55737.23	11.15
55739.78	11.15	55753.91	11.14	55754.04	11.14	55768.3	11.13	55782.55	11.13
55789.45	11.12	55796.81	11.12	55811.06	11.11	55824.61	11.15	5825.32	11.09
55839.58	11.02	55841.68	11.01	55853.84	10.94	55858.95	10.91	55868.09	10.82
55882.29	10.67	55882.35	10.67	55893.9	10.56	55896.61	10.56	55910.86	10.55
55917.18	10.54	55925.12	10.54	55939.38	10.53	55946.12	10.53	55952.05	10.52
55953.63	10.52	55963.98	10.51	55967.89	10.51	55982.15	10.55	5986.94	10.5
55996.4	10.49	55998.34	10.49	56010.66	10.37	56024.91	10.22	56032.32	10.15
56039.17	10.08	56050.57	9.96	56053.43	9.94	56056.7	9.95	6067.69	9.79
56069.03	9.78	56081.95	9.64	56096.2	9.55	6102.79	9.43	56110.46	9.35
56124.71	9.21	56136.18	9.09	56138.97	9.06	56153.23	8.91	56155.01	8.9
56167.48	8.77	56174.07	8.71	56181.74	8.59	56196	8.38	56196.23	8.37
56207.23	8.21	56210.25	8.16	56224.51	7.95	56231.1	7.85	56238.77	7.74
56253.02	7.52	56259.45	7.43	56267.28	7.38	56279.12	7.32	56279.21	7.32
56281.54	7.31	56295.79	7.21	56307.34	7.14	56310.05	7.05	56313.96	6.92
56315.05	6.88	56315.26	6.88	56322.38	6.61	56324.3	6.51	56338.56	5.76
56352.82	5.02	56355.67	4.87	56360.85	5.25	6361.22	5.15	56361.25	5.14
56364.57	4.99	56367.08	4.88	56367.75	4.85	56367.85	4.85	56367.89	4.81
56367.98	4.73	56368.82	3.95	56375.59	-2.31	56377.23	-3.83	56377.58	-3.96
56395	-3.96	56396.06	-3.67	56398.38	-2.58	56398.94	-2.33	56400.25	-1.73
56402.73	-.65	56404.3	-.77	56404.52	-.71	56404.97	-.59	56407.88	.06
56410.09	.58	56412.18	1.05	56415.53	1.75	6415.68	1.74	56419.43	2.53
56419.65	2.54	56419.69	2.54	56419.8	2.55	56421.6	2.75	6424.13	2.89
56428.24	3.22	56428.47	3.23	56432.34	3.54	56434.88	3.95	6435.28	3.96
56441.51	4.14	56445.06	4.24	56446.18	4.27	56448.14	4.33	56448.76	4.35
56454.13	4.55	6454.42	4.51	56454.66	4.51	56454.78	4.52	56457.02	4.72
56461.41	5.14	56468.05	5.76	56469.05	5.85	56471.67	6.15	6474.68	6.42
56481.32	7.11	56487.95	7.81	56488.27	7.84	56489.34	7.89	56490.3	7.93
56492.78	8.12	56499.98	8.19	56509.62	8.35	6518.75	8.39	56529.91	8.51
56536.21	8.58	56550.2	8.73	56570.49	8.94	56590.78	9.16	56597.74	9.24
56611.07	9.38	56627.06	9.55	56631.36	9.59	56651.65	9.81	56671.94	10.02
56692.23	10.24	56695.48	10.28	56707.1	10.45	6712.52	10.46	56717.91	10.52
56732.8	10.59	56753.09	10.75	6773.38	10.85	6793.23	10.91	56793.67	10.91
56808.77	10.91	56813.96	10.91	56834.25	10.91	56848.37	10.91	56854.54	10.91

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56874.83   10.9156890.98   10.9156895.12   10.9156895.46   10.9156899.64   10.91
56915.41   10.91 56935.7   10.9156942.55   10.9156955.98   10.9156976.27   10.91
56988.71   10.9256989.64   10.92 56990.5   10.9256996.56   10.9557013.87   11.05
57016.85   11.0657037.14   11.1758660.25    12.5

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
54350.52      .156367.85     .0356419.43      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      56367.8556419.43              260     260     260             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
54350.52 55977.5    13.9       T
 56523.558660.25    14.3       T

CROSS SECTION


RIVER: Thornhill Creek
REACH: Bridge Area          RS: -710

INPUT
Description:
Station Elevation Data      num=     164
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
54952.85      1255757.31   10.5655767.31   10.6955768.26   10.7155777.31   10.83
   55779   10.8555782.61    10.955787.31   10.9755789.86      1155797.31      11
55807.31      1155815.63      1155817.31      1155827.31      1155837.31      11
55841.11      1155847.31      1155852.26      1155857.31      1155863.54      11
55867.31      1155877.31      1155880.47      1155887.31      1155888.89      11
55897.31      1155904.94      1155907.31      1155917.31      1155925.52      11
55927.31      1155937.22      1155937.31      1155947.31      1155957.31      11
55962.15      1155967.31      1155977.31      1155986.81      1155987.31   10.99
55997.31   10.8655998.78   10.8456007.31   10.72 56010.9   10.6756017.31   10.49
56027.27   10.2256027.31   10.2256035.41      1056037.31      1056047.31      10
56051.74      1056057.31      1056067.31      1056072.04      10 56076.2      10
56077.31      1056084.57      1056087.31      1056097.31      1056100.67      10
56107.31      1056108.67      1056117.31    9.7656127.31    9.49 56132.5    9.35
56137.31    9.22 56145.3       956147.31    8.95 56149.6    8.8856157.31    8.67
56158.25    8.6556167.31     8.456177.31    8.1356181.93       856187.31    7.85
56197.31    7.5856205.35    7.3656207.31    7.3156217.31    7.0356218.56       7
56227.31    6.7656231.93    6.6456237.31    6.4256247.31    6.0156247.47       6
56255.19    5.6856257.31     5.656267.31    5.1956271.93       556277.31    4.78
56287.31    4.3756291.82    4.1956297.31    4.1156305.61       456305.68       4
56307.31    3.9756317.31     3.856327.31    3.6456330.05    3.5956337.31    3.47
56347.31     3.356357.31    3.1456365.55       356367.31       356367.78       3
56367.85       356372.93  -3.77556407.77  -3.77556412.85       356415.17       3
56417.31       356425.49       356426.04       356427.31       356437.31       3
 56438.6       356447.31    3.3856452.56     3.656457.31    3.8156461.81       4
56467.31    4.2456470.41    4.3756477.31    4.6756487.31     5.156497.31    5.53
56500.74    5.6856507.31    5.9656515.19     6.356517.31    6.3956527.31    6.82
56537.31    7.2556547.31    7.6856548.91    7.7556554.64       856557.31    8.11
56559.97    8.2356567.31    8.3856577.31    8.5956587.31     8.856597.09       9
56597.31       956604.75       956607.31       956617.31       956624.27       9
56627.31       956637.31       956645.27       956647.31       956647.48       9
56649.54       956657.31       956667.31       956670.69       956677.31       9
56687.31       956693.44       9 56693.9       956694.32       956697.31    9.07
56705.84    9.2656707.31    9.2956717.31     9.557517.31      12

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
54952.85      .156367.85     .0356412.85      .1
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Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      56367.8556412.85              460     460     460              .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
54952.85 55197.5    13.9       T
 57303.557517.31    14.3       T

CROSS SECTION


RIVER: Thornhill Creek
REACH: Bridge Area        RS: -1170.*

INPUT
Description:
Station Elevation Data    num=     377
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
55032.85     9.5 55671.1   8.8955676.11   8.8955683.07   8.8855686.74    8.88
55697.38   8.8755699.21   8.8755708.02   8.8655718.66   8.8555721.94    8.85
55729.29    8.84 55734.6   8.8355739.93   8.8355750.57    8.82 55761.2   8.81
55764.56   8.8155769.99    8.855771.84    8.855782.48   8.7955791.83    8.78
55793.12   8.7955796.59   8.8155801.26   8.8455802.16   8.8455803.76    8.85
55804.11   8.8555805.38    8.86 55810.7   8.8855812.29   8.8955814.39     8.9
 55815.7    8.955820.13   8.9355822.54   8.9455825.03   8.9355829.57    8.92
55834.36   8.9155835.67     8.9   55839    8.955840.77     8.9 55846.3   8.88
55846.85   8.8855848.44   8.8755856.94   8.8555857.87   8.8555864.62    8.84
 55867.3   8.8355867.58   8.8355870.89   8.8255876.16   8.8155876.74     8.8
55878.22   8.7755881.41   8.7255886.17   8.6455888.86    8.655892.05    8.55
55894.88    8.555895.61    8.555899.49    8.555905.04    8.555908.02     8.5
55910.13    8.555911.55    8.555914.48    8.555915.97    8.555920.77     8.5
55923.91    8.555925.14    8.555931.11    8.555931.41    8.555933.34     8.5
55942.04    8.555942.78    8.555946.94    8.555950.53    8.555952.21     8.5
55952.68    8.555955.39    8.555961.57    8.555961.65    8.555963.32     8.5
55971.09    8.555973.95    8.555980.52    8.555982.33    8.555984.59     8.5
55985.09    8.555985.66    8.555989.95   8.4355995.23   8.3455999.39    8.27
56005.26   8.1856005.87   8.1656008.35   8.1356008.82   8.12 56016.5    7.96
56017.72   7.9356018.26   7.9356019.65   7.9256027.14   7.86 56027.7    7.86
56031.08   7.8456037.12   7.7456037.78   7.7456046.16   7.6256046.52    7.61
56046.56   7.6156048.41   7.5856053.11   7.52 56054.2     7.5   56056     7.5
56059.05    7.556062.88    7.556065.43    7.556069.61    7.556069.69     7.5
56074.87    7.556080.33     7.5 56084.3    7.556088.49    7.556088.77     7.5
56090.97   7.4756092.69   7.4456093.73   7.4356100.59   7.33 56101.6    7.32
56103.17   7.2956105.49   7.2656112.24   7.24 56112.6   7.2456115.78    7.24
56122.04   7.2256122.88   7.2256123.32   7.2256123.88   7.2156131.47    7.08
56133.52   7.0556140.91   6.9256144.16   6.86 56145.8   6.8456148.11     6.8
56150.34   6.7656154.79   6.6956157.88   6.6356159.27   6.6156159.78     6.6
56161.94   6.5656165.43    6.556169.21   6.44 56170.1   6.4356176.07    6.33
56178.65   6.28 56186.7   6.1556188.08   6.1356190.73   6.0856192.44    6.03
56194.66   5.9756197.34   5.9356197.46   5.9356197.52   5.9356206.95    5.79
56207.98   5.7856213.92   5.6956214.54   5.6856216.38   5.6556218.62    5.62
56225.82    5.52   56227    5.556227.71   5.4956229.25   5.4756230.05    5.46
56233.34   5.4156235.25   5.3856239.62   5.3256239.89   5.3156244.69    5.21
56250.53   5.0856254.12   5.0156254.27       556261.16   4.8556261.56    4.84
56263.56    4.856265.44   4.76 56271.8   4.6256272.99    4.656275.96    4.53
56277.35    4.556282.43   4.3956291.86   4.1856293.08   4.1656296.12     4.1
56300.82   4.06 56301.3   4.0556303.71       456309.13   3.88 56309.2    3.88
56310.73   3.8556314.35   3.7656318.58   3.6656320.16   3.6356324.99    3.52
 56329.6   3.4156332.19   3.3556335.62   3.2756336.21   3.2656339.04    3.27
56346.27   3.3156348.47   3.32 56356.9   3.3756357.91   3.3856361.19     3.4
56365.68   3.3756367.34   3.3756367.54   3.3756367.79   3.3756367.85    3.37
56373.73  -4.4756380.37  -4.4756396.98  -4.4756402.85   3.3756405.29    3.44
56407.34    3.556407.53    3.556414.11    3.556416.12    3.5 56416.7     3.5
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56416.89	3.556418.03	3.556426.44	3.5 56428.1	3.556428.53	3.5
56429.89	3.556435.98	3.6356439.03	3.69 56443.3	3.7856444.54	3.8
56445.53	3.8256445.88	3.8356449.53	3.956454.25	456455.08	4.02
56460.03	4.1256463.28	4.1856464.62	4.2156470.45	4.3356470.52	4.34
56474.17	4.4156477.64	4.4856481.02	4.5556483.71	4.6156491.52	4.77
56493.26	4.856495.12	4.8456497.61	4.8956502.02	4.98 56502.8	5
56509.38	5.13 56510.3	5.1556512.35	5.1956512.52	5.19 56521.9	5.39
56523.02	5.4156524.76	5.4556531.45	5.5856533.52	5.6256540.99	5.78
56541.14	5.7856544.02	5.84 56545.7	5.8856550.54	5.9856551.72	6
56551.91	656554.52	6.0556557.31	6.1156560.09	6.1456565.02	6.19
56569.63	6.2456572.91	6.2756575.52	6.356579.06	6.3356579.18	6.33
56586.02	6.456588.72	6.4356596.29	6.556596.52	6.556598.27	6.5
56604.33	6.556604.67	6.556606.21	6.556607.02	6.556607.81	6.5
56615.36	6.556617.36	6.556617.52	6.556624.82	6.556626.91	6.5
56628.01	6.556636.43	6.556636.45	6.556638.51	6.5356640.73	6.57
56646	6.6556646.87	6.6656649.01	6.756649.19	6.756651.35	6.73
56655.55	6.856659.51	6.8656665.09	6.9556668.19	756670.01	7
56673.56	756674.64	756678.98	756680.51	7.0256684.18	7.07
56691.01	7.1656693.73	7.1956697.45	7.2456697.93	7.2556698.37	7.25
56699.95	7.2956701.51	7.3356703.28	7.3756710.46	7.5456712.01	7.58
56712.82	7.656714.83	7.6456722.37	7.81 56722.5	7.82 56731.7	7.95
56731.91	7.9556741.46	8.0956751.01	8.2356755.46	8.356760.55	8.37
56763.46	8.42 56770.1	8.5156779.65	8.65 56789.2	8.7956793.71	8.86
56795.22	8.8656798.74	8.9256802.62	8.9856808.29	9.0856817.83	9.25
56823.45	9.3556826.98	9.3456827.38	9.3456836.92	9.3356846.47	9.32
56850.59	9.3156856.02	9.456858.74	9.4556865.56	9.4656875.11	9.48
56877.75	9.4856884.66	9.49 56890.5	9.5 56894.2	9.5156903.75	9.52
56904.9	9.5256913.29	9.5356922.25	9.5556922.84	9.5556932.05	9.56
56932.38	9.5656941.93	9.5856951.48	9.5956954.01	9.5956959.21	9.6
56961.02	9.656970.57	9.6256980.12	9.6356985.77	9.6456986.36	9.65
56989.66	9.6557562.43	10.5			

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
55032.85	.156367.85	.0356402.85	.1		

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
56367.85	56402.85	460	460	460	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
55032.85	54507.5	13.9	T
57993.55	57562.43	14.3	T

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: -1630

INPUT
Description:
Station Elevation Data num= 220

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
55112.85		755712.85		755717.56		755724.11		755727.56	7
55737.56		755739.28		755747.56		755757.56		755760.65	7
55767.56		755772.55		755777.56		755787.56		755797.56	7
55800.71		755805.82		755807.56		755817.56		755827.56	7
55830.83		755837.56	6.9755837.89		6.9655839.09		6.9655847.56		6.91
55857.56	6.8655866.33		6.8255867.56		6.8155872.36		6.7955877.56		6.76
55887.56	6.7155894.78		6.6755897.56		6.6655905.62		6.6255907.56		6.55
55917.56	6.255923.22		655927.56		655937.56		655938.89		6
55947.56		655951.67		655957.56		655967.56		655972.16	6
55977.56		655980.11		655987.56		655997.56		656005.43	6

56007.56	656008.56	656017.56	5.6856026.99	5.3556027.56	5.33
56037.56	5.03 56038.7	556047.56	556057.56	556065.44	5
56067.56	556071.97	556077.56	556081.15	556087.56	5
56097.56	556105.23	556107.56	4.9356117.56	4.6356121.21	4.52
56127.56	4.4956137.56	4.44 56138.5	4.4356147.56	4.3956157.56	4.33
56161.28	4.3256167.56	4.2856171.77	4.2656177.56	4.2356187.56	4.18
56197.56	4.1356201.34	4.1156205.04	456207.56	456207.67	4
56217.56	456223.15	456227.56	456236.11	456237.56	4
56238.31	4 56241.4	456247.56	456257.56	456267.56	4
56271.58	456277.56	456281.47	456287.56	456297.56	4
56304.84	456307.56	3.9256317.56	3.6256321.53	3.556327.56	3.32
56337.56	3.0256338.11	356347.56	3.2856357.56	3.5856361.59	3.71
56367.56	3.7456367.85	3.7456374.52	-5.15556377.85	-5.15556386.18	-5.155
56392.85	3.7456397.56	456404.65	456407.56	456417.56	4
56419.3	456427.56	456435.22	456437.56	456437.92	4
56447.56	456457.56	456463.66	456467.56	456471.19	4
56477.56	456487.56	456492.11	456497.56	456504.45	4
56507.56	456517.56	456520.55	456527.56	456537.56	4
56537.72	456547.56	4 56549	456557.56	456567.56	4
56570.99	456577.44	456577.56	456587.56	456597.56	4
56604.26	456605.88	456607.56	456615.46	456617.56	4
56627.56	456637.53	456637.56	456642.04	4.1456647.56	4.3
56657.56	4.656667.56	4.9 56670.8	556677.56	5 56682.1	5
56687.56	5.1456697.56	5.3956704.07	5.5556707.56	5.6456717.56	5.89
56719.66	5.9456727.56	6.1356737.33	6.3856737.56	6.3856747.56	6.63
56757.56	6.8856762.22	756767.56	7.13 56770.6	7.2156777.56	7.38
56787.56	7.6356797.56	7.8856802.29	856803.87	856807.56	8.11
56811.62	8.2356817.56	8.4156827.56	8.7156833.44	8.8956837.14	8.87
56837.56	8.8756847.56	8.8256857.56	8.7756861.88	8.7456867.56	8.91
56870.41	956877.56	956887.56	956890.33	956897.56	9
56903.68	956907.56	956917.56	956918.77	956927.56	9
56936.94	956937.56	956947.21	956947.56	956957.56	9
56967.56	956970.21	956975.66	956977.56	956987.56	9
56997.56	957003.48	9 57004.1	9.0257007.56	957607.56	9

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
55112.85	.156	367.85	.035	6392.85	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
56367.85	56392.85	360	360	360	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
55112.85	53817.5	13.9	T
58683.55	57607.56	14.3	T

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: -1990.*

INPUT
Description:
Station Elevation Data num= 274

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
54842.85	7.55	4917.73	6.38	54924.09	6.33	54936.89	6.21	54938.86	6.22
54944.2	6.24	54961.01	6.02	54962.19		655571.93		655577.66	6
55585.61	6	55589.8		655601.96		655604.05		655614.11	6
55626.26		655630.02		655638.41		655644.48		655650.56	6
55662.71		655674.87	6	55678.7		655684.91		655687.02	6
55699.17		655711.32		655715.29		655723.47	5.98	55723.88	5.97
55725.33	5.97	55735.62	5.94	55747.77	5.91	55758.43	5.88	55759.93	5.87

55765.76	5.8655772.08	5.8455784.23	5.81 55793	5.7855796.38	5.77
55806.18	5.7555808.53	5.755820.68	5.4755827.56	5.3355832.84	5.33
55844.98	5.3355846.61	5.3355857.14	5.3355862.14	5.3355869.29	5.33
55881.44	5.3355887.03	5.3355893.59	5.3355896.69	5.3355905.74	5.33
55917.89	5.3355927.46	5.3355930.05	5.3355931.26	5.33 55942.2	5.12
55953.66	4.955954.35	4.89 55966.5	4.6955967.89	4.6755978.65	4.67
55990.8	4.6756000.38	4.6756002.95	4.6756008.31	4.6756015.11	4.67
56019.47	4.6756027.26	4.6756039.41	4.6756048.73	4.6756051.56	4.62
56063.71	4.4256068.15	4.3556075.86	4.3356088.01	4.2956089.16	4.29
56100.16	4.2656112.32	4.2256116.84	4.2156124.47	4.1956129.59	4.17
56136.62	4.1556148.77	4.1256160.92	4.0956165.52	4.0756170.01	4
56173.07	456173.21	456185.23	456192.02	456197.38	4
56207.77	456209.53	456210.44	4 56214.2	456221.68	4
56233.83	456245.98	456250.87	456258.13	456262.88	4
56270.29	456282.44	456291.29	456294.59	3.9556306.74	3.75
56311.57	3.6756318.89	3.5556331.04	3.3556331.71	3.3356333.06	3.36
56334.62	3.3756343.19	3.4356355.34	3.5156360.24	3.5656364.16	3.53
56367.5	3.556367.85	3.4956374.74	-5.756380.33	-5.756394.29	-5.7
56401.18	3.4956405.46	3.6956407.43	3.756411.91	3.7156414.56	3.72
56423.66	3.7456425.24	3.74 56431	3.7556432.39	3.7456432.75	3.74
56439.72	3.6956441.85	3.6756442.18	3.6756442.29	3.6756450.94	3.67
56460.04	3.6756465.59	3.6756469.13	3.6756472.44	3.6756478.23	3.67
56487.32	3.6756491.46	3.6756496.42	3.6756502.69	3.6756505.51	3.67
56514.61	3.6756517.33	3.67 56523.7	3.67 56532.8	3.6756532.95	3.67
56541.89	3.6756543.21	3.6756550.99	3.6756560.09	3.67 56563.2	3.67
56569.07	3.6756569.18	3.6756578.28	3.6756587.37	3.6756593.47	3.67
56594.94	3.67 56595.4	3.6756596.46	3.6856603.65	3.7556605.56	3.77
56607.17	3.79 56613.3	3.8556614.66	3.8556623.73	3.8756623.75	3.87
56627.83	3.9756632.85	4.0956641.94	4.3156644.62	4.3856646.59	4.43
56651.04	4.5656653.98	4.6556656.06	4.6756660.13	4.6756664.27	4.67
56669.23	4.7656678.32	4.9356684.25	5.0356687.42	5.0956696.51	5.26
56698.43	5.2956705.61	5.42 56714.5	5.59 56714.7	5.59 56723.8	5.75
56732.89	5.9256737.13	656741.99	6.0956744.76	6.1456751.09	6.25
56760.18	6.4256769.28	6.5956773.58	6.6756775.02	6.6756778.37	6.74
56782.07	6.8256787.46	6.9456796.56	7.1456801.91	7.2656805.28	7.25
56805.66	7.2556814.75	7.2156820.48	7.1956823.85	7.1956825.55	7.18
56827.78	7.18 56829.9	7.2356831.87	7.2856832.94	7.356835.54	7.37
56842.04	7.3856851.13	7.456853.65	7.4156860.23	7.43 56865.8	7.44
56869.32	7.4556869.82	7.4556878.42	7.4756879.52	7.4756887.51	7.49
56891	7.556894.29	7.5156896.05	7.5156896.61	7.5156905.39	7.53
56905.7	7.5356912.57	7.55 56914.8	7.5656923.89	7.5856926.31	7.58
56931.26	7.5956932.99	7.656942.09	7.6256951.18	7.64 56952.1	7.64
56955.33	7.6556956.57	7.6556957.13	7.6756960.28	7.6656962.85	7.67
56998.09	7.6757019.13	7.557022.82	7.4757040.83	7.5257044.09	7.52
57069.06	7.5857081.54	7.6157083.59	7.62 57105.2	7.6757126.34	7.67
57154.34	7.4557156.45	7.4557168.93	7.4857169.09	7.4857187.21	7.53
57218.86	7.6 57220.1	7.657247.55	7.3957252.98	7.3557256.32	7.35
57293.77	7.4457297.36	7.4557318.73	7.3357505.99	8.67	

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
54842.85	.156367.85	.0356401.18	.1		

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
56367.8	556401.18	360	360	360	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
54842.85	53277.5	13.9	T
59223.5	57505.99	14.3	T

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: -2350.*

INPUT
Description:
Station Elevation Data num= 274

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
54572.85		854660.98	5.7754668.47		5.6554683.54		5.4154685.86		5.43
54692.14	5.4754711.93		5.0354713.31		555431.02		555437.75		5
55447.12		555452.05		555466.36		555468.82		555480.66	5
55494.96		555499.38		555509.27		555516.41		555523.57	5
55537.87		555552.17		555556.68		555563.99		555566.48	5
55580.78		555595.08		555599.76		555609.38	4.9955609.86		4.99
55611.57	4.9955623.69		4.9755637.99		4.9555650.54		4.9455652.29		4.94
55659.16	4.9355666.59		4.92 55680.9		4.955691.23		4.89 55695.2		4.89
55706.73	4.87 55709.5		4.85 55723.8		4.73 55731.9		4.6755738.11		4.67
55752.41	4.6755754.32		4.6755766.71		4.67 55772.6		4.6755781.02		4.67
55795.32	4.67 55801.9		4.6755809.62		4.6755813.27		4.6755823.93		4.67
55838.23	4.6755849.49		4.6755852.53		4.6755853.96		4.6755866.84		4.56
55880.32	4.4555881.14		4.4455895.44		4.3455897.07		4.3355909.74		4.33
55924.05	4.3355935.32		4.3355938.35		4.3355944.66		4.3355952.65		4.33
55957.79	4.3355966.95		4.3355981.26		4.3355992.23		4.3355995.56		4.31
56009.86	4.2156015.09		4.1756024.16		4.1656038.47		4.1556039.82		4.14
56052.77	4.1356067.07		4.11 56072.4		4.1156081.38		4.09 56087.4		4.09
56095.68	4.0856109.98		4.0656124.29		4.04 56129.7		4.0456134.98		4
56138.59		456138.75		456152.89		456160.89		4 56167.2	4
56179.43		4 56181.5		456182.57		456186.99		4 56195.8	4
56210.1		456224.41		456230.15		456238.71		4 56244.3	4
56253.01		456267.31		456277.73		456281.62	3.9756295.92		3.87
56301.6	3.8356310.22		3.7756324.52		3.6756325.31		3.67 56326.9		3.68
56328.73	3.6656338.83		3.5756353.13		3.4556358.89		3.4 56363.5		3.34
56367.43	3.2656367.85		3.2556374.96		-6.24 56382.8		-6.2456402.41		-6.24
56409.52	3.2556413.38		3.3856415.14		3.456419.18		3.4256421.56		3.43
56429.75	3.4756431.18		3.4856436.37		3.5156437.62		3.4956437.95		3.48
56444.22	3.3756446.13		3.3456446.43		3.3456446.54		3.3356454.33		3.33
56462.52	3.3356467.52		3.3356470.71		3.3356473.68		3.33 56478.9		3.33
56487.09	3.3356490.82		3.3356495.28		3.3356500.92		3.3356503.47		3.33
56511.66	3.3356514.11		3.3356519.85		3.3356528.04		3.3356528.17		3.33
56536.23	3.3356537.41		3.3356544.42		3.3356552.61		3.3356555.42		3.33
56560.71	3.33 56560.8		3.3356568.99		3.3356577.18		3.3356582.67		3.33
56584	3.3356584.42		3.3356585.38		3.3656591.85		3.556593.56		3.54
56595.01	3.5756600.54		3.6956601.75		3.756609.92		3.7456609.95		3.74
56613.61	3.8156618.13		3.8856626.33		4.0356628.73		4.0756630.51		4.1
56634.52	4.2256637.17		4.356639.04		4.3356642.71		4.3356646.43		4.33
56650.9	4.3856659.09		4.4656664.42		4.5256667.28		4.5556675.47		4.63
56677.19	4.6556683.66		4.7156691.66		4.7956691.85		4.7956700.04		4.88
56708.23	4.9656712.05			556716.42	5.0456718.91		5.0756724.61		5.13
56732.8	5.2156740.99		5.2956744.87		5.3356746.16		5.3356749.18		5.37
56752.51	5.4156757.38		5.4756765.56		5.5756770.38		5.6356773.41		5.62
56773.75	5.6256781.95		5.6156787.11		5.656790.13		5.6156791.67		5.61
56793.67	5.6256795.58		5.6556797.36		5.6856798.33		5.6956800.66		5.74
56806.52	5.7756814.71		5.8156816.97		5.82 56822.9		5.8556827.91		5.88
56831.09	5.8956831.54		5.956839.28		5.9456840.27		5.9556847.47		5.98
56850.61		656853.57	6.0156855.15		6.0256855.66		6.0256863.57		6.07
56863.85	6.0756870.04		6.156872.04		6.1156880.23		6.15 56882.4		6.16
56886.87	6.1956888.42		6.1956896.61		6.23 56904.8		6.2856905.63		6.28
56908.54	6.356909.65		6.3156910.16		6.3156912.99		6.3256915.31		6.33
56947.04	6.3356965.99		6.0156969.31		5.9556985.54		6.0356988.47		6.05
57010.96	6.17 57022.2		6.2257024.04		6.23 57043.5		6.3357062.54		6.33
57087.75	5.957089.65		5.9157100.89		5.9757101.04		5.9757117.36		6.05
57145.86	6.257146.97		6.2157171.69		5.7757176.58		5.6957179.58		5.71
57213.31	5.8857216.55		5.957235.79		5.6757404.42		8.33		

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Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
54572.85      .156367.85     .0356409.52      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      56367.8556409.52              360     360     360              .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
54572.85 52737.5    13.9       T
 59763.557404.42    14.3       T

CROSS SECTION


RIVER: Thornhill Creek
REACH: Bridge Area          RS: -2710

INPUT
Description:
Station Elevation Data      num=      61
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
54302.85     8.554404.24    5.1554412.85    4.9854430.19    4.6254432.85    4.65
54440.09    4.7154462.85    4.0554464.44       456320.74       456322.85    3.96
56362.85    3.1456367.85       356375.18  -6.77556410.52  -6.77556417.85       3
56422.85     3.156441.74    3.2656442.85    3.2356450.78       356573.43       3
56582.85    3.3656587.77    3.5456612.85    3.7656614.43    3.7856622.02       4
56753.73       456757.79    4.0456761.27    4.0756762.85    4.0856792.85    4.34
56793.25    4.3556810.22     4.556812.85    4.52 56827.5    4.6556859.16    4.92
56861.75    4.9556867.77       5   56896       556912.85    4.5156915.81    4.42
56930.24    4.5556932.85    4.5756952.85    4.7556962.85    4.8356964.49    4.85
 56981.8       556998.74       557021.16    4.3557022.85    4.3657032.85    4.45
57032.98    4.45 57047.5    4.5857072.85     4.857073.84    4.8157095.83    4.16
57100.18    4.0457102.85    4.0657132.85    4.3257135.73    4.3557152.85       4
57302.85       8

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
54302.85      .156367.85     .0356417.85      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      56367.8556417.85             442.5   442.5   442.5              .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
54302.85 52197.5    13.9       T
 60303.557302.85    14.3       T

CROSS SECTION


RIVER: Thornhill Creek
REACH: Bridge Area          RS: -3152.5*

INPUT
Description:
Station Elevation Data      num=     102
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
  -18.75     8.44   88.01     5.05   92.19     4.96   97.08     4.89  102.84      4.8
  110.66     4.62  115.33     4.54  118.14     4.57  125.76     4.62  149.72     4.04
   151.4        4  641.89        4  646.88     3.97  649.52     3.96  667.18     3.99
  669.06     3.98   675.3     3.96  676.46     3.95  691.25     3.88  692.48     3.88
 2106.02     3.88 2108.24     3.84 2150.36     3.12 2155.62        3 2163.45    -7.44
  2197.8    -7.44 2205.62        3  2211.2     3.09 2232.26     3.23  2233.5      3.2
 2242.34        3  2320.4        3 2321.76     3.01 2339.18     3.12 2339.45     3.12
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2379.1	3.12	2389.6	3.44	2395.09	3.6	2423.05	3.79	2424.82	3.81
2433.28	4	2580.14	4	2584.66	4.03	2588.54	4.06	2590.31	4.07
2623.76	4.3	2624.2	4.31	2643.13	4.44	2646.06	4.45	2662.39	4.57
2697.69	4.81	2700.58	4.83	2707.29	4.88	2738.77	4.88	2757.56	4.45
2760.86	4.37	2776.95	4.48	2779.86	4.5	2802.16	4.66	2810.62	4.71
2813.31	4.74	2814.77	4.77	2815.14	4.77	2815.35	4.77	2831.18	4.98
2834.44	5	2853.33	5	2878.33	4.43	2880.21	4.44	2891.36	4.52
2891.51	4.52	2907.7	4.63	2935.96	4.83	2937.07	4.83	2954.58	4.43
2954.72	4.43	2955.01	4.42	2956.05	4.39	2961.59	4.26	2966.44	4.16
2969.41	4.18	3002.86	4.41	3006.08	4.43	3022.97	4.16	3025.16	4.13
3036.01	4.4	3036.84	4.42	3041.82	4.51	3042.69	4.53	3057.04	4.79
3057.41	4.8	3070.86	5.16	3071.92	5.19	3076.66	5.28	3077.97	5.3
3086.53	5.46	3088.28	5.51	3098.54	5.79	3119.11	6.22	3139.67	6.77
3188.83	7.8	3192.42	7.91						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-18.75	.1	2155.62	.03	2205.62	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
2155.62	2205.62	442.5	442.5	442.5	.1	.3

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: -3595.*

INPUT
Description:
Station Elevation Data num= 102

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-37.5	8.38	74.63	4.94	79.02	4.85	84.15	4.79	90.2	4.73
98.42	4.53	103.33	4.47	106.27	4.49	114.28	4.53	139.45	4.04
141.21	4	656.37	4	661.61	3.95	664.38	3.92	682.94	3.98
684.91	3.96	691.46	3.92	692.68	3.91	708.21	3.76	709.5	3.75
2194.15	3.75	2196.48	3.72	2240.72	3.11	2246.25	3	2254.58	-8.1
2287.92	-8.1	2296.25	3	2302.4	3.07	2325.64	3.19	2327	3.17
2336.76	3	2422.86	3	2424.37	3.02	2443.59	3.25	2443.87	3.25
2487.62	3.25	2499.21	3.52	2505.26	3.65	2536.11	3.82	2538.05	3.84
2547.39	4	2709.4	4	2714.39	4.03	2718.67	4.05	2720.61	4.06
2757.51	4.26	2758.01	4.26	2778.88	4.38	2782.12	4.39	2800.14	4.49
2839.08	4.69	2842.26	4.71	2849.67	4.75	2884.39	4.75	2905.12	4.38
2908.76	4.32	2926.51	4.41	2929.72	4.43	2954.32	4.56	2963.65	4.61
2966.62	4.65	2968.23	4.68	2968.64	4.69	2968.87	4.7	2986.34	4.98
2989.93	5	3010.77	5	3038.35	4.51	3040.42	4.52	3052.72	4.59
3052.88	4.59	3070.74	4.68	3101.93	4.85	3103.14	4.86	3122.46	4.51
3122.61	4.51	3122.94	4.51	3124.09	4.48	3130.19	4.37	3135.54	4.28
3138.83	4.3	3175.73	4.49	3179.27	4.51	3197.9	4.28	3200.33	4.27
3212.3	4.54	3213.21	4.56	3218.7	4.62	3219.66	4.63	3235.49	4.82
3235.9	4.83	3250.73	5.23	3251.91	5.27	3257.14	5.33	3258.59	5.34
3268.02	5.46	3269.95	5.51	3281.28	5.82	3303.96	6.19	3326.65	6.8
3380.88	7.69	3384.83	7.81						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-37.5	.1	2246.25	.03	2296.25	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
2246.25	2296.25	442.5	442.5	442.5	.1	.3

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: -4037.5*

INPUT
Description:
Station Elevation Data num= 102

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-56.25	8.31	61.25	4.84	65.85	4.74	71.23	4.7	77.57	4.66
86.18	4.45	91.32	4.39	94.41	4.41	102.8	4.44	129.17	4.03
131.02	4	670.85	4	676.34	3.92	679.25	3.89	698.69	3.97
700.76	3.94	707.62	3.88	708.9	3.86	725.18	3.64	726.53	3.62
2282.28	3.62	2284.72	3.6	2331.08	3.09	2336.88	3	2345.7	-8.77
2378.05	-8.77	2386.88	3	2393.6	3.06	2419.01	3.16	2420.5	3.14
2431.17	3	2525.33	3	2526.97	3.03	2547.99	3.37	2548.3	3.38
2596.14	3.38	2608.81	3.6	2615.43	3.71	2649.16	3.85	2651.29	3.86
2661.5	4	2838.65	4	2844.11	4.03	2848.8	4.04	2850.92	4.05
2891.27	4.21	2891.81	4.22	2914.64	4.31	2918.17	4.32	2937.88	4.41
2980.46	4.57	2983.95	4.59	2992.04	4.62	3030.01	4.62	3052.68	4.32
3056.66	4.26	3076.07	4.34	3079.58	4.36	3106.48	4.47	3116.68	4.51
3119.93	4.57	3121.69	4.6	3122.14	4.61	3122.39	4.62	3141.49	4.98
3145.42	5	3168.21	5	3198.36	4.59	3200.64	4.6	3214.09	4.66
3214.26	4.66	3233.79	4.74	3267.89	4.88	3269.22	4.88	3290.34	4.59
3290.51	4.59	3290.86	4.59	3292.12	4.57	3298.8	4.47	3304.65	4.4
3308.24	4.41	3348.59	4.58	3352.47	4.59	3372.84	4.4	3375.49	4.4
3388.58	4.68	3389.58	4.7	3395.59	4.74	3396.64	4.74	3413.95	4.85
3414.39	4.86	3430.61	5.3	3431.89	5.34	3437.62	5.37	3439.2	5.39
3449.52	5.45	3451.63	5.51	3464.01	5.85	3488.82	6.15	3513.63	6.84
3572.92	7.57	3577.25	7.72						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-56.25	.1	2336.88	.03	2386.88	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
2336.88	2386.88	442.5	442.5	442.5	.1	.3

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: -4480.*

INPUT
Description:
Station Elevation Data num= 102

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-75	8.25	47.87	4.74	52.68	4.63	58.31	4.61	64.94	4.59
73.94	4.36	79.32	4.31	82.54	4.32	91.32	4.36	118.9	4.03
120.83	4	685.33	4	691.07	3.9	694.11	3.85	714.45	3.95
716.61	3.92	723.78	3.84	725.12	3.82	742.14	3.53	743.56	3.5
2370.41	3.5	2372.97	3.48	2421.44	3.07	2427.5	3	2436.82	-9.43
2468.18	-9.43	2477.5	3	2484.8	3.05	2512.38	3.13	2514	3.12
2525.58	3	2627.79	3	2629.58	3.03	2652.39	3.49	2652.73	3.5
2704.66	3.5	2718.41	3.68	2725.6	3.77	2762.22	3.88	2764.52	3.89
2775.6	4	2967.91	4	2973.84	4.02	2978.92	4.03	2981.23	4.04
3025.03	4.17	3025.61	4.18	3050.39	4.25	3054.23	4.26	3075.62	4.32
3121.85	4.46	3125.63	4.47	3134.42	4.5	3175.64	4.5	3200.24	4.26
3204.56	4.21	3225.63	4.28	3229.44	4.28	3258.64	4.38	3269.72	4.41
3273.24	4.48	3275.15	4.52	3275.64	4.53	3275.92	4.54	3296.64	4.99
3300.91	5	3325.65	5	3358.38	4.68	3360.85	4.68	3375.45	4.72
3375.64	4.72	3396.84	4.79	3433.85	4.9	3435.3	4.9	3458.23	4.67
3458.41	4.68	3458.79	4.68	3460.16	4.65	3467.4	4.58	3473.76	4.52

3477.65	4.53	3521.46	4.66	3525.66	4.68	3547.78	4.52	3550.66	4.53
3564.87	4.82	3565.95	4.84	3572.47	4.85	3573.61	4.85	3592.4	4.88
3592.89	4.89	3610.49	5.37	3611.88	5.41	3618.09	5.42	3619.81	5.43
3631.01	5.44	3633.3	5.5	3646.74	5.88	3673.67	6.12	3700.6	6.87
3764.97	7.46	3769.67	7.62						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-75	.1	2427.5	.03	2477.5	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
2427.5	2477.5	442.5	442.5	442.5	.1	.3

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: -4922.5*

INPUT
Description:
Station Elevation Data num= 102

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-93.75	8.19	34.49	4.63	39.51	4.51	45.38	4.52	52.3	4.52
61.7	4.27	67.31	4.23	70.68	4.24	79.84	4.27	108.62	4.02
110.63	4	699.82	4	705.8	3.88	708.98	3.81	730.2	3.94
732.46	3.91	739.94	3.8	741.34	3.77	759.11	3.41	760.58	3.38
2458.54	3.38	2461.21	3.36	2511.8	3.05	2518.12	3	2527.95	-10.09
2558.3	-10.09	2568.12	3	2576	3.04	2605.75	3.1	2607.5	3.09
2619.99	3	2730.26	3	2732.18	3.04	2756.79	3.62	2757.16	3.62
2813.18	3.62	2828.02	3.76	2835.77	3.83	2875.27	3.91	2877.76	3.92
2889.71	4	3097.17	4	3103.56	4.01	3109.05	4.03	3111.53	4.03
3158.79	4.13	3159.42	4.13	3186.15	4.19	3190.29	4.2	3213.36	4.24
3263.23	4.35	3267.31	4.36	3276.79	4.38	3321.26	4.38	3347.8	4.19
3352.46	4.16	3375.19	4.21	3379.3	4.21	3410.8	4.28	3422.75	4.3
3426.55	4.39	3428.62	4.44	3429.14	4.46	3429.44	4.46	3451.8	4.99
3456.4	5	3483.08	5	3518.4	4.76	3521.06	4.76	3536.81	4.79
3537.02	4.79	3559.89	4.84	3599.81	4.93	3601.37	4.93	3626.11	4.75
3626.31	4.76	3626.72	4.76	3628.19	4.74	3636.01	4.68	3642.86	4.64
3647.07	4.65	3694.32	4.74	3698.86	4.76	3722.72	4.64	3725.82	4.67
3741.15	4.96	3742.32	4.98	3749.35	4.96	3750.58	4.96	3770.85	4.91
3771.38	4.91	3790.37	5.44	3791.87	5.49	3798.57	5.47	3800.42	5.47
3812.51	5.44	3814.98	5.5	3829.48	5.91	3858.52	6.09	3887.58	6.9
3957.02	7.34	3962.09	7.53						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-93.75	.1	2518.12	.03	2568.12	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
2518.12	2568.12	442.5	442.5	442.5	.1	.3

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: -5365.*

INPUT
Description:
Station Elevation Data num= 102

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-112.5	8.12	21.11	4.53	26.34	4.4	32.46	4.42	39.67	4.45

49.46	4.18	55.31	4.15	58.81	4.16	68.35	4.18	98.35	4.01
100.44	4	714.3	4	720.54	3.85	723.84	3.78	745.95	3.93
748.3	3.89	756.11	3.76	757.56	3.72	776.07	3.29	777.61	3.25
2546.67	3.25	2549.45	3.24	2602.16	3.04	2608.75	3	2619.07	-10.76
2648.43	-10.76	2658.75	3	2667.2	3.03	2699.13	3.07	2701	3.06
2714.41	3	2832.72	3	2834.79	3.05	2861.2	3.74	2861.59	3.75
2921.7	3.75	2937.62	3.84	2945.93	3.88	2988.32	3.94	2990.99	3.94
3003.82	4	3226.43	4	3233.29	4.01	3239.17	4.02	3241.84	4.02
3292.54	4.09	3293.22	4.09	3321.9	4.12	3326.35	4.13	3351.11	4.16
3404.62	4.23	3408.99	4.24	3419.17	4.25	3466.88	4.25	3495.36	4.13
3500.36	4.11	3524.75	4.14	3529.16	4.14	3562.96	4.19	3575.78	4.2
3579.86	4.3	3582.08	4.36	3582.64	4.38	3582.96	4.39	3606.95	4.99
3611.89	5	3640.52	5	3678.42	4.84	3681.27	4.84	3698.17	4.86
3698.39	4.86	3722.93	4.89	3765.78	4.95	3767.45	4.95	3793.99	4.84
3794.21	4.84	3794.65	4.85	3796.23	4.83	3804.62	4.79	3811.97	4.76
3816.48	4.76	3867.18	4.83	3872.05	4.84	3897.65	4.76	3900.99	4.8
3917.43	5.1	3918.69	5.12	3926.23	5.07	3927.55	5.06	3949.3	4.94
3949.87	4.94	3970.24	5.51	3971.86	5.56	3979.05	5.52	3981.04	5.51
3994	5.43	3996.65	5.5	4012.21	5.94	4043.38	6.06	4074.56	6.93
4149.07	7.23	4154.5	7.44						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-112.5	.1	2608.75	.03	2658.75	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
2608.75	2658.75	442.5	442.5	442.5	.1	.3

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: -5807.5*

INPUT
Description:
Station Elevation Data num= 102

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-131.25	8.06	7.73	4.43	13.17	4.29	19.53	4.33	27.03	4.38
37.22	4.09	43.3	4.08	46.95	4.08	56.87	4.09	88.07	4.01
90.25	4	728.78	4	735.27	3.83	738.71	3.74	761.71	3.92
764.15	3.87	772.27	3.72	773.78	3.68	793.04	3.17	794.63	3.12
2634.8	3.12	2637.69	3.12	2692.52	3.02	2699.38	3	2710.19	-11.42
2738.56	-11.42	2749.38	3	2758.4	3.01	2792.5	3.03	2794.5	3.03
2808.82	3	2935.19	3	2937.39	3.06	2965.6	3.87	2966.02	3.88
3030.22	3.88	3047.22	3.92	3056.1	3.94	3101.38	3.97	3104.23	3.97
3117.93	4	3355.68	4	3363.01	4.01	3369.3	4.01	3372.15	4.01
3426.3	4.04	3427.02	4.04	3457.66	4.06	3462.4	4.07	3488.85	4.08
3546	4.11	3550.68	4.12	3561.54	4.12	3612.5	4.12	3642.92	4.06
3648.26	4.05	3674.31	4.07	3679.02	4.07	3715.12	4.09	3728.82	4.1
3733.18	4.22	3735.54	4.28	3736.14	4.3	3736.48	4.31	3762.11	5
3767.38	5	3797.96	5	3838.43	4.92	3841.48	4.92	3859.54	4.93
3859.77	4.93	3885.98	4.95	3931.74	4.97	3933.53	4.98	3961.88	4.92
3962.1	4.93	3962.57	4.93	3964.26	4.91	3973.22	4.89	3981.08	4.88
3985.89	4.88	4040.05	4.91	4045.25	4.92	4072.59	4.88	4076.15	4.93
4093.72	5.24	4095.06	5.26	4103.12	5.19	4104.53	5.17	4127.76	4.97
4128.36	4.97	4150.12	5.58	4151.84	5.64	4159.52	5.56	4161.65	5.55
4175.5	5.43	4178.33	5.5	4194.95	5.97	4228.23	6.03	4261.53	6.97
4341.11	7.11	4346.92	7.34						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-131.25	.1	2699.38	.03	2749.38	.1

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       2699.38 2749.38             442.5   442.5   442.5              .1       .3

CROSS SECTION


RIVER: Thornhill Creek
REACH: Bridge Area        RS: -6250

INPUT
Description:
Station Elevation Data    num=      47
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
53427.85       853577.85    4.1853592.25    4.3153602.83       454321.11       4
54327.85     3.854331.42     3.754355.31    3.9154357.85    3.8554366.28    3.68
54367.85    3.6354387.85    3.0554389.51       356367.85       356379.16 -12.085
56406.54 -12.08556417.85       3 56615.5       356617.85    3.0756647.85    3.99
 56648.3       4 57459.7       457466.85     4.257467.85    4.2357495.11       5
57707.61       557707.85    5.0157708.35    5.0257710.15       557825.38       5
57847.85    5.3857849.28     5.457857.85     5.357859.35    5.2857884.06       5
 57884.7       557907.85    5.6557909.68    5.7157917.85    5.6157920.11    5.59
57934.84    5.4257937.85     5.557955.53       657990.94       658026.36       7
58111.01       758117.19    7.25

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
53427.85      .156367.85     .0356417.85      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      56367.8556417.85              305     305     305              .1       .3

CROSS SECTION


RIVER: Thornhill Creek
REACH: Bridge Area        RS: -6555.*

INPUT
Description:
Station Elevation Data    num=      47
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
    -150    7.54        0    3.72     14.4    3.85    24.98    3.54   743.26    3.54
     750    3.34   753.57    3.24   777.46    3.45      780    3.39   788.43    3.22
     790    3.17      810    2.59   811.66    2.54     2790    2.54  2801.66  -12.54
 2828.34  -12.54     2840    2.54  3037.65    2.54     3040    2.61     3070    3.53
 3070.45    3.54  3881.85    3.54     3889    3.74     3890    3.77  3917.26    4.54
 4129.76    4.54     4130    4.55   4130.5    4.56   4132.3    4.54  4247.53    4.54
    4270    4.92  4271.43    4.94     4280    4.84   4281.5    4.82  4306.21    4.54
 4306.85    4.54     4330    5.19  4331.83    5.25     4340    5.15  4342.26    5.13
 4356.99    4.96     4360    5.04  4377.68    5.54  4413.09    5.54  4448.51    6.54
 4533.16    6.54  4539.34    6.79

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
    -150      .1     2790     .03     2840      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          2790    2840              305     305     305              .1       .3

CROSS SECTION
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RIVER: Thornhill Creek
REACH: Bridge Area RS: -6860

INPUT
Description:
Station Elevation Data num= 47

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
53427.85	7.08	53577.85	3.26	53592.25	3.39	53602.83	3.08	54321.11	3.085
54327.85	2.88	54331.42	2.78	54355.31	2.99	54357.85	2.93	54366.28	2.765
54367.85	2.71	54387.85	2.13	54389.51	2.08	56367.85	2.08	56379.85	-13
56405.85	-13	56417.85	2.085	56615.5	2.08	56617.85	2.15	56647.85	3.075
56648.3	3.085	57459.7	3.08	57466.85	3.28	57467.85	3.31	57495.11	4.085
57707.61	4.08	57707.85	4.09	57708.35	4.10	57710.15	4.08	57825.38	4.085
57847.85	4.46	57849.28	4.48	57857.85	4.38	57859.35	4.36	57884.06	4.085
57884.7	4.08	57907.85	4.73	57909.68	4.79	57917.85	4.69	57920.11	4.675
57934.84	4.50	57937.85	4.58	57955.53	5.08	57990.94	5.08	58026.36	6.085
58111.01	6.08	58117.19	6.335						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
53427.85	.15	56367.85	.03	56417.85	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
56367.85	56417.85	0	0	0	.1	.3

SUMMARY OF MANNING'S N VALUES

River:Thornhill Creek

Reach	River Sta.	n1	n2	n3
Bridge Area	4700	.1	.03	.1
Bridge Area	4266.66*	.1	.03	.1
Bridge Area	3833.33*	.1	.03	.1
Bridge Area	3400.*	.1	.03	.1
Bridge Area	2966.66*	.1	.03	.1
Bridge Area	2533.33*	.1	.03	.1
Bridge Area	2100	.1	.03	.1
Bridge Area	1682.5*	.1	.03	.1
Bridge Area	1265.*	.1	.03	.1
Bridge Area	847.5*	.1	.03	.1
Bridge Area	430	.1	.03	.1
Bridge Area	155	.1	.03	.1
Bridge Area	125	.1	.03	.1
Bridge Area	-47	Bridge		
Bridge Area	-125	.1	.03	.1
Bridge Area	-450.*	.1	.03	.1
Bridge Area	-710	.1	.03	.1
Bridge Area	-1170.*	.1	.03	.1
Bridge Area	-1630	.1	.03	.1
Bridge Area	-1990.*	.1	.03	.1
Bridge Area	-2350.*	.1	.03	.1
Bridge Area	-2710	.1	.03	.1
Bridge Area	-3152.5*	.1	.03	.1
Bridge Area	-3595.*	.1	.03	.1
Bridge Area	-4037.5*	.1	.03	.1
Bridge Area	-4480.*	.1	.03	.1
Bridge Area	-4922.5*	.1	.03	.1
Bridge Area	-5365.*	.1	.03	.1
Bridge Area	-5807.5*	.1	.03	.1
Bridge Area	-6250	.1	.03	.1

Bridge Area	-6555.*	.1	.03	.1
Bridge Area	-6860	.1	.03	.1

SUMMARY OF REACH LENGTHS

River: Thornhill Creek

Reach	River Sta.	Left	Channel	Right
Bridge Area	4700	433.33	433.33	433.33
Bridge Area	4266.66*	433.33	433.33	433.33
Bridge Area	3833.33*	433.33	433.33	433.33
Bridge Area	3400.*	433.33	433.33	433.33
Bridge Area	2966.66*	433.33	433.33	433.33
Bridge Area	2533.33*	433.33	433.33	433.33
Bridge Area	2100	417.52	417.52	417.52
Bridge Area	1682.5*	417.52	417.52	417.52
Bridge Area	1265.*	417.52	417.52	417.52
Bridge Area	847.5*	417.52	417.52	417.52
Bridge Area	430	275	275	275
Bridge Area	155	30	30	30
Bridge Area	125	250	250	250
Bridge Area	-47	Bridge		
Bridge Area	-125	325	325	325
Bridge Area	-450.*	260	260	260
Bridge Area	-710	460	460	460
Bridge Area	-1170.*	460	460	460
Bridge Area	-1630	360	360	360
Bridge Area	-1990.*	360	360	360
Bridge Area	-2350.*	360	360	360
Bridge Area	-2710	442.5	442.5	442.5
Bridge Area	-3152.5*	442.5	442.5	442.5
Bridge Area	-3595.*	442.5	442.5	442.5
Bridge Area	-4037.5*	442.5	442.5	442.5
Bridge Area	-4480.*	442.5	442.5	442.5
Bridge Area	-4922.5*	442.5	442.5	442.5
Bridge Area	-5365.*	442.5	442.5	442.5
Bridge Area	-5807.5*	442.5	442.5	442.5
Bridge Area	-6250	305	305	305
Bridge Area	-6555.*	305	305	305
Bridge Area	-6860	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Thornhill Creek

Reach	River Sta.	Contr.	Expan.
Bridge Area	4700	.1	.3
Bridge Area	4266.66*	.1	.3
Bridge Area	3833.33*	.1	.3
Bridge Area	3400.*	.1	.3
Bridge Area	2966.66*	.1	.3
Bridge Area	2533.33*	.1	.3
Bridge Area	2100	.1	.3
Bridge Area	1682.5*	.1	.3
Bridge Area	1265.*	.1	.3

Bridge Area	847.5*		.1	.3
Bridge Area	430		.3	.5
Bridge Area	155		.3	.5
Bridge Area	125		.3	.5
Bridge Area	-47	Bridge		
Bridge Area	-125		.3	.5
Bridge Area	-450.*		.1	.3
Bridge Area	-710		.1	.3
Bridge Area	-1170.*		.1	.3
Bridge Area	-1630		.1	.3
Bridge Area	-1990.*		.1	.3
Bridge Area	-2350.*		.1	.3
Bridge Area	-2710		.1	.3
Bridge Area	-3152.5*		.1	.3
Bridge Area	-3595.*		.1	.3
Bridge Area	-4037.5*		.1	.3
Bridge Area	-4480.*		.1	.3
Bridge Area	-4922.5*		.1	.3
Bridge Area	-5365.*		.1	.3
Bridge Area	-5807.5*		.1	.3
Bridge Area	-6250		.1	.3
Bridge Area	-6555.*		.1	.3
Bridge Area	-6860		.1	.3

25 Year Existing Bridge

(Storm Tide + Base Flow)

HEC-RAS Output

HEC-RAS Plan: 25Exist SS no US River: Thornhill Creek Reach: Bridge Area

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Bridge Area	4700	28SEP2008 0918	350.00	14.00	15.64		15.76	0.002812	2.82	130.41	133.11	0.47
Bridge Area	4700	28SEP2008 1448	350.00	14.00	15.64		15.76	0.002807	2.82	130.49	133.13	0.47
Bridge Area	4266.66*	28SEP2008 0918	350.00	13.17	14.51		14.60	0.002552	2.48	143.34	156.88	0.44
Bridge Area	4266.66*	28SEP2008 1448	350.04	13.17	14.51		14.60	0.002564	2.48	143.15	156.84	0.44
Bridge Area	3833.33*	28SEP2008 0918	350.00	12.33	13.47		13.55	0.002395	2.24	156.49	181.06	0.42
Bridge Area	3833.33*	28SEP2008 1448	349.88	12.33	13.47		13.55	0.002369	2.23	157.00	181.22	0.42
Bridge Area	3400.*	28SEP2008 0918	350.00	11.50	12.51		12.58	0.002164	2.03	172.25	208.49	0.39
Bridge Area	3400.*	28SEP2008 1448	350.45	11.50	12.51		12.57	0.002215	2.05	171.19	208.29	0.40
Bridge Area	2966.66*	28SEP2008 0918	350.00	10.67	11.51		11.58	0.002543	2.05	170.35	228.32	0.42
Bridge Area	2966.66*	28SEP2008 1448	349.26	10.67	11.52		11.58	0.002442	2.03	172.42	228.99	0.41
Bridge Area	2533.33*	28SEP2008 0918	350.00	9.83	10.77		10.81	0.001168	1.52	263.33	622.73	0.29
Bridge Area	2533.33*	28SEP2008 1448	342.25	9.83	10.90		10.92	0.000679	1.26	343.63	647.38	0.23
Bridge Area	2100	28SEP2008 0918	350.00	9.00	9.48		9.53	0.005090	2.08	262.10	579.37	0.55
Bridge Area	2100	28SEP2008 1448	350.32	9.00	10.75		10.75	0.000048	0.48	1466.82	1216.03	0.07
Bridge Area	1682.5*	28SEP2008 0918	350.00	6.34	6.93		7.06	0.007749	2.98	117.46	207.81	0.70
Bridge Area	1682.5*	28SEP2008 1448	384.28	6.34	10.73		10.73	0.000007	0.34	2117.92	1420.04	0.03
Bridge Area	1265.*	28SEP2008 0918	350.00	3.68	4.53		4.67	0.004877	3.01	116.28	143.04	0.59
Bridge Area	1265.*	28SEP2008 1448	428.98	3.68	10.72		10.73	0.000004	0.33	2487.62	1507.61	0.02
Bridge Area	847.5*	28SEP2008 0918	350.00	1.03	3.60		3.65	0.000428	1.73	202.38	91.19	0.20
Bridge Area	847.5*	28SEP2008 1448	470.39	1.03	10.71		10.72	0.000004	0.40	2612.16	1691.41	0.02
Bridge Area	430	28SEP2008 0918	350.00	-1.63	2.78		3.01	0.003311	3.82	91.56	57.09	0.53
Bridge Area	430	28SEP2008 1448	539.38	-1.63	10.70		10.70	0.000012	0.72	2243.22	1785.29	0.04
Bridge Area	155	28SEP2008 0918	350.00	-2.60	2.25	0.80	2.39	0.001379	3.05	115.56	54.98	0.36
Bridge Area	155	28SEP2008 1448	596.84	-2.60	10.68	1.54	10.68	0.000010	0.76	2146.64	1874.92	0.04
Bridge Area	125	28SEP2008 0918	350.00	-2.68	2.25	0.67	2.41	0.001657	3.22	112.73	57.97	0.39
Bridge Area	125	28SEP2008 1448	601.57	-2.68	10.68	1.68	10.68	0.000012	0.80	1979.75	1267.54	0.04
Bridge Area	-47		Bridge									
Bridge Area	-125	28SEP2008 0918	350.00	-2.54	1.85	0.00	1.41	0.001260	3.28	115.17	76.81	0.36

HEC-RAS Plan: 25Exist SS no US River: Thornhill Creek Reach: Bridge Area (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Bridge Area	-125	28SEP2008 1448	601.57	-2.54	10.69	0.83	10.68	0.000009	0.68	2029.06	1649.23	0.04
Bridge Area	-450.*	28SEP2008 0918	350.63	-3.96	0.74		0.86	0.000713	2.79	125.88	38.50	0.27
Bridge Area	-450.*	28SEP2008 1448	637.00	-3.96	10.65		10.66	0.000011	0.81	1959.99	860.30	0.04
Bridge Area	-710	28SEP2008 0918	351.20	-3.78	0.66		0.73	0.000308	2.08	169.24	41.49	0.18
Bridge Area	-710	28SEP2008 1448	644.50	-3.78	10.64		10.64	0.000008	0.73	3084.15	1118.40	0.03
Bridge Area	-1170.*	28SEP2008 0918	352.23	-4.47	0.43		0.54	0.000505	2.67	131.92	30.59	0.23
Bridge Area	-1170.*	28SEP2008 1448	645.25	-4.47	10.62		10.62	0.000006	0.62	6019.63	2529.58	0.03
Bridge Area	-1630	28SEP2008 0918	353.43	-5.16	-0.44		-0.07	0.002244	4.94	71.56	18.72	0.45
Bridge Area	-1630	28SEP2008 1448	636.07	-5.16	10.61		10.61	0.000002	0.35	9645.51	2494.71	0.02
Bridge Area	-1990.*	28SEP2008 0918	355.09	-5.70	-0.76		-0.61	0.000704	3.09	114.94	26.96	0.26
Bridge Area	-1990.*	28SEP2008 1448	620.69	-5.70	10.61		10.61	0.000001	0.24	12829.08	2663.14	0.01
Bridge Area	-2350.*	28SEP2008 0918	357.70	-6.24	-0.86		-0.79	0.000273	2.11	169.42	35.51	0.17
Bridge Area	-2350.*	28SEP2008 1448	595.40	-6.24	10.61		10.61	0.000000	0.18	16155.71	2831.57	0.01
Bridge Area	-2710	28SEP2008 0918	361.23	-6.78	-0.90		-0.86	0.000125	1.55	233.53	44.15	0.12
Bridge Area	-2710	28SEP2008 1448	559.71	-6.78	10.60		10.60	0.000000	0.13	19618.30	3000.00	0.01
Bridge Area	-3152.5*	28SEP2008 0918	366.13	-7.44	-0.94		-0.91	0.000098	1.44	254.73	44.09	0.11
Bridge Area	-3152.5*	28SEP2008 1448	501.70	-7.44	10.60		10.60	0.000000	0.11	21158.30	3211.17	0.00
Bridge Area	-3595.*	28SEP2008 0918	371.10	-8.10	-0.98		-0.95	0.000078	1.35	275.38	44.02	0.09
Bridge Area	-3595.*	28SEP2008 1448	429.32	-8.10	10.60		10.60	0.000000	0.09	22732.71	3422.33	0.00
Bridge Area	-4037.5*	28SEP2008 0918	376.13	-8.77	-1.01		-0.99	0.000064	1.27	296.17	43.99	0.09
Bridge Area	-4037.5*	28SEP2008 1448	342.06	-8.77	10.60		10.60	0.000000	0.07	24328.38	3633.50	0.00
Bridge Area	-4480.*	28SEP2008 0918	381.21	-9.43	-1.04		-1.01	0.000054	1.21	316.10	43.95	0.08
Bridge Area	-4480.*	28SEP2008 1448	241.20	-9.43	10.60		10.60	0.000000	0.04	25927.04	3844.67	0.00
Bridge Area	-4922.5*	28SEP2008 0918	386.32	-10.09	-1.06		-1.04	0.000046	1.15	335.42	43.91	0.07
Bridge Area	-4922.5*	28SEP2008 1448	130.00	-10.09	10.60		10.60	0.000000	0.02	27545.79	4055.84	0.00
Bridge Area	-5365.*	28SEP2008 0918	391.35	-10.76	-1.07		-1.06	0.000040	1.10	354.71	43.89	0.07
Bridge Area	-5365.*	28SEP2008 1448	13.59	-10.76	10.60		10.60	0.000000	0.00	29201.67	4267.00	0.00
Bridge Area	-5807.5*	28SEP2008 0918	396.41	-11.42	-1.09		-1.07	0.000035	1.06	373.06	43.86	0.06

HEC-RAS Plan: 25Exist SS no US River: Thornhill Creek Reach: Bridge Area (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Bridge Area	-5807.5*	28SEP2008 1448	-104.41	-11.42	10.61		10.61	0.000000	-0.02	30876.33	4478.17	0.00
Bridge Area	-6250	28SEP2008 0918	401.50	-12.09	-1.11		-1.09	0.000031	1.03	391.01	43.84	0.06
Bridge Area	-6250	28SEP2008 1448	-220.70	-12.09	10.61		10.61	0.000000	-0.03	32551.13	4689.34	0.00
Bridge Area	-6555.*	28SEP2008 0918	405.05	-12.54	-1.11		-1.10	0.000029	1.00	405.79	44.35	0.06
Bridge Area	-6555.*	28SEP2008 1448	-295.04	-12.54	10.61		10.61	0.000000	-0.04	34706.42	4689.34	0.00
Bridge Area	-6860	28SEP2008 0918	408.63	-13.00	-1.12	-11.07	-1.11	0.000026	0.97	421.06	44.90	0.06
Bridge Area	-6860	28SEP2008 1448	-362.09	-13.00	10.61	-11.22	10.61	0.000000	-0.05	36838.60	4689.34	0.00

HEC-RAS Plan: 25Exist SS no US River: Thornhill Creek Reach: Bridge Area

Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Crit W.S.	Frctn Loss	C & E Loss	Top Width	Q Left	Q Channel	Q Right	Vel Chnl
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft/s)
Bridge Area	155	28SEP2008 0918	2.39	2.25	0.80	0.06	0.00	54.98	0.22	349.78	0.00	3.05
Bridge Area	155	28SEP2008 1448	10.68	10.68	1.54	0.00	0.00	1874.92	144.62	421.23	30.99	0.76
Bridge Area	125	28SEP2008 0918	2.41	2.25	0.67	0.39	0.00	57.97	0.57	347.81	1.62	3.22
Bridge Area	125	28SEP2008 1448	10.68	10.68	1.68			1267.54	114.84	436.63	50.11	0.80
Bridge Area	-47 BR U	28SEP2008 0918	2.21	1.89	0.89	0.09	0.00	33.09	0.34	349.66		4.50
Bridge Area	-47 BR U	28SEP2008 1448	10.70	10.67	1.67			79.00	55.35	546.22		1.38
Bridge Area	-47 BR D	28SEP2008 0918	2.12	1.84	0.42	0.12	0.00	32.99		350.00		4.19
Bridge Area	-47 BR D	28SEP2008 1448	10.69	10.68	1.36			79.00	3.27	561.34	36.96	1.15
Bridge Area	-125	28SEP2008 0918	1.41	1.85	0.00	0.59	0.00	76.81		348.09	1.91	3.28
Bridge Area	-125	28SEP2008 1448	10.68	10.69	0.83			1649.23	27.57	388.61	185.39	0.68
Bridge Area	-450.*	28SEP2008 0918	0.86	0.74		0.12		38.50		350.63		2.79
Bridge Area	-450.*	28SEP2008 1448	10.66	10.65		0.00		860.30	70.97	501.18	64.85	0.81

Plan: 25Exist SS no US Thornhill Creek Bridge Area RS: -47 Profile: 28SEP2008 0918

E.G. US. (ft)	2.41	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	2.25	E.G. Elev (ft)	2.21	2.12
Q Total (cfs)	350.00	W.S. Elev (ft)	1.89	1.84
Q Bridge (cfs)	350.00	Crit W.S. (ft)	0.89	0.42
Q Weir (cfs)		Max Chl Dpth (ft)	4.52	4.38
Weir Sta Lft (ft)		Vel Total (ft/s)	4.46	4.19
Weir Sta Rgt (ft)		Flow Area (sq ft)	78.44	83.50
Weir Submerg		Froude # Chl	0.50	0.46
Weir Max Depth (ft)		Specif Force (cu ft)	169.89	185.89
Min El Weir Flow (ft)	13.91	Hydr Depth (ft)	2.37	2.53
Min El Prs (ft)	11.65	W.P. Total (ft)	43.90	40.84
Delta EG (ft)	1.00	Conv. Total (cfs)	5802.1	6662.4
Delta WS (ft)	0.40	Top Width (ft)	33.09	32.99
BR Open Area (sq ft)	642.60	Frctn Loss (ft)	0.09	0.12
BR Open Vel (ft/s)	4.46	C & E Loss (ft)	0.00	0.00
Coef of Q	1.00	Shear Total (lb/sq ft)	0.41	0.35
Br Sel Method	WSPRO	Power Total (lb/ft s)	53748.20	53748.20

Plan: 25Exist SS no US Thornhill Creek Bridge Area RS: -47 Profile: 28SEP2008 1448

E.G. US. (ft)	10.68	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	10.68	E.G. Elev (ft)	10.70	10.69
Q Total (cfs)	601.57	W.S. Elev (ft)	10.67	10.68
Q Bridge (cfs)	601.57	Crit W.S. (ft)	1.67	1.36
Q Weir (cfs)		Max Chl Dpth (ft)	13.30	13.22
Weir Sta Lft (ft)		Vel Total (ft/s)	1.06	0.97
Weir Sta Rgt (ft)		Flow Area (sq ft)	569.26	621.66
Weir Submerg		Froude # Chl	0.08	0.06
Weir Max Depth (ft)		Specif Force (cu ft)	2657.38	3046.98
Min El Weir Flow (ft)	13.91	Hydr Depth (ft)	7.21	7.87
Min El Prs (ft)	11.65	W.P. Total (ft)	125.54	129.07
Delta EG (ft)	0.00	Conv. Total (cfs)	65165.3	77951.5
Delta WS (ft)	-0.02	Top Width (ft)	79.00	79.00
BR Open Area (sq ft)	642.60	Frctn Loss (ft)		
BR Open Vel (ft/s)	1.06	C & E Loss (ft)		
Coef of Q	0.90	Shear Total (lb/sq ft)	0.02	0.02
Br Sel Method	WSPRO	Power Total (lb/ft s)	53748.20	53748.20

100 Year Existing Bridge

(Storm Tide + Base Flow)

HEC-RAS Output

HEC-RAS Plan: Exist 100 SS River: Thornhill Creek Reach: Bridge Area

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Bridge Area	4700	28SEP2008 1336	400.00	14.00	15.72		15.86	0.002894	2.99	141.32	135.71	0.48
Bridge Area	4700	28SEP2008 1354	400.00	14.00	15.73		15.86	0.002839	2.98	142.23	135.93	0.48
Bridge Area	4266.66*	28SEP2008 1336	399.07	13.17	14.59		14.69	0.002562	2.61	155.85	159.63	0.45
Bridge Area	4266.66*	28SEP2008 1354	402.41	13.17	14.59		14.69	0.002633	2.64	155.30	159.52	0.45
Bridge Area	3833.33*	28SEP2008 1336	402.29	12.33	13.55		13.64	0.002394	2.37	170.69	185.38	0.42
Bridge Area	3833.33*	28SEP2008 1354	396.28	12.33	13.54		13.63	0.002386	2.35	169.26	184.96	0.42
Bridge Area	3400.*	28SEP2008 1336	397.18	11.50	12.56		12.63	0.002320	2.18	182.06	210.30	0.41
Bridge Area	3400.*	28SEP2008 1354	367.68	11.50	12.97		13.00	0.000553	1.38	272.26	230.92	0.21
Bridge Area	2966.66*	28SEP2008 1336	342.27	10.67	12.04		12.06	0.000413	1.16	301.13	291.28	0.18
Bridge Area	2966.66*	28SEP2008 1354	172.69	10.67	12.87		12.87	0.000016	0.32	898.68	1221.54	0.04
Bridge Area	2533.33*	28SEP2008 1336	-26.65	9.83	11.97		11.97	0.000000	-0.04	1471.29	1396.65	0.00
Bridge Area	2533.33*	28SEP2008 1354	-273.71	9.83	12.87		12.87	0.000005	-0.23	2896.70	1753.01	0.02
Bridge Area	2100	28SEP2008 1336	-680.39	9.00	11.97		11.97	0.000023	-0.48	3214.02	1503.81	0.05
Bridge Area	2100	28SEP2008 1354	-806.84	9.00	12.87		12.87	0.000011	-0.41	4621.50	1588.89	0.04
Bridge Area	1682.5*	28SEP2008 1336	-1452.63	6.34	11.98		11.99	0.000030	-0.83	4283.08	1989.00	0.06
Bridge Area	1682.5*	28SEP2008 1354	-1442.89	6.34	12.87		12.87	0.000014	-0.64	6168.59	2468.43	0.04
Bridge Area	1265.*	28SEP2008 1336	-2364.24	3.68	11.99		12.01	0.000045	-1.30	4894.57	2419.28	0.08
Bridge Area	1265.*	28SEP2008 1354	-2417.69	3.68	12.87		12.88	0.000026	-1.07	7315.96	4257.80	0.06
Bridge Area	847.5*	28SEP2008 1336	-3336.90	1.03	11.99		12.04	0.000086	-2.08	5160.55	3264.87	0.12
Bridge Area	847.5*	28SEP2008 1354	-3797.29	1.03	12.88		12.92	0.000065	-1.91	7762.30	4981.81	0.10
Bridge Area	430	28SEP2008 1336	-4697.59	-1.63	12.03		12.21	0.000353	-4.31	4048.09	4107.03	0.23
Bridge Area	430	28SEP2008 1354	-5453.13	-1.63	12.91		13.05	0.000274	-4.01	5277.56	5558.23	0.21
Bridge Area	155	28SEP2008 1336	-5651.43	-2.60	12.08		12.39	0.000482	-5.61	2954.21	4165.13	0.29
Bridge Area	155	28SEP2008 1354	-6359.60	-2.60	12.94		13.22	0.000424	-5.52	3447.72	5573.71	0.27
Bridge Area	125	28SEP2008 1336	-5748.03	-2.68	12.07		12.43	0.000568	-6.02	2655.15	3885.98	0.31
Bridge Area	125	28SEP2008 1354	-6438.44	-2.68	12.92		13.26	0.000501	-5.92	3072.38	5535.40	0.29
Bridge Area	-47		Bridge									

HEC-RAS Plan: Exist 100 SS River: Thornhill Creek Reach: Bridge Area (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Bridge Area	-125	28SEP2008 1336	-5748.03	-2.54	12.96		13.18	0.000349	-4.87	2823.50	5758.00	0.24
Bridge Area	-125	28SEP2008 1354	-6438.44	-2.54	14.11		14.38	0.000356	-5.21	3710.31	6055.00	0.25
Bridge Area	-450.*	28SEP2008 1336	-7686.01	-3.96	12.93		13.40	0.000604	-6.79	3201.88	4309.73	0.32
Bridge Area	-450.*	28SEP2008 1354	-7499.49	-3.96	14.15		14.63	0.000516	-6.62	4265.55	4309.73	0.30
Bridge Area	-710	28SEP2008 1336	-8183.63	-3.78	13.05		13.25	0.000337	-5.27	7767.17	2564.46	0.23
Bridge Area	-710	28SEP2008 1354	-7793.12	-3.78	14.22		14.31	0.000167	-3.89	10310.93	2564.46	0.17
Bridge Area	-1170.*	28SEP2008 1336	-9114.71	-4.47	13.42		13.47	0.000166	-3.63	13088.58	2529.58	0.16
Bridge Area	-1170.*	28SEP2008 1354	-8359.38	-4.47	14.48		14.50	0.000081	-2.64	15774.84	2529.58	0.11
Bridge Area	-1630	28SEP2008 1336	-10327.60	-5.16	13.58		13.59	0.000109	-2.72	17036.90	2494.71	0.12
Bridge Area	-1630	28SEP2008 1354	-9091.89	-5.16	14.57		14.58	0.000055	-2.01	19529.13	2494.71	0.08
Bridge Area	-1990.*	28SEP2008 1336	-11347.50	-5.70	13.65		13.67	0.000071	-2.38	20940.98	2663.14	0.10
Bridge Area	-1990.*	28SEP2008 1354	-9698.06	-5.70	14.62		14.63	0.000036	-1.76	23520.86	2663.14	0.07
Bridge Area	-2350.*	28SEP2008 1336	-12600.80	-6.24	13.70		13.71	0.000053	-2.18	24906.02	2831.57	0.09
Bridge Area	-2350.*	28SEP2008 1354	-10445.00	-6.24	14.65		14.65	0.000026	-1.59	27603.58	2831.57	0.06
Bridge Area	-2710	28SEP2008 1336	-13888.00	-6.78	13.73		13.74	0.000041	-2.01	28986.20	3000.00	0.08
Bridge Area	-2710	28SEP2008 1354	-11237.70	-6.78	14.67		14.67	0.000020	-1.45	31808.41	3000.00	0.06
Bridge Area	-3152.5*	28SEP2008 1336	-15509.70	-7.44	13.75		13.76	0.000044	-2.10	31270.27	3211.17	0.08
Bridge Area	-3152.5*	28SEP2008 1354	-12281.40	-7.44	14.68		14.69	0.000021	-1.49	34259.36	3211.17	0.06
Bridge Area	-3595.*	28SEP2008 1336	-17165.10	-8.10	13.78		13.79	0.000047	-2.18	33615.11	3422.33	0.09
Bridge Area	-3595.*	28SEP2008 1354	-13382.50	-8.10	14.70		14.71	0.000021	-1.52	36757.02	3422.33	0.06
Bridge Area	-4037.5*	28SEP2008 1336	-18875.50	-8.77	13.82		13.83	0.000049	-2.25	36007.14	3633.50	0.09
Bridge Area	-4037.5*	28SEP2008 1354	-14549.70	-8.77	14.72		14.73	0.000022	-1.56	39288.59	3633.50	0.06
Bridge Area	-4480.*	28SEP2008 1336	-20612.70	-9.43	13.85		13.86	0.000051	-2.32	38416.48	3844.67	0.09
Bridge Area	-4480.*	28SEP2008 1354	-15778.40	-9.43	14.74		14.74	0.000023	-1.59	41829.55	3844.67	0.06
Bridge Area	-4922.5*	28SEP2008 1336	-22347.60	-10.09	13.89		13.90	0.000053	-2.37	40879.57	4055.84	0.09
Bridge Area	-4922.5*	28SEP2008 1354	-17071.30	-10.09	14.76		14.77	0.000024	-1.63	44406.69	4055.84	0.06

HEC-RAS Plan: Exist 100 SS River: Thornhill Creek Reach: Bridge Area (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Bridge Area	-5365.*	28SEP2008 1336	-24062.10	-10.76	13.93		13.94	0.000054	-2.41	43394.27	4267.00	0.09
Bridge Area	-5365.*	28SEP2008 1354	-18423.10	-10.76	14.78		14.79	0.000024	-1.67	47028.35	4267.00	0.06
Bridge Area	-5807.5*	28SEP2008 1336	-25747.40	-11.42	13.98		13.99	0.000055	-2.45	45967.54	4478.17	0.09
Bridge Area	-5807.5*	28SEP2008 1354	-19837.20	-11.42	14.81		14.81	0.000025	-1.71	49689.74	4478.17	0.06
Bridge Area	-6250	28SEP2008 1336	-27418.70	-12.09	14.01		14.03	0.000055	-2.47	48526.11	4689.34	0.09
Bridge Area	-6250	28SEP2008 1354	-21331.00	-12.09	14.83		14.83	0.000026	-1.75	52345.48	4689.34	0.06
Bridge Area	-6555.*	28SEP2008 1336	-28534.90	-12.54	14.04		14.05	0.000052	-2.43	50802.72	4689.34	0.09
Bridge Area	-6555.*	28SEP2008 1354	-22380.50	-12.54	14.84		14.85	0.000025	-1.74	54568.12	4689.34	0.06
Bridge Area	-6860	28SEP2008 1336	-29603.00	-13.00	14.07	5.52	14.08	0.000048	-2.38	53054.34	4689.34	0.09
Bridge Area	-6860	28SEP2008 1354	-23426.60	-13.00	14.86	5.15	14.86	0.000024	-1.73	56768.29	4689.34	0.06

HEC-RAS Plan: Exist 100 SS River: Thornhill Creek Reach: Bridge Area

Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Crit W.S.	Frctn Loss	C & E Loss	Top Width	Q Left	Q Channel	Q Right	Vel Chnl
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft/s)
Bridge Area	155	28SEP2008 1336	12.39	12.08		0.02		4165.13	-1595.16	-3539.49	-516.79	-5.61
Bridge Area	155	28SEP2008 1354	13.22	12.94		0.01		5573.71	-1912.11	-3726.41	-721.08	-5.52
Bridge Area	125	28SEP2008 1336	12.43	12.07				3885.98	-1330.35	-3717.07	-700.62	-6.02
Bridge Area	125	28SEP2008 1354	13.26	12.92				5535.40	-1609.94	-3921.07	-907.43	-5.92
Bridge Area	-47 BR U	28SEP2008 1336	14.05	12.07					-556.58	-5191.45		-11.87
Bridge Area	-47 BR U	28SEP2008 1354	15.42	12.92					-623.43	-5815.01		-13.30
Bridge Area	-47 BR D	28SEP2008 1336	14.43	12.96					-42.79	-5354.07	-351.17	-10.07
Bridge Area	-47 BR D	28SEP2008 1354	15.95	14.11					-47.93	-5997.16	-393.34	-11.28
Bridge Area	-125	28SEP2008 1336	13.18	12.96		0.15		5758.00	-523.92	-3404.19	-1819.92	-4.87
Bridge Area	-125	28SEP2008 1354	14.38	14.11		0.14		6055.00	-244.96	-3977.11	-2216.38	-5.21
Bridge Area	-450.*	28SEP2008 1336	13.40	12.93		0.11		4309.73	-1733.15	-5006.37	-946.49	-6.79
Bridge Area	-450.*	28SEP2008 1354	14.63	14.15		0.07		4309.73	-1052.78	-5299.82	-1146.90	-6.62

Plan: Exist 100 SS Thornhill Creek Bridge Area RS: -47 Profile: 28SEP2008 1336

E.G. US. (ft)	12.43	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	12.07	E.G. Elev (ft)	14.05	14.43
Q Total (cfs)	-5748.03	W.S. Elev (ft)	12.07	12.96
Q Bridge (cfs)		Crit W.S. (ft)		
Q Weir (cfs)		Max Chl Dpth (ft)	14.69	15.50
Weir Sta Lft (ft)		Vel Total (ft/s)	-8.94	-8.28
Weir Sta Rgt (ft)		Flow Area (sq ft)	642.60	694.45
Weir Submerg		Froude # Chl	-0.52	-0.44
Weir Max Depth (ft)		Specif Force (cu ft)	5457.13	6279.88
Min El Weir Flow (ft)	13.91	Hydr Depth (ft)		
Min El Prs (ft)	11.65	W.P. Total (ft)	210.11	213.60
Delta EG (ft)		Conv. Total (cfs)	56260.8	67051.1
Delta WS (ft)	-0.89	Top Width (ft)		
BR Open Area (sq ft)		Frctn Loss (ft)		
BR Open Vel (ft/s)		C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	1.99	1.49
Br Sel Method	Energy/Weir	Power Total (lb/ft s)	53748.20	53748.20

Plan: Exist 100 SS Thornhill Creek Bridge Area RS: -47 Profile: 28SEP2008 1354

E.G. US. (ft)	13.26	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	12.92	E.G. Elev (ft)	15.42	15.95
Q Total (cfs)	-6438.44	W.S. Elev (ft)	12.92	14.11
Q Bridge (cfs)		Crit W.S. (ft)		
Q Weir (cfs)		Max Chl Dpth (ft)	15.55	16.65
Weir Sta Lft (ft)		Vel Total (ft/s)	-10.02	-9.27
Weir Sta Rgt (ft)		Flow Area (sq ft)	642.60	694.45
Weir Submerg		Froude # Chl	-0.57	-0.47
Weir Max Depth (ft)		Specif Force (cu ft)	6508.10	7514.06
Min El Weir Flow (ft)	13.91	Hydr Depth (ft)		
Min El Prs (ft)	11.65	W.P. Total (ft)	210.11	213.60
Delta EG (ft)		Conv. Total (cfs)	56260.8	67051.1
Delta WS (ft)	-1.18	Top Width (ft)		
BR Open Area (sq ft)		Frctn Loss (ft)		
BR Open Vel (ft/s)		C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	2.50	1.87
Br Sel Method	Energy/Weir	Power Total (lb/ft s)	53748.20	53748.20

25 Year Existing

(Storm Tide +Creek Flood)

HEC-RAS Output

HEC-RAS Plan: 25 Yr EXT ST+RF River: Thornhill Creek Reach: Bridge Area

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Bridge Area	4700	28SEP2008 0918	834.00	14.00	16.33		16.58	0.003027	4.04	245.71	199.35	0.53
Bridge Area	4700	28SEP2008 1448	834.00	14.00	16.33		16.58	0.003027	4.04	245.71	199.35	0.53
Bridge Area	4266.66*	28SEP2008 0918	834.00	13.17	15.14		15.34	0.002715	3.56	255.75	219.43	0.49
Bridge Area	4266.66*	28SEP2008 1448	833.98	13.17	15.14		15.34	0.002715	3.56	255.72	219.43	0.49
Bridge Area	3833.33*	28SEP2008 0918	834.00	12.33	14.06		14.21	0.002508	3.21	271.67	241.79	0.47
Bridge Area	3833.33*	28SEP2008 1448	833.93	12.33	14.06		14.22	0.002506	3.21	271.73	241.80	0.47
Bridge Area	3400.*	28SEP2008 0918	834.00	11.50	13.06		13.19	0.002268	2.91	295.09	266.95	0.44
Bridge Area	3400.*	28SEP2008 1448	834.67	11.50	13.06		13.19	0.002264	2.91	295.47	267.01	0.44
Bridge Area	2966.66*	28SEP2008 0918	834.00	10.67	12.02		12.15	0.002560	2.85	296.70	290.52	0.46
Bridge Area	2966.66*	28SEP2008 1448	833.23	10.67	12.02		12.14	0.002587	2.86	295.40	290.30	0.46
Bridge Area	2533.33*	28SEP2008 0918	834.00	9.83	11.13		11.21	0.001793	2.36	503.51	717.63	0.38
Bridge Area	2533.33*	28SEP2008 1448	828.77	9.83	11.18		11.25	0.001518	2.24	540.31	775.52	0.35
Bridge Area	2100	28SEP2008 0918	834.00	9.00	9.84		9.93	0.004191	2.72	478.51	616.20	0.54
Bridge Area	2100	28SEP2008 1448	851.09	9.00	10.83		10.85	0.000234	1.10	1568.62	1220.30	0.15
Bridge Area	1682.5*	28SEP2008 0918	834.00	6.34	7.33		7.60	0.007396	4.11	202.94	213.92	0.74
Bridge Area	1682.5*	28SEP2008 1448	916.63	6.34	10.77		10.78	0.000037	0.79	2175.33	1428.31	0.07
Bridge Area	1265.*	28SEP2008 0918	834.00	3.68	5.51		5.67	0.002093	3.21	260.20	154.01	0.43
Bridge Area	1265.*	28SEP2008 1448	1001.76	3.68	10.76		10.76	0.000019	0.75	2537.06	1537.08	0.05
Bridge Area	847.5*	28SEP2008 0918	834.00	1.03	5.05		5.13	0.000523	2.32	359.54	122.04	0.24
Bridge Area	847.5*	28SEP2008 1448	1086.47	1.03	10.74		10.75	0.000020	0.91	2658.32	1702.50	0.06
Bridge Area	430	28SEP2008 0918	834.01	-1.63	4.32		4.63	0.002022	4.52	187.11	64.91	0.46
Bridge Area	430	28SEP2008 1448	1195.85	-1.63	10.71		10.74	0.000057	1.59	2261.66	1804.63	0.09
Bridge Area	155	28SEP2008 0918	834.01	-2.60	3.89	2.02	4.15	0.001191	4.12	211.82	61.63	0.37
Bridge Area	155	28SEP2008 1448	1286.09	-2.60	10.68	2.72	10.71	0.000048	1.63	2150.98	1877.46	0.09
Bridge Area	125	28SEP2008 0918	834.01	-2.68	3.89	2.16	4.17	0.001328	4.24	212.40	63.36	0.39
Bridge Area	125	28SEP2008 1448	1293.72	-2.68	10.68	2.84	10.72	0.000055	1.72	1983.41	1272.07	0.09
Bridge Area	-47		Bridge									
Bridge Area	-125	28SEP2008 0918	834.01	-2.54	4.14	1.49	3.90	0.000742	3.41	385.13	134.82	0.29

HEC-RAS Plan: 25 Yr EXT ST+RF River: Thornhill Creek Reach: Bridge Area (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Bridge Area	-125	28SEP2008 1448	1293.72	-2.54	10.75	2.60	10.71	0.000040	1.45	2051.08	1708.45	0.08
Bridge Area	-450.*	28SEP2008 0918	834.12	-3.96	3.43		3.60	0.000595	3.35	254.13	61.59	0.26
Bridge Area	-450.*	28SEP2008 1448	1346.53	-3.96	10.66		10.69	0.000048	1.71	1962.84	861.82	0.09
Bridge Area	-710	28SEP2008 0918	834.21	-3.78	3.35		3.48	0.000353	2.91	300.99	102.16	0.20
Bridge Area	-710	28SEP2008 1448	1365.69	-3.78	10.64		10.67	0.000036	1.55	3091.14	1124.57	0.07
Bridge Area	-1170.*	28SEP2008 0918	834.36	-4.47	3.02		3.25	0.000684	3.86	216.04	34.47	0.27
Bridge Area	-1170.*	28SEP2008 1448	1406.54	-4.47	10.63		10.64	0.000029	1.34	6031.24	2529.58	0.06
Bridge Area	-1630	28SEP2008 0918	834.77	-5.16	0.98		2.07	0.004988	8.36	99.82	20.87	0.67
Bridge Area	-1630	28SEP2008 1448	1448.21	-5.16	10.61		10.62	0.000012	0.79	9651.24	2494.71	0.04
Bridge Area	-1990.*	28SEP2008 0918	835.72	-5.70	0.25		0.78	0.002096	5.85	142.76	28.46	0.46
Bridge Area	-1990.*	28SEP2008 1448	1468.37	-5.70	10.61		10.61	0.000005	0.57	12832.57	2663.14	0.03
Bridge Area	-2350.*	28SEP2008 0918	837.46	-6.24	-0.05		0.23	0.000940	4.22	198.58	36.72	0.32
Bridge Area	-2350.*	28SEP2008 1448	1478.87	-6.24	10.61		10.61	0.000003	0.44	16159.16	2831.57	0.02
Bridge Area	-2710	28SEP2008 0918	840.00	-6.78	-0.19		-0.03	0.000463	3.17	265.36	45.22	0.23
Bridge Area	-2710	28SEP2008 1448	1472.30	-6.78	10.61		10.61	0.000002	0.35	19623.19	3000.00	0.02
Bridge Area	-3152.5*	28SEP2008 0918	843.75	-7.44	-0.36		-0.22	0.000389	3.01	280.72	44.96	0.21
Bridge Area	-3152.5*	28SEP2008 1448	1439.55	-7.44	10.61		10.61	0.000001	0.32	21165.65	3211.17	0.01
Bridge Area	-3595.*	28SEP2008 0918	847.75	-8.10	-0.51		-0.38	0.000330	2.86	296.37	44.73	0.20
Bridge Area	-3595.*	28SEP2008 1448	1381.15	-8.10	10.60		10.61	0.000001	0.29	22742.43	3422.33	0.01
Bridge Area	-4037.5*	28SEP2008 0918	852.00	-8.77	-0.63		-0.52	0.000281	2.72	312.91	44.55	0.18
Bridge Area	-4037.5*	28SEP2008 1448	1300.65	-8.77	10.61		10.61	0.000001	0.25	24340.16	3633.50	0.01
Bridge Area	-4480.*	28SEP2008 0918	856.46	-9.43	-0.74		-0.63	0.000242	2.60	329.18	44.39	0.17
Bridge Area	-4480.*	28SEP2008 1448	1205.45	-9.43	10.61		10.61	0.000001	0.22	25940.04	3844.67	0.01
Bridge Area	-4922.5*	28SEP2008 0918	861.03	-10.09	-0.83		-0.74	0.000211	2.49	345.33	44.25	0.16
Bridge Area	-4922.5*	28SEP2008 1448	1102.31	-10.09	10.61		10.61	0.000000	0.19	27558.72	4055.84	0.01
Bridge Area	-5365.*	28SEP2008 0918	865.75	-10.76	-0.91		-0.82	0.000185	2.39	361.85	44.13	0.15
Bridge Area	-5365.*	28SEP2008 1448	996.69	-10.76	10.61		10.61	0.000000	0.17	29213.02	4267.00	0.01
Bridge Area	-5807.5*	28SEP2008 0918	870.62	-11.42	-0.98		-0.90	0.000164	2.30	377.76	44.02	0.14

HEC-RAS Plan: 25 Yr EXT ST+RF River: Thornhill Creek Reach: Bridge Area (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Bridge Area	-5807.5*	28SEP2008 1448	890.84	-11.42	10.61		10.61	0.000000	0.14	30884.98	4478.17	0.01
Bridge Area	-6250	28SEP2008 0918	875.53	-12.09	-1.05		-0.97	0.000146	2.22	393.53	43.93	0.13
Bridge Area	-6250	28SEP2008 1448	785.28	-12.09	10.61		10.61	0.000000	0.12	32556.29	4689.34	0.00
Bridge Area	-6555.*	28SEP2008 0918	878.99	-12.54	-1.09		-1.01	0.000134	2.16	407.01	44.39	0.13
Bridge Area	-6555.*	28SEP2008 1448	715.47	-12.54	10.61		10.61	0.000000	0.10	34708.95	4689.34	0.00
Bridge Area	-6860	28SEP2008 0918	882.54	-13.00	-1.12	-9.82	-1.05	0.000123	2.10	421.06	44.90	0.12
Bridge Area	-6860	28SEP2008 1448	649.89	-13.00	10.61	-10.40	10.61	0.000000	0.08	36838.60	4689.34	0.00

HEC-RAS Plan: 25 Yr EXT ST+RF River: Thornhill Creek Reach: Bridge Area

Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Crit W.S.	Frctn Loss	C & E Loss	Top Width	Q Left	Q Channel	Q Right	Vel Chnl
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft/s)
Bridge Area	155	28SEP2008 0918	4.15	3.89	2.02	0.05	0.00	61.63	5.46	827.49	1.05	4.12
Bridge Area	155	28SEP2008 1448	10.71	10.68	2.72	0.00	0.00	1877.46	311.98	907.02	67.09	1.63
Bridge Area	125	28SEP2008 0918	4.17	3.89	2.16	0.33	0.00	63.36	5.10	820.74	8.16	4.24
Bridge Area	125	28SEP2008 1448	10.72	10.68	2.84			1272.07	247.31	938.35	108.06	1.72
Bridge Area	-47 BR U	28SEP2008 0918	4.39	3.86	2.22	0.08	0.00	39.24	7.87	826.14		5.83
Bridge Area	-47 BR U	28SEP2008 1448	10.78	10.65	3.20			79.00	118.79	1174.93		2.97
Bridge Area	-47 BR D	28SEP2008 0918	4.30	3.99	2.09	0.09	0.00	53.46		814.36	19.65	4.90
Bridge Area	-47 BR D	28SEP2008 1448	10.77	10.69	3.06			79.00	7.07	1207.08	79.57	2.48
Bridge Area	-125	28SEP2008 0918	3.90	4.14	1.49	0.29	0.03	134.82		719.74	114.27	3.41
Bridge Area	-125	28SEP2008 1448	10.71	10.75	2.60			1708.45	61.10	833.44	399.17	1.45
Bridge Area	-450.*	28SEP2008 0918	3.60	3.43		0.12		61.59		833.01	1.11	3.35
Bridge Area	-450.*	28SEP2008 1448	10.69	10.66		0.01		861.82	150.44	1058.93	137.17	1.71

Plan: 25 Yr EXT ST+RF Thornhill Creek Bridge Area RS: -47 Profile: 28SEP2008 0918

E.G. US. (ft)	4.17	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	3.89	E.G. Elev (ft)	4.39	4.30
Q Total (cfs)	834.01	W.S. Elev (ft)	3.86	3.99
Q Bridge (cfs)	834.01	Crit W.S. (ft)	2.22	2.09
Q Weir (cfs)		Max Chl Dpth (ft)	6.49	6.53
Weir Sta Lft (ft)		Vel Total (ft/s)	5.57	4.50
Weir Sta Rgt (ft)		Flow Area (sq ft)	149.67	185.18
Weir Submerg		Froude # Chl	0.50	0.44
Weir Max Depth (ft)		Specif Force (cu ft)	493.67	539.76
Min El Weir Flow (ft)	13.91	Hydr Depth (ft)	3.81	3.46
Min El Prs (ft)	11.65	W.P. Total (ft)	55.26	71.01
Delta EG (ft)	0.27	Conv. Total (cfs)	14421.4	16705.2
Delta WS (ft)	-0.25	Top Width (ft)	39.24	53.46
BR Open Area (sq ft)	642.60	Frctn Loss (ft)	0.08	0.09
BR Open Vel (ft/s)	5.57	C & E Loss (ft)	0.00	0.00
Coef of Q	1.00	Shear Total (lb/sq ft)	0.57	0.41
Br Sel Method	WSPRO	Power Total (lb/ft s)	53748.20	53748.20

Plan: 25 Yr EXT ST+RF Thornhill Creek Bridge Area RS: -47 Profile: 28SEP2008 1418

E.G. US. (ft)	10.02	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	10.02	E.G. Elev (ft)	10.03	10.03
Q Total (cfs)	-380.02	W.S. Elev (ft)	10.02	10.02
Q Bridge (cfs)		Crit W.S. (ft)		
Q Weir (cfs)		Max Chl Dpth (ft)	12.64	12.56
Weir Sta Lft (ft)		Vel Total (ft/s)	-0.73	-0.67
Weir Sta Rgt (ft)		Flow Area (sq ft)	517.70	569.73
Weir Submerg		Froude # Chl	0.06	0.05
Weir Max Depth (ft)		Specif Force (cu ft)	2289.18	2644.13
Min El Weir Flow (ft)	13.91	Hydr Depth (ft)	6.55	7.21
Min El Prs (ft)	11.65	W.P. Total (ft)	121.63	125.13
Delta EG (ft)		Conv. Total (cfs)	58123.6	70359.8
Delta WS (ft)	0.00	Top Width (ft)	79.00	79.00
BR Open Area (sq ft)		Frctn Loss (ft)		
BR Open Vel (ft/s)		C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	0.01	0.01
Br Sel Method	Energy/Weir	Power Total (lb/ft s)	53748.20	53748.20

100 Year Existing

(Storm Tide +Creek Flood)

HEC-RAS Output

HEC-RAS Plan: Exist 100 ST+RF River: Thornhill Creek Reach: Bridge Area

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Bridge Area	4700	28SEP2008 1336	1200.00	14.00	16.73		17.05	0.003105	4.67	326.27	209.73	0.55
Bridge Area	4700	28SEP2008 1354	1200.00	14.00	16.73		17.05	0.003115	4.67	325.84	209.68	0.56
Bridge Area	4266.66*	28SEP2008 1336	1199.38	13.17	15.51		15.76	0.002772	4.11	337.44	229.81	0.51
Bridge Area	4266.66*	28SEP2008 1354	1198.82	13.17	15.51		15.77	0.002750	4.10	338.35	229.93	0.51
Bridge Area	3833.33*	28SEP2008 1336	1201.84	12.33	14.40		14.61	0.002522	3.71	357.35	252.95	0.48
Bridge Area	3833.33*	28SEP2008 1354	1201.78	12.33	14.38		14.59	0.002648	3.76	350.88	252.14	0.50
Bridge Area	3400.*	28SEP2008 1336	1196.30	11.50	13.31		13.50	0.002644	3.52	362.85	276.37	0.49
Bridge Area	3400.*	28SEP2008 1354	1172.14	11.50	13.54		13.68	0.001624	3.01	429.97	352.59	0.39
Bridge Area	2966.66*	28SEP2008 1336	1111.05	10.67	12.55		12.65	0.001278	2.57	569.50	835.46	0.34
Bridge Area	2966.66*	28SEP2008 1354	902.54	10.67	13.23		13.25	0.000218	1.32	1408.35	1518.94	0.15
Bridge Area	2533.33*	28SEP2008 1336	775.68	9.83	12.31		12.32	0.000099	0.88	1971.17	1512.91	0.10
Bridge Area	2533.33*	28SEP2008 1354	394.46	9.83	13.19		13.19	0.000007	0.28	3478.03	1834.50	0.03
Bridge Area	2100	28SEP2008 1336	221.11	9.00	12.30		12.30	0.000002	0.14	3722.03	1563.38	0.01
Bridge Area	2100	28SEP2008 1354	-211.62	9.00	13.19		13.19	0.000001	-0.10	5214.75	2033.40	0.01
Bridge Area	1682.5*	28SEP2008 1336	-440.35	6.34	12.30		12.30	0.000002	-0.23	4923.33	2005.82	0.02
Bridge Area	1682.5*	28SEP2008 1354	-1052.72	6.34	13.19		13.19	0.000006	-0.42	6974.15	2531.96	0.03
Bridge Area	1265.*	28SEP2008 1336	-1327.90	3.68	12.30		12.30	0.000012	-0.68	5683.03	2656.09	0.04
Bridge Area	1265.*	28SEP2008 1354	-2271.93	3.68	13.19		13.20	0.000019	-0.92	8318.35	4558.14	0.05
Bridge Area	847.5*	28SEP2008 1336	-2717.19	1.03	12.29		12.32	0.000048	-1.58	5959.48	4350.89	0.09
Bridge Area	847.5*	28SEP2008 1354	-3739.58	1.03	13.20		13.23	0.000050	-1.72	8819.67	5248.70	0.09
Bridge Area	430	28SEP2008 1336	-4571.82	-1.63	12.31		12.46	0.000282	-3.92	4441.47	4765.47	0.21
Bridge Area	430	28SEP2008 1354	-5410.92	-1.63	13.23		13.34	0.000223	-3.68	5723.82	5931.93	0.19
Bridge Area	155	28SEP2008 1336	-5658.75	-2.60	12.34		12.62	0.000432	-5.39	3102.57	4851.54	0.27
Bridge Area	155	28SEP2008 1354	-6356.47	-2.60	13.24		13.50	0.000375	-5.27	3624.89	5936.72	0.26
Bridge Area	125	28SEP2008 1336	-5762.15	-2.68	12.32		12.66	0.000511	-5.79	2780.46	4734.98	0.29
Bridge Area	125	28SEP2008 1354	-6438.68	-2.68	13.23		13.54	0.000445	-5.67	3222.09	5933.46	0.28
Bridge Area	-47		Bridge									

HEC-RAS Plan: Exist 100 ST+RF River: Thornhill Creek Reach: Bridge Area (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Bridge Area	-125	28SEP2008 1336	-5762.15	-2.54	12.97		13.20	0.000349	-4.87	2829.84	5767.11	0.24
Bridge Area	-125	28SEP2008 1354	-6438.68	-2.54	14.11		14.38	0.000356	-5.21	3711.68	6055.00	0.25
Bridge Area	-450.*	28SEP2008 1336	-7680.56	-3.96	12.95		13.42	0.000599	-6.76	3212.31	4309.73	0.31
Bridge Area	-450.*	28SEP2008 1354	-7496.38	-3.96	14.15		14.63	0.000515	-6.62	4267.07	4309.73	0.30
Bridge Area	-710	28SEP2008 1336	-8161.05	-3.78	13.07		13.27	0.000331	-5.23	7806.13	2564.46	0.23
Bridge Area	-710	28SEP2008 1354	-7788.86	-3.78	14.22		14.31	0.000167	-3.89	10312.55	2564.46	0.17
Bridge Area	-1170.*	28SEP2008 1336	-9070.02	-4.47	13.43		13.48	0.000163	-3.60	13125.19	2529.58	0.16
Bridge Area	-1170.*	28SEP2008 1354	-8353.51	-4.47	14.48		14.50	0.000081	-2.63	15775.88	2529.58	0.11
Bridge Area	-1630	28SEP2008 1336	-10252.50	-5.16	13.59		13.60	0.000107	-2.69	17066.89	2494.71	0.12
Bridge Area	-1630	28SEP2008 1354	-9084.45	-5.16	14.57		14.58	0.000055	-2.00	19529.85	2494.71	0.08
Bridge Area	-1990.*	28SEP2008 1336	-11229.30	-5.70	13.67		13.68	0.000069	-2.36	20970.56	2663.14	0.10
Bridge Area	-1990.*	28SEP2008 1354	-9689.61	-5.70	14.62		14.63	0.000036	-1.76	23521.45	2663.14	0.07
Bridge Area	-2350.*	28SEP2008 1336	-12436.10	-6.24	13.71		13.72	0.000051	-2.14	24935.70	2831.57	0.09
Bridge Area	-2350.*	28SEP2008 1354	-10435.60	-6.24	14.65		14.66	0.000026	-1.58	27604.11	2831.57	0.06
Bridge Area	-2710	28SEP2008 1336	-13697.40	-6.78	13.74		13.75	0.000040	-1.98	29014.96	3000.00	0.08
Bridge Area	-2710	28SEP2008 1354	-11227.30	-6.78	14.67		14.67	0.000020	-1.45	31808.89	3000.00	0.06
Bridge Area	-3152.5*	28SEP2008 1336	-15302.50	-7.44	13.76		13.77	0.000043	-2.07	31297.86	3211.17	0.08
Bridge Area	-3152.5*	28SEP2008 1354	-12269.80	-7.44	14.68		14.69	0.000021	-1.49	34259.84	3211.17	0.06
Bridge Area	-3595.*	28SEP2008 1336	-16933.50	-8.10	13.79		13.80	0.000045	-2.15	33641.39	3422.33	0.08
Bridge Area	-3595.*	28SEP2008 1354	-13369.70	-8.10	14.70		14.71	0.000021	-1.52	36757.49	3422.33	0.06
Bridge Area	-4037.5*	28SEP2008 1336	-18610.20	-8.77	13.82		13.84	0.000047	-2.22	36031.92	3633.50	0.09
Bridge Area	-4037.5*	28SEP2008 1354	-14535.80	-8.77	14.72		14.73	0.000022	-1.56	39289.06	3633.50	0.06
Bridge Area	-4480.*	28SEP2008 1336	-20321.10	-9.43	13.86		13.87	0.000049	-2.28	38438.98	3844.67	0.09
Bridge Area	-4480.*	28SEP2008 1354	-15763.50	-9.43	14.74		14.74	0.000023	-1.59	41829.98	3844.67	0.06
Bridge Area	-4922.5*	28SEP2008 1336	-22038.70	-10.09	13.90		13.91	0.000051	-2.34	40898.47	4055.84	0.09
Bridge Area	-4922.5*	28SEP2008 1354	-17055.50	-10.09	14.76		14.77	0.000024	-1.63	44407.02	4055.84	0.06

HEC-RAS Plan: Exist 100 ST+RF River: Thornhill Creek Reach: Bridge Area (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Bridge Area	-5365.*	28SEP2008 1336	-23736.50	-10.76	13.93		13.95	0.000052	-2.38	43409.38	4267.00	0.09
Bridge Area	-5365.*	28SEP2008 1354	-18406.60	-10.76	14.78		14.79	0.000024	-1.67	47028.60	4267.00	0.06
Bridge Area	-5807.5*	28SEP2008 1336	-25407.60	-11.42	13.98		13.99	0.000053	-2.41	45977.97	4478.17	0.09
Bridge Area	-5807.5*	28SEP2008 1354	-19820.10	-11.42	14.81		14.81	0.000025	-1.70	49689.88	4478.17	0.06
Bridge Area	-6250	28SEP2008 1336	-27071.00	-12.09	14.01		14.03	0.000054	-2.44	48532.30	4689.34	0.09
Bridge Area	-6250	28SEP2008 1354	-21313.70	-12.09	14.83		14.83	0.000026	-1.74	52345.58	4689.34	0.06
Bridge Area	-6555.*	28SEP2008 1336	-28184.30	-12.54	14.04		14.05	0.000050	-2.40	50805.73	4689.34	0.09
Bridge Area	-6555.*	28SEP2008 1354	-22363.10	-12.54	14.84		14.85	0.000025	-1.74	54568.17	4689.34	0.06
Bridge Area	-6860	28SEP2008 1336	-29251.10	-13.00	14.07	5.50	14.08	0.000047	-2.35	53054.34	4689.34	0.09
Bridge Area	-6860	28SEP2008 1354	-23409.00	-13.00	14.86	5.20	14.86	0.000024	-1.73	56768.29	4689.34	0.06

HEC-RAS Plan: Exist 100 ST+RF River: Thornhill Creek Reach: Bridge Area

Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Crit W.S.	Frctn Loss	C & E Loss	Top Width	Q Left	Q Channel	Q Right	Vel Chnl
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft/s)
Bridge Area	155	28SEP2008 1336	12.62	12.34		0.01		4851.54	-1631.30	-3470.73	-556.72	-5.39
Bridge Area	155	28SEP2008 1354	13.50	13.24		0.01		5936.72	-1946.75	-3643.82	-765.90	-5.27
Bridge Area	125	28SEP2008 1336	12.66	12.32				4734.98	-1368.27	-3656.58	-737.30	-5.79
Bridge Area	125	28SEP2008 1354	13.54	13.23				5933.46	-1647.21	-3844.83	-946.63	-5.67
Bridge Area	-47 BR U	28SEP2008 1336	14.32	12.32					-557.95	-5204.21		-11.90
Bridge Area	-47 BR U	28SEP2008 1354	15.73	13.23					-623.45	-5815.23		-13.30
Bridge Area	-47 BR D	28SEP2008 1336	14.45	12.97					-42.90	-5367.22	-352.03	-10.09
Bridge Area	-47 BR D	28SEP2008 1354	15.96	14.11					-47.94	-5997.39	-393.36	-11.28
Bridge Area	-125	28SEP2008 1336	13.20	12.97		0.15		5767.11	-527.01	-3410.52	-1824.62	-4.87
Bridge Area	-125	28SEP2008 1354	14.38	14.11		0.14		6055.00	-245.32	-3977.00	-2216.35	-5.21
Bridge Area	-450.*	28SEP2008 1336	13.42	12.95		0.11		4309.73	-1737.96	-4995.85	-946.76	-6.76
Bridge Area	-450.*	28SEP2008 1354	14.63	14.15		0.07		4309.73	-1053.08	-5296.95	-1146.35	-6.62

Plan: Exist 100 ST+RF Thornhill Creek Bridge Area RS: -47 Profile: 28SEP2008 1336

E.G. US. (ft)	12.66	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	12.32	E.G. Elev (ft)	14.32	14.45
Q Total (cfs)	-5762.15	W.S. Elev (ft)	12.32	12.97
Q Bridge (cfs)		Crit W.S. (ft)		
Q Weir (cfs)		Max Chl Dpth (ft)	14.95	15.51
Weir Sta Lft (ft)		Vel Total (ft/s)	-8.97	-8.30
Weir Sta Rgt (ft)		Flow Area (sq ft)	642.60	694.45
Weir Submerg		Froude # Chl	-0.52	-0.44
Weir Max Depth (ft)		Specif Force (cu ft)	5632.46	6300.80
Min El Weir Flow (ft)	13.91	Hydr Depth (ft)		
Min El Prs (ft)	11.65	W.P. Total (ft)	210.11	213.60
Delta EG (ft)		Conv. Total (cfs)	56260.8	67051.1
Delta WS (ft)	-0.65	Top Width (ft)		
BR Open Area (sq ft)		Frctn Loss (ft)		
BR Open Vel (ft/s)		C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	2.00	1.50
Br Sel Method	Energy/Weir	Power Total (lb/ft s)	53748.20	53748.20

Plan: Exist 100 ST+RF Thornhill Creek Bridge Area RS: -47 Profile: 28SEP2008 1354

E.G. US. (ft)	13.54	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	13.23	E.G. Elev (ft)	15.73	15.96
Q Total (cfs)	-6438.68	W.S. Elev (ft)	13.23	14.11
Q Bridge (cfs)		Crit W.S. (ft)		
Q Weir (cfs)		Max Chl Dpth (ft)	15.86	16.65
Weir Sta Lft (ft)		Vel Total (ft/s)	-10.02	-9.27
Weir Sta Rgt (ft)		Flow Area (sq ft)	642.60	694.45
Weir Submerg		Froude # Chl	-0.56	-0.47
Weir Max Depth (ft)		Specif Force (cu ft)	6706.22	7514.57
Min El Weir Flow (ft)	13.91	Hydr Depth (ft)		
Min El Prs (ft)	11.65	W.P. Total (ft)	210.11	213.60
Delta EG (ft)		Conv. Total (cfs)	56260.8	67051.1
Delta WS (ft)	-0.88	Top Width (ft)		
BR Open Area (sq ft)		Frctn Loss (ft)		
BR Open Vel (ft/s)		C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	2.50	1.87
Br Sel Method	Energy/Weir	Power Total (lb/ft s)	53748.20	53748.20

Proposed 280'

(Daily Tide)

HEC-RAS Output

HEC-RAS Plan: Pro4- Tidal River: Thornhill Creek Reach: Bridge Area

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Bridge Area	4700	Max WS	300.00	14.00	15.55		15.66	0.002753	2.63	118.48	130.20	0.46
Bridge Area	4700	28SEP2008 1642	300.00	14.00	15.54		15.65	0.002831	2.66	117.39	129.93	0.47
Bridge Area	4700	28SEP2008 1912	300.00	14.00	15.54		15.65	0.002834	2.66	117.35	129.92	0.47
Bridge Area	4266.66*	Max WS	303.80	13.17	14.44		14.52	0.002497	2.33	131.85	154.31	0.43
Bridge Area	4266.66*	28SEP2008 1642	299.99	13.17	14.43		14.51	0.002506	2.32	130.65	154.01	0.43
Bridge Area	4266.66*	28SEP2008 1912	299.99	13.17	14.43		14.51	0.002498	2.31	130.78	154.05	0.43
Bridge Area	3833.33*	Max WS	304.44	12.33	13.40		13.47	0.002437	2.13	142.95	177.65	0.42
Bridge Area	3833.33*	28SEP2008 1642	300.01	12.33	13.39		13.46	0.002423	2.11	141.94	177.47	0.41
Bridge Area	3833.33*	28SEP2008 1912	300.01	12.33	13.39		13.46	0.002440	2.12	141.65	177.41	0.42
Bridge Area	3400.*	Max WS	303.04	11.50	12.43		12.49	0.002142	1.94	156.17	200.45	0.39
Bridge Area	3400.*	28SEP2008 1642	299.93	11.50	12.42		12.48	0.002185	1.95	153.87	199.16	0.39
Bridge Area	3400.*	28SEP2008 1912	299.65	11.50	12.43		12.49	0.002133	1.93	155.12	199.86	0.39
Bridge Area	2966.66*	Max WS	300.01	10.67	11.46		11.51	0.002313	1.89	158.71	224.46	0.40
Bridge Area	2966.66*	28SEP2008 1642	300.01	10.67	11.46		11.51	0.002347	1.90	157.94	224.21	0.40
Bridge Area	2966.66*	28SEP2008 1912	300.16	10.67	11.45		11.50	0.002455	1.93	155.67	223.45	0.41
Bridge Area	2533.33*	Max WS	305.29	9.83	10.74		10.77	0.001020	1.39	242.09	617.75	0.27
Bridge Area	2533.33*	28SEP2008 1642	299.23	9.83	10.61		10.65	0.001656	1.61	185.95	260.65	0.34
Bridge Area	2533.33*	28SEP2008 1912	293.82	9.83	10.64		10.68	0.001386	1.51	194.53	262.44	0.31
Bridge Area	2100	Max WS	299.97	9.00	9.49		9.53	0.003456	1.74	268.55	580.59	0.45
Bridge Area	2100	28SEP2008 1642	300.26	9.00	9.48		9.52	0.003885	1.80	259.17	578.82	0.48
Bridge Area	2100	28SEP2008 1912	296.17	9.00	9.44		9.48	0.005086	1.95	236.53	574.42	0.54
Bridge Area	1682.5*	Max WS	325.21	6.34	6.91		7.03	0.007600	2.88	113.02	207.64	0.69
Bridge Area	1682.5*	28SEP2008 1642	301.86	6.34	6.86		6.99	0.008822	2.92	103.27	207.27	0.73
Bridge Area	1682.5*	28SEP2008 1912	305.20	6.34	6.87		7.00	0.008150	2.87	106.48	207.39	0.70
Bridge Area	1265.*	Max WS	299.94	3.68	5.08		5.11	0.000650	1.53	195.76	145.91	0.23
Bridge Area	1265.*	28SEP2008 1642	297.90	3.68	5.00		5.04	0.000770	1.61	184.93	145.23	0.25
Bridge Area	1265.*	28SEP2008 1912	310.25	3.68	4.51		4.63	0.004005	2.70	114.74	143.00	0.53
Bridge Area	847.5*	Max WS	300.05	1.03	4.95		4.96	0.000075	0.86	348.09	121.71	0.09
Bridge Area	847.5*	28SEP2008 1642	290.29	1.03	4.86		4.87	0.000079	0.86	336.71	121.38	0.09
Bridge Area	847.5*	28SEP2008 1912	330.14	1.03	3.76		3.79	0.000317	1.52	216.74	94.37	0.18
Bridge Area	430	Max WS	299.25	-1.63	4.89		4.92	0.000147	1.36	224.87	66.75	0.13
Bridge Area	430	28SEP2008 1642	283.85	-1.63	4.80		4.82	0.000144	1.32	218.79	66.45	0.12

HEC-RAS Plan: Pro4- Tidal River: Thornhill Creek Reach: Bridge Area (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Bridge Area	430	28SEP2008 1912	368.40	-1.63	3.22		3.37	0.001731	3.14	117.64	61.38	0.40
Bridge Area	155	Max WS	298.97	-2.60	4.86	0.58	4.88	0.000071	1.17	273.21	64.76	0.09
Bridge Area	155	28SEP2008 1642	280.51	-2.60	4.77	0.48	4.79	0.000067	1.12	267.50	64.52	0.09
Bridge Area	155	28SEP2008 1912	405.69	-2.60	2.85	1.01	2.97	0.000825	2.77	149.29	57.85	0.29
Bridge Area	125	Max WS	298.86	-2.68	4.86	0.44	4.88	0.000078	1.20	276.03	67.95	0.10
Bridge Area	125	28SEP2008 1642	280.12	-2.68	4.77	0.35	4.79	0.000073	1.15	270.05	67.52	0.09
Bridge Area	125	28SEP2008 1912	410.59	-2.68	2.85	1.04	2.98	0.000976	2.92	147.97	59.93	0.31
Bridge Area	-23		Bridge									
Bridge Area	-125	Max WS	298.97	-2.54	4.90	-0.19	4.88	0.000058	1.03	491.97	187.74	0.08
Bridge Area	-125	28SEP2008 1642	280.12	-2.54	4.80	-0.27	4.79	0.000051	0.95	475.51	149.10	0.08
Bridge Area	-125	28SEP2008 1912	410.59	-2.54	3.10	0.22	2.98	0.000454	2.36	250.26	121.75	0.22
Bridge Area	-450.*	Max WS	298.34	-3.96	4.85		4.87	0.000033	0.92	360.67	90.77	0.06
Bridge Area	-450.*	28SEP2008 1642	272.20	-3.96	4.77		4.78	0.000029	0.85	352.90	89.59	0.06
Bridge Area	-450.*	28SEP2008 1912	489.40	-3.96	2.73		2.81	0.000330	2.28	214.56	51.90	0.19
Bridge Area	-710	Max WS	299.12	-3.78	4.85		4.86	0.000020	0.81	542.07	205.89	0.05
Bridge Area	-710	28SEP2008 1642	264.13	-3.78	4.77		4.77	0.000017	0.72	524.93	201.89	0.05
Bridge Area	-710	28SEP2008 1912	525.96	-3.78	2.68		2.74	0.000200	2.05	256.09	44.52	0.15
Bridge Area	-1170.*	Max WS	297.37	-4.47	4.83		4.85	0.000034	1.01	464.03	232.91	0.06
Bridge Area	-1170.*	28SEP2008 1642	243.89	-4.47	4.76		4.77	0.000024	0.84	446.36	225.23	0.05
Bridge Area	-1170.*	28SEP2008 1912	572.19	-4.47	2.48		2.61	0.000413	2.89	197.87	33.67	0.21
Bridge Area	-1630	Max WS	294.12	-5.16	4.81		4.83	0.000071	1.32	606.04	552.67	0.08
Bridge Area	-1630	28SEP2008 1642	214.15	-5.16	4.74		4.75	0.000040	0.98	571.10	548.45	0.06
Bridge Area	-1630	28SEP2008 1912	588.92	-5.16	1.82		2.20	0.001582	5.00	117.72	22.12	0.38
Bridge Area	-1990.*	Max WS	292.03	-5.70	4.79		4.80	0.000026	0.90	814.08	710.58	0.05
Bridge Area	-1990.*	28SEP2008 1642	181.47	-5.70	4.74		4.74	0.000010	0.57	774.17	704.09	0.03
Bridge Area	-1990.*	28SEP2008 1912	588.17	-5.70	1.71		1.87	0.000491	3.16	186.09	30.66	0.23
Bridge Area	-2350.*	Max WS	289.50	-6.24	4.79		4.79	0.000012	0.66	1086.88	974.02	0.04
Bridge Area	-2350.*	28SEP2008 1642	146.04	-6.24	4.73		4.73	0.000003	0.34	1035.05	962.29	0.02
Bridge Area	-2350.*	28SEP2008 1912	585.67	-6.24	1.70		1.78	0.000200	2.21	265.16	39.35	0.15
Bridge Area	-2710	Max WS	285.58	-6.78	4.78		4.79	0.000005	0.45	2575.75	2646.22	0.02
Bridge Area	-2710	28SEP2008 1642	70.42	-6.78	4.73		4.73	0.000000	0.11	2437.78	2617.87	0.01

HEC-RAS Plan: Pro4- Tidal River: Thornhill Creek Reach: Bridge Area (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Bridge Area	-2710	28SEP2008 1912	585.32	-6.78	1.71		1.75	0.000097	1.66	353.65	48.06	0.11
Bridge Area	-3152.5*	Max WS	276.76	-7.44	4.78		4.78	0.000004	0.40	2898.59	2845.39	0.02
Bridge Area	-3152.5*	28SEP2008 1642	-85.15	-7.44	4.73		4.73	0.000000	-0.13	2752.49	2814.79	0.01
Bridge Area	-3152.5*	28SEP2008 1912	589.47	-7.44	1.70		1.74	0.000081	1.56	376.68	48.05	0.10
Bridge Area	-3595.*	Max WS	262.42	-8.10	4.78		4.78	0.000003	0.36	3253.27	3077.16	0.02
Bridge Area	-3595.*	28SEP2008 1642	-257.51	-8.10	4.72		4.73	0.000003	-0.36	3096.91	3008.87	0.02
Bridge Area	-3595.*	28SEP2008 1912	598.00	-8.10	1.71		1.74	0.000070	1.50	399.06	48.06	0.09
Bridge Area	-4037.5*	Max WS	238.50	-8.77	4.77		4.77	0.000002	0.31	3630.19	3247.69	0.02
Bridge Area	-4037.5*	28SEP2008 1642	-430.01	-8.77	4.72		4.73	0.000007	-0.56	3467.46	3212.63	0.03
Bridge Area	-4037.5*	28SEP2008 1912	609.42	-8.77	1.71		1.75	0.000061	1.45	421.51	48.07	0.09
Bridge Area	-4480.*	Max WS	207.76	-9.43	4.77		4.77	0.000001	0.25	4009.54	3394.81	0.01
Bridge Area	-4480.*	28SEP2008 1642	-588.98	-9.43	4.72		4.73	0.000011	-0.72	3848.18	3364.33	0.04
Bridge Area	-4480.*	28SEP2008 1912	621.61	-9.43	1.72		1.75	0.000055	1.40	443.02	48.08	0.08
Bridge Area	-4922.5*	Max WS	188.33	-10.09	4.77		4.77	0.000001	0.21	4407.98	3525.58	0.01
Bridge Area	-4922.5*	28SEP2008 1642	-736.95	-10.09	4.72		4.73	0.000014	-0.85	4257.10	3485.85	0.04
Bridge Area	-4922.5*	28SEP2008 1912	633.18	-10.09	1.74		1.77	0.000050	1.36	463.91	48.10	0.08
Bridge Area	-5365.*	Max WS	179.79	-10.76	4.76		4.76	0.000001	0.19	4847.86	3591.07	0.01
Bridge Area	-5365.*	28SEP2008 1642	-869.33	-10.76	4.72		4.73	0.000017	-0.94	4717.76	3582.47	0.05
Bridge Area	-5365.*	28SEP2008 1912	644.50	-10.76	1.75		1.78	0.000045	1.33	484.86	48.13	0.07
Bridge Area	-5807.5*	Max WS	206.28	-11.42	4.76		4.76	0.000001	0.21	5314.19	3757.84	0.01
Bridge Area	-5807.5*	28SEP2008 1642	-971.76	-11.42	4.73		4.74	0.000018	-0.98	5208.16	3755.71	0.05
Bridge Area	-5807.5*	28SEP2008 1912	656.43	-11.42	1.78		1.80	0.000041	1.30	504.94	48.16	0.07
Bridge Area	-6250	Max WS	492.74	-12.09	4.75		4.75	0.000004	0.46	5782.73	3930.99	0.02
Bridge Area	-6250	28SEP2008 1642	-1043.11	-12.09	4.73		4.74	0.000018	-0.99	5703.78	3929.49	0.05
Bridge Area	-6250	28SEP2008 1912	669.32	-12.09	1.80		1.82	0.000039	1.28	524.61	48.20	0.07
Bridge Area	-6555.*	Max WS	484.28	-12.54	4.75		4.75	0.000002	0.37	7661.60	4327.35	0.02
Bridge Area	-6555.*	28SEP2008 1642	-1075.02	-12.54	4.74		4.74	0.000012	-0.83	7594.84	4323.92	0.04
Bridge Area	-6555.*	28SEP2008 1912	704.91	-12.54	1.81		1.84	0.000039	1.30	542.16	48.87	0.07
Bridge Area	-6860	Max WS	489.75	-13.00	4.75	-10.83	4.75	0.000002	0.31	9641.06	4419.10	0.01
Bridge Area	-6860	28SEP2008 1642	-1095.25	-13.00	4.74	-9.35	4.74	0.000008	-0.69	9588.05	4416.86	0.03
Bridge Area	-6860	28SEP2008 1912	765.11	-13.00	1.82	-10.10	1.85	0.000042	1.37	559.94	49.58	0.07

HEC-RAS Plan: Pro4- Tidal River: Thornhill Creek Reach: Bridge Area

Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Crit W.S.	Frctn Loss	C & E Loss	Top Width	Q Left	Q Channel	Q Right	Vel Chnl
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft/s)
Bridge Area	155	Max WS	4.88	4.86	0.58	0.00	0.00	64.76	3.18	294.91	0.87	1.17
Bridge Area	155	28SEP2008 1642	4.79	4.77	0.48	0.00	0.00	64.52	2.89	276.86	0.76	1.12
Bridge Area	155	28SEP2008 1912	2.97	2.85	1.01	0.03	0.00	57.85	0.86	404.75	0.08	2.77
Bridge Area	125	Max WS	4.88	4.86	0.44	0.01	0.00	67.95	2.68	292.59	3.59	1.20
Bridge Area	125	28SEP2008 1642	4.79	4.77	0.35	0.01	0.00	67.52	2.43	274.38	3.31	1.15
Bridge Area	125	28SEP2008 1912	2.98	2.85	1.04	0.06	0.00	59.93	1.26	406.52	2.81	2.92
Bridge Area	-23 BR U	Max WS	4.91	4.89	0.46	0.01	0.00	65.09	2.98	291.91	3.96	1.23
Bridge Area	-23 BR U	28SEP2008 1642	4.82	4.80	0.37	0.01	0.00	64.64	2.69	273.78	3.64	1.18
Bridge Area	-23 BR U	28SEP2008 1912	3.25	3.14	1.04	0.06	0.00	57.90	1.65	405.66	3.29	2.69
Bridge Area	-23 BR D	Max WS	4.91	4.90	0.17	0.01	0.00	180.62		243.06	55.80	1.12
Bridge Area	-23 BR D	28SEP2008 1642	4.81	4.81	0.09	0.01	0.00	153.09		227.57	52.54	1.07
Bridge Area	-23 BR D	28SEP2008 1912	3.19	3.14	0.63	0.05	0.00	118.55		369.74	40.85	2.70
Bridge Area	-125	Max WS	4.88	4.90	-0.19	0.02	0.00	187.74		257.06	41.80	1.03
Bridge Area	-125	28SEP2008 1642	4.79	4.80	-0.27	0.02	0.00	149.10		233.32	46.80	0.95
Bridge Area	-125	28SEP2008 1912	2.98	3.10	0.22	0.16	0.00	121.75		378.69	31.90	2.36
Bridge Area	-450.*	Max WS	4.87	4.85		0.01		90.77	0.00	294.94	3.40	0.92
Bridge Area	-450.*	28SEP2008 1642	4.78	4.77		0.01		89.59		269.42	2.79	0.85
Bridge Area	-450.*	28SEP2008 1912	2.81	2.73		0.07		51.90		489.38	0.02	2.28

HEC-RAS Plan: Pro4- Tidal River: Thornhill Creek Reach: Bridge Area

Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Crit W.S.	Frctn Loss	C & E Loss	Top Width	Q Left	Q Channel	Q Right	Vel Chnl
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft/s)
Bridge Area	155	Max WS	4.88	4.86	0.58	0.00	0.00	64.76	3.18	294.91	0.87	1.17
Bridge Area	155	28SEP2008 1642	4.79	4.77	0.48	0.00	0.00	64.52	2.89	276.86	0.76	1.12
Bridge Area	155	28SEP2008 1912	2.97	2.85	1.01	0.03	0.00	57.85	0.86	404.75	0.08	2.77
Bridge Area	125	Max WS	4.88	4.86	0.44	0.01	0.00	67.95	2.68	292.59	3.59	1.20
Bridge Area	125	28SEP2008 1642	4.79	4.77	0.35	0.01	0.00	67.52	2.43	274.38	3.31	1.15
Bridge Area	125	28SEP2008 1912	2.98	2.85	1.04	0.06	0.00	59.93	1.26	406.52	2.81	2.92
Bridge Area	-23 BR U	Max WS	4.91	4.89	0.46	0.01	0.00	65.09	2.98	291.91	3.96	1.23
Bridge Area	-23 BR U	28SEP2008 1642	4.82	4.80	0.37	0.01	0.00	64.64	2.69	273.78	3.64	1.18
Bridge Area	-23 BR U	28SEP2008 1912	3.25	3.14	1.04	0.06	0.00	57.90	1.65	405.66	3.29	2.69
Bridge Area	-23 BR D	Max WS	4.91	4.90	0.17	0.01	0.00	180.62		243.06	55.80	1.12
Bridge Area	-23 BR D	28SEP2008 1642	4.81	4.81	0.09	0.01	0.00	153.09		227.57	52.54	1.07
Bridge Area	-23 BR D	28SEP2008 1912	3.19	3.14	0.63	0.05	0.00	118.55		369.74	40.85	2.70
Bridge Area	-125	Max WS	4.88	4.90	-0.19	0.02	0.00	187.74		257.06	41.80	1.03
Bridge Area	-125	28SEP2008 1642	4.79	4.80	-0.27	0.02	0.00	149.10		233.32	46.80	0.95
Bridge Area	-125	28SEP2008 1912	2.98	3.10	0.22	0.16	0.00	121.75		378.69	31.90	2.36
Bridge Area	-450.*	Max WS	4.87	4.85		0.01		90.77	0.00	294.94	3.40	0.92
Bridge Area	-450.*	28SEP2008 1642	4.78	4.77		0.01		89.59		269.42	2.79	0.85
Bridge Area	-450.*	28SEP2008 1912	2.81	2.73		0.07		51.90		489.38	0.02	2.28

Plan: Pro4- Tidal Thornhill Creek Bridge Area RS: -23 Profile: Max WS

E.G. US. (ft)	4.88	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	4.86	E.G. Elev (ft)	4.91	4.91
Q Total (cfs)	298.86	W.S. Elev (ft)	4.89	4.90
Q Bridge (cfs)	298.86	Crit W.S. (ft)	0.46	0.17
Q Weir (cfs)		Max Chl Dpth (ft)	7.57	7.44
Weir Sta Lft (ft)		Vel Total (ft/s)	1.11	0.65
Weir Sta Rgt (ft)		Flow Area (sq ft)	269.05	460.51
Weir Submerg		Froude # Chl	0.10	0.09
Weir Max Depth (ft)		Specif Force (cu ft)	679.19	957.98
Min El Weir Flow (ft)	14.40	Hydr Depth (ft)	4.13	2.55
Min El Prs (ft)	14.00	W.P. Total (ft)	74.91	195.61
Delta EG (ft)	0.00	Conv. Total (cfs)	31095.3	34365.7
Delta WS (ft)	-0.03	Top Width (ft)	65.09	180.62
BR Open Area (sq ft)	2440.83	Frctn Loss (ft)	0.01	0.01
BR Open Vel (ft/s)	1.11	C & E Loss (ft)	0.00	0.00
Coef of Q	1.00	Shear Total (lb/sq ft)	0.02	0.01
Br Sel Method	WSPRO	Power Total (lb/ft s)	53748.20	53748.20

Plan: Pro4- Tidal Thornhill Creek Bridge Area RS: -23 Profile: 28SEP2008 1642

E.G. US. (ft)	4.79	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	4.77	E.G. Elev (ft)	4.82	4.81
Q Total (cfs)	280.12	W.S. Elev (ft)	4.80	4.81
Q Bridge (cfs)	280.12	Crit W.S. (ft)	0.37	0.09
Q Weir (cfs)		Max Chl Dpth (ft)	7.48	7.35
Weir Sta Lft (ft)		Vel Total (ft/s)	1.06	0.63
Weir Sta Rgt (ft)		Flow Area (sq ft)	263.12	444.43
Weir Submerg		Froude # Chl	0.10	0.09
Weir Max Depth (ft)		Specif Force (cu ft)	653.72	915.63
Min El Weir Flow (ft)	14.40	Hydr Depth (ft)	4.07	2.90
Min El Prs (ft)	14.00	W.P. Total (ft)	74.23	167.51
Delta EG (ft)	0.00	Conv. Total (cfs)	30167.5	33389.4
Delta WS (ft)	-0.03	Top Width (ft)	64.64	153.09
BR Open Area (sq ft)	2440.83	Frctn Loss (ft)	0.01	0.01
BR Open Vel (ft/s)	1.06	C & E Loss (ft)	0.00	0.00
Coef of Q	1.00	Shear Total (lb/sq ft)	0.02	0.01
Br Sel Method	WSPRO	Power Total (lb/ft s)	53748.20	53748.20

Plan: Pro4- Tidal Thornhill Creek Bridge Area RS: -23 Profile: 28SEP2008 1912

E.G. US. (ft)	2.98	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	2.85	E.G. Elev (ft)	3.25	3.19
Q Total (cfs)	410.59	W.S. Elev (ft)	3.14	3.14
Q Bridge (cfs)	410.59	Crit W.S. (ft)	1.04	0.63
Q Weir (cfs)		Max Chl Dpth (ft)	5.82	5.68
Weir Sta Lft (ft)		Vel Total (ft/s)	2.53	1.78
Weir Sta Rgt (ft)		Flow Area (sq ft)	162.10	230.10
Weir Submerg		Froude # Chl	0.27	0.26
Weir Max Depth (ft)		Specif Force (cu ft)	326.62	374.87
Min El Weir Flow (ft)	14.40	Hydr Depth (ft)	2.80	1.94
Min El Prs (ft)	14.00	W.P. Total (ft)	63.25	125.89
Delta EG (ft)	0.00	Conv. Total (cfs)	15165.8	16055.0
Delta WS (ft)	-0.25	Top Width (ft)	57.90	118.55
BR Open Area (sq ft)	2440.83	Frctn Loss (ft)	0.06	0.05
BR Open Vel (ft/s)	2.53	C & E Loss (ft)	0.00	0.00

Plan: Pro4- Tidal Thornhill Creek Bridge Area RS: -23 Profile: 28SEP2008 1912 (Continued)

Coef of Q	1.00	Shear Total (lb/sq ft)	0.12	0.07
Br Sel Method	WSPRO	Power Total (lb/ft s)	53748.20	53748.20

532650-ThornhillC.rep

HEC-RAS Version 4.1.0 Jan 2010
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

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X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X      X   X     X  X    X
X     X  X        X           X   X    X    X   X
XXXXXXX  XXXX     X       XXX XXXX     XXXXXX    XXXX
X     X  X        X           X  X     X    X        X
X     X  X        X    X      X   X    X    X        X
X     X  XXXXXX    XXXX       X    X   X    X   XXXXX
```

PROJECT DATA
Project Title: 532650- Thornhill Creek
Project File : 532650-ThornhillC.prj
Run Date and Time: 3/3/2016 7:34:06 AM

Project in English units

Project Description: Proposed 280' Bridge- Tidal FLows + Base Flow

PLAN DATA

Plan Title: Pro 4 (280' Bridge) Tidal (W.base Flow)
Plan File : z:\Bridge Hydraulics\Projects\532650-Glynn\HEC-RAS\532650-ThornhillC.p61

Geometry Title: Thorn Hill unsteady pro4 (280)
Geometry File : z:\Bridge Hydraulics\Projects\532650-Glynn\HEC-RAS\532650-ThornhillC.g13

Flow Title :
Flow File :

Plan Summary Information:

Number of:	Cross Sections =	31	Multiple Openings =	0
	Culverts =	0	Inline Structures =	0
	Bridges =	1	Lateral Structures =	0

Computational Information

Water surface calculation tolerance	=	0.01
Critical depth calculation tolerance	=	0.01
Maximum number of iterations	=	20
Maximum difference tolerance	=	0.3
Flow tolerance factor	=	0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

GEOMETRY DATA

Geometry Title: Thorn Hill unsteady pro4 (280)
Geometry File : z:\Bridge Hydraulics\Projects\532650-Glynn\HEC-RAS\532650-ThornhillC.g13

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: 4700

INPUT
Description:
Station Elevation Data num= 93

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
55865.48	2056	335.82	2056	337.78	19.6	456341.61	19.4	356346.07	19
56416	19	56464	19	56483.96	19	56488.53	18.8	456491.01	18.76
56499.41	19	56513.34	19	56519.58	18.7	956522.97	18.6	756538.97	18.13
56540.1	18.09	56540.3	18.0	856542.76	18	56631.19	18	56635.14	17.87
56644.15	17	56675.36	17	56683.32	16.2	356685.77	16	56699.39	16
56710.27	15.32	56711.99	15.2	656715.46	15.15	56717	15	56731.54	15
56733.52	14.88	56747.61	14	56779.77	14	56780.75	14.06	56795.85	14.57
56800.31	15	56828	15	56828.01	15	56844.08	16	56876.22	16
56883.61	16.46	56884.22	16.5	56892.29	17	56956.49	17	56970.2	17.85
56972.53	18	57116.4	18	57122.11	18.36	57132.33	18.01	57132.42	18.01
57132.6	18.02	57161.85	18.86	57162.66	18.91	57163.33	18.95	57164.13	19
58240.08	19	58307.14	18.52	58310.82	18.5	58380.32	18	60139.81	18
60171.13	18.84	60195.29	18.49	60196.17	18.51	60214.42	19	60228.71	19
60243.62	18.78	60251.72	19	61370.75	19	61379.25	19.23	61394.88	19
61408.06	19	61445.02	19.99	61445.36	20	61596.71	20	61600.67	19.84
61631.86	19	62340.59	19	62344.19	19.1	62369.91	19.79	62394.08	19.43
62394.14	19.43	62415.19	19.13	62418.24	19.08	62423.85	19	66905.19	19
66920.46	18.51	66940.47	18.86	66966.97	18	67499.51	18	67550.35	17
68804.41	17	68830.81	18	68946.02	18				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
55865.48	.1	56717	.03	56828	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
56717	56828	433.33	433.33	433.33	.1	.3

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: 4266.66*

INPUT
Description:
Station Elevation Data num= 157

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
55836.07	18.5	56124.84	18.5	56180.08	18.37	56189.02	18.33	56271.29	18.33
56273.11	18.03	56276.65	17.86	56280.78	17.5	56345.49	17.5	56389.9	17.5
56408.38	17.5	56412.6	17.37	56414.9	17.3	56422.67	17.5	56435.56	17.5
56441.33	17.33	56444.47	17.23	56459.27	16.77	56460.32	16.74	56460.51	16.73
56462.79	16.67	56544.61	16.67	56548.27	16.56	56556.6	15.83	56585.48	15.83
56592.85	15.19	56595.12	15	56607.72	15	56617.79	14.43	56619.38	14.38
56622.59	14.29	56624.02	14.17	56636.85	14.07	56637.64	14.07	56639.49	13.96
56652.7	13.17	56716.68	13.17	56718.7	13.22	56722.49	13.17	56723.14	13.17
56724.04	13.22	56737.88	13.7	56741.96	14.07	56767.33	14.17	56767.34	14.17
56767.43	14.17	56781.67	15	56810.33	15	56816.92	15.38	56817.46	15.42
56824.66	15.83	56881.91	15.83	56894.13	16.54	56896.21	16.67	57024.5	16.67

57029.59	16.97 57038.7	16.6857038.79	16.6857038.95	16.6857065.03	17.38
57065.75	17.4257066.34	17.4657067.06	17.557145.51	17.5 57164.1	17.42
57197.21	17.3357870.22	17.3357874.33	17.35 57946.6	17.45 57950.6	17.46
57978.63	17.558026.47	17.558086.27	17.158089.55	17.0858151.52	16.67
58281.73	16.6758297.54	16.6958303.32	16.6758304.27	16.758311.14	16.67
58316.17	16.7258325.95	16.7358354.79	16.7758359.07	16.8258364.32	16.83
58377.18	16.8158379.78	16.8158397.09	16.83 58523.1	16.83 58543.7	16.88
58546.86	16.8358559.62	16.958620.26	16.9958625.42	1758626.86	17
58741.22	1758855.05	17.1759168.39	17.1759261.52	17.3359313.95	17.33
59340.59	17.3159354.67	17.3359720.45	17.3359748.37	18.0359769.91	17.74
59770.7	17.7659786.98	18.1759799.72	18.1759813.01	17.9859820.23	18.17
60006.63	18.1760010.71	18.17 60018.4	18.1960099.77	18.3360802.17	18.33
60818.06	18.360825.64	18.4760839.58	18.2560851.33	18.2360884.29	18.98
60884.59	18.9960958.58	18.8361019.55	18.8361023.08	18.761050.89	18
61682.86	1861686.07	18.0861686.13	18.0861709.01	18.6761730.55	18.39
61730.61	18.3961749.38	18.15 61752.1	18.1161757.11	18.0561869.81	18.13
61877.61	18.1461897.17	18.1561914.61	18.1762260.57	18.1762372.95	18.32
62378.84	18.3362458.29	18.3362537.79	18.1765753.07	18.17 65766.7	17.76
65784.53	18.0565808.16	17.3366283.02	17.3366328.36	16.566799.84	16.5
66978.41	16.6767316.66	16.6767335.57	16.7267401.07	16.8367446.59	16.83
67470.13	17.6767572.87	17.67			

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
55836.07	.156624.02		.0356767.33		.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
56624.0	256767.33	433.33	433.33	433.33	.1	.3

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: 3833.33*

INPUT
Description:
Station Elevation Data num= 157

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
55806.65	1756072.13		1756122.91		16.7456131.13		16.6756206.77		16.67
56208.43	16.4356211.69		16.2956215.48		1656274.97		16 56315.8		16
56332.79	1656336.68		15.8956338.79		15.8456345.93		1656357.78		16
56363.09	15.8656365.97		15.7856379.58		15.4256380.54		15.3956380.71		15.39
56382.81	15.3356458.04		15.3356461.39		15.2556469.05		14.6756495.61		14.67
56502.38	14.1556504.46		1456516.05		14 56525.3		13.5556526.77		13.51
56529.72	13.4356531.03		13.33	56543	13.1556543.74		13.1456545.47		13.04
56557.78	12.3356656.55		12.3356656.56		12.3356659.65		12.4456665.51		12.33
56666.52	12.3356667.34		12.3856679.91		12.8256683.62		13.1456706.67		13.33
56706.75	13.3456719.26		1456744.44		1456750.23		14.3156750.71		14.33
56757.03	14.6756807.32		14.6756818.06		15.2356819.89		15.3356932.59		15.33
56937.07	15.5756945.07		15.3456945.14		15.3456945.29		15.35 56968.2		15.91
56968.83	15.9456969.36		15.9756969.98		1657038.91		1657055.24		15.85
57084.32	15.6757675.59		15.67 57679.2		15.757742.69		15.9157746.21		15.92
57770.83	1657812.86		16 57865.4		15.6857868.28		15.6757922.73		15.33
58037.12	15.3358051.01		15.3858056.09		15.3358056.92		15.458062.96		15.33
58067.37	15.4358075.96		15.46 58101.3		15.5458105.06		15.6458109.68		15.67
58120.97	15.6158123.26		15.6258138.46		15.6758249.17		15.6758267.27		15.76
58270.05	15.6758281.25		15.858334.53		15.9858339.06		1658340.32		16
58440.8	16 58540.8		16.3358816.08		16.33 58897.9		16.6758943.96		16.67
58967.37	16.6258979.73		16.6759301.08		16.6759325.61		17.2359344.54		16.99
59345.23	17.0159359.53		17.3359370.72		17.33 59382.4		17.1959388.75		17.33
59552.5	17.3359556.09		17.3559562.84		17.3859634.32		17.6760251.42		17.67
60265.38	17.660272.04		17.7260284.28		17.5160294.61		17.4660323.56		17.98

```
60323.82   17.9860388.83   17.6760442.39   17.6760445.49   17.5660469.93      17
61025.13      1761027.95   17.07   61028   17.07 61048.1   17.5661067.04   17.35
61067.08   17.3561083.57   17.1861085.96   17.1561090.36    17.161189.38   17.27
61196.23   17.2861213.41   17.3161228.73   17.3361532.67   17.33 61631.4   17.64
61636.57   17.6761706.38   17.6761776.22   17.3364600.96   17.3364612.92   17.01
 64628.6   17.2464649.36   16.6765066.54   16.6765106.37      1665520.58      16
65677.46   16.3365974.62   16.3365991.24   16.4466048.78   16.6766088.77   16.67
66109.46   17.3366199.71   17.33

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
55806.65      .156531.03     .0356706.67      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      56531.0356706.67           433.33  433.33  433.33             .1       .3

CROSS SECTION


RIVER: Thornhill Creek
REACH: Bridge Area         RS: 3400.*

INPUT
Description:
Station Elevation Data     num=     157
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
55777.24    15.556019.41   15.556065.74   15.1156073.24      1556142.24      15
56143.76   14.8256146.73   14.7256150.19    14.556204.46   14.556241.71    14.5
 56257.2    14.556260.75   14.4256262.67   14.3856269.19    14.5   56280    14.5
56284.84    14.456287.47   14.3456299.89   14.0656300.77   14.0556300.92   14.04
56302.83      1456371.45      1456374.52   13.9456381.51    13.556405.73    13.5
56411.91   13.1156413.81      1356424.38      1356432.82   12.6656434.16   12.63
56436.85   12.5756438.05    12.556449.15   12.2356449.84   12.2156451.44   12.13
56462.87    11.556596.41    11.556596.43    11.556600.61   11.6656608.53    11.5
56609.89    11.556610.63   11.5456621.93   11.9556625.27   12.21   56646    12.5
56646.08    12.556656.85      1356678.55      1356683.54   13.2356683.95   13.25
 56689.4    13.556732.74    13.556741.99   13.9356743.57      1456840.69      14
56844.55   14.1856851.45   14.0156851.51   14.0156851.63   14.0156871.38   14.43
56871.92   14.4556872.37   14.4856872.91    14.5 56932.3    14.556946.38   14.27
56971.45      1457480.96      1457484.07   14.0557538.79   14.3657541.81   14.38
57563.04    14.557599.26    14.557644.53   14.2657647.02   14.2557693.93      14
57792.51      1457804.48   14.0757808.85      1457809.57    14.157814.77      14
57818.58   14.1557825.98   14.1857847.82   14.3257851.05   14.4557855.03    14.5
57864.77   14.4157866.74   14.4357879.84    14.557975.24    14.557990.84   14.64
57993.23    14.558002.88    14.7 58048.8   14.97 58052.7   14.9958053.79      15
58140.38      1558226.55    15.558463.77    15.558534.27      1658573.97      16
58594.14   15.93 58604.8      1658881.71      1658902.86   16.4258919.17   16.24
58919.77   16.2658932.09    16.558941.73    16.5 58951.8   16.3958957.26    16.5
59098.38    16.559101.47   16.5259107.29   16.5759168.89      1759700.66      17
59712.69    16.959718.43   16.9659728.98   16.7659737.88   16.6959762.83   16.97
59763.05   16.9759819.07    16.559865.23    16.559867.91   16.4259888.96      16
60367.41      1660369.84   16.0560369.88   16.05 60387.2   16.4460403.51   16.31
60403.55   16.3160417.77    16.260419.82   16.1860423.61   16.1560508.94    16.4
60514.84   16.4260529.65   16.4660542.85    16.560804.77    16.560889.85   16.97
60894.31      1760954.46      1761014.65    16.563448.84    16.563459.15   16.26
63472.66   16.4363490.55      1663850.05      1663884.38    15.564241.32    15.5
64376.51      1664632.59      1664646.91   16.1664696.49    16.564730.95    16.5
64748.78      1764826.55      17

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
55777.24      .156438.05     .03   56646      .1
```

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
56438.05	56646	433.33	433.33	433.33	.1	.3

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: 2966.66*

INPUT
Description:
Station Elevation Data num= 157

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
55747.83	14	55966.7	1456008.57	13.4956015.35		13.3356077.71		13.33	
56079.09	13.2156081.77		13.14	56084.9	1356133.95		1356167.61		13
56181.61	1356184.82		12.9556186.56		12.9256192.45		1356202.22		13
56206.59	12.9356208.97		12.8956220.19		12.7156220.99		12.756221.13		12.69
56222.85	12.6756284.88		12.6756287.64		12.6256293.96		12.3356315.86		12.33
56321.44	12.0856323.16		1256332.71		1256340.34		11.7756341.55		11.75
56343.98	11.7256345.06		11.67	56355.3	11.356355.93		11.2956357.41		11.21
56367.96	10.6756536.27		10.67	56536.3	10.6756541.57		10.8756551.55		10.67
56553.27	10.6756553.92		10.756563.96		11.0856566.92		11.2856585.33		11.67
56585.4	11.6756594.45		1256612.66		1256616.85		12.15	56617.2	12.17
56621.77	12.3356658.16		12.3356665.93		12.6256667.25		12.6756748.79		12.67
56752.02	12.7956757.82		12.6756757.87		12.6756757.97		12.6756774.55		12.95
56775.01	12.9756775.39		12.9856775.84		13	56825.7	1356837.52		12.69
56858.56	12.3357286.34		12.3357288.95		12.457334.88		12.8157337.42		12.84
57355.24	1357385.65		1357423.66		12.8457425.75		12.8357465.13		12.67
57547.9	12.6757557.95		12.7657561.62		12.6757562.22		12.857566.59		12.67
57569.78	12.87	57576	12.9157594.33		13.0957597.05		13.2757600.39		13.33
57608.56	13.2257610.21		13.2357621.22		13.3357701.31		13.33	57714.4	13.51
57716.41	13.3357724.52		13.6157763.06		13.9657766.34		13.9957767.26		14
57839.95	14	57912.3	14.6758111.46		14.6758170.65		15.3358203.98		15.33
58220.91	15.2358229.86		15.3358462.35		15.33	58480.1	15.6158493.79		15.5
58494.29	15.558504.64		15.6758512.74		15.6758521.19		15.5958525.78		15.67
58644.25	15.6758646.84		15.6958651.73		15.7558703.45		16.33	59149.9	16.33
59160	16.259164.82		16.2159173.68		16.0159181.15		15.91	59202.1	15.96
59202.29	15.9659249.32		15.3359288.07		15.3359290.32		15.2859307.99		15
59709.68	1559711.71		15.0359711.75		15.0359726.29		15.3359739.99		15.27
59740.03	15.2759751.96		15.2359753.68		15.2259756.86		15.21	59828.5	15.53
59833.46	15.5659845.89		15.6159856.97		15.6760076.87		15.67	60148.3	16.29
60152.04	16.3360202.54		16.3360253.07		15.6762296.73		15.6762305.38		15.5
62316.72	15.6262331.74		15.3362633.57		15.3362662.38		1562962.06		15
63075.56	15.6763290.55		15.6763302.57		15.8763344.21		16.3363373.14		16.33
63388.11	16.67	63453.4	16.67						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
55747.83	.156345.06		.0356585.33		.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
56345.06	56585.33	433.33	433.33	433.33	.1	.3

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: 2533.33*

INPUT
Description:
Station Elevation Data num= 157

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

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55718.41    12.555913.99    12.555951.41   11.8655957.46   11.6756013.18   11.67
56014.41   11.6156016.81   11.5756019.61    11.556063.43    11.556093.52    11.5
56106.02    11.556108.89   11.4756110.45   11.4656115.71    11.556124.44    11.5
56128.35   11.4756130.47   11.45 56140.5   11.3656141.21   11.3556141.34   11.35
56142.88   11.33 56198.3   11.3356200.77   11.3156206.42   11.1756225.98   11.17
56230.97   11.04 56232.5      1156241.04      1156247.86   10.8956248.93   10.88
56251.11   10.8656252.07   10.8356261.46   10.3856262.04   10.3656263.39   10.29
56273.04    9.8356476.14    9.8356476.16    9.8356482.52   10.0956494.57    9.83
56496.64    9.8356497.21    9.8656505.99   10.2156508.58   10.3556524.67   10.83
56524.72   10.8356532.04      1156546.77      1156550.16   11.0856550.44   11.08
56554.14   11.1756583.57   11.1756589.86   11.3156590.93   11.3356656.88   11.33
 56659.5   11.3956664.19   11.3456664.23   11.3456664.31   11.3456677.72   11.48
56678.09   11.49 56678.4   11.4956678.77    11.5 56719.1    11.556728.66   11.12
56745.68   10.6757091.71   10.6757093.82   10.7557130.98   11.2757133.03    11.3
57147.45    11.557172.04    11.557202.79   11.4257204.48   11.4257236.34   11.33
57303.29   11.3357311.41   11.4557314.38   11.3357314.87    11.5 57318.4   11.33
57320.99   11.5857326.02   11.6457340.85   11.8657343.05   12.0957345.75   12.17
57352.36   12.03 57353.7   12.0457362.59   12.1757427.38   12.1757437.97   12.39
 57439.6   12.1757446.16   12.5157477.33   12.9557479.99   12.9957480.72      13
57539.53      1357598.05   13.8357759.15   13.8357807.03   14.6757833.99   14.67
57847.69   14.5457854.93   14.6758042.98   14.6758057.34   14.8158068.42   14.75
58068.82   14.7558077.19   14.8358083.74   14.8358090.58    14.858094.29   14.83
58190.12   14.8358192.22   14.8758196.18   14.9458238.01   15.6758599.15   15.67
58607.32    15.558611.21   15.4558618.38   15.2758624.42   15.1458641.37   14.96
58641.52   14.9658679.56   14.1758710.91   14.1758712.73   14.1458727.03      14
59051.95      14 59053.6   14.0259053.62   14.0259065.39   14.2159076.47   14.23
 59076.5   14.2359086.15   14.2559087.55   14.2559090.12   14.2659148.07   14.67
59152.07    14.759162.13   14.77 59171.1   14.8359348.97   14.8359406.75   15.61
59409.78   15.6759450.63   15.67 59491.5   14.8361144.61   14.8361151.61   14.75
61160.79   14.8161172.94   14.6761417.08   14.6761440.39    14.5 61682.8    14.5
61774.61   15.3361948.52   15.3361958.24   15.5961991.92   16.1762015.32   16.17
62027.43   16.3362080.25   16.33

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
55718.41      .156252.07     .0356524.67      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      56252.0756524.67            433.33  433.33  433.33             .1       .3

CROSS SECTION


RIVER: Thornhill Creek
REACH: Bridge Area          RS: 2100

INPUT
Description:
Station Elevation Data      num=      71
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
   55689      1155861.28      1155894.24   10.2355899.57      1056159.09      10
56167.61    9.4556178.13       9   56416       956416.03       956423.48    9.31
56437.59       956440.02       9   56464   9.99856464.04      10 56612.5      10
 56619.8    9.54 56632.8       956897.08       956898.69     9.156927.07    9.72
56928.64    9.7656939.65      1057058.67      1057064.88   10.1457067.15      10
57067.52    10.257070.22      1057072.19    10.357076.03   10.3757087.36   10.63
57089.04   10.91 57091.1      1157096.15   10.8357097.17   10.8557103.97      11
57153.45      1157161.54   11.2757162.78      1157167.79   11.41 57191.6   11.94
57193.63   11.9957194.19      12 57239.1      12 57283.8      1357406.84      13
57443.41      14   57464      1457474.46   13.8557479.99      14   57736      14
 57737.6   14.0457740.62   14.1357772.57      1558048.39      1558109.81      13
 58395.5      1358467.63    13.858470.69   13.8458478.37   13.9258485.22      14
58621.07      14 58665.2   14.9358667.51      1558698.71      1558729.93      14
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60403.54      1460473.66      1560606.48      1560613.91   15.3160639.63      16
60707.09      16

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   55689      .156159.09     .03   56464      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      56159.09   56464           417.52  417.52  417.52             .1       .3
Ineffective Flow      num=       2
   Sta L   Sta R    Elev  Permanent
   55689   53099   14.02       T
   5952960707.09    14.4       T

CROSS SECTION


RIVER: Thornhill Creek
REACH: Bridge Area          RS: 1682.5*

INPUT
Description:
Station Elevation Data      num=     440
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
 55203.8   11.3555213.85   11.3555214.99   11.3655216.21   11.3555227.87   11.36
55229.89   11.3555242.46   11.3755245.27   11.38 55261.8   11.3155262.27   11.31
55264.98   11.3255268.75    11.355270.12    11.355271.15   11.26 55272.8   11.27
 55277.7   11.2855279.57   11.2855285.13   11.2455288.52   11.2455294.43   11.27
55320.21   11.29 55326.8   11.2755339.88   11.2855343.71   11.2755349.03   11.27
55350.34   11.2655352.48   11.25 55353.2   11.26 55355.8   11.2955356.49   11.27
55357.98   11.2855358.46   11.2855361.09   11.2955362.12   11.28 55364.2   11.22
55366.14   11.0955367.09   11.0455368.48   10.9755369.88   10.8255372.88   10.63
55373.14   10.6155373.68   10.5955385.79   10.5955386.15   10.6155386.82   10.65
55389.35   10.8255433.47   11.0555434.39   11.0755439.71   11.2255440.85   11.23
55450.64   11.3855451.05   11.3855461.07   11.4355464.02    11.555465.11   11.52
55466.26   11.5255467.81   11.5455468.07   11.5655473.91   11.5455495.52   11.43
55498.64   11.4355504.02   11.4755511.38   11.47 55512.5   11.4855514.94   11.45
55523.16   11.3955559.77   11.5255560.74   11.5255565.58   11.4555566.35   11.45
 55569.1   11.4455609.88   11.0455610.88   11.0255613.22   11.0355614.15   11.06
55614.74   11.0655616.53   11.0255638.98   10.7155650.29   10.4855675.01   10.35
55723.53   10.5555727.19   10.4355737.39   10.0255738.98   10.0655742.83    10.1
 55743.3   10.1155747.16    9.9855747.54    9.9655748.14    9.9455748.37    9.93
55749.01    9.8855749.51    9.86 55750.7    9.95 55752.9   10.0155754.87   10.07
55755.37   10.0855762.59   10.1855766.43   10.1855768.86   10.1955775.31   10.17
 55777.2   10.1555780.98   10.1555781.89   10.1355782.56   10.1255815.07   10.04
55816.01   10.0455818.94   10.0555820.66   10.0555821.71   10.0455822.61   10.04
55824.19   10.0555825.71   10.0755826.67   10.0855829.51   10.1255830.54   10.11
55833.21   10.0855834.41   10.0755835.25   10.0755836.85   10.0355899.54   10.14
55899.89   10.1455903.01   10.1555904.25   10.16 55908.6   10.1855909.95   10.19
55911.65   10.1855915.01   10.1855915.81   10.1955916.88   10.18 55917.3   10.18
55918.68   10.16   55928   10.5455928.36   10.4455931.47   10.45 55932.4   10.45
55934.71   10.44 55935.6   10.4355935.91   10.5155935.96   10.52 55938.4   10.49
55941.86   10.44 55948.8    9.9355949.12     9.9 55949.7    9.8755950.49    9.77
55952.27    9.56 55974.3    9.5655975.56     9.855976.74    9.9555985.49   10.04
56007.07   10.1456009.41    10.156011.57   10.09   56014    10.156018.93    10.1
56020.02   10.1156020.94   10.1156038.27   10.21 56040.8   10.2156043.16   10.19
56045.21   10.1956045.66   10.1856047.88    10.2   56049    10.256055.41    10.1
56059.08   10.02 56059.5   10.0156060.68    9.9456060.93    9.9356062.32    9.83
56062.91    9.8556064.26     9.956065.21     9.956065.62    9.8956067.96    9.89
56069.01     9.956069.64    9.8956071.34    9.8756071.74    9.8656072.21    9.87
56072.95    9.8556073.99    9.8456074.45    9.8256074.74    9.8456076.34    9.93
56104.45    9.9356107.01    9.9256112.09    9.8956113.16    9.8856113.66    9.87
56116.33    9.6456117.41    9.5356119.08     9.656120.27    9.6756124.15    9.77
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56193.21    8.9656195.86    8.8956196.68    8.8756198.19    8.8256198.47    8.73
56200.14    8.3256200.21    8.3156200.56    8.2256205.48    7.9756207.01    7.89
56211.23    7.6856212.26    7.6456218.89    7.23 56219.5     6.856220.29    6.62
56221.06    6.5756222.26     6.556223.42    6.4256224.39    6.3456402.81    6.34
 56408.4    6.5856418.98    6.34 56420.8    6.3456422.21    6.4556425.85     6.7
 56426.1    6.7556426.57    6.8456428.69    7.1756441.76    8.0556443.16    8.78
56445.19    9.1356448.42    9.2756451.28    9.2956586.44    9.8156593.39    9.49
56594.09    9.4756605.75    9.1256634.32    9.2256648.02    9.2656834.77    9.34
 56839.3    9.3256841.13     9.356843.73    9.2856856.77    9.2956857.12     9.3
56857.87    9.3556858.66     9.456860.76    9.4656885.65    9.8556887.15    9.88
56897.62   10.04   56921      1056924.71   10.01 56927.3      10   56939    9.98
 56942.2    9.9756943.95    9.9656952.79    9.97 56953.9    9.9857010.83   10.05
57016.73   10.1657018.89   10.0657019.25   10.2157021.81   10.0757023.69   10.29
57027.34   10.3557038.12   10.5657039.71   10.7757041.68   10.8457046.48   10.72
57047.45   10.7457053.91   10.8657100.98   10.9257108.68   11.1357109.86   10.93
57114.62   11.2557137.27   11.67 57139.2   11.7157139.73   11.7257182.45   11.78
57224.97   12.5957324.23   12.72   57342   12.7157376.79   13.4457396.37   13.42
57406.32    13.357411.58   13.4157498.74   13.3657500.62   13.3757507.93   13.39
57539.09   13.4157550.02   13.4657551.71   13.4757566.19   13.5157576.92   13.51
57579.86    13.557581.02    13.557586.05   13.5257600.45   13.5257603.76   13.54
57621.13    13.657622.32   13.6157655.09    13.657656.61   13.6257659.48   13.69
57689.88   14.3357845.86   14.2757849.22   14.2957854.39   14.3157860.09   14.29
57904.64   14.3557910.16   14.3557933.02    14.357952.23    14.357974.77   13.77
57998.62   13.0858010.64   12.7658027.39   12.7658029.23   12.7558054.26   12.77
 58065.3   12.7458070.78   12.7858076.51   12.7858080.68   12.7958089.63   12.77
58092.31   12.75 58099.3   12.72 58104.7   12.7158110.14   12.6758124.23   12.68
 58128.6   12.6958154.43   12.6758167.31   12.6858171.58   12.6558282.39   12.46
   58351   13.0658353.91   13.0958367.73   13.2158496.95    13.258520.11   13.59
58528.68   13.6958537.32   13.8658538.92   13.8858539.54   13.8958541.12   13.89
58542.25   13.8558563.42   13.82 58570.8   13.9458573.11   13.9258576.75   13.92
58580.43   13.8458581.73   13.8258583.46   13.7758600.49   13.4158612.42    13.4
58628.67   13.4558630.58   13.4658632.16   13.4658634.32   13.4458647.97    13.4
58655.38   13.3658663.18   13.2758666.14   13.26 58864.7   13.3758868.14   13.38
58894.66   13.3558897.45   13.3858900.27   13.42 58903.1   13.4959021.91   13.38
59050.98   13.4259057.82   13.42 59064.6   13.3859069.51   13.4259091.41   13.38
 59107.1   13.3859135.09    13.359138.31    13.359142.88   13.3159155.02   13.36
 59171.3   13.3459183.58   13.3859187.11   13.3859197.38    13.3 59277.5   13.27
59281.47    13.359297.18   13.3259299.26   13.3259308.15   13.3559311.02    13.3
59323.05   13.2859392.28   13.2759416.14   13.3959425.32   13.3759437.81   13.32
59461.86   13.2859473.92   13.3559479.03   13.3759518.41   13.2759791.02   13.54
59804.32    13.6 59809.3   13.6159821.44    13.759838.69   13.7959845.27   13.85
59909.88   13.8659992.09   13.7860192.39   13.7660237.24   14.2560255.08   14.39
60259.09   14.4460303.77   14.4660329.88   14.3760338.89   14.3660345.26   14.38
60353.33   14.3760356.97   14.3860358.84   14.4260359.68   14.4460366.31   14.45
60370.94   14.5360382.64   14.6160384.62   14.6260385.42   14.6260387.17   14.67
60392.49   14.83 60397.5   14.9260399.51   14.9460405.59   14.9360406.83   14.92
60407.69    14.960409.89   14.8760410.57   14.81 60414.1   14.9160414.71   14.96
 60416.4   15.0560416.95   15.0760428.53   15.16 60435.4   15.1760445.06   15.15
60449.63   15.1760468.71    15.260471.12   15.2160473.89   15.2460481.12   15.23

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 55203.8      .156200.56     .0356445.19      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
      56200.5656445.19            417.52  417.52  417.52              .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 55203.853725.25   14.02       T
58902.7560481.12    14.4       T

CROSS SECTION
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RIVER: Thornhill Creek
REACH: Bridge Area RS: 1265.*

INPUT
Description:
Station Elevation Data num= 493

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
54718.6	11.75	4733.96	11.71	54735.7	11.72	54737.56	11.71	54755.39	11.72
54758.48	11.69	54766.85	11.73	54777.7	11.74	54781.97	11.75	54807.24	11.62
54807.96	11.61	54812.1	11.63	54817.87	11.65	4819.97	11.65	4821.53	11.52
54824.05	11.55	54831.55	11.57	54832.48	11.57	54833.16	11.56	54834.4	11.56
54842.91	11.49	54844.48	11.48	54848.08	11.48	54857.12	11.53	54871.85	11.57
54884	11.56	54895.77	11.59	54896.52	11.59	54906.59	11.55	54914.54	11.55
54916.25	11.53	54925.43	11.56	54926.58	11.57	54932.44	11.55	54936.46	11.55
54938.36	11.53	54940.56	11.53	54942.57	11.51	54946.94	11.51	54949.52	11.56
54950.92	11.57	54951.97	11.54	54954.25	11.57	54954.98	11.57	54959.01	11.58
54960.57	11.57	54963.74	11.43	54966.72	11.18	54968.17	11.08	54970.29	10.94
54972.43	10.65	54977.02	10.26	54977.41	10.23	54978.25	10.18	54996.76	10.18
54997.3	10.22	55002.2	10.65	55069.63	11.09	55079.16	11.44	55080.91	11.45
55095.87	11.75	55096.49	11.75	55111.8	11.86	55116.3	12.01	55117.98	12.03
55119.73	12.03	55122.11	12.09	55122.52	12.11	55131.42	12.08	55164.46	11.87
55169.23	11.87	55177.45	11.94	55182.28	11.93	55187.81	11.94	55188.7	11.94
55190.41	11.97	55194.14	11.91	55202.76	11.82	55206.71	11.77	55252.71	12
55262.66	12.03	55264.14	12.04	55271.54	11.91	55272.71	11.95	5276.92	11.89
55339.25	11.54	55340.77	11.49	55344.36	11.54	55345.77	11.61	55346.67	11.62
55349.41	11.55	55383.73	11.19	55401	10.95	55438.8	10.69	55512.95	11.1
55516.16	10.95	55518.55	10.85	55534.12	10.05	55536.56	10.11	55542.45	10.21
55543.17	10.22	55549.06	9.95	55549.65	9.92	55550.57	9.89	55550.91	9.85
55551.88	9.76	55552.65	9.73	55554.48	9.91	55557.84	10.02	55560.85	10.14
55561.62	10.16	55572.64	10.35	55578.52	10.36	55582.23	10.38	55587.44	10.37
55592.09	10.34	55594.98	10.31	55600.75	10.29	55602.14	10.26	55603.17	10.25
55652.86	10.09	55658.77	10.09	55661.4	10.15	5663.02	10.09	55664.38	10.07
55666.8	10.09	55669.12	10.14	55670.59	10.16	55674.92	10.24	55676.49	10.22
55680.58	10.16	55682.41	10.15	55683.7	10.14	55686.15	10.06	55781.96	10.27
55782.5	10.28	55795.8	10.36	55797.86	10.38	55800.46	10.37	55805.6	10.37
55806.82	10.38	55808.46	10.36	55811.21	10.32	55825.45	11.08	55826.01	10.88
55830.75	10.91	55832.18	10.91	55835.71	10.88	55837.07	10.86	55837.54	11.01
55837.62	11.05	55838.87	11.02	55841.35	10.98	55842.37	10.97	55846.65	10.89
55857.25	9.85	55857.73	9.85	55858.62	9.74	55859.84	9.55	55862.55	9.11
55896.21	9.11	55898.15	9.59	55899.95	9.95	5913.32	10.09	55946.3	10.28
55949.89	10.19	55953.18	10.18	55958.67	10.21	55962.11	10.25	5964.42	10.2
55966.09	10.22	55967.5	10.23	55972.8	10.26	55995.37	10.42	55997.87	10.43
56001.47	10.39	56002.02	10.39	56004.59	10.38	56005.28	10.37	56008.67	10.4
56009.53	10.41	56010.38	10.41	56020.19	10.19	56025.79	10.03	56026.44	10.01
56028.23	9.89	56028.63	9.85	56030.75	9.66	56031.65	9.75	6033.71	9.81
56035.16	9.79	56035.8	9.77	56036.39	9.77	56039.38	9.78	56040.97	9.81
56041.93	9.78	56044.54	9.74	56045.15	9.72	56045.86	9.74	56046.98	9.71
56048.58	9.67	56049.28	9.65	56049.73	9.68	56051.62	9.82	56052.17	9.87
56095.15	9.86	56099.05	9.84	56106.82	9.78	56108.45	9.76	56109.22	9.74
56113.3	9.28	56114.95	9.07	56117.49	9.25	6119.31	9.34	56125.25	9.53
56230.8	7.92	56234.84	7.78	56236.1	7.74	56238.41	7.64	56238.84	7.45
56241.39	6.64	56241.5	6.61	56242.04	6.44	56247.94	6.19	56249.78	6.12
56254.84	5.91	56256.09	5.86	56261.38	5.47	56264.05	5.26	56264.77	4.43
56265.72	4.11	56266.65	4.03	56268.09	3.92	56269.48	3.81	56270.64	3.68
56389.59	3.68	56393.32	3.84	56400.38	3.68	56401.59	3.68	56403.02	3.84
56406.72	4.19	56406.97	4.28	56407.45	4.45	56409.61	5.03	56418.21	5.81
56422.89	6.23	56424.32	7.65	56426.38	8.26	56429.45	8.53	56432.16	8.58
56560.38	9.61	56566.97	9.43	56578.7	9.25	56615.85	9.51	56618.8	9.52
56795.96	9.68	56800.27	9.63	56802	9.59	56804.47	9.57	56808.05	9.57
56809.52	9.56	56815.54	9.58	56816.84	9.59	56817.17	9.65	6817.88	9.65
56818.63	9.75	6820.62	9.78	56844.23	9.98	56845.66	10.05	6855.59	10.08
56877.77	10.01	56881.29	10.01	56894.85	9.95	56897.88	9.93	56907.92	9.94

56908.98	9.9556962.99	10.156968.59	10.1956970.64	10.1256970.97	10.22
56973.41	10.1356975.19	10.2956978.65	10.3356988.88	10.4956990.39	10.63
56992.25	10.68 56996.8	10.6156997.73	10.6257003.86	10.7257048.51	10.84
57055.81	1157056.93	10.8657061.45	11.0857084.77	11.4457085.27	11.44
57125.8	11.5657166.13	12.17 57260.3	12.4357277.16	12.4157310.16	12.87
57328.73	12.8557338.18	12.7657343.16	12.8357425.85	12.7257427.64	12.74
57445.73	12.8157464.13	12.8357466.05	12.84 57474.5	12.9257486.26	13
57494.81	13.0257497.47	13.0257500.02	13.0157502.81	12.9957503.91	13
57511.39	13.0557517.98	13.04 57519.9	13.0357522.34	13.0357525.48	13.08
57541.96	13.257543.09	13.2257574.18	13.1957607.18	13.6657755.16	13.55
57758.34	13.5957763.24	13.6157768.65	13.5957785.21	13.5957800.93	13.67
57810.92	13.6957816.16	13.6957820.91	13.6857837.84	13.5957854.76	13.6
57856.06	13.6157877.45	13.357900.08	12.7557911.48	12.5357917.74	12.51
57952.86	12.5357963.34	12.4957968.53	12.5757973.97	12.5657977.93	12.57
57986.41	12.5357988.96	12.4957995.59	12.4358000.71	12.4158005.87	12.34
58016.12	12.3758019.23	12.3658023.38	12.3858047.89	12.3458056.74	12.36
58060.11	12.3658064.16	12.3158160.39	11.9358169.28	11.9358234.36	12.32
58237.12	12.3458250.23	12.4258372.82	12.41 58394.8	12.6658402.93	12.68
58411.12	12.8358413.23	12.8358414.73	12.77 58415.8	12.7158428.73	12.66
58435.88	12.6558442.88	12.8858445.08	12.9258448.53	13.0558452.02	13.01
58453.25	13 58454.9	12.9858471.05	12.81 58472.2	12.8258473.26	12.82
58482.37	12.7958497.78	12.91 58499.6	12.92 58501.1	12.9258503.14	12.89
58509.34	12.8458516.09	12.8158523.12	12.7358527.12	12.6158530.52	12.55
58533.33	12.5258719.82	12.74 58721.7	12.7458724.97	12.75 58739.6	12.74
58750.12	12.7158752.77	12.7658755.45	12.8458758.12	12.9958870.84	12.76
58881.99	12.7858898.41	12.8458904.91	12.8458911.34	12.76 58916	12.84
58936.78	12.7658945.45	12.7558951.66	12.7658978.21	12.5958981.27	12.59
58985.6	12.6158988.09	12.6458997.12	12.7259012.55	12.6759024.21	12.75
59027.56	12.75 59037.3	12.5959039.88	12.6 59056.4	12.5759095.36	12.57
59097.58	12.5659113.31	12.5559117.08	12.5959131.98	12.6459133.95	12.63
59142.39	12.69 59145.1	12.5959156.52	12.5659178.56	12.5659192.34	12.53
59201.09	12.55 59222.2	12.5359244.83	12.7859253.55	12.7459265.39	12.64
59288.21	12.5759304.49	12.7459307.18	12.7359341.85	12.5459600.47	13.09
59613.09	13.259617.82	13.2359629.32	13.4 59645.7	13.5959651.93	13.69
59662.05	13.759669.78	13.7359713.23	13.73 59729.7	13.6659772.58	13.59
59779.2	13.5959781.09	13.5859791.22	13.5659981.23	13.5160023.79	13.84
60040.71	13.8560044.51	13.88 60086.9	13.9260104.04	13.8160111.67	13.74
60120.21	13.7260126.26	13.7560133.91	13.7460137.38	13.7660139.14	13.84
60139.94	13.8960146.23	13.960150.62	14.0660161.73	14.22 60163.6	14.24
60164.36	14.2360171.06	14.3560175.82	14.3960177.73	14.3760183.49	14.18
60184.67	14.1360185.48	14.0660187.57	13.9460188.22	13.8160191.56	13.9
60192.15	13.9760193.75	14.1160194.27	14.1360196.43	14.1860205.26	14.33
60211.77	14.3460220.94	14.360225.27	14.3460232.94	14.3860243.37	14.41
60245.66	14.4360248.29	14.4960255.14	14.47		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
54718.6	.156242.04	.0356426.38	.1		

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
56242.0	456426.38	417.52	417.52	417.52	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
54718.6	54351.5	14.02	T
58276.5	60255.14	14.4	T

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: 847.5*

INPUT

Description:
Station Elevation Data num= 500

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
54233.4	12.06	54254.07	12.06	54256.42	12.07	54258.91	12.06	54282.91	12.07
54287.06	12.04	54298.33	12.09	54318.68	12.12	54352.68	11.93	54353.65	11.92
54359.23	11.94	54366.99	11.95	54369.82	11.95	54371.92	11.79	54375.31	11.82
54385.4	11.86	54386.65	11.85	54387.57	11.83	54389.24	11.83	54400.69	11.73
54402.8	11.72	54407.65	11.71	54419.8	11.85	54439.63	11.86	54455.99	11.84
54471.83	11.88	54472.82	11.88	54486.37	11.82	54497.08	11.82	54499.38	11.8
54511.73	11.84	54513.28	11.85	54521.17	11.82	54526.58	11.82	54529.14	11.8
54532.09	11.8	54534.8	11.77	54539.21	11.76	54540.68	11.77	54546.04	11.86
54547.45	11.81	54550.52	11.85	54551.49	11.85	54556.92	11.87	54559.02	11.86
54563.29	11.65	54567.29	11.28	54569.25	11.12	54572.11	10.91	54574.98	10.48
54581.15	9.88	54581.69	9.85	54582.81	9.78	54607.72	9.78	54608.45	9.82
54609.84	9.97	54615.04	10.47	54705.79	11.14	54707.66	11.25	54718.61	11.67
54720.96	11.67	54741.09	12.12	54741.94	12.12	54762.54	12.3	54768.6	12.51
54770.86	12.55	54773.21	12.55	54776.41	12.63	54776.95	12.67	54788.94	12.62
54833.4	12.35	54839.81	12.35	54850.87	12.41	54857.39	12.45	54864.83	12.42
54866.02	12.42	54868.33	12.45	54873.34	12.36	54884.94	12.24	54890.26	12.15
54952.16	12.55	54965.56	12.55	54967.55	12.56	54977.5	12.36	54979.08	12.34
54984.74	12.33	55068.61	12.03	55070.66	11.97	55075.49	12.05	55077.39	12.16
55078.61	12.18	55082.29	12.09	55202.58	11.03	55302.37	11.65	55306.69	11.42
55309.9	11.27	55330.86	10.07	55334.14	10.17	55342.06	10.31	55343.04	10.33
55350.97	9.93	55351.75	9.88	55352.99	9.83	55353.46	9.77	55354.76	9.64
55355.8	9.65	55358.26	9.86	55366.82	10.25	55367.86	10.25	55382.7	10.52
55390.61	10.54	55395.61	10.57	55402.61	10.55	55408.86	10.52	55412.76	10.47
55420.53	10.43	55422.39	10.45	55423.78	10.38	55490.64	10.13	55492.57	10.13
55498.59	10.14	55502.14	10.16	55504.31	10.13	55506.14	10.11	55509.41	10.14
55512.54	10.25	55514.51	10.25	55520.34	10.36	55522.45	10.32	55527.95	10.23
55530.41	10.22	55532.15	10.25	55535.45	10.08	55664.38	10.41	55665.11	10.42
55683.01	10.55	55685.78	10.56	55689.28	10.55	55696.2	10.55	55697.84	10.57
55700.04	10.55	55700.91	10.53	55703.75	10.47	55722.91	11.62	55723.66	11.31
55730.04	11.36	55731.96	11.36	55738.55	11.29	55739.18	11.52	55740.96	11.54
55744.3	11.47	55745.67	11.45	55751.43	11.34	55765.7	9.77	55766.35	9.7
55767.54	9.61	55769.18	9.32	55772.82	8.67	55818.13	8.67	55820.73	9.39
55823.17	9.84	55841.16	10.13	55885.54	10.42	55890.37	10.29	55894.8	10.28
55902.18	10.31	55909.92	10.31	55912.17	10.33	55914.06	10.34	55921.2	10.4
55924.7	10.42	55949.72	10.62	55951.57	10.63	55954.93	10.64	55959.77	10.58
55960.52	10.58	55963.98	10.56	55964.91	10.55	55969.46	10.59	55970.62	10.61
55971.77	10.61	55984.96	10.28	55992.5	10.05	55993.38	10.02	55995.79	9.83
55996.32	9.77	55999.18	9.48	56000.39	9.56	56003.17	9.71	56005.12	9.69
56005.97	9.65	56006.77	9.65	56010.79	9.68	56012.93	9.71	56017.73	9.6
56018.56	9.58	56019.51	9.61	56023.18	9.51	56024.11	9.48	56024.72	9.52
56027.27	9.74	56028.01	9.81	56083.97	9.79	56085.84	9.8	56091.1	9.75
56098.23	9.75	56101.55	9.67	56103.75	9.63	56104.77	9.62	56110.27	8.92
56112.49	8.65	56115.91	8.81	56118.36	9	56126.35	9.35	56268.39	6.88
56273.83	6.68	56275.52	6.61	56278.62	6.47	56279.21	6.18	56282.64	4.97
56283.51	4.66	56290.4	4.42	56292.55	4.34	56298.45	4.13	56299.91	4.09
56306.08	3.57	56309.2	3.35	56310.05	2.07	56311.16	1.59	56312.24	1.49
56313.92	1.35	56315.55	1.2	56316.9	1.03	56376.37	1.03	56378.24	1.11
56381.77	1.03	56382.38	1.03	56383.83	1.23	56387.59	1.68	56387.84	1.81
56388.34	2.05	56390.52	2.88	56401.55	4.14	56404.03	4.42	56405.48	6.51
56407.58	7.39	56410.47	7.85	56413.04	7.87	56534.33	9.42	56540.56	9.38
56551.66	9.37	56577.29	9.66	56581.73	9.75	56589.58	9.79	56757.16	10.03
56761.23	9.94	56762.87	9.89	56765.21	9.86	56766.66	9.85	56768.59	9.85
56769.99	9.84	56775.67	9.87	56776.9	9.88	56778.6	10	56780.48	10.09
56802.82	10.11	56804.16	10.12	56813.56	10.12	56834.54	10.01	56837.87	10.02
56840.2	10	56850.7	9.93	56853.56	9.89	56855.13	9.89	56863.06	9.92
56864.06	9.93	56915.15	10.15	56920.45	10.21	56922.38	10.18	56922.7	10.24
56925	10.25	56926.69	10.28	56929.96	10.31	56939.63	10.42	56941.07	10.49
56942.83	10.53	56947.13	10.55	56953.81	10.57	56996.04	10.76	57002.95	10.86
57004.01	10.85	57008.28	10.92	57030.34	11.16	57030.82	11.17	57069.15	11.34
57107.3	11.76	57196.38	12.15	57212.32	12.12	57243.53	12.31	57261.11	12.27

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57270.04   12.2157274.75   12.2457352.96   12.0857354.66    12.157371.76   12.22
57389.18   12.2457390.99   12.2757398.98   12.38 57400.5   12.3957410.11    12.5
 57418.2   12.5457423.12   12.5257425.76   12.49 57426.8    12.557431.32   12.55
57433.88   12.5757440.11   12.5657441.93   12.5557444.24   12.5557447.21   12.62
57462.79   12.8157463.86   12.8257494.63   12.7957524.48      1357664.45   12.82
57667.47   12.88 57672.1   12.9157677.21   12.8857692.88   12.8957707.75   13.01
57722.15   13.0457742.67   12.8957758.66   12.91 57759.9   12.9157780.12   12.84
57801.54   12.4257812.32   12.2957818.24   12.2757827.35   12.27   57829   12.26
57851.46    12.357861.37   12.2357866.28   12.3657871.42   12.3457875.17   12.36
 57883.2    12.357885.61   12.2457891.88   12.1457896.72   12.12 57901.6   12.01
57911.29   12.0657914.24   12.0457918.17   12.0757941.34   12.0157949.72   12.05
 57952.9   12.0457956.73   11.9658047.76   11.3958056.17   11.3958132.74   11.63
 58248.7   11.6158269.48   11.7458277.18   11.6758284.93    11.858286.36   11.78
58286.92   11.7858288.34   11.6658289.35   11.5758301.58   11.4958308.35   11.47
58314.96   11.8258317.05   11.9158320.31   12.1758323.61   12.1758324.78   12.19
58326.34   12.1858341.61   12.22 58343.7   12.2458352.31   12.1958368.61   12.38
58370.04   12.3858371.96   12.3458377.83   12.2758384.22   12.2258390.87    12.1
58394.64   11.9158397.87   11.8258400.52   11.7858576.92   12.1158578.69   12.11
58581.79   12.1258595.63   12.1258605.58   12.0758608.08   12.1358610.62   12.26
58613.15   12.4858719.77   12.1558730.32   12.1858745.85   12.2758751.99   12.27
58758.07   12.1458762.48   12.2658782.14   12.1558790.35   12.1258796.21   12.13
58802.95   12.0858821.33   11.8958824.22   11.8958828.32   11.9158830.68   11.95
58839.21   12.0758853.82   12.0158864.84   12.1258868.01   12.1258877.23   11.89
58879.66    11.958895.29   11.8658922.62   11.8458932.14   11.8658934.24   11.83
58940.77   11.8258949.12   11.8358952.68   11.8958966.78   11.9558968.65   11.95
58976.62   12.0458979.19   11.8958992.12   11.8359010.84   11.8359023.88    11.8
59032.15   11.8359052.11    11.859073.53   12.1759081.77   12.1259092.97   11.95
59107.37   11.9159114.55   11.8559125.38   12.0459129.96   12.11 59132.5    12.1
 59165.3   11.8159409.92   12.6359421.86   12.8159426.33   12.8559437.21    13.1
 59452.7   13.38 59458.6   13.5459464.83   13.5559468.16   13.5559475.48   13.59
59516.58   13.5959532.15   13.4859548.77   13.4659572.71   13.3959574.46   13.39
59578.98   13.3859580.77   13.3759590.35   13.3459770.08   13.2759810.33   13.42
59826.34    13.359827.71   13.3159829.93   13.3259870.03   13.3859886.24   13.22
59893.46   13.1159901.54   13.0759907.26   13.12 59914.5   13.1259917.77   13.15
59919.45   13.26 59920.2   13.3459926.15   13.34 59930.3   13.5959940.81   13.82
59942.58   13.85 59943.3   13.8559944.87   13.8659949.64   13.8659954.14   13.85
59955.95   13.81 59961.4   13.4359962.51   13.3459963.28   13.2259965.26   13.01
59965.87    12.859969.03    12.959969.59   12.99 59971.1   13.1859971.59    13.2
59973.64   13.2859981.98   13.4959988.14    13.559996.81   13.4560000.91   13.51
60008.17   13.5760018.04   13.61 60020.2   13.6460022.69   13.7360029.17    13.7

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
 54233.4      .156283.51     .0356407.58      .1

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.    Expan.
      56283.5156407.58            417.52  417.52  417.52              .1        .3
Ineffective Flow      num=       2
   Sta L   Sta R    Elev  Permanent
 54233.4 54977.5   14.02       T
57650.2560029.17    14.4       T

CROSS SECTION


RIVER: Thornhill Creek
REACH: Bridge Area          RS: 430

INPUT
Description:
Station Elevation Data      num=     482
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
 53748.2   12.4153774.18   12.4253777.13   12.4353780.27   12.4253810.43   12.43
```

53815.65	12.3953829.81	12.4553848.16	12.4853855.39	12.553898.13	12.24
53899.34	12.2353906.35	12.2653916.11	12.253919.66	12.2 53922.3	12.05
53926.57	12.153939.25	12.1453940.82	12.1353941.98	12.1153944.07	12.11
53958.46	11.9753961.12	11.9653967.21	11.9553982.49	12.0654007.41	12.14
54027.97	12.1254047.88	12.1754049.13	12.1754066.16	12.154079.62	12.09
54082.51	12.0754098.03	12.1254099.98	12.13 54109.9	12.0954113.38	12.1
54116.7	12.0954119.91	12.0754123.63	12.0654127.03	12.0354132.57	12.01
54134.42	12.0254138.79	12.1154141.16	12.1554142.92	12.0854146.79	12.13
54148.01	12.1354154.83	12.1654157.47	12.1454162.84	11.8754167.87	11.37
54170.33	11.1654173.92	10.8854177.53	10.354185.29	9.5154185.96	9.46
54187.37	9.3754218.68	9.37 54219.6	9.4354221.34	9.6254227.88	10.29
54341.94	11.18 54344.3	11.2754358.06	11.8954361.02	11.954386.32	12.5
54387.38	12.554413.27	12.7354420.89	13.0154423.73	13.0754426.69	13.07
54430.71	13.1754431.39	13.2354446.46	13.1654502.34	12.74 54510.4	12.74
54524.3	12.8854532.49	12.8754541.84	12.8954543.34	12.8954546.24	12.93
54552.54	12.8154567.12	12.6554573.81	12.5454651.61	1354668.45	13.06
54670.95	13.0854683.46	12.8254685.44	12.7954797.98	12.5254800.56	12.45
54806.62	12.5654809.01	12.7154810.54	12.7454815.17	12.6354966.36	11.38
55091.79	12.255097.22	11.955101.25	11.7 55127.6	10.155131.72	10.23
55141.68	10.42 55142.9	10.4455152.87	9.955153.86	9.8455155.41	9.77
55156	9.755157.64	9.5255158.94	9.4655162.03	9.8155167.72	10.05
55172.8	10.27 55174.1	10.3355192.75	10.755202.69	10.7255208.98	10.76
55217.78	10.7455225.64	10.6955230.54	10.62 55240.3	10.5855242.65	10.53
55244.39	10.555328.43	10.1755330.85	10.1755338.42	10.1955342.88	10.21
55345.61	10.1755347.91	10.1555352.01	10.1955355.95	10.2755358.42	10.33
55365.75	10.4855368.41	10.4355375.32	10.3155378.41	10.29 55380.6	10.27
55384.74	10.11 55546.8	10.5555547.71	10.5655555.77	10.6255558.96	10.65
55570.21	10.7355573.69	10.7555578.09	10.7455586.79	10.7455588.85	10.76
55591.62	10.7355592.71	10.7155596.28	10.6355620.36	12.16 55621.3	11.75
55629.33	11.8155630.45	11.8255631.74	11.8155637.72	11.7555640.02	11.72
55640.81	12.0255640.95	12.0955643.05	12.0555647.25	11.9655648.97	11.93
55656.21	11.7855674.14	9.755674.97	9.655676.46	9.4855678.52	9.09
55683.1	8.2355740.05	8.2355743.32	9.1855746.38	9.7955768.99	10.17
55824.77	10.5655830.84	10.3955836.41	10.37 55842.7	10.455845.69	10.42
55851.5	10.4155855.42	10.4155858.25	10.4455860.62	10.4555869.59	10.53
55874	10.5655905.44	10.8355907.76	10.8455911.99	10.8555918.08	10.77
55919.01	10.7755923.37	10.7555924.53	10.7455930.26	10.7955931.71	10.81
55933.16	10.8255941.29	10.655949.74	10.3855959.22	10.0655960.32	10.02
55963.35	9.7755964.02	9.7 55967.6	9.3155969.13	9.4155972.62	9.61
55975.07	9.5855976.15	9.5455977.14	9.54 55982.2	9.5755984.89	9.61
55986.52	9.5755990.93	9.4755991.97	9.4455993.16	9.4855995.07	9.42
55997.77	9.3455998.95	9.355999.71	9.3656002.91	9.6556003.84	9.74
56074.18	9.7256076.53	9.7356083.14	9.6756092.11	9.656096.28	9.56
56099.04	9.5156100.33	9.4956107.23	8.5656110.03	8.1356114.33	8.41
56117.4	8.6756127.45	9.0656305.98	5.8456312.82	5.5756314.94	5.48
56318.84	5.2956319.58	4.91 56323.9	3.2956324.07	3.2356324.99	2.88
56332.86	2.6456335.32	2.5756343.73	2.3156350.79	1.6756354.36	1.34
56355.33	-.356356.59	-.9356357.83	-1.0556359.75	-1.2356361.61	-1.41
56363.16	-1.6356364.64	-1.3856368.46	-.8356368.72	-.6656369.22	-.34
56371.44	.7356377.68	1.5956380.33	1.9556382.64	2.2756385.16	2.61
56386.64	5.3856388.77	6.52 56391.5	7.0656393.92	7.1656514.74	9.34
56548.77	9.8856552.96	9.9356555.36	9.9856557.73	10.0156560.36	10.05
56718.35	10.3756722.19	10.2656723.74	10.1856725.94	10.1456727.31	10.13
56729.13	10.1356730.45	10.1256735.81	10.1656736.97	10.17 56737.9	10.25
56740.34	10.4156791.31	10.0156794.45	10.0356796.64	1056806.54	9.9
56809.24	9.8656810.72	9.85 56818.2	9.8956819.14	9.957132.45	11.87
57280.08	11.4457281.67	11.4757287.85	11.54 57297.8	11.6257314.22	11.66
57315.93	11.6957323.46	11.84 57324.9	11.8657333.95	1257337.14	12.03
57341.58	12.0557343.95	12.0457346.22	12.0257348.71	11.9957349.69	12
57353.95	12.0657356.36	12.0957362.24	12.0857363.95	12.0757366.13	12.07
57368.93	12.1657373.95	12.2557383.62	12.4157384.63	12.4357573.75	12.09
57576.59	12.1757580.96	12.2257585.78	12.1757588.03	12.1757600.55	12.19
57614.57	12.3457623.48	12.3857628.15	12.3957632.39	12.3557647.49	12.18

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57662.57   12.21 57682.8   12.3857702.99   12.0957718.74   12.0357726.24   12.02
57727.33   12.0257728.88   12.0157750.06   12.06 57756.4      12 57759.4   11.98
57764.03   12.1457768.88   12.1257772.41   12.1557779.98   12.0657782.25   11.99
57788.16   11.8657792.73   11.8357797.33   11.6857806.47   11.7457809.25   11.72
57812.95   11.76 57834.8   11.68 57842.7   11.73 57845.7   11.7257849.31   11.61
57935.13   10.8658144.17   10.8158151.42   10.6658158.73   10.7758160.61   10.72
 58162.9   10.4258174.43   10.3258180.81   10.2958189.01   10.9158192.09    11.3
 58195.2   11.34 58196.3   11.3758197.77   11.3858213.19   11.6458214.14   11.65
58222.26   11.5858236.01   11.8258237.63   11.8458238.97   11.8458240.79   11.78
58246.32   11.6958252.34   11.6258258.61   11.4658262.17   11.2258265.21   11.09
58267.71   11.0458434.02   11.4858435.69   11.4858438.61    11.558451.66   11.49
58461.04   11.42 58463.4   11.5158465.79   11.6858468.18   11.97 58568.7   11.53
58578.64   11.5758593.29   11.6958599.08   11.6958604.81   11.5258608.97   11.68
 58627.5   11.5358635.24    11.558640.77   11.5158647.12   11.4458664.45   11.19
58667.17   11.1958671.04   11.2258673.26   11.2758681.31   11.4358695.08   11.34
58705.47    11.558708.46    11.558717.15   11.1958719.44    11.258734.18   11.15
58743.11   11.1558759.95   11.1258768.92   11.14 58770.9   11.1158777.05   11.09
58784.93    11.158788.29   11.1858801.58   11.2758803.34   11.2658810.86   11.39
58813.28   11.1958823.46   11.1258825.47   11.1158843.12   11.1158855.41   11.07
58863.21    11.158872.32   11.0958882.03   11.0658902.22   11.5658909.99   11.49
58920.55   11.2758934.13   11.21 58940.9   11.13 58951.1   11.3958955.42   11.48
58957.82   11.4658988.74   11.0859219.37   12.1759230.62   12.4159234.84   12.46
 59245.1    12.8 59259.7   13.1759265.26   13.3959271.14    13.459274.28    13.4
59281.18   13.45 59292.5   13.4759319.93   13.4559334.61   13.3159350.28   13.28
59372.85   13.19 59374.5   13.1859378.76   13.1759380.44   13.1659389.48   13.12
59596.88      1359611.97   12.7659613.26   12.7659653.16   12.8459668.44   12.62
59675.25   12.4859682.87   12.4359688.26    12.559695.09   12.4959698.17   12.53
59699.75   12.6859700.46   12.7859706.07   12.7959709.99   13.1259719.89   13.43
59721.56   13.4759723.72   13.4559732.46   13.3259734.16   13.24 59739.3   12.68
59740.35   12.5559741.08   12.3859742.94   12.0859743.52   11.79 59746.5   11.89
59747.02   12.0159748.45   12.2459750.84   12.3759758.71   12.6659764.52   12.67
59772.69    12.659776.56   12.68 59783.4   12.76 59792.7   12.8159794.74   12.85
59797.09   12.97 59803.2   12.94

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
 53748.2      .156324.99     .0356388.77      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      56324.9956388.77              275     275     275              .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 53748.2   55604   14.02        T
   57024 59803.2    14.4        T

CROSS SECTION


RIVER: Thornhill Creek
REACH: Bridge Area         RS: 155

INPUT
Description:
Station Elevation Data     num=     496
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
 53748.2   12.4153774.18   12.4253777.13   12.4353780.27   12.4253810.43   12.43
53815.65   12.3953829.81   12.4553848.16   12.4853855.39    12.553898.13   12.24
53899.34   12.2353906.35   12.2653916.11    12.253919.66    12.2 53922.3   12.05
53926.57    12.153939.25   12.1453940.82   12.1353941.98   12.1153944.07   12.11
53958.46   11.9753961.12   11.9653967.21   11.9553982.49   12.0654007.41   12.14
54027.97   12.1254047.88   12.1754049.13   12.1754066.16    12.154079.62   12.09
54082.51   12.0754098.03   12.1254099.98   12.13 54109.9   12.0954113.38    12.1
 54116.7   12.0954119.91   12.0754123.63   12.0654127.03   12.0354132.57   12.01
```

54134.42	12.0254138.79	12.1154141.16	12.1554142.92	12.0854146.79	12.13
54148.01	12.1354154.83	12.1654157.47	12.1454162.84	11.8754167.87	11.37
54170.33	11.1654173.92	10.8854177.53	10.354185.29	9.5154185.96	9.46
54187.37	9.3754218.68	9.37 54219.6	9.4354221.34	9.6254227.88	10.29
54341.94	11.18 54344.3	11.2754358.06	11.8954361.02	11.954386.32	12.5
54387.38	12.554413.27	12.7354420.89	13.0154423.73	13.0754426.69	13.07
54430.71	13.1754431.39	13.2354446.46	13.1654502.34	12.74 54510.4	12.74
54524.3	12.8854532.49	12.8754541.84	12.8954543.34	12.8954546.24	12.93
54552.54	12.8154567.12	12.6554573.81	12.5454651.61	1354668.45	13.06
54670.95	13.0854683.46	12.8254685.44	12.7954797.98	12.5254800.56	12.45
54806.62	12.5654809.01	12.7154810.54	12.7454815.17	12.6354966.36	11.38
55091.79	12.255097.22	11.955101.25	11.7 55127.6	10.155131.72	10.23
55141.68	10.4255837.66	9.8555841.54	9.7955842.69	9.7355852.26	9.21
55853.65	9.1355859.22	8.8355862.47	8.8355867.33	8.8155870.56	8.76
55873.38	8.7255876.69	8.7855880.99	8.8455882.18	8.8655886.21	8.84
55888.6	8.8555890.58	8.8555898.93	8.8755900.59	8.8755909.69	8.6
55911.9	8.5455914.83	8.4555919.03	8.2955928.63	6.8455929.59	6.72
55931.61	6.9155938.44	7.6355943.39	8.15 55946.8	855948.02	7.95
55949.37	7.8955952.73	7.8455957.59	7.9555959.33	7.9955962.51	8.07
55966.69	855970.14	7.955972.25	7.9955973.35	8.0355975.83	7.79
55976.75	7.6955981.79	7.1855984.06	6.9455986.32	6.9755990.67	7.02
55993.44	7.13 55995.8	7.2355999.07	7.3456005.09	7.5156008.22	7.6
56213.03	6.0156214.78	5.9856216.15	5.9556220.42	5.8556238.08	5.35
56240.68	5.2856243.87	5.1856247.17	4.9556249.73	3.5656250.75	3
56255.45	1.5456258.97	-.0256261.38	-.5956263.01	-.9756264.03	-1.13
56264.49	-1.256266.49	-1.9356269.52	-2.53 56270.7	-2.656273.03	-2.21
56273.6	-2.1156274.39	-1.9856274.94	-1.9356277.08	-.5256280.54	.23
56283.18	.3856284.67	.4656292.75	.9256294.22	1.0156302.33	1.66
56307.94	2.1256311.87	4.656314.06	7.1856319.62	8.3156321.48	8.68
56322.05	8.856322.53	8.956331.06	8.7656335.29	8.6956340.63	8.72
56342.92	8.74 56350.2	8.7856359.77	8.8456369.36	8.956377.87	8.95
56378.94	8.96 56388	9.0856389.52	9.0856398.08	9.1156401.17	9.12
56407.64	9.1356412.82	9.1556417.24	9.1556424.47	9.1356426.82	9.12
56436.12	9.156445.97	9.0756447.76	9.0656455.54	9.0456471.06	8.99
56473.07	8.98 56474.7	956482.71	9.0756484.27	9.0856493.85	9.16
56512.48	9.3156570.46	9.3256575.91	9.3356589.61	9.33 56592.4	9.32
56606.41	9.3156618.33	9.37 56627.9	9.4256637.48	9.47 56645.8	9.51
56647.06	9.5256656.64	9.5756666.21	9.6256680.75	9.7256681.98	9.73
56694.14	10.34 56698.7	10.3356700.73	10.3356704.05	10.1556705.45	10.08
56706.28	1056706.72	9.7556710.73	7.1556711.69	7.2256714.09	8.33
56715.7	9.156716.33	9.4156717.07	9.7156723.66	9.756727.35	9.7
56733.23	9.69 56739	9.6856781.14	9.6456785.59	9.6356788.53	9.63
56790.7	9.6456808.89	9.7256809.85	9.7356816.27	9.76 56829	10
56832.19	10.0656838.57	10.1956848.15	10.3756857.73	10.5556867.14	10.74
56875.27	10.8956876.89	10.9356878.79	10.9656896.04	11.3156902.09	11.36
56924.76	11.556934.33	11.5656937.03	11.57 56943.9	11.6256948.68	11.65
56953.47	11.6756960.33	11.7256963.05	11.7356971.98	11.7956982.21	11.85
56991.77	11.9156993.75	11.9256995.28	11.9357006.25	11.9757009.31	11.98
57010.95	11.9757018.58	11.9657039.68	11.9357042.85	11.9357049.25	11.91
57053.53	11.9157058.83	11.957065.18	11.8857068.45	11.8857076.83	11.86
57077.99	11.8657087.56	11.8457088.48	11.8457097.13	11.8257100.34	11.82
57103.49	11.8457106.69	11.8557116.24	11.8757119.06	11.8757123.42	11.88
57154.59	11.9157158.37	11.9257202.47	11.9657204.97	11.9757212.04	11.97
57216.62	11.9857229.25	11.9957231.19	11.9757239.92	11.92 57241.8	11.9
57242.96	11.7657244.54	11.9557250.35	1257251.57	1257252.58	12.01
57260.62	11.957261.22	11.8357263.21	11.5957264.51	11.4457268.06	11.45
57269.5	11.4457274.86	11.4457276.75	11.4557280.49	12.06 57307.8	12.07
57309.81	12.0857317.38	12.0857321.46	12.0957592.83	12.18 57598.4	12.29
57623.48	12.3857628.15	12.3957632.39	12.3557647.49	12.1857662.57	12.21
57682.8	12.3857702.99	12.0957718.74	12.0357726.24	12.0257727.33	12.02
57728.88	12.0157750.06	12.06 57756.4	12 57759.4	11.9857764.03	12.14
57768.88	12.1257772.41	12.1557779.98	12.0657782.25	11.9957788.16	11.86
57792.73	11.8357797.33	11.6857806.47	11.7457809.25	11.7257812.95	11.76

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 57834.8   11.68 57842.7   11.73 57845.7   11.7257849.31   11.6157935.13   10.86
58144.17   10.8158151.42   10.6658158.73   10.7758160.61   10.72 58162.9   10.42
58174.43   10.3258180.81   10.2958189.01   10.9158192.09    11.3 58195.2   11.34
 58196.3   11.3758197.77   11.3858213.19   11.6458214.14   11.6558222.26   11.58
58236.01   11.8258237.63   11.8458238.97   11.8458240.79   11.7858246.32   11.69
58252.34   11.6258258.61   11.4658262.17   11.2258265.21   11.0958267.71   11.04
58434.02   11.4858435.69   11.4858438.61    11.558451.66   11.4958461.04   11.42
 58463.4   11.5158465.79   11.6858468.18   11.97 58568.7   11.5358578.64   11.57
58593.29   11.6958599.08   11.6958604.81   11.5258608.97   11.68 58627.5   11.53
58635.24    11.558640.77   11.5158647.12   11.4458664.45   11.1958667.17   11.19
58671.04   11.2258673.26   11.2758681.31   11.4358695.08   11.3458705.47    11.5
58708.46    11.558717.15   11.1958719.44    11.258734.18   11.1558743.11   11.15
58759.95   11.1258768.92   11.14 58770.9   11.1158777.05   11.0958784.93    11.1
58788.29   11.1858801.58   11.2758803.34   11.2658810.86   11.3958813.28   11.19
58823.46   11.1258825.47   11.1158843.12   11.1158855.41   11.0758863.21    11.1
58872.32   11.0958882.03   11.0658902.22   11.5658909.99   11.4958920.55   11.27
58934.13   11.21 58940.9   11.13 58951.1   11.3958955.42   11.4858957.82   11.46
58988.74   11.0859219.37   12.1759230.62   12.4159234.84   12.46 59245.1    12.8
 59259.7   13.1759265.26   13.3959271.14    13.459274.28    13.459281.18   13.45
 59292.5   13.4759319.93   13.4559334.61   13.3159350.28   13.2859372.85   13.19
 59374.5   13.1859378.76   13.1759380.44   13.1659389.48   13.1259596.88      13
59611.97   12.7659613.26   12.7659653.16   12.8459668.44   12.6259675.25   12.48
59682.87   12.4359688.26    12.559695.09   12.4959698.17   12.5359699.75   12.68
59700.46   12.7859706.07   12.7959709.99   13.1259719.89   13.4359721.56   13.47
59723.72   13.4559732.46   13.3259734.16   13.24 59739.3   12.6859740.35   12.55
59741.08   12.3859742.94   12.0859743.52   11.79 59746.5   11.8959747.02   12.01
59748.45   12.2459750.84   12.3759758.71   12.6659764.52   12.6759772.69    12.6
59776.56   12.68 59783.4   12.76 59792.7   12.8159794.74   12.8559797.09   12.97
 59803.2   12.94

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 53748.2      .156255.45     .0356307.94      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      56255.4556307.94                30      30      30              .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 53748.2 56016.5   14.02        T
 56611.5 59803.2    14.4        T

CROSS SECTION


RIVER: Thornhill Creek
REACH: Bridge Area          RS: 125

INPUT
Description:
Station Elevation Data      num=     359
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 53748.2   12.4153774.18   12.4253810.43   12.4353855.39    12.553898.13   12.24
53916.11    12.2 53922.3   12.0553926.57    12.153939.25   12.1454113.38    12.1
54127.03   12.0354138.79   12.1154154.83   12.1654162.84   11.8754167.87   11.37
54170.33   11.1654173.92   10.8854177.53    10.354185.29    9.5154185.96    9.46
54187.37    9.3754218.68    9.37 54219.6    9.4354221.34    9.6254227.88   10.29
54341.94   11.18 54344.3   11.2754358.06   11.8954386.32    12.554413.27   12.73
54420.89   13.0154423.73   13.0754430.71   13.1754431.39   13.2354446.46   13.16
54502.34   12.74 54524.3   12.8854543.34   12.8954552.54   12.8154567.12   12.65
54573.81   12.5454651.61      1354668.45   13.0654685.44   12.7954797.98   12.52
54800.56   12.4554806.62   12.5654809.01   12.7154815.17   12.6354966.36   11.38
55091.79    12.255097.22    11.955101.25    11.7 55127.6    10.155131.72   10.23
55141.68   10.4255469.22   11.7655478.88   11.6755491.65   11.5655523.71   12.17
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55546.47	11.9755555.84	11.8955556.97	12.0155559.94	12.8755575.18	12.88
55578.95	12.9955585.09	13.1355588.12	13.1955597.37	13.1355614.04	12.79
55620.66	12.6455623.71	12.5655632.31	12.3655636.68	12.2655652.67	12.19
55665.12	12.155666.99	12.0555671.98	11.9355680.82	11.5955700.95	12.21
55705.57	12.3655709.54	12.52 55713.8	12.5855715.77	12.2655718.25	12.31
55725.51	12.4955728.15	12.4455735.12	12.2655735.85	12.3855736.69	12.58
55741.22	12.3955744.26	12.3155745.44	12.2355759.82	11.3355760.46	11.28
55764.37	11.0455771.13	11.1955780.47	11.5255783.48	11.6255789.53	11.9
55791.11	11.8255795.31	10.87 55797.5	10.3755799.14	1055801.22	9.42
55804.33	9.0155805.95	8.8555816.81	9.15 55818.7	9.21 55842	9.86
55844.25	9.9255845.78	10.0355853.65	9.9855862.71	9.8955874.74	9.81
55888.51	9.6455898.41	9.3255900.23	9.22 55903.7	8.8755907.19	8.51
55913.02	8.4155913.36	8.3655915.91	7.9555923.02	6.755923.37	6.64
55930.29	7.6 55935.2	8.3655936.38	8.5555942.33	8.4155943.65	8.46
55946.85	8.5455954.23	8.7455958.27	8.5355961.64	8.3455964.11	8.21
55970.14	8.0455971.29	7.8955979.25	6.81 55990.6	6.9156004.71	7.02
56115.46	7.6656125.12	7.56 56132.9	7.4256135.43	7.3356140.77	7.15
56144.43	7.0856154.73	6.7456174.05	6.6156178.78	6.5556190.55	6.61
56200.45	6.7156205.92	6.5356212.67	6.3756219.74	6.3156224.24	5.79
56236.54	5.156240.67	456241.64	3.5556244.69	2.1456246.64	1.08
56246.77	1.0456249.61	.3656249.82	.3156254.52	-.7856257.35	-1.21
56258.3	-1.5556260.95	-2.0756261.38	-2.1556264.04	-2.6856266.33	-2.42
56267.4	-2.32 56270.6	-.2456271.59	.456273.01	.756273.26	.76
56295.94	2.0456296.32	1.8356298.17	.78 56298.7	1.1456299.57	1.21
56301.44	1.3756304.09	3.7456307.38	6.6156307.97	6.8956308.34	7.07
56309.22	7.4356309.66	7.6156319.95	7.9956324.03	8.1556365.88	8.58
56374.32	8.6756386.46	8.6956401.17	8.5356405.11	8.4856444.07	8.05
56471.06	7.9756540.95	8.4956587.56	8.8756598.22	8.9656608.53	9.07
56618.19	9.1556668.74	9.5456675.46	9.8556676.12	9.9156681.31	10.23
56699.09	10.2556700.63	10.3156703.92	8.8156704.05	8.7256704.14	8.67
56705.09	8.0256705.96	7.4356706.82	6.8756711.84	7.0156712.76	9.39
56713.9	9.9456772.68	9.93 56797.5	9.9556811.29	9.9656820.54	10.09
56855.49	10.7656859.57	10.8156888.53	11.0856896.93	11.1656913.52	11.19
56927.16	11.2156971.36	11.3556994.74	11.4357018.58	11.5257041.27	11.59
57065.35	11.6257096.82	11.5657120.26	11.5857135.07	11.5957168.53	11.61
57229.55	11.6657237.06	11.0757243.54	11.8457244.15	1257259.77	11.91
57263.12	11.5157263.58	11.45 57270.6	12.05 57284.4	12.1257300.69	12.24
57333.11	12.2757592.83	12.18 57598.4	12.2957623.48	12.3857647.49	12.18
57662.57	12.21 57682.8	12.3857702.99	12.0957718.74	12.0357750.06	12.06
57756.4	1257764.03	12.1457779.98	12.0657782.25	11.9957788.16	11.86
57797.33	11.6857806.47	11.74 57834.8	11.6857849.31	11.6157935.13	10.86
58144.17	10.8158151.42	10.6658158.73	10.7758160.61	10.72 58162.9	10.42
58174.43	10.3258189.01	10.9158192.09	11.3 58196.3	11.3758213.19	11.64
58222.26	11.5858236.01	11.8258252.34	11.6258258.61	11.4658262.17	11.22
58265.21	11.0958267.71	11.0458434.02	11.4858451.66	11.4958461.04	11.42
58463.4	11.5158465.79	11.6858468.18	11.97 58568.7	11.5358593.29	11.69
58604.81	11.5258608.97	11.68 58627.5	11.5358640.77	11.5158647.12	11.44
58664.45	11.1958673.26	11.2758681.31	11.4358695.08	11.3458705.47	11.5
58717.15	11.1958734.18	11.1558759.95	11.1258777.05	11.0958801.58	11.27
58810.86	11.3958813.28	11.1958823.46	11.1258843.12	11.1158855.41	11.07
58872.32	11.0958902.22	11.5658909.99	11.4958920.55	11.2758934.13	11.21
58940.9	11.13 58951.1	11.3958955.42	11.4858988.74	11.0859219.37	12.17
59230.62	12.4159234.84	12.46 59245.1	12.8 59259.7	13.1759265.26	13.39
59281.18	13.4559319.93	13.4559334.61	13.3159350.28	13.2859372.85	13.19
59389.48	13.1259596.88	1359611.97	12.7659653.16	12.8459668.44	12.62
59675.25	12.4859688.26	12.559699.75	12.6859700.46	12.7859709.99	13.12
59719.89	13.4359732.46	13.3259734.16	13.24 59739.3	12.6859740.35	12.55
59741.08	12.3859742.94	12.0859743.52	11.79 59746.5	11.8959747.02	12.01
59748.45	12.2459750.84	12.3759758.71	12.6659772.69	12.659776.56	12.68
59783.4	12.76 59792.7	12.8159797.09	12.97 59803.2	12.94	

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

53748.2 .156246.77 .03 56298.7 .1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
56246.77	56298.7	250	250	250	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
53748.2	56061.5	14.02	T
56566.5	59803.2	14.4	T

BRIDGE

RIVER: Thornhill Creek
REACH: Bridge Area RS: -23

INPUT
Description:
Distance from Upstream XS = 75
Deck/Roadway Width = 88
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 97

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
53700	17.51	0	54000	18.43	0	54700	20.34	0
55500	15.01	0	55550	14.85	0	55600	14.69	0
55650	14.52	0	55700	14.36	0	55750	14.23	0
55800	14.29	0	55850	14.56	0	55900	15.05	0
55950	15.75	0	56000	16.67	0	56050	17.75	0
56100	18.82	0	56150	19.71	0	56174	20.06	0
56174	20.06	15.15	56214	20.53	15.62	56214	20.53	14.2
56294	21.05	14.72	56294	21.05	16.14	56334	21.11	16.2
56374	21.03	16.12	56414	20.81	15.9	56454	20.53	15.62
56454	20.53	0	56550	19.85	0	56600	19.5	0
56650	19.15	0	56700	18.8	0	56750	18.45	0
56800	18.1	0	56850	17.75	0	56900	17.4	0
56950	17.05	0	57000	16.7	0	57050	16.35	0
57100	16	0	57150	15.65	0	57200	15.3	0
57250	14.95	0	57300	14.2	0	57350	13.95	0
57400	13.33	0	57450	13.47	0	57500	13.33	0
57550	13.28	0	57600	13.32	0	57650	13.39	0
57700	13.45	0	57750	13.51	0	57800	13.57	0
57850	13.64	0	57900	13.7	0	57950	13.76	0
58000	13.82	0	58050	13.88	0	58100	13.95	0
58150	13.95	0	58200	14.07	0	58250	14.13	0
58300	14.19	0	58350	14.26	0	58400	14.32	0
58450	14.38	0	58500	14.44	0	58550	14.51	0
58600	14.57	0	58650	14.62	0	58700	14.69	0
58750	14.75	0	58800	14.82	0	58850	14.88	0
58900	15.06	0	58950	15	0	59000	15.06	0
59050	15.13	0	59100	15.19	0	59150	15.25	0
59200	15.31	0	59250	15.38	0	59300	15.44	0
59350	15.5	0	59400	15.56	0	59450	15.62	0
59500	15.69	0	59550	15.75	0	59600	15.81	0
59650	15.87	0	59700	15.93	0	59750	16	0
59800	16.06	0	59850	16.12	0	59900	16.18	0
59950	16.25	0						

Upstream Bridge Cross Section Data
Station Elevation Data num= 359

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
53748.2	12.4153	774.18	12.4253	810.43	12.4353	855.39	12.553	898.13	12.24
53916.11	12.2	53922.3	12.0553	926.57	12.153	939.25	12.1454	113.38	12.1
54127.03	12.0354	138.79	12.1154	154.83	12.1654	162.84	11.8754	167.87	11.37

54170.33	11.1654173.92	10.8854177.53	10.354185.29	9.5154185.96	9.46
54187.37	9.3754218.68	9.37 54219.6	9.4354221.34	9.6254227.88	10.29
54341.94	11.18 54344.3	11.2754358.06	11.8954386.32	12.554413.27	12.73
54420.89	13.0154423.73	13.0754430.71	13.1754431.39	13.2354446.46	13.16
54502.34	12.74 54524.3	12.8854543.34	12.8954552.54	12.8154567.12	12.65
54573.81	12.5454651.61	1354668.45	13.0654685.44	12.7954797.98	12.52
54800.56	12.4554806.62	12.5654809.01	12.7154815.17	12.6354966.36	11.38
55091.79	12.255097.22	11.955101.25	11.7 55127.6	10.155131.72	10.23
55141.68	10.4255469.22	11.7655478.88	11.6755491.65	11.5655523.71	12.17
55546.47	11.9755555.84	11.8955556.97	12.0155559.94	12.8755575.18	12.88
55578.95	12.9955585.09	13.1355588.12	13.1955597.37	13.1355614.04	12.79
55620.66	12.6455623.71	12.5655632.31	12.3655636.68	12.2655652.67	12.19
55665.12	12.155666.99	12.0555671.98	11.9355680.82	11.5955700.95	12.21
55705.57	12.3655709.54	12.52 55713.8	12.5855715.77	12.2655718.25	12.31
55725.51	12.4955728.15	12.4455735.12	12.2655735.85	12.3855736.69	12.58
55741.22	12.3955744.26	12.3155745.44	12.2355759.82	11.3355760.46	11.28
55764.37	11.0455771.13	11.1955780.47	11.5255783.48	11.6255789.53	11.9
55791.11	11.8255795.31	10.87 55797.5	10.3755799.14	1055801.22	9.42
55804.33	9.0155805.95	8.8555816.81	9.15 55818.7	9.21 55842	9.86
55844.25	9.9255845.78	10.0355853.65	9.9855862.71	9.8955874.74	9.81
55888.51	9.6455898.41	9.3255900.23	9.22 55903.7	8.8755907.19	8.51
55913.02	8.4155913.36	8.3655915.91	7.9555923.02	6.755923.37	6.64
55930.29	7.6 55935.2	8.3655936.38	8.5555942.33	8.4155943.65	8.46
55946.85	8.5455954.23	8.7455958.27	8.5355961.64	8.3455964.11	8.21
55970.14	8.0455971.29	7.8955979.25	6.81 55990.6	6.9156004.71	7.02
56115.46	7.6656125.12	7.56 56132.9	7.4256135.43	7.3356140.77	7.15
56144.43	7.0856154.73	6.7456174.05	6.6156178.78	6.5556190.55	6.61
56200.45	6.7156205.92	6.5356212.67	6.3756219.74	6.3156224.24	5.79
56236.54	5.156240.67	456241.64	3.5556244.69	2.1456246.64	1.08
56246.77	1.0456249.61	.3656249.82	.3156254.52	-.7856257.35	-1.21
56258.3	-1.5556260.95	-2.0756261.38	-2.1556264.04	-2.6856266.33	-2.42
56267.4	-2.32 56270.6	-.2456271.59	.456273.01	.756273.26	.76
56295.94	2.0456296.32	1.8356298.17	.78 56298.7	1.1456299.57	1.21
56301.44	1.3756304.09	3.7456307.38	6.6156307.97	6.8956308.34	7.07
56309.22	7.4356309.66	7.6156319.95	7.9956324.03	8.1556365.88	8.58
56374.32	8.6756386.46	8.6956401.17	8.5356405.11	8.4856444.07	8.05
56471.06	7.9756540.95	8.4956587.56	8.8756598.22	8.9656608.53	9.07
56618.19	9.1556668.74	9.5456675.46	9.8556676.12	9.9156681.31	10.23
56699.09	10.2556700.63	10.3156703.92	8.8156704.05	8.7256704.14	8.67
56705.09	8.0256705.96	7.4356706.82	6.8756711.84	7.0156712.76	9.39
56713.9	9.9456772.68	9.93 56797.5	9.9556811.29	9.9656820.54	10.09
56855.49	10.7656859.57	10.8156888.53	11.0856896.93	11.1656913.52	11.19
56927.16	11.2156971.36	11.3556994.74	11.4357018.58	11.5257041.27	11.59
57065.35	11.6257096.82	11.5657120.26	11.5857135.07	11.5957168.53	11.61
57229.55	11.6657237.06	11.0757243.54	11.8457244.15	1257259.77	11.91
57263.12	11.5157263.58	11.45 57270.6	12.05 57284.4	12.1257300.69	12.24
57333.11	12.2757592.83	12.18 57598.4	12.2957623.48	12.3857647.49	12.18
57662.57	12.21 57682.8	12.3857702.99	12.0957718.74	12.0357750.06	12.06
57756.4	1257764.03	12.1457779.98	12.0657782.25	11.9957788.16	11.86
57797.33	11.6857806.47	11.74 57834.8	11.6857849.31	11.6157935.13	10.86
58144.17	10.8158151.42	10.6658158.73	10.7758160.61	10.72 58162.9	10.42
58174.43	10.3258189.01	10.9158192.09	11.3 58196.3	11.3758213.19	11.64
58222.26	11.5858236.01	11.8258252.34	11.6258258.61	11.4658262.17	11.22
58265.21	11.0958267.71	11.0458434.02	11.4858451.66	11.4958461.04	11.42
58463.4	11.5158465.79	11.6858468.18	11.97 58568.7	11.5358593.29	11.69
58604.81	11.5258608.97	11.68 58627.5	11.5358640.77	11.5158647.12	11.44
58664.45	11.1958673.26	11.2758681.31	11.4358695.08	11.3458705.47	11.5
58717.15	11.1958734.18	11.1558759.95	11.1258777.05	11.0958801.58	11.27
58810.86	11.3958813.28	11.1958823.46	11.1258843.12	11.1158855.41	11.07
58872.32	11.0958902.22	11.5658909.99	11.4958920.55	11.2758934.13	11.21
58940.9	11.13 58951.1	11.3958955.42	11.4858988.74	11.0859219.37	12.17
59230.62	12.4159234.84	12.46 59245.1	12.8 59259.7	13.1759265.26	13.39
59281.18	13.4559319.93	13.4559334.61	13.3159350.28	13.2859372.85	13.19

59389.48	13.1259596.88	1359611.97	12.7659653.16	12.8459668.44	12.62
59675.25	12.4859688.26	12.559699.75	12.6859700.46	12.7859709.99	13.12
59719.89	13.4359732.46	13.3259734.16	13.24 59739.3	12.6859740.35	12.55
59741.08	12.3859742.94	12.0859743.52	11.79 59746.5	11.8959747.02	12.01
59748.45	12.2459750.84	12.3759758.71	12.6659772.69	12.659776.56	12.68
59783.4	12.76 59792.7	12.8159797.09	12.97 59803.2	12.94	

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
53748.2	.15	56246.77	.03	56298.7	.1

Bank Sta: Left	Right	Coeff Contr.	Expan.
56246.77	56298.7	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
53748.2	56061.5	14.02	T
56566.5	59803.2	14.4	T

Downstream Deck/Roadway Coordinates
num= 97

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
53700	17.51	0	54000	18.43	0	54700	20.34	0
55500	15.01	0	55550	14.85	0	55600	14.69	0
55650	14.52	0	55700	14.36	0	55750	14.23	0
55800	14.29	0	55850	14.56	0	55900	15.05	0
55950	15.75	0	56000	16.67	0	56050	17.75	0
56100	18.82	0	56150	19.71	0	56174	20.06	0
56174	20.06	15.15	56214	20.53	15.62	56214	20.53	14.2
56294	21.05	14.72	56294	21.05	16.14	56334	21.11	16.2
56374	21.03	16.12	56414	20.81	15.9	56454	20.53	15.62
56454	20.53	0	56550	19.85	0	56600	19.5	0
56650	19.15	0	56700	18.8	0	56750	18.45	0
56800	18.1	0	56850	17.75	0	56900	17.4	0
56950	17.05	0	57000	16.7	0	57050	16.35	0
57100	16	0	57150	15.65	0	57200	15.3	0
57250	14.95	0	57300	14.2	0	57350	13.95	0
57400	13.33	0	57450	13.47	0	57500	13.33	0
57550	13.28	0	57600	13.32	0	57650	13.39	0
57700	13.45	0	57750	13.51	0	57800	13.57	0
57850	13.64	0	57900	13.7	0	57950	13.76	0
58000	13.82	0	58050	13.88	0	58100	13.95	0
58150	13.95	0	58200	14.07	0	58250	14.13	0
58300	14.19	0	58350	14.26	0	58400	14.32	0
58450	14.38	0	58500	14.44	0	58550	14.51	0
58600	14.57	0	58650	14.62	0	58700	14.69	0
58750	14.75	0	58800	14.82	0	58850	14.88	0
58900	15.06	0	58950	15	0	59000	15.06	0
59050	15.13	0	59100	15.19	0	59150	15.25	0
59200	15.31	0	59250	15.38	0	59300	15.44	0
59350	15.5	0	59400	15.56	0	59450	15.62	0
59500	15.69	0	59550	15.75	0	59600	15.81	0
59650	15.87	0	59700	15.93	0	59750	16	0
59800	16.06	0	59850	16.12	0	59900	16.18	0
59950	16.25	0						

Downstream Bridge Cross Section Data
Station Elevation Data num= 332

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
53748.2	12.41	55469.22	12.88	55474.66	12.78	55476.26	12.69	55485.16	12.34
55489.97	12.19	55492.71	12.15	55493.43	12.08	55499.38	11.93	55500.34	11.94
55500.62	11.94	55503.49	11.96	55517.46	12.37	55517.64	12.38	55518.58	12.4
55518.71	12.44	55519.12	12.65	55519.69	12.73	55521.08	12.77	55526.14	12.95
55529.36	13.03	55529.74	13.03	55531.45	13.07	55533.54	13.11	55541.55	12.97

55541.82	12.9655546.41	12.8255547.46	12.4955547.91	12.3155548.47	12.3
55552.19	12.2955562.28	12.2455562.56	12.2355563.39	12.2155563.52	12.21
55572.93	12.1755573.49	12.1755574.32	12.455575.27	12.2555576.29	11.72
55576.59	11.7 55577.6	11.7455578.15	11.83 55583.3	12.7255583.67	12.78
55585.25	13.0355585.57	13.0555602.36	13.2855604.04	13.3155614.41	13.45
55614.46	13.4655615.26	13.4755624.78	13.3655626.57	13.3555626.97	13.34
55656.38	13.3555662.87	13.3255666.26	13.3155674.98	13.2755676.63	13.27
55687	13.2355687.08	13.2355697.37	13.1955698.64	13.1855699.18	13.19
55718.11	13.355723.39	13.3455727.16	13.3655728.48	13.3555746.62	13.25
55747.6	13.2355748.26	13.2255749.22	13.22 55754.1	13.2455759.59	13.2
55759.7	13.255769.97	13.12 55771.8	13.155778.26	13.0555780.34	13.04
55783.91	13.0355797.89	12.9655801.08	12.9255808.11	12.8255811.45	12.78
55816.92	12.755820.22	12.7155821.82	12.7155832.19	12.7355834.74	12.73
55860.56	12.9255861.41	12.91 55863.3	12.9255863.68	12.9255868.63	12.94
55877.33	12.9655891.34	12.8755892.26	12.8755892.83	12.8655893.29	12.85
55902.92	13.0355904.78	13.1955904.94	13.255907.36	13.4155915.15	13.27
55915.44	13.2655917.04	13.2555920.31	13.2255925.52	13.255926.42	13.2
55929.14	13.0355935.89	12.6255937.79	12.5 55940.4	12.2655941.25	12.25
55941.9	12.2455947.42	12.33 55947.7	12.3355953.35	12.1955956.63	12.1
55956.79	12.1 55963.2	12.8155965.45	13.0155966.37	13.1 55967	13.1
55970.97	13.0855996.86	13.0556004.95	12.5456008.48	12.2956008.83	12.27
56009.01	12.2756018.85	12.0456018.97	12.0456025.97	11.956029.22	11.83
56049.97	11.4256050.18	11.4156059.34	11.2356060.34	11.1356061.75	10.98
56062.28	10.9556070.71	10.456074.38	10.1756086.49	9.3856086.69	9.37
56106.64	9.5756120.51	9.2956122.56	9.2356122.79	9.22 56147	8.48
56158.88	8.17 56159.1	8.1656164.04	7.9956166.72	7.8956184.54	7.44
56184.78	7.4456186.64	7.4356195.15	7.0456195.41	7.0256198.56	6.88
56219.44	5.656219.62	5.5756219.91	5.5356221.54	5.0656231.72	2.55
56233.81	2.0456236.63	1.72 56239.9	1.3456240.24	1.3156240.34	1.26
56243.31	.3556243.83	.11 56247	-1.3656248.25	-1.9356251.43	-1.6
56255.93	-2.0856260.36	-2.5456262.24	-2.4656262.24	-1.8656262.65	-1.44
56262.94	-1.3156263.23	-1.1956270.89	1.9956276.13	2.0156278.11	1.99
56279.3	1.9856280.14	1.9756288.48	1.8956292.24	1.8656304.14	1.74
56304.34	1.7456307.46	1.6456312.39	1.1656316.45	1.456316.74	1.42
56326.56	1.6756329.97	1.8656331.15	1.9256333.68	1.9656340.34	2.41
56340.65	2.4356345.41	2.7556350.71	3.0756355.01	3.3456359.61	3.97
56361.08	4.53 56361.4	4.6556362.08	4.8256362.61	4.8256363.41	4.87
56371.45	4.8256376.96	4.8256381.82	4.8156402.77	4.856403.77	4.95
56412.93	5.1256413.27	5.13 56418.5	5.2256433.04	4.7456433.67	4.79
56444.04	5.6956444.48	5.7356449.58	5.8856454.41	6.0156475.15	6.61
56481.73	6.7956485.52	6.956485.89	6.9156489.82	7.0356495.89	7.01
56497.99	7.01 56534.3	6.9156537.37	6.9156545.02	6.8856546.41	6.89
56547.74	6.8956558.11	6.9256558.51	6.9256568.48	6.9456570.61	6.94
56606.92	7.0256609.34	7.0256609.97	7.0156611.21	756614.51	7.03
56749.96	8.0356752.16	8.0356755.15	8.0256766.54	8.0156772.04	8.04
56772.83	7.9856775.89	856776.37	856786.26	8.0656788.47	8.07
56792.99	8.156796.54	8.1356796.63	8.1356799.04	8.1856836.88	7.94
56838.11	7.9456848.48	7.8756848.98	7.8656858.85	7.856861.09	7.79
56869.05	7.7356869.22	7.7356873.19	7.6756874.63	7.6456917.94	8.68
56921.6	8.7556923.22	8.7956923.88	8.7856926.94	8.7856931.45	8.15
56932.2	8.0456933.71	8.1756939.58	8.64 56940.2	8.5856940.33	8.58
56941.82	8.6156957.91	8.9756961.22	9.0456962.56	9.0856963.03	9.09
56964.28	9.0856965.48	9.0957017.25	9.0757018.43	9.0857023.53	9.11
57024.78	9.1257042.63	9.1557045.52	9.1557054.74	9.1757055.89	9.17
57066.26	9.1957066.84	9.1957076.63	9.2157078.94	9.2157080.71	9.22
57082.73	9.21 57087	9.2157091.05	9.2357127.36	9.3657128.48	9.36
57136.26	9.3957138.85	9.4157139.46	9.41 57179.6	9.7257180.34	9.72
57199.98	9.8557201.08	9.8657202.68	9.8757211.45	9.8857212.08	9.88
57219.93	9.8957221.82	9.9157224.18	9.9257228.81	9.9557252.93	9.9
57257.93	9.8857260.49	9.9 57263.3	9.9157272.59	9.9657273.67	9.97
57283.62	10.02 57284.7	10.02 57308.9	10.1957311.55	10.257315.15	10.22
57333.11	10.28 59803.2	13			

```
Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
 53748.2      .156219.91     .0356270.89      .1

Bank Sta: Left   Right    Coeff Contr.   Expan.
      56219.9156270.89              .3       .5
Ineffective Flow     num=        2
   Sta L   Sta R    Elev  Permanent
 53748.2   56039   14.02       T
   56589 59803.2    14.4       T

Upstream Embankment side slope              =       2 horiz. to 1.0 vertical
Downstream Embankment side slope            =       2 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =    14.4
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Abutments =  2

Abutment Data
Upstream     num=        4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   56174   15.15   56174   13.15   56178   13.15   56198    3.15
Downstream     num=        4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   56174   15.15   56174   13.15   56178   13.15   56198    3.15

Abutment Data
Upstream     num=        4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   56430    3.62   56450   13.62   56454   13.62   56454   15.62
Downstream     num=        4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   56430    3.62   56450   13.62   56454   13.62   56454   15.62

Number of Piers =  5

Pier Data
Pier Station     Upstream=   56214    Downstream=   56214
Upstream     num=        2
    Width   Elev    Width   Elev
        3       0       3     17
Downstream     num=        2
    Width   Elev    Width   Elev
        3       0       3     17

Pier Data
Pier Station     Upstream=   56294    Downstream=   56294
Upstream     num=        2
    Width   Elev    Width   Elev
        3       0       3     17
Downstream     num=        2
    Width   Elev    Width   Elev
        3       0       3     17

Pier Data
Pier Station     Upstream=   56334    Downstream=   56334
Upstream     num=        2
    Width   Elev    Width   Elev
        1       0       1     17
Downstream     num=        2
```

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    Width    Elev     Width    Elev
       1        0        1       17

Pier Data
Pier Station      Upstream=   56374    Downstream=   56374
Upstream      num=        2
    Width    Elev     Width    Elev
       1        0        1       17
Downstream      num=        2
    Width    Elev     Width    Elev
       1        0        1       17

Pier Data
Pier Station      Upstream=   56414    Downstream=   56414
Upstream      num=        2
    Width    Elev     Width    Elev
       1        0        1       17
Downstream      num=        2
    Width    Elev     Width    Elev
       1        0        1       17

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       W.S. Pro Method

  W.S.Pro Data
    Left Embankment
       El of the top of the embankment = 14.04
       El of the toe of the abutment   = 7.4
    Right Embankment
       El of the top of the embankment = 14.42
       El of the toe of the abutment   = 1.4
    Abtument Type                      = 3 Sloping abutments and sloping embankments
    Slope of abutments                 = 2
    Top with of embankment             = 88
    Centroid station of bridge opening =
    Wing Wall Type                     = No wing walls present
       Width                           =
       Angle                           =
       Radius                          =
    Guide Banks Type                   = No Guide Bank present
       Length                          =
       Offset                          =
       Angle                           =

Selected Low Flow Methods = W.S.Pro Method

High Flow Method
       Energy Only

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION


RIVER: Thornhill Creek
REACH: Bridge Area        RS: -125
```

INPUT
Description:
Station Elevation Data num= 332

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
53748.2	12.4	55469.22	12.88	55474.66	12.78	55476.26	12.69	55485.16	12.34
55489.97	12.19	55492.71	12.15	5493.43	12.08	55499.38	11.93	55500.34	11.94
55500.62	11.94	55503.49	11.96	55517.46	12.37	55517.64	12.38	55518.58	12.4
55518.71	12.44	55519.12	12.6	55519.69	12.73	55521.08	12.77	55526.14	12.95
55529.36	13.03	55529.74	13.03	55531.45	13.07	55533.54	13.11	55541.55	12.97
55541.82	12.96	55546.41	12.82	55547.46	12.49	55547.91	12.31	55548.47	12.3
55552.19	12.29	55562.28	12.24	55562.56	12.23	55563.39	12.21	55563.52	12.21
55572.93	12.17	55573.49	12.17	55574.32	12.4	55575.27	12.25	55576.29	11.72
55576.59	11.7	55577.6	11.74	55578.15	11.83	55583.3	12.72	55583.67	12.78
55585.25	13.03	55585.57	13.05	55602.36	13.28	55604.04	13.31	55614.41	13.45
55614.46	13.46	55615.26	13.47	55624.78	13.36	55626.57	13.35	55626.97	13.34
55656.38	13.35	55662.87	13.32	55666.26	13.31	55674.98	13.27	55676.63	13.27
55687	13.23	55687.08	13.23	55697.37	13.19	55698.64	13.18	55699.18	13.19
55718.11	13.3	55723.39	13.34	55727.16	13.36	55728.48	13.35	55746.62	13.25
55747.6	13.23	55748.26	13.22	55749.22	13.22	55754.1	13.24	55759.59	13.2
55759.7	13.2	55769.97	13.12	55771.8	13.1	55778.26	13.05	55780.34	13.04
55783.91	13.03	55797.89	12.96	55801.08	12.92	55808.11	12.82	55811.45	12.78
55816.92	12.7	55820.22	12.71	55821.82	12.71	55832.19	12.73	55834.74	12.73
55860.56	12.92	55861.41	12.91	55863.3	12.92	55863.68	12.92	55868.63	12.94
55877.33	12.96	55891.34	12.87	55892.26	12.87	55892.83	12.86	55893.29	12.85
55902.92	13.03	55904.78	13.19	55904.94	13.2	55907.36	13.41	55915.15	13.27
55915.44	13.26	55917.04	13.25	55920.31	13.22	55925.52	13.2	55926.42	13.2
55929.14	13.03	55935.89	12.62	55937.79	12.5	55940.4	12.26	55941.25	12.25
55941.9	12.24	55947.42	12.33	55947.7	12.33	55953.35	12.19	55956.63	12.1
55956.79	12.1	55963.2	12.81	55965.45	13.01	55966.37	13.1	55967	13.1
55970.97	13.08	55996.86	13.05	56004.95	12.54	56008.48	12.29	56008.83	12.27
56009.01	12.27	56018.85	12.04	56018.97	12.04	56025.97	11.9	56029.22	11.83
56049.97	11.42	56050.18	11.41	56059.34	11.23	56060.34	11.13	56061.75	10.98
56062.28	10.95	56070.71	10.4	56074.38	10.17	56086.49	9.38	56086.69	9.37
56106.64	9.57	56120.51	9.29	56122.56	9.23	56122.79	9.22	56147	8.48
56158.88	8.17	56159.1	8.16	56164.04	7.99	56166.72	7.89	56184.54	7.44
56184.78	7.44	56186.64	7.43	56195.15	7.04	56195.41	7.02	56198.56	6.88
56219.44	5.6	56219.62	5.57	56219.91	5.53	56221.54	5.06	56231.72	2.55
56233.81	2.04	56236.63	1.72	56239.9	1.34	56240.24	1.31	56240.34	1.26
56243.31	.35	56243.83	.11	56247	-1.36	56248.25	-1.93	56251.43	-1.6
56255.93	-2.08	56260.36	-2.54	56262.24	-2.46	56267.04	-1.86	56267.45	-1.44
56267.74	-1.31	56268.03	-1.19	56275.69	1.99	56276.13	2.01	56278.11	1.99
56279.3	1.98	56280.14	1.97	56288.48	1.89	56292.24	1.86	56304.14	1.74
56304.34	1.74	56307.46	1.64	56312.39	1.16	56316.45	1.4	56316.74	1.42
56326.56	1.67	56329.97	1.86	56331.15	1.92	56333.68	1.96	56340.34	2.41
56340.65	2.43	56345.41	2.75	56350.71	3.07	56355.01	3.34	56359.61	3.97
56361.08	4.53	56361.4	4.65	56362.08	4.82	56362.61	4.82	56363.41	4.87
56371.45	4.82	56376.96	4.82	56381.82	4.81	56402.77	4.8	56403.77	4.95
56412.93	5.12	56413.27	5.13	56418.5	5.22	56433.04	4.74	56433.67	4.79
56444.04	5.69	56444.48	5.73	56449.58	5.88	56454.41	6.01	56475.15	6.61
56481.73	6.79	56485.52	6.9	56485.89	6.91	56489.82	7.03	56495.89	7.01
56497.99	7.01	56534.3	6.91	56537.37	6.91	56545.02	6.88	56546.41	6.89
56547.74	6.89	56558.11	6.92	56558.51	6.92	56568.48	6.94	56570.61	6.94
56606.92	7.02	56609.34	7.02	56609.97	7.01	56611.21	7	56614.51	7.03
56749.96	8.03	56752.16	8.03	56755.15	8.02	56766.54	8.01	56772.04	8.04
56772.83	7.98	56775.89	8	56776.37	8	56786.26	8.06	56788.47	8.07
56792.99	8.1	56796.54	8.13	56796.63	8.13	56799.04	8.18	56836.88	7.94
56838.11	7.94	56848.48	7.87	56848.98	7.86	56858.85	7.8	56861.09	7.79
56869.05	7.73	56869.22	7.73	56873.19	7.67	56874.63	7.64	56917.94	8.68
56921.6	8.75	56923.22	8.79	56923.88	8.78	56926.94	8.78	56931.45	8.15
56932.2	8.04	56933.71	8.17	56939.58	8.64	56940.2	8.58	56940.33	8.58
56941.82	8.61	56957.91	8.97	56961.22	9.04	56962.56	9.08	56963.03	9.09
56964.28	9.08	56965.48	9.09	57017.25	9.07	57018.43	9.08	57023.53	9.11

57024.78	9.1257042.63	9.1557045.52	9.1557054.74	9.1757055.89	9.17
57066.26	9.1957066.84	9.1957076.63	9.2157078.94	9.2157080.71	9.22
57082.73	9.21 57087	9.2157091.05	9.2357127.36	9.3657128.48	9.36
57136.26	9.3957138.85	9.4157139.46	9.41 57179.6	9.7257180.34	9.72
57199.98	9.8557201.08	9.8657202.68	9.8757211.45	9.8857212.08	9.88
57219.93	9.8957221.82	9.9157224.18	9.9257228.81	9.9557252.93	9.9
57257.93	9.8857260.49	9.9 57263.3	9.9157272.59	9.9657273.67	9.97
57283.62	10.02 57284.7	10.02 57308.9	10.1957311.55	10.257315.15	10.22
57333.11	10.28 59803.2	12.94			

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
53748.2	.156219.91		.0356275.69		.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
56219.9	56275.69	325	325	325	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
53748.2	56039	14.02	T
56589	59803.2	14.4	T

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: -450.*

INPUT
Description:
Station Elevation Data num= 213

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
54350.52	12.555497.42		11.0855511.67		11.1455513.03		11.1555525.93		11.2
55528.34	11.2155533.49		11.2355540.19		11.2655543.82		11.2755554.45		11.26
55568.7	11.2655580.56		11.2555582.96		11.2555597.21		11.2455611.47		11.23
55616.89	11.2355625.73		11.2255632.79		11.2255639.98		11.2155648.87		11.21
55654.24	11.2 55668.5		11.2 55673		11.1955682.75		11.1955685.01		11.19
55697.01	11.1855707.89		11.1755711.27		11.1755725.52		11.1655737.23		11.15
55739.78	11.1555753.91		11.1455754.04		11.14 55768.3		11.1355782.55		11.13
55789.45	11.1255796.81		11.1255811.06		11.1155824.61		11.155825.32		11.09
55839.58	11.0255841.68		11.0155853.84		10.9455858.95		10.9155868.09		10.82
55882.29	10.6755882.35		10.67 55893.9		10.5655896.61		10.5655910.86		10.55
55917.18	10.5455925.12		10.5455939.38		10.5355946.12		10.5355952.05		10.52
55953.63	10.5255963.98		10.5155967.89		10.5155982.15		10.555986.94		10.5
55996.4	10.4955998.34		10.4956010.66		10.3756024.91		10.2256032.32		10.15
56039.17	10.0856050.57		9.9656053.43		9.94 56056.7		9.956067.69		9.79
56069.03	9.7856081.95		9.64 56096.2		9.556102.79		9.4356110.46		9.35
56124.71	9.2156136.18		9.0956138.97		9.0656153.23		8.9156155.01		8.9
56167.48	8.7756174.07		8.7156181.74		8.59 56196		8.3856196.23		8.37
56207.23	8.2156210.25		8.1656224.51		7.95 56231.1		7.8556238.77		7.74
56253.02	7.5256259.45		7.4356267.28		7.3856279.12		7.3256279.21		7.32
56281.54	7.3156295.79		7.2156307.34		7.1456310.05		7.0556313.96		6.92
56315.05	6.8856315.26		6.8856322.38		6.61 56324.3		6.5156338.56		5.76
56352.82	5.0256355.67		4.8756360.85		5.256361.22		5.1556361.25		5.14
56364.57	4.9956367.08		4.8856367.75		4.8556367.85		4.8556367.89		4.81
56367.98	4.7356368.82		3.9556375.59		-2.3156377.23		-3.8356377.58		-3.96
56395	-3.9656396.06		-3.6756398.38		-2.5856398.94		-2.3356400.25		-1.73
56402.73	-.65 56404.3		-.7756404.52		-.7156404.97		-.5956407.88		.06
56410.09	.5856412.18		1.0556415.53		1.756415.68		1.7456419.43		2.53
56419.65	2.5456419.69		2.54 56419.8		2.55 56421.6		2.756424.13		2.89
56428.24	3.2256428.47		3.2356432.34		3.5456434.88		3.956435.28		3.96
56441.51	4.1456445.06		4.2456446.18		4.2756448.14		4.3356448.76		4.35
56454.13	4.556454.42		4.5156454.66		4.5156454.78		4.5256457.02		4.72
56461.41	5.1456468.05		5.7656469.05		5.8556471.67		6.156474.68		6.42

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56481.32    7.1156487.95    7.8156488.27    7.8456489.34    7.89 56490.3    7.93
56492.78    8.1256499.98    8.1956509.62     8.356518.75    8.3956529.91    8.51
56536.21    8.58 56550.2    8.7356570.49    8.9456590.78    9.1656597.74    9.24
56611.07    9.3856627.06    9.5556631.36    9.5956651.65    9.8156671.94   10.02
56692.23   10.2456695.48   10.28 56707.1    10.456712.52   10.4656717.91   10.52
 56732.8   10.5956753.09    10.756773.38    10.856793.23   10.9156793.67   10.91
56808.77   10.9156813.96   10.9156834.25   10.9156848.37   10.9156854.54   10.91
56874.83   10.9156890.98   10.9156895.12   10.9156895.46   10.9156899.64   10.91
56915.41   10.91 56935.7   10.9156942.55   10.9156955.98   10.9156976.27   10.91
56988.71   10.9256989.64   10.92 56990.5   10.9256996.56   10.9557013.87   11.05
57016.85   11.0657037.14   11.1758660.25    12.5

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
54350.52      .156367.85     .0356419.43      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      56367.8556419.43              260     260     260              .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
54350.52 55941.5   14.02        T
 56686.558660.25    14.4        T

CROSS SECTION


RIVER: Thornhill Creek
REACH: Bridge Area          RS: -710

INPUT
Description:
Station Elevation Data      num=     164
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
54952.85      1255757.31   10.5655767.31   10.6955768.26   10.7155777.31   10.83
   55779   10.8555782.61    10.955787.31   10.9755789.86      1155797.31      11
55807.31      1155815.63      1155817.31      1155827.31      1155837.31      11
55841.11      1155847.31      1155852.26      1155857.31      1155863.54      11
55867.31      1155877.31      1155880.47      1155887.31      1155888.89      11
55897.31      1155904.94      1155907.31      1155917.31      1155925.52      11
55927.31      1155937.22      1155937.31      1155947.31      1155957.31      11
55962.15      1155967.31      1155977.31      1155986.81      1155987.31   10.99
55997.31   10.8655998.78   10.8456007.31   10.72 56010.9   10.6756017.31   10.49
56027.27   10.2256027.31   10.2256035.41      1056037.31      1056047.31      10
56051.74      1056057.31      1056067.31      1056072.04      10 56076.2      10
56077.31      1056084.57      1056087.31      1056097.31      1056100.67      10
56107.31      1056108.67      1056117.31    9.7656127.31    9.49 56132.5    9.35
56137.31    9.22 56145.3       956147.31    8.95 56149.6    8.8856157.31    8.67
56158.25    8.6556167.31     8.456177.31    8.1356181.93       856187.31    7.85
56197.31    7.5856205.35    7.3656207.31    7.3156217.31    7.0356218.56       7
56227.31    6.7656231.93    6.6456237.31    6.4256247.31    6.0156247.47       6
56255.19    5.6856257.31     5.656267.31    5.1956271.93       556277.31    4.78
56287.31    4.3756291.82    4.1956297.31    4.1156305.61       456305.68       4
56307.31    3.9756317.31     3.856327.31    3.6456330.05    3.5956337.31    3.47
56347.31     3.356357.31    3.1456365.55       356367.31       356367.78       3
56367.85       356372.93  -3.77556407.77  -3.77556412.85       356415.17       3
56417.31       356425.49       356426.04       356427.31       356437.31       3
 56438.6       356447.31    3.3856452.56     3.656457.31    3.8156461.81       4
56467.31    4.2456470.41    4.3756477.31    4.6756487.31     5.156497.31    5.53
56500.74    5.6856507.31    5.9656515.19     6.356517.31    6.3956527.31    6.82
56537.31    7.2556547.31    7.6856548.91    7.7556554.64       856557.31    8.11
56559.97    8.2356567.31    8.3856577.31    8.5956587.31     8.856597.09       9
56597.31       956604.75       956607.31       956617.31       956624.27       9
56627.31       956637.31       956645.27       956647.31       956647.48       9
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56649.54       956657.31       956667.31       956670.69       956677.31       9
56687.31       956693.44       9 56693.9       956694.32       956697.31    9.07
56705.84    9.2656707.31    9.2956717.31     9.557517.31      12

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
54952.85      .156367.85     .0356412.85      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      56367.8556412.85              460     460     460              .1       .3
Ineffective Flow      num=       2
   Sta L   Sta R    Elev  Permanent
54952.85 55161.5   14.02       T
 57466.557517.31    14.4       T

CROSS SECTION


RIVER: Thornhill Creek
REACH: Bridge Area          RS: -1170.*

INPUT
Description:
Station Elevation Data      num=     377
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
55032.85      9.5 55671.1    8.8955676.11    8.8955683.07    8.8855686.74    8.88
55697.38    8.8755699.21    8.8755708.02    8.8655718.66    8.8555721.94    8.85
55729.29    8.84 55734.6    8.8355739.93    8.8355750.57    8.82 55761.2    8.81
55764.56    8.8155769.99     8.855771.84     8.855782.48    8.7955791.83    8.78
55793.12    8.7955796.59    8.8155801.26    8.8455802.16    8.8455803.76    8.85
55804.11    8.8555805.38    8.86 55810.7    8.8855812.29    8.8955814.39     8.9
 55815.7     8.955820.13    8.9355822.54    8.9455825.03    8.9355829.57    8.92
55834.36    8.9155835.67     8.9   55839     8.955840.77     8.9 55846.3    8.88
55846.85    8.8855848.44    8.8755856.94    8.8555857.87    8.8555864.62    8.84
 55867.3    8.8355867.58    8.8355870.89    8.8255876.16    8.8155876.74     8.8
55878.22    8.7755881.41    8.7255886.17    8.6455888.86     8.655892.05    8.55
55894.88     8.555895.61     8.555899.49     8.555905.04     8.555908.02     8.5
55910.13     8.555911.55     8.555914.48     8.555915.97     8.555920.77     8.5
55923.91     8.555925.14     8.555931.11     8.555931.41     8.555933.34     8.5
55942.04     8.555942.78     8.555946.94     8.555950.53     8.555952.21     8.5
55952.68     8.555955.39     8.555961.57     8.555961.65     8.555963.32     8.5
55971.09     8.555973.95     8.555980.52     8.555982.33     8.555984.59     8.5
55985.09     8.555985.66     8.555989.95    8.4355995.23    8.3455999.39    8.27
56005.26    8.1856005.87    8.1656008.35    8.1356008.82    8.12 56016.5    7.96
56017.72    7.9356018.26    7.9356019.65    7.9256027.14    7.86 56027.7    7.86
56031.08    7.8456037.12    7.7456037.78    7.7456046.16    7.6256046.52    7.61
56046.56    7.6156048.41    7.5856053.11    7.52 56054.2     7.5   56056     7.5
56059.05     7.556062.88     7.556065.43     7.556069.61     7.556069.69     7.5
56074.87     7.556080.33     7.5 56084.3     7.556088.49     7.556088.77     7.5
56090.97    7.4756092.69    7.4456093.73    7.4356100.59    7.33 56101.6    7.32
56103.17    7.2956105.49    7.2656112.24    7.24 56112.6    7.2456115.78    7.24
56122.04    7.2256122.88    7.2256123.32    7.2256123.88    7.2156131.47    7.08
56133.52    7.0556140.91    6.9256144.16    6.86 56145.8    6.8456148.11     6.8
56150.34    6.7656154.79    6.6956157.88    6.6356159.27    6.6156159.78     6.6
56161.94    6.5656165.43     6.556169.21    6.44 56170.1    6.4356176.07    6.33
56178.65    6.28 56186.7    6.1556188.08    6.1356190.73    6.0856192.44    6.03
56194.66    5.9756197.34    5.9356197.46    5.9356197.52    5.9356206.95    5.79
56207.98    5.7856213.92    5.6956214.54    5.6856216.38    5.6556218.62    5.62
56225.82    5.52   56227     5.556227.71    5.4956229.25    5.4756230.05    5.46
56233.34    5.4156235.25    5.3856239.62    5.3256239.89    5.3156244.69    5.21
56250.53    5.0856254.12    5.0156254.27       556261.16    4.8556261.56    4.84
56263.56     4.856265.44    4.76 56271.8    4.6256272.99     4.656275.96    4.53
56277.35     4.556282.43    4.3956291.86    4.1856293.08    4.1656296.12     4.1
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56300.82    4.06 56301.3    4.0556303.71       456309.13    3.88 56309.2    3.88
56310.73    3.8556314.35    3.7656318.58    3.6656320.16    3.6356324.99    3.52
 56329.6    3.4156332.19    3.3556335.62    3.2756336.21    3.2656339.04    3.27
56346.27    3.3156348.47    3.32 56356.9    3.3756357.91    3.3856361.19     3.4
56365.68    3.3756367.34    3.3756367.54    3.3756367.79    3.3756367.85    3.37
56373.73   -4.4756380.37   -4.4756396.98   -4.4756402.85    3.3756405.29    3.44
56407.34     3.556407.53     3.556414.11     3.556416.12     3.5 56416.7     3.5
56416.89     3.556418.03     3.556426.44     3.5 56428.1     3.556428.53     3.5
56429.89     3.556435.98    3.6356439.03    3.69 56443.3    3.7856444.54     3.8
56445.53    3.8256445.88    3.8356449.53     3.956454.25       456455.08    4.02
56460.03    4.1256463.28    4.1856464.62    4.2156470.45    4.3356470.52    4.34
56474.17    4.4156477.64    4.4856481.02    4.5556483.71    4.6156491.52    4.77
56493.26     4.856495.12    4.8456497.61    4.8956502.02    4.98 56502.8       5
56509.38    5.13 56510.3    5.1556512.35    5.1956512.52    5.19 56521.9    5.39
56523.02    5.4156524.76    5.4556531.45    5.5856533.52    5.6256540.99    5.78
56541.14    5.7856544.02    5.84 56545.7    5.8856550.54    5.9856551.72       6
56551.91       656554.52    6.0556557.31    6.1156560.09    6.1456565.02    6.19
56569.63    6.2456572.91    6.2756575.52     6.356579.06    6.3356579.18    6.33
56586.02     6.456588.72    6.4356596.29     6.556596.52     6.556598.27     6.5
56604.33     6.556604.67     6.556606.21     6.556607.02     6.556607.81     6.5
56615.36     6.556617.36     6.556617.52     6.556624.82     6.556626.91     6.5
56628.01     6.556636.43     6.556636.45     6.556638.51    6.5356640.73    6.57
   56646    6.6556646.87    6.6656649.01     6.756649.19     6.756651.35    6.73
56655.55     6.856659.51    6.8656665.09    6.9556668.19       756670.01       7
56673.56       756674.64       756678.98       756680.51    7.0256684.18    7.07
56691.01    7.1656693.73    7.1956697.45    7.2456697.93    7.2556698.37    7.25
56699.95    7.2956701.51    7.3356703.28    7.3756710.46    7.5456712.01    7.58
56712.82     7.656714.83    7.6456722.37    7.81 56722.5    7.82 56731.7    7.95
56731.91    7.9556741.46    8.0956751.01    8.2356755.46     8.356760.55    8.37
56763.46    8.42 56770.1    8.5156779.65    8.65 56789.2    8.7956793.71    8.86
56795.22    8.8656798.74    8.9256802.62    8.9856808.29    9.0856817.83    9.25
56823.45    9.3556826.98    9.3456827.38    9.3456836.92    9.3356846.47    9.32
56850.59    9.3156856.02     9.456858.74    9.4556865.56    9.4656875.11    9.48
56877.75    9.4856884.66    9.49 56890.5     9.5 56894.2    9.5156903.75    9.52
 56904.9    9.5256913.29    9.5356922.25    9.5556922.84    9.5556932.05    9.56
56932.38    9.5656941.93    9.5856951.48    9.5956954.01    9.5956959.21     9.6
56961.02     9.656970.57    9.6256980.12    9.6356985.77    9.6456986.36    9.65
56989.66    9.6557562.43    10.5

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
55032.85      .156367.85     .0356402.85      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      56367.8556402.85              460     460     460             .1        .3
Ineffective Flow     num=        2
   Sta L   Sta R    Elev  Permanent
55032.85 54471.5   14.02        T
 58156.557562.43    14.4        T

CROSS SECTION


RIVER: Thornhill Creek
REACH: Bridge Area          RS: -1630

INPUT
Description:
Station Elevation Data      num=      220
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
55112.85       755712.85       755717.56       755724.11       755727.56       7
55737.56       755739.28       755747.56       755757.56       755760.65       7
55767.56       755772.55       755777.56       755787.56       755797.56       7
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55800.71	755805.82	755807.56	755817.56	755827.56	7
55830.83	755837.56	6.9755837.89	6.9655839.09	6.9655847.56	6.91
55857.56	6.8655866.33	6.8255867.56	6.8155872.36	6.7955877.56	6.76
55887.56	6.7155894.78	6.6755897.56	6.6655905.62	6.6255907.56	6.55
55917.56	6.255923.22	655927.56	655937.56	655938.89	6
55947.56	655951.67	655957.56	655967.56	655972.16	6
55977.56	655980.11	655987.56	655997.56	656005.43	6
56007.56	656008.56	656017.56	5.6856026.99	5.3556027.56	5.33
56037.56	5.03 56038.7	556047.56	556057.56	556065.44	5
56067.56	556071.97	556077.56	556081.15	556087.56	5
56097.56	556105.23	556107.56	4.9356117.56	4.6356121.21	4.52
56127.56	4.4956137.56	4.44 56138.5	4.4356147.56	4.3956157.56	4.33
56161.28	4.3256167.56	4.2856171.77	4.2656177.56	4.2356187.56	4.18
56197.56	4.1356201.34	4.1156205.04	456207.56	456207.67	4
56217.56	456223.15	456227.56	456236.11	456237.56	4
56238.31	4 56241.4	456247.56	456257.56	456267.56	4
56271.58	456277.56	456281.47	456287.56	456297.56	4
56304.84	456307.56	3.9256317.56	3.6256321.53	3.556327.56	3.32
56337.56	3.0256338.11	356347.56	3.2856357.56	3.5856361.59	3.71
56367.56	3.7456367.85	3.7456374.52	-5.15556377.85	-5.15556386.18	-5.155
56392.85	3.7456397.56	456404.65	456407.56	456417.56	4
56419.3	456427.56	456435.22	456437.56	456437.92	4
56447.56	456457.56	456463.66	456467.56	456471.19	4
56477.56	456487.56	456492.11	456497.56	456504.45	4
56507.56	456517.56	456520.55	456527.56	456537.56	4
56537.72	456547.56	4 56549	456557.56	456567.56	4
56570.99	456577.44	456577.56	456587.56	456597.56	4
56604.26	456605.88	456607.56	456615.46	456617.56	4
56627.56	456637.53	456637.56	456642.04	4.1456647.56	4.3
56657.56	4.656667.56	4.9 56670.8	556677.56	5 56682.1	5
56687.56	5.1456697.56	5.3956704.07	5.5556707.56	5.6456717.56	5.89
56719.66	5.9456727.56	6.1356737.33	6.3856737.56	6.3856747.56	6.63
56757.56	6.8856762.22	756767.56	7.13 56770.6	7.2156777.56	7.38
56787.56	7.6356797.56	7.8856802.29	856803.87	856807.56	8.11
56811.62	8.2356817.56	8.4156827.56	8.7156833.44	8.8956837.14	8.87
56837.56	8.8756847.56	8.8256857.56	8.7756861.88	8.7456867.56	8.91
56870.41	956877.56	956887.56	956890.33	956897.56	9
56903.68	956907.56	956917.56	956918.77	956927.56	9
56936.94	956937.56	956947.21	956947.56	956957.56	9
56967.56	956970.21	956975.66	956977.56	956987.56	9
56997.56	957003.48	9 57004.1	9.0257007.56	957607.56	9

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
55112.85	.156367.85		.0356392.85		.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
56367.85	56392.85	360	360	360	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
55112.85	53781.5	14.02	T
58846.55	57607.56	14.4	T

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: -1990.*

INPUT
Description:
Station Elevation Data num= 274

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

54842.85	7.554917.73	6.3854924.09	6.3354936.89	6.2154938.86	6.22
54944.2	6.2454961.01	6.0254962.19	655571.93	655577.66	6
55585.61	6 55589.8	655601.96	655604.05	655614.11	6
55626.26	655630.02	655638.41	655644.48	655650.56	6
55662.71	655674.87	6 55678.7	655684.91	655687.02	6
55699.17	655711.32	655715.29	655723.47	5.9855723.88	5.97
55725.33	5.9755735.62	5.9455747.77	5.9155758.43	5.8855759.93	5.87
55765.76	5.8655772.08	5.8455784.23	5.81 55793	5.7855796.38	5.77
55806.18	5.7555808.53	5.755820.68	5.4755827.56	5.3355832.84	5.33
55844.98	5.3355846.61	5.3355857.14	5.3355862.14	5.3355869.29	5.33
55881.44	5.3355887.03	5.3355893.59	5.3355896.69	5.3355905.74	5.33
55917.89	5.3355927.46	5.3355930.05	5.3355931.26	5.33 55942.2	5.12
55953.66	4.955954.35	4.89 55966.5	4.6955967.89	4.6755978.65	4.67
55990.8	4.6756000.38	4.6756002.95	4.6756008.31	4.6756015.11	4.67
56019.47	4.6756027.26	4.6756039.41	4.6756048.73	4.6756051.56	4.62
56063.71	4.4256068.15	4.3556075.86	4.3356088.01	4.2956089.16	4.29
56100.16	4.2656112.32	4.2256116.84	4.2156124.47	4.1956129.59	4.17
56136.62	4.1556148.77	4.1256160.92	4.0956165.52	4.0756170.01	4
56173.07	456173.21	456185.23	456192.02	456197.38	4
56207.77	456209.53	456210.44	4 56214.2	456221.68	4
56233.83	456245.98	456250.87	456258.13	456262.88	4
56270.29	456282.44	456291.29	456294.59	3.9556306.74	3.75
56311.57	3.6756318.89	3.5556331.04	3.3556331.71	3.3356333.06	3.36
56334.62	3.3756343.19	3.4356355.34	3.5156360.24	3.5656364.16	3.53
56367.5	3.556367.85	3.4956374.74	-5.756380.33	-5.756394.29	-5.7
56401.18	3.4956405.46	3.6956407.43	3.756411.91	3.7156414.56	3.72
56423.66	3.7456425.24	3.74 56431	3.7556432.39	3.7456432.75	3.74
56439.72	3.6956441.85	3.6756442.18	3.6756442.29	3.6756450.94	3.67
56460.04	3.6756465.59	3.6756469.13	3.6756472.44	3.6756478.23	3.67
56487.32	3.6756491.46	3.6756496.42	3.6756502.69	3.6756505.51	3.67
56514.61	3.6756517.33	3.67 56523.7	3.67 56532.8	3.6756532.95	3.67
56541.89	3.6756543.21	3.6756550.99	3.6756560.09	3.67 56563.2	3.67
56569.07	3.6756569.18	3.6756578.28	3.6756587.37	3.6756593.47	3.67
56594.94	3.67 56595.4	3.6756596.46	3.6856603.65	3.7556605.56	3.77
56607.17	3.79 56613.3	3.8556614.66	3.8556623.73	3.8756623.75	3.87
56627.83	3.9756632.85	4.0956641.94	4.3156644.62	4.3856646.59	4.43
56651.04	4.5656653.98	4.6556656.06	4.6756660.13	4.6756664.27	4.67
56669.23	4.7656678.32	4.9356684.25	5.0356687.42	5.0956696.51	5.26
56698.43	5.2956705.61	5.42 56714.5	5.59 56714.7	5.59 56723.8	5.75
56732.89	5.9256737.13	656741.99	6.0956744.76	6.1456751.09	6.25
56760.18	6.4256769.28	6.5956773.58	6.6756775.02	6.6756778.37	6.74
56782.07	6.8256787.46	6.9456796.56	7.1456801.91	7.2656805.28	7.25
56805.66	7.2556814.75	7.2156820.48	7.1956823.85	7.1956825.55	7.18
56827.78	7.18 56829.9	7.2356831.87	7.2856832.94	7.356835.54	7.37
56842.04	7.3856851.13	7.456853.65	7.4156860.23	7.43 56865.8	7.44
56869.32	7.4556869.82	7.4556878.42	7.4756879.52	7.4756887.51	7.49
56891	7.556894.29	7.5156896.05	7.5156896.61	7.5156905.39	7.53
56905.7	7.5356912.57	7.55 56914.8	7.5656923.89	7.5856926.31	7.58
56931.26	7.5956932.99	7.656942.09	7.6256951.18	7.64 56952.1	7.64
56955.33	7.6556956.57	7.6556957.13	7.6756960.28	7.6656962.85	7.67
56998.09	7.6757019.13	7.557022.82	7.4757040.83	7.5257044.09	7.52
57069.06	7.5857081.54	7.6157083.59	7.62 57105.2	7.6757126.34	7.67
57154.34	7.4557156.45	7.4557168.93	7.4857169.09	7.4857187.21	7.53
57218.86	7.6 57220.1	7.657247.55	7.3957252.98	7.3557256.32	7.35
57293.77	7.4457297.36	7.4557318.73	7.3357505.99	8.67	

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
54842.85	.156367.85	.0356401.18	.1		

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
56367.8	556401.18	360	360	360	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
54842.85	53241.5	14.02	T
59386.5	57505.99	14.4	T

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: -2350.*

INPUT
Description:
Station Elevation Data num= 274

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
54572.85		854660.98	5.77	54668.47	5.65	54683.54	5.41	54685.86	5.43
54692.14	5.47	54711.93	5.03	54713.31		555431.02		555437.75	5
55447.12		555452.05		555466.36		555468.82		555480.66	5
55494.96		555499.38		555509.27		555516.41		555523.57	5
55537.87		555552.17		555556.68		555563.99		555566.48	5
55580.78		555595.08		555599.76		555609.38	4.99	55609.86	4.99
55611.57	4.99	55623.69	4.97	55637.99	4.95	55650.54	4.94	55652.29	4.94
55659.16	4.93	55666.59	4.92	55680.9	4.95	55691.23	4.89	55695.2	4.89
55706.73	4.87	55709.5	4.85	55723.8	4.73	55731.9	4.67	55738.11	4.67
55752.41	4.67	55754.32	4.67	55766.71	4.67	55772.6	4.67	55781.02	4.67
55795.32	4.67	55801.9	4.67	55809.62	4.67	55813.27	4.67	55823.93	4.67
55838.23	4.67	55849.49	4.67	55852.53	4.67	55853.96	4.67	55866.84	4.56
55880.32	4.45	55881.14	4.44	55895.44	4.34	55897.07	4.33	55909.74	4.33
55924.05	4.33	55935.32	4.33	55938.35	4.33	55944.66	4.33	55952.65	4.33
55957.79	4.33	55966.95	4.33	55981.26	4.33	55992.23	4.33	55995.56	4.31
56009.86	4.21	56015.09	4.17	56024.16	4.16	56038.47	4.15	56039.82	4.14
56052.77	4.13	56067.07	4.11	56072.4	4.11	56081.38	4.09	56087.4	4.09
56095.68	4.08	56109.98	4.06	56124.29	4.04	56129.7	4.04	56134.98	4
56138.59		456138.75		456152.89		456160.89	4	56167.2	4
56179.43	4	56181.5		456182.57		456186.99	4	56195.8	4
56210.1		456224.41		456230.15		456238.71	4	56244.3	4
56253.01		456267.31		456277.73		456281.62	3.97	56295.92	3.87
56301.6	3.83	56310.22	3.77	56324.52	3.67	56325.31	3.67	56326.9	3.68
56328.73	3.66	56338.83	3.57	56353.13	3.45	56358.89	3.4	56363.5	3.34
56367.43	3.26	56367.85	3.25	56374.96	-6.24	56382.8	-6.24	56402.41	-6.24
56409.52	3.25	56413.38	3.38	56415.14	3.45	6419.18	3.42	56421.56	3.43
56429.75	3.47	56431.18	3.48	56436.37	3.51	56437.62	3.49	56437.95	3.48
56444.22	3.37	56446.13	3.34	56446.43	3.34	56446.54	3.33	56454.33	3.33
56462.52	3.33	56467.52	3.33	56470.71	3.33	56473.68	3.33	56478.9	3.33
56487.09	3.33	56490.82	3.33	56495.28	3.33	56500.92	3.33	56503.47	3.33
56511.66	3.33	56514.11	3.33	56519.85	3.33	56528.04	3.33	56528.17	3.33
56536.23	3.33	56537.41	3.33	56544.42	3.33	56552.61	3.33	56555.42	3.33
56560.71	3.33	56560.8	3.33	56568.99	3.33	56577.18	3.33	56582.67	3.33
56584	3.33	56584.42	3.33	56585.38	3.36	56591.85	3.5	56593.56	3.54
56595.01	3.57	56600.54	3.69	56601.75	3.7	56609.92	3.74	56609.95	3.74
56613.61	3.81	56618.13	3.88	56626.33	4.03	56628.73	4.07	56630.51	4.1
56634.52	4.22	56637.17	4.3	56639.04	4.33	56642.71	4.33	56646.43	4.33
56650.9	4.38	56659.09	4.46	56664.42	4.52	56667.28	4.55	56675.47	4.63
56677.19	4.65	56683.66	4.71	56691.66	4.79	56691.85	4.79	56700.04	4.88
56708.23	4.96	56712.05		556716.42	5.04	56718.91	5.07	56724.61	5.13
56732.8	5.21	56740.99	5.29	56744.87	5.33	56746.16	5.33	56749.18	5.37
56752.51	5.41	56757.38	5.47	56765.56	5.57	56770.38	5.63	56773.41	5.62
56773.75	5.62	56781.95	5.61	56787.11	5.6	56790.13	5.61	56791.67	5.61
56793.67	5.62	56795.58	5.65	56797.36	5.68	56798.33	5.69	56800.66	5.74
56806.52	5.77	56814.71	5.81	56816.97	5.82	56822.9	5.85	56827.91	5.88
56831.09	5.89	56831.54	5.9	56839.28	5.94	56840.27	5.95	56847.47	5.98
56850.61		656853.57	6.01	56855.15	6.02	56855.66	6.02	56863.57	6.07
56863.85	6.07	56870.04	6.1	56872.04	6.11	56880.23	6.15	56882.4	6.16
56886.87	6.19	56888.42	6.19	56896.61	6.23	56904.8	6.28	56905.63	6.28

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56908.54     6.356909.65    6.3156910.16    6.3156912.99    6.3256915.31    6.33
56947.04    6.3356965.99    6.0156969.31    5.9556985.54    6.0356988.47    6.05
57010.96    6.17 57022.2    6.2257024.04    6.23 57043.5    6.3357062.54    6.33
57087.75     5.957089.65    5.9157100.89    5.9757101.04    5.9757117.36    6.05
57145.86     6.257146.97    6.2157171.69    5.7757176.58    5.6957179.58    5.71
57213.31    5.8857216.55     5.957235.79    5.6757404.42    8.33

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
54572.85      .156367.85     .0356409.52      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      56367.8556409.52              360     360     360             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
54572.85 52701.5   14.02       T
 59926.557404.42    14.4       T

CROSS SECTION


RIVER: Thornhill Creek
REACH: Bridge Area          RS: -2710

INPUT
Description:
Station Elevation Data      num=      61
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
54302.85     8.554404.24    5.1554412.85    4.9854430.19    4.6254432.85    4.65
54440.09    4.7154462.85    4.0554464.44       456320.74       456322.85    3.96
56362.85    3.1456367.85       356375.18  -6.77556410.52  -6.77556417.85       3
56422.85     3.156441.74    3.2656442.85    3.2356450.78       356573.43       3
56582.85    3.3656587.77    3.5456612.85    3.7656614.43    3.7856622.02       4
56753.73       456757.79    4.0456761.27    4.0756762.85    4.0856792.85    4.34
56793.25    4.3556810.22     4.556812.85    4.52 56827.5    4.6556859.16    4.92
56861.75    4.9556867.77       5   56896       556912.85    4.5156915.81    4.42
56930.24    4.5556932.85    4.5756952.85    4.7556962.85    4.8356964.49    4.85
 56981.8       556998.74       557021.16    4.3557022.85    4.3657032.85    4.45
57032.98    4.45 57047.5    4.5857072.85     4.857073.84    4.8157095.83    4.16
57100.18    4.0457102.85    4.0657132.85    4.3257135.73    4.3557152.85       4
57302.85       8

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
54302.85      .156367.85     .0356417.85      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      56367.8556417.85             442.5   442.5   442.5             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
54302.85 52161.5   14.02       T
 60466.557302.85    14.4       T

CROSS SECTION


RIVER: Thornhill Creek
REACH: Bridge Area          RS: -3152.5*

INPUT
Description:
Station Elevation Data      num=     102
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
```

-18.75	8.44	88.01	5.05	92.19	4.96	97.08	4.89	102.84	4.8
110.66	4.62	115.33	4.54	118.14	4.57	125.76	4.62	149.72	4.04
151.4	4	641.89	4	646.88	3.97	649.52	3.96	667.18	3.99
669.06	3.98	675.3	3.96	676.46	3.95	691.25	3.88	692.48	3.88
2106.02	3.88	2108.24	3.84	2150.36	3.12	2155.62	3	2163.45	-7.44
2197.8	-7.44	2205.62	3	2211.2	3.09	2232.26	3.23	2233.5	3.2
2242.34	3	2320.4	3	2321.76	3.01	2339.18	3.12	2339.45	3.12
2379.1	3.12	2389.6	3.44	2395.09	3.6	2423.05	3.79	2424.82	3.81
2433.28	4	2580.14	4	2584.66	4.03	2588.54	4.06	2590.31	4.07
2623.76	4.3	2624.2	4.31	2643.13	4.44	2646.06	4.45	2662.39	4.57
2697.69	4.81	2700.58	4.83	2707.29	4.88	2738.77	4.88	2757.56	4.45
2760.86	4.37	2776.95	4.48	2779.86	4.5	2802.16	4.66	2810.62	4.71
2813.31	4.74	2814.77	4.77	2815.14	4.77	2815.35	4.77	2831.18	4.98
2834.44	5	2853.33	5	2878.33	4.43	2880.21	4.44	2891.36	4.52
2891.51	4.52	2907.7	4.63	2935.96	4.83	2937.07	4.83	2954.58	4.43
2954.72	4.43	2955.01	4.42	2956.05	4.39	2961.59	4.26	2966.44	4.16
2969.41	4.18	3002.86	4.41	3006.08	4.43	3022.97	4.16	3025.16	4.13
3036.01	4.4	3036.84	4.42	3041.82	4.51	3042.69	4.53	3057.04	4.79
3057.41	4.8	3070.86	5.16	3071.92	5.19	3076.66	5.28	3077.97	5.3
3086.53	5.46	3088.28	5.51	3098.54	5.79	3119.11	6.22	3139.67	6.77
3188.83	7.8	3192.42	7.91						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-18.75	.1	2155.62	.03	2205.62	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
2155.62	2205.62	442.5	442.5	442.5	.1	.3

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: -3595.*

INPUT
Description:
Station Elevation Data num= 102

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-37.5	8.38	74.63	4.94	79.02	4.85	84.15	4.79	90.2	4.73
98.42	4.53	103.33	4.47	106.27	4.49	114.28	4.53	139.45	4.04
141.21	4	656.37	4	661.61	3.95	664.38	3.92	682.94	3.98
684.91	3.96	691.46	3.92	692.68	3.91	708.21	3.76	709.5	3.75
2194.15	3.75	2196.48	3.72	2240.72	3.11	2246.25	3	2254.58	-8.1
2287.92	-8.1	2296.25	3	2302.4	3.07	2325.64	3.19	2327	3.17
2336.76	3	2422.86	3	2424.37	3.02	2443.59	3.25	2443.87	3.25
2487.62	3.25	2499.21	3.52	2505.26	3.65	2536.11	3.82	2538.05	3.84
2547.39	4	2709.4	4	2714.39	4.03	2718.67	4.05	2720.61	4.06
2757.51	4.26	2758.01	4.26	2778.88	4.38	2782.12	4.39	2800.14	4.49
2839.08	4.69	2842.26	4.71	2849.67	4.75	2884.39	4.75	2905.12	4.38
2908.76	4.32	2926.51	4.41	2929.72	4.43	2954.32	4.56	2963.65	4.61
2966.62	4.65	2968.23	4.68	2968.64	4.69	2968.87	4.7	2986.34	4.98
2989.93	5	3010.77	5	3038.35	4.51	3040.42	4.52	3052.72	4.59
3052.88	4.59	3070.74	4.68	3101.93	4.85	3103.14	4.86	3122.46	4.51
3122.61	4.51	3122.94	4.51	3124.09	4.48	3130.19	4.37	3135.54	4.28
3138.83	4.3	3175.73	4.49	3179.27	4.51	3197.9	4.28	3200.33	4.27
3212.3	4.54	3213.21	4.56	3218.7	4.62	3219.66	4.63	3235.49	4.82
3235.9	4.83	3250.73	5.23	3251.91	5.27	3257.14	5.33	3258.59	5.34
3268.02	5.46	3269.95	5.51	3281.28	5.82	3303.96	6.19	3326.65	6.8
3380.88	7.69	3384.83	7.81						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

-37.5	.1	2246.25	.03	2296.25	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
2246.25	2296.25	442.5	442.5	442.5	.1	.3

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: -4037.5*

INPUT
Description:
Station Elevation Data num= 102

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-56.25	8.31	61.25	4.84	65.85	4.74	71.23	4.7	77.57	4.66
86.18	4.45	91.32	4.39	94.41	4.41	102.8	4.44	129.17	4.03
131.02	4	670.85	4	676.34	3.92	679.25	3.89	698.69	3.97
700.76	3.94	707.62	3.88	708.9	3.86	725.18	3.64	726.53	3.62
2282.28	3.62	2284.72	3.6	2331.08	3.09	2336.88	3	2345.7	-8.77
2378.05	-8.77	2386.88	3	2393.6	3.06	2419.01	3.16	2420.5	3.14
2431.17	3	2525.33	3	2526.97	3.03	2547.99	3.37	2548.3	3.38
2596.14	3.38	2608.81	3.6	2615.43	3.71	2649.16	3.85	2651.29	3.86
2661.5	4	2838.65	4	2844.11	4.03	2848.8	4.04	2850.92	4.05
2891.27	4.21	2891.81	4.22	2914.64	4.31	2918.17	4.32	2937.88	4.41
2980.46	4.57	2983.95	4.59	2992.04	4.62	3030.01	4.62	3052.68	4.32
3056.66	4.26	3076.07	4.34	3079.58	4.36	3106.48	4.47	3116.68	4.51
3119.93	4.57	3121.69	4.6	3122.14	4.61	3122.39	4.62	3141.49	4.98
3145.42	5	3168.21	5	3198.36	4.59	3200.64	4.6	3214.09	4.66
3214.26	4.66	3233.79	4.74	3267.89	4.88	3269.22	4.88	3290.34	4.59
3290.51	4.59	3290.86	4.59	3292.12	4.57	3298.8	4.47	3304.65	4.4
3308.24	4.41	3348.59	4.58	3352.47	4.59	3372.84	4.4	3375.49	4.4
3388.58	4.68	3389.58	4.7	3395.59	4.74	3396.64	4.74	3413.95	4.85
3414.39	4.86	3430.61	5.3	3431.89	5.34	3437.62	5.37	3439.2	5.39
3449.52	5.45	3451.63	5.51	3464.01	5.85	3488.82	6.15	3513.63	6.84
3572.92	7.57	3577.25	7.72						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-56.25	.1	2336.88	.03	2386.88	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
2336.88	2386.88	442.5	442.5	442.5	.1	.3

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: -4480.*

INPUT
Description:
Station Elevation Data num= 102

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-75	8.25	47.87	4.74	52.68	4.63	58.31	4.61	64.94	4.59
73.94	4.36	79.32	4.31	82.54	4.32	91.32	4.36	118.9	4.03
120.83	4	685.33	4	691.07	3.9	694.11	3.85	714.45	3.95
716.61	3.92	723.78	3.84	725.12	3.82	742.14	3.53	743.56	3.5
2370.41	3.5	2372.97	3.48	2421.44	3.07	2427.5	3	2436.82	-9.43
2468.18	-9.43	2477.5	3	2484.8	3.05	2512.38	3.13	2514	3.12
2525.58	3	2627.79	3	2629.58	3.03	2652.39	3.49	2652.73	3.5
2704.66	3.5	2718.41	3.68	2725.6	3.77	2762.22	3.88	2764.52	3.89
2775.6	4	2967.91	4	2973.84	4.02	2978.92	4.03	2981.23	4.04

3025.03	4.17	3025.61	4.18	3050.39	4.25	3054.23	4.26	3075.62	4.32
3121.85	4.46	3125.63	4.47	3134.42	4.5	3175.64	4.5	3200.24	4.26
3204.56	4.21	3225.63	4.28	3229.44	4.28	3258.64	4.38	3269.72	4.41
3273.24	4.48	3275.15	4.52	3275.64	4.53	3275.92	4.54	3296.64	4.99
3300.91	5	3325.65	5	3358.38	4.68	3360.85	4.68	3375.45	4.72
3375.64	4.72	3396.84	4.79	3433.85	4.9	3435.3	4.9	3458.23	4.67
3458.41	4.68	3458.79	4.68	3460.16	4.65	3467.4	4.58	3473.76	4.52
3477.65	4.53	3521.46	4.66	3525.66	4.68	3547.78	4.52	3550.66	4.53
3564.87	4.82	3565.95	4.84	3572.47	4.85	3573.61	4.85	3592.4	4.88
3592.89	4.89	3610.49	5.37	3611.88	5.41	3618.09	5.42	3619.81	5.43
3631.01	5.44	3633.3	5.5	3646.74	5.88	3673.67	6.12	3700.6	6.87
3764.97	7.46	3769.67	7.62						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-75	.1	2427.5	.03	2477.5	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
2427.5	2477.5	442.5	442.5	442.5	.1	.3

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: -4922.5*

INPUT
Description:
Station Elevation Data num= 102

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-93.75	8.19	34.49	4.63	39.51	4.51	45.38	4.52	52.3	4.52
61.7	4.27	67.31	4.23	70.68	4.24	79.84	4.27	108.62	4.02
110.63	4	699.82	4	705.8	3.88	708.98	3.81	730.2	3.94
732.46	3.91	739.94	3.8	741.34	3.77	759.11	3.41	760.58	3.38
2458.54	3.38	2461.21	3.36	2511.8	3.05	2518.12	3	2527.95	-10.09
2558.3	-10.09	2568.12	3	2576	3.04	2605.75	3.1	2607.5	3.09
2619.99	3	2730.26	3	2732.18	3.04	2756.79	3.62	2757.16	3.62
2813.18	3.62	2828.02	3.76	2835.77	3.83	2875.27	3.91	2877.76	3.92
2889.71	4	3097.17	4	3103.56	4.01	3109.05	4.03	3111.53	4.03
3158.79	4.13	3159.42	4.13	3186.15	4.19	3190.29	4.2	3213.36	4.24
3263.23	4.35	3267.31	4.36	3276.79	4.38	3321.26	4.38	3347.8	4.19
3352.46	4.16	3375.19	4.21	3379.3	4.21	3410.8	4.28	3422.75	4.3
3426.55	4.39	3428.62	4.44	3429.14	4.46	3429.44	4.46	3451.8	4.99
3456.4	5	3483.08	5	3518.4	4.76	3521.06	4.76	3536.81	4.79
3537.02	4.79	3559.89	4.84	3599.81	4.93	3601.37	4.93	3626.11	4.75
3626.31	4.76	3626.72	4.76	3628.19	4.74	3636.01	4.68	3642.86	4.64
3647.07	4.65	3694.32	4.74	3698.86	4.76	3722.72	4.64	3725.82	4.67
3741.15	4.96	3742.32	4.98	3749.35	4.96	3750.58	4.96	3770.85	4.91
3771.38	4.91	3790.37	5.44	3791.87	5.49	3798.57	5.47	3800.42	5.47
3812.51	5.44	3814.98	5.5	3829.48	5.91	3858.52	6.09	3887.58	6.9
3957.02	7.34	3962.09	7.53						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-93.75	.1	2518.12	.03	2568.12	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
2518.12	2568.12	442.5	442.5	442.5	.1	.3

CROSS SECTION

RIVER: Thornhill Creek

REACH: Bridge Area RS: -5365.*

INPUT
Description:
Station Elevation Data num= 102

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-112.5	8.12	21.11	4.53	26.34	4.4	32.46	4.42	39.67	4.45
49.46	4.18	55.31	4.15	58.81	4.16	68.35	4.18	98.35	4.01
100.44	4	714.3	4	720.54	3.85	723.84	3.78	745.95	3.93
748.3	3.89	756.11	3.76	757.56	3.72	776.07	3.29	777.61	3.25
2546.67	3.25	2549.45	3.24	2602.16	3.04	2608.75	3	2619.07	-10.76
2648.43	-10.76	2658.75	3	2667.2	3.03	2699.13	3.07	2701	3.06
2714.41	3	2832.72	3	2834.79	3.05	2861.2	3.74	2861.59	3.75
2921.7	3.75	2937.62	3.84	2945.93	3.88	2988.32	3.94	2990.99	3.94
3003.82	4	3226.43	4	3233.29	4.01	3239.17	4.02	3241.84	4.02
3292.54	4.09	3293.22	4.09	3321.9	4.12	3326.35	4.13	3351.11	4.16
3404.62	4.23	3408.99	4.24	3419.17	4.25	3466.88	4.25	3495.36	4.13
3500.36	4.11	3524.75	4.14	3529.16	4.14	3562.96	4.19	3575.78	4.2
3579.86	4.3	3582.08	4.36	3582.64	4.38	3582.96	4.39	3606.95	4.99
3611.89	5	3640.52	5	3678.42	4.84	3681.27	4.84	3698.17	4.86
3698.39	4.86	3722.93	4.89	3765.78	4.95	3767.45	4.95	3793.99	4.84
3794.21	4.84	3794.65	4.85	3796.23	4.83	3804.62	4.79	3811.97	4.76
3816.48	4.76	3867.18	4.83	3872.05	4.84	3897.65	4.76	3900.99	4.8
3917.43	5.1	3918.69	5.12	3926.23	5.07	3927.55	5.06	3949.3	4.94
3949.87	4.94	3970.24	5.51	3971.86	5.56	3979.05	5.52	3981.04	5.51
3994	5.43	3996.65	5.5	4012.21	5.94	4043.38	6.06	4074.56	6.93
4149.07	7.23	4154.5	7.44						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-112.5	.1	2608.75	.03	2658.75	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
2608.75	2658.75	442.5	442.5	442.5	.1	.3

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: -5807.5*

INPUT
Description:
Station Elevation Data num= 102

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-131.25	8.06	7.73	4.43	13.17	4.29	19.53	4.33	27.03	4.38
37.22	4.09	43.3	4.08	46.95	4.08	56.87	4.09	88.07	4.01
90.25	4	728.78	4	735.27	3.83	738.71	3.74	761.71	3.92
764.15	3.87	772.27	3.72	773.78	3.68	793.04	3.17	794.63	3.12
2634.8	3.12	2637.69	3.12	2692.52	3.02	2699.38	3	2710.19	-11.42
2738.56	-11.42	2749.38	3	2758.4	3.01	2792.5	3.03	2794.5	3.03
2808.82	3	2935.19	3	2937.39	3.06	2965.6	3.87	2966.02	3.88
3030.22	3.88	3047.22	3.92	3056.1	3.94	3101.38	3.97	3104.23	3.97
3117.93	4	3355.68	4	3363.01	4.01	3369.3	4.01	3372.15	4.01
3426.3	4.04	3427.02	4.04	3457.66	4.06	3462.4	4.07	3488.85	4.08
3546	4.11	3550.68	4.12	3561.54	4.12	3612.5	4.12	3642.92	4.06
3648.26	4.05	3674.31	4.07	3679.02	4.07	3715.12	4.09	3728.82	4.1
3733.18	4.22	3735.54	4.28	3736.14	4.3	3736.48	4.31	3762.11	5
3767.38	5	3797.96	5	3838.43	4.92	3841.48	4.92	3859.54	4.93
3859.77	4.93	3885.98	4.95	3931.74	4.97	3933.53	4.98	3961.88	4.92
3962.1	4.93	3962.57	4.93	3964.26	4.91	3973.22	4.89	3981.08	4.88
3985.89	4.88	4040.05	4.91	4045.25	4.92	4072.59	4.88	4076.15	4.93
4093.72	5.24	4095.06	5.26	4103.12	5.19	4104.53	5.17	4127.76	4.97

4128.36	4.97	4150.12	5.58	4151.84	5.64	4159.52	5.56	4161.65	5.55
4175.5	5.43	4178.33	5.5	4194.95	5.97	4228.23	6.03	4261.53	6.97
4341.11	7.11	4346.92	7.34						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-131.25	.1	2699.38	.03	2749.38	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
2699.38	2749.38	442.5	442.5	442.5	.1	.3

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: -6250

INPUT
Description:
Station Elevation Data num= 47

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-150	8	0	4.18	14.4	4.31	24.98	4	743.26	4
750	3.8	753.57	3.7	777.46	3.91	780	3.85	788.43	3.68
790	3.63	810	3.05	811.66	3	2790	32801.314		-12.085
2828.686	-12.085	2840	3	3037.65	3	3040	3.07	3070	3.99
3070.45	4	3881.85	4	3889	4.2	3890	4.23	3917.26	5
4129.76	5	4130	5.01	4130.5	5.02	4132.3	5	4247.53	5
4270	5.38	4271.43	5.4	4280	5.3	4281.5	5.28	4306.21	5
4306.85	5	4330	5.65	4331.83	5.71	4340	5.61	4342.26	5.59
4356.99	5.42	4360	5.5	4377.68	6	4413.09	6	4448.51	7
4533.16	7	4539.34	7.25						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-150	.1	2790	.03	2840	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
2790	2840	305	305	305	.1	.3

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: -6555.*

INPUT
Description:
Station Elevation Data num= 47

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-150	7.54	0	3.72	14.4	3.85	24.98	3.54	743.26	3.54
750	3.34	753.57	3.24	777.46	3.45	780	3.39	788.43	3.22
790	3.17	810	2.59	811.66	2.54	2790	2.54	2801.66	-12.54
2828.34	-12.54	2840	2.54	3037.65	2.54	3040	2.61	3070	3.53
3070.45	3.54	3881.85	3.54	3889	3.74	3890	3.77	3917.26	4.54
4129.76	4.54	4130	4.55	4130.5	4.56	4132.3	4.54	4247.53	4.54
4270	4.92	4271.43	4.94	4280	4.84	4281.5	4.82	4306.21	4.54
4306.85	4.54	4330	5.19	4331.83	5.25	4340	5.15	4342.26	5.13
4356.99	4.96	4360	5.04	4377.68	5.54	4413.09	5.54	4448.51	6.54
4533.16	6.54	4539.34	6.79						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-150	.1	2790	.03	2840	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
2790	2840	305	305	305	.1	.3

CROSS SECTION

RIVER: Thornhill Creek
REACH: Bridge Area RS: -6860

INPUT
Description:
Station Elevation Data num= 47

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-150	7.085	0	3.265	14.4	3.395	24.98	3.085	743.26	3.085
750	2.885	753.57	2.785	777.46	2.995	780	2.935	788.43	2.765
790	2.715	810	2.135	811.66	2.085	2790	2.085	2802	-13
2828	-13	2840	2.085	3037.65	2.085	3040	2.155	3070	3.075
3070.45	3.085	3881.85	3.085	3889	3.285	3890	3.315	3917.26	4.085
4129.76	4.085	4130	4.095	4130.5	4.105	4132.3	4.085	4247.53	4.085
4270	4.465	4271.43	4.485	4280	4.385	4281.5	4.365	4306.21	4.085
4306.85	4.085	4330	4.735	4331.83	4.795	4340	4.695	4342.26	4.675
4356.99	4.505	4360	4.585	4377.68	5.085	4413.09	5.085	4448.51	6.085
4533.16	6.085	4539.34	6.335						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-150	.1	2790	.03	2840	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
2790	2840	0	0	0	.1	.3

SUMMARY OF MANNING'S N VALUES

River:Thornhill Creek

Reach	River Sta.	n1	n2	n3
Bridge Area	4700	.1	.03	.1
Bridge Area	4266.66*	.1	.03	.1
Bridge Area	3833.33*	.1	.03	.1
Bridge Area	3400.*	.1	.03	.1
Bridge Area	2966.66*	.1	.03	.1
Bridge Area	2533.33*	.1	.03	.1
Bridge Area	2100	.1	.03	.1
Bridge Area	1682.5*	.1	.03	.1
Bridge Area	1265.*	.1	.03	.1
Bridge Area	847.5*	.1	.03	.1
Bridge Area	430	.1	.03	.1
Bridge Area	155	.1	.03	.1
Bridge Area	125	.1	.03	.1
Bridge Area	-23	Bridge		
Bridge Area	-125	.1	.03	.1
Bridge Area	-450.*	.1	.03	.1
Bridge Area	-710	.1	.03	.1
Bridge Area	-1170.*	.1	.03	.1
Bridge Area	-1630	.1	.03	.1
Bridge Area	-1990.*	.1	.03	.1
Bridge Area	-2350.*	.1	.03	.1
Bridge Area	-2710	.1	.03	.1
Bridge Area	-3152.5*	.1	.03	.1

Bridge Area	-3595.*	.1	.03	.1
Bridge Area	-4037.5*	.1	.03	.1
Bridge Area	-4480.*	.1	.03	.1
Bridge Area	-4922.5*	.1	.03	.1
Bridge Area	-5365.*	.1	.03	.1
Bridge Area	-5807.5*	.1	.03	.1
Bridge Area	-6250	.1	.03	.1
Bridge Area	-6555.*	.1	.03	.1
Bridge Area	-6860	.1	.03	.1

SUMMARY OF REACH LENGTHS

River: Thornhill Creek

Reach	River Sta.	Left	Channel	Right
Bridge Area	4700	433.33	433.33	433.33
Bridge Area	4266.66*	433.33	433.33	433.33
Bridge Area	3833.33*	433.33	433.33	433.33
Bridge Area	3400.*	433.33	433.33	433.33
Bridge Area	2966.66*	433.33	433.33	433.33
Bridge Area	2533.33*	433.33	433.33	433.33
Bridge Area	2100	417.52	417.52	417.52
Bridge Area	1682.5*	417.52	417.52	417.52
Bridge Area	1265.*	417.52	417.52	417.52
Bridge Area	847.5*	417.52	417.52	417.52
Bridge Area	430	275	275	275
Bridge Area	155	30	30	30
Bridge Area	125	250	250	250
Bridge Area	-23	Bridge		
Bridge Area	-125	325	325	325
Bridge Area	-450.*	260	260	260
Bridge Area	-710	460	460	460
Bridge Area	-1170.*	460	460	460
Bridge Area	-1630	360	360	360
Bridge Area	-1990.*	360	360	360
Bridge Area	-2350.*	360	360	360
Bridge Area	-2710	442.5	442.5	442.5
Bridge Area	-3152.5*	442.5	442.5	442.5
Bridge Area	-3595.*	442.5	442.5	442.5
Bridge Area	-4037.5*	442.5	442.5	442.5
Bridge Area	-4480.*	442.5	442.5	442.5
Bridge Area	-4922.5*	442.5	442.5	442.5
Bridge Area	-5365.*	442.5	442.5	442.5
Bridge Area	-5807.5*	442.5	442.5	442.5
Bridge Area	-6250	305	305	305
Bridge Area	-6555.*	305	305	305
Bridge Area	-6860	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Thornhill Creek

Reach	River Sta.	Contr.	Expan.
Bridge Area	4700	.1	.3
Bridge Area	4266.66*	.1	.3

Bridge Area	3833.33*		.1	.3
Bridge Area	3400.*		.1	.3
Bridge Area	2966.66*		.1	.3
Bridge Area	2533.33*		.1	.3
Bridge Area	2100		.1	.3
Bridge Area	1682.5*		.1	.3
Bridge Area	1265.*		.1	.3
Bridge Area	847.5*		.1	.3
Bridge Area	430		.3	.5
Bridge Area	155		.3	.5
Bridge Area	125		.3	.5
Bridge Area	-23	Bridge		
Bridge Area	-125		.3	.5
Bridge Area	-450.*		.1	.3
Bridge Area	-710		.1	.3
Bridge Area	-1170.*		.1	.3
Bridge Area	-1630		.1	.3
Bridge Area	-1990.*		.1	.3
Bridge Area	-2350.*		.1	.3
Bridge Area	-2710		.1	.3
Bridge Area	-3152.5*		.1	.3
Bridge Area	-3595.*		.1	.3
Bridge Area	-4037.5*		.1	.3
Bridge Area	-4480.*		.1	.3
Bridge Area	-4922.5*		.1	.3
Bridge Area	-5365.*		.1	.3
Bridge Area	-5807.5*		.1	.3
Bridge Area	-6250		.1	.3
Bridge Area	-6555.*		.1	.3
Bridge Area	-6860		.1	.3

25 Year Proposed 280' Bridge

(Storm Tide + Base Flow)

HEC-RAS Output

HEC-RAS Plan: Pro4 25 ST only River: Thornhill Creek Reach: Bridge Area

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Bridge Area	4700	28SEP2008 0918	350.00	14.00	15.64		15.76	0.002812	2.82	130.41	133.11	0.47
Bridge Area	4700	28SEP2008 1448	350.00	14.00	15.64		15.76	0.002807	2.82	130.49	133.13	0.47
Bridge Area	4266.66*	28SEP2008 0918	350.00	13.17	14.51		14.60	0.002552	2.48	143.34	156.88	0.44
Bridge Area	4266.66*	28SEP2008 1448	350.05	13.17	14.51		14.60	0.002564	2.48	143.15	156.84	0.44
Bridge Area	3833.33*	28SEP2008 0918	350.00	12.33	13.47		13.55	0.002395	2.24	156.49	181.06	0.42
Bridge Area	3833.33*	28SEP2008 1448	349.87	12.33	13.47		13.55	0.002368	2.23	157.01	181.22	0.42
Bridge Area	3400.*	28SEP2008 0918	350.00	11.50	12.51		12.58	0.002164	2.03	172.25	208.49	0.39
Bridge Area	3400.*	28SEP2008 1448	350.42	11.50	12.51		12.57	0.002217	2.05	171.13	208.28	0.40
Bridge Area	2966.66*	28SEP2008 0918	350.00	10.67	11.51		11.58	0.002543	2.05	170.36	228.32	0.42
Bridge Area	2966.66*	28SEP2008 1448	349.31	10.67	11.52		11.58	0.002435	2.02	172.60	229.05	0.41
Bridge Area	2533.33*	28SEP2008 0918	350.00	9.83	10.76		10.80	0.001208	1.53	258.12	621.35	0.29
Bridge Area	2533.33*	28SEP2008 1448	345.69	9.83	10.89		10.92	0.000701	1.28	341.65	646.73	0.23
Bridge Area	2100	28SEP2008 0918	350.00	9.00	9.49		9.54	0.004927	2.06	264.76	579.88	0.54
Bridge Area	2100	28SEP2008 1448	363.53	9.00	10.74		10.74	0.000053	0.50	1457.24	1215.65	0.07
Bridge Area	1682.5*	28SEP2008 0918	350.00	6.34	6.92		7.06	0.007869	2.99	116.92	207.79	0.70
Bridge Area	1682.5*	28SEP2008 1448	412.06	6.34	10.72		10.73	0.000008	0.36	2105.64	1418.32	0.03
Bridge Area	1265.*	28SEP2008 0918	350.00	3.68	4.54		4.67	0.004678	2.97	117.76	143.09	0.58
Bridge Area	1265.*	28SEP2008 1448	474.37	3.68	10.72		10.72	0.000004	0.36	2474.62	1501.18	0.02
Bridge Area	847.5*	28SEP2008 0918	350.00	1.03	3.65		3.70	0.000404	1.69	206.70	92.15	0.20
Bridge Area	847.5*	28SEP2008 1448	541.39	1.03	10.70		10.71	0.000005	0.46	2560.49	1687.68	0.03
Bridge Area	430	28SEP2008 0918	350.00	-1.63	2.64		2.91	0.003980	4.18	83.70	52.29	0.58
Bridge Area	430	28SEP2008 1448	632.81	-1.63	10.69		10.69	0.000016	0.84	2230.00	1775.63	0.05
Bridge Area	155	28SEP2008 0918	350.00	-2.60	1.80	0.80	2.03	0.002622	3.81	91.95	49.45	0.49
Bridge Area	155	28SEP2008 1448	703.81	-2.60	10.67	1.78	10.68	0.000015	0.91	2067.46	1871.50	0.05
Bridge Area	125	28SEP2008 0918	350.00	-2.68	1.80	0.67	2.06	0.003236	4.08	87.63	51.96	0.54
Bridge Area	125	28SEP2008 1448	709.66	-2.68	10.67	1.94	10.68	0.000017	0.96	1951.78	1261.45	0.05
Bridge Area	-23		Bridge									
Bridge Area	-125	28SEP2008 0918	350.00	-2.54	1.87	0.00	1.41	0.001240	3.26	116.52	79.30	0.35

HEC-RAS Plan: Pro4 25 ST only River: Thornhill Creek Reach: Bridge Area (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Bridge Area	-125	28SEP2008 1448	709.66	-2.54	10.68	1.13	10.67	0.000010	0.73	2693.71	1634.08	0.04
Bridge Area	-450.*	28SEP2008 0918	350.63	-3.96	0.74		0.86	0.000713	2.79	125.89	38.50	0.27
Bridge Area	-450.*	28SEP2008 1448	750.80	-3.96	10.65		10.66	0.000015	0.96	2179.70	858.80	0.05
Bridge Area	-710	28SEP2008 0918	351.19	-3.78	0.66		0.73	0.000308	2.08	169.25	41.49	0.18
Bridge Area	-710	28SEP2008 1448	764.36	-3.78	10.63		10.64	0.000011	0.87	3080.16	1114.86	0.04
Bridge Area	-1170.*	28SEP2008 0918	352.21	-4.47	0.43		0.54	0.000505	2.67	131.92	30.59	0.23
Bridge Area	-1170.*	28SEP2008 1448	766.59	-4.47	10.62		10.62	0.000009	0.73	6002.65	2529.58	0.03
Bridge Area	-1630	28SEP2008 0918	353.42	-5.16	-0.44		-0.07	0.002244	4.94	71.56	18.72	0.45
Bridge Area	-1630	28SEP2008 1448	745.04	-5.16	10.61		10.61	0.000003	0.41	9626.95	2494.71	0.02
Bridge Area	-1990.*	28SEP2008 0918	355.09	-5.70	-0.76		-0.61	0.000704	3.09	114.95	26.96	0.26
Bridge Area	-1990.*	28SEP2008 1448	703.84	-5.70	10.60		10.60	0.000001	0.28	12810.20	2663.14	0.01
Bridge Area	-2350.*	28SEP2008 0918	357.70	-6.24	-0.86		-0.79	0.000273	2.11	169.43	35.51	0.17
Bridge Area	-2350.*	28SEP2008 1448	643.37	-6.24	10.60		10.60	0.000001	0.19	16137.25	2831.57	0.01
Bridge Area	-2710	28SEP2008 0918	361.23	-6.78	-0.90		-0.86	0.000125	1.55	233.52	44.15	0.12
Bridge Area	-2710	28SEP2008 1448	572.26	-6.78	10.60		10.60	0.000000	0.13	19600.88	3000.00	0.01
Bridge Area	-3152.5*	28SEP2008 0918	366.14	-7.44	-0.94		-0.91	0.000098	1.44	254.73	44.09	0.11
Bridge Area	-3152.5*	28SEP2008 1448	472.72	-7.44	10.60		10.60	0.000000	0.10	21142.76	3211.17	0.00
Bridge Area	-3595.*	28SEP2008 0918	371.13	-8.10	-0.98		-0.95	0.000078	1.35	275.38	44.02	0.09
Bridge Area	-3595.*	28SEP2008 1448	361.66	-8.10	10.60		10.60	0.000000	0.08	22719.64	3422.33	0.00
Bridge Area	-4037.5*	28SEP2008 0918	376.17	-8.77	-1.01		-0.99	0.000064	1.27	296.17	43.99	0.09
Bridge Area	-4037.5*	28SEP2008 1448	239.76	-8.77	10.60		10.60	0.000000	0.05	24317.96	3633.50	0.00
Bridge Area	-4480.*	28SEP2008 0918	381.26	-9.43	-1.04		-1.01	0.000054	1.21	316.10	43.95	0.08
Bridge Area	-4480.*	28SEP2008 1448	111.80	-9.43	10.60		10.60	0.000000	0.02	25919.23	3844.67	0.00
Bridge Area	-4922.5*	28SEP2008 0918	386.37	-10.09	-1.06		-1.04	0.000046	1.15	335.42	43.91	0.07
Bridge Area	-4922.5*	28SEP2008 1448	-17.03	-10.09	10.60		10.60	0.000000	0.00	27540.27	4055.84	0.00
Bridge Area	-5365.*	28SEP2008 0918	391.40	-10.76	-1.07		-1.06	0.000040	1.10	354.71	43.89	0.07
Bridge Area	-5365.*	28SEP2008 1448	-141.27	-10.76	10.60		10.60	0.000000	-0.02	29197.96	4267.00	0.00
Bridge Area	-5807.5*	28SEP2008 0918	396.46	-11.42	-1.09		-1.07	0.000035	1.06	373.06	43.86	0.06

HEC-RAS Plan: Pro4 25 ST only River: Thornhill Creek Reach: Bridge Area (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Bridge Area	-5807.5*	28SEP2008 1448	-257.53	-11.42	10.60		10.60	0.000000	-0.04	30874.05	4478.17	0.00
Bridge Area	-6250	28SEP2008 0918	401.55	-12.09	-1.11		-1.09	0.000031	1.03	390.96	43.84	0.06
Bridge Area	-6250	28SEP2008 1448	-366.78	-12.09	10.61		10.61	0.000000	-0.06	32549.91	4689.34	0.00
Bridge Area	-6555.*	28SEP2008 0918	405.10	-12.54	-1.11		-1.10	0.000029	1.00	405.79	44.35	0.06
Bridge Area	-6555.*	28SEP2008 1448	-436.84	-12.54	10.61		10.61	0.000000	-0.06	34705.91	4689.34	0.00
Bridge Area	-6860	28SEP2008 0918	408.68	-13.00	-1.12	-11.07	-1.11	0.000026	0.97	421.06	44.90	0.06
Bridge Area	-6860	28SEP2008 1448	-502.32	-13.00	10.61	-10.79	10.61	0.000000	-0.06	36838.61	4689.34	0.00

HEC-RAS Plan: Pro4 25 ST only River: Thornhill Creek Reach: Bridge Area

Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Crit W.S.	Frctn Loss	C & E Loss	Top Width	Q Left	Q Channel	Q Right	Vel Chnl
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft/s)
Bridge Area	155	28SEP2008 0918	2.03	1.80	0.80	0.11	0.00	49.45	0.02	349.98		3.81
Bridge Area	155	28SEP2008 1448	10.68	10.67	1.78	0.00	0.00	1871.50	152.41	507.44	43.97	0.91
Bridge Area	125	28SEP2008 0918	2.06	1.80	0.67	0.19	0.00	51.96	0.24	348.94	0.82	4.08
Bridge Area	125	28SEP2008 1448	10.68	10.67	1.94			1261.45	110.75	522.12	76.79	0.96
Bridge Area	-23 BR U	28SEP2008 0918	2.31	2.13	0.70	0.17	0.00	54.57	0.47	348.13	1.40	3.44
Bridge Area	-23 BR U	28SEP2008 1448	10.68	10.66	1.93			252.11	63.72	586.54	59.40	1.13
Bridge Area	-23 BR D	28SEP2008 0918	2.14	1.97	0.39	0.13	0.00	86.86		345.65	4.35	3.80
Bridge Area	-23 BR D	28SEP2008 1448	10.68	10.68	1.73			252.16	15.33	473.03	221.30	0.93
Bridge Area	-125	28SEP2008 0918	1.41	1.87	0.00	0.58	0.02	79.30		347.96	2.04	3.26
Bridge Area	-125	28SEP2008 1448	10.67	10.68	1.13			1634.08	28.41	414.86	266.40	0.73
Bridge Area	-450.*	28SEP2008 0918	0.86	0.74		0.12		38.50		350.63		2.79
Bridge Area	-450.*	28SEP2008 1448	10.66	10.65		0.00		858.80	79.84	594.40	76.56	0.96

Plan: Pro4 25 ST only Thornhill Creek Bridge Area RS: -23 Profile: 28SEP2008 0918

E.G. US. (ft)	2.06	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1.80	E.G. Elev (ft)	2.31	2.14
Q Total (cfs)	350.00	W.S. Elev (ft)	2.13	1.97
Q Bridge (cfs)	350.00	Crit W.S. (ft)	0.70	0.39
Q Weir (cfs)		Max Chl Dpth (ft)	4.81	4.51
Weir Sta Lft (ft)		Vel Total (ft/s)	3.33	3.33
Weir Sta Rgt (ft)		Flow Area (sq ft)	105.10	105.05
Weir Submerg		Froude # Chl	0.42	0.42
Weir Max Depth (ft)		Specif Force (cu ft)	194.75	194.76
Min El Weir Flow (ft)	14.40	Hydr Depth (ft)	1.93	1.21
Min El Prs (ft)	14.00	W.P. Total (ft)	57.29	89.38
Delta EG (ft)	0.65	Conv. Total (cfs)	7954.9	8071.2
Delta WS (ft)	-0.07	Top Width (ft)	54.57	86.86
BR Open Area (sq ft)	2440.83	Frctn Loss (ft)	0.17	0.13
BR Open Vel (ft/s)	3.33	C & E Loss (ft)	0.00	0.00
Coef of Q	1.00	Shear Total (lb/sq ft)	0.22	0.14
Br Sel Method	WSPRO	Power Total (lb/ft s)	53748.20	53748.20

Plan: Pro4 25 ST only Thornhill Creek Bridge Area RS: -23 Profile: 28SEP2008 1448

E.G. US. (ft)	10.68	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	10.67	E.G. Elev (ft)	10.68	10.68
Q Total (cfs)	709.66	W.S. Elev (ft)	10.66	10.68
Q Bridge (cfs)	709.66	Crit W.S. (ft)	1.93	1.73
Q Weir (cfs)		Max Chl Dpth (ft)	13.34	13.22
Weir Sta Lft (ft)		Vel Total (ft/s)	0.61	0.39
Weir Sta Rgt (ft)		Flow Area (sq ft)	1170.44	1806.54
Weir Submerg		Froude # Chl	0.06	0.05
Weir Max Depth (ft)		Specif Force (cu ft)	4175.74	7353.51
Min El Weir Flow (ft)	14.40	Hydr Depth (ft)	4.64	7.16
Min El Prs (ft)	14.00	W.P. Total (ft)	297.98	324.66
Delta EG (ft)	0.00	Conv. Total (cfs)	120354.5	170052.4
Delta WS (ft)	-0.01	Top Width (ft)	252.11	252.16
BR Open Area (sq ft)	2440.83	Frctn Loss (ft)		
BR Open Vel (ft/s)	0.61	C & E Loss (ft)		
Coef of Q	0.92	Shear Total (lb/sq ft)	0.01	0.01
Br Sel Method	WSPRO	Power Total (lb/ft s)	53748.20	53748.20

100 Year Proposed 280' Bridge

(Storm Tide + Base Flow)

HEC-RAS Output

HEC-RAS Plan: Pro4 100 ST only River: Thornhill Creek Reach: Bridge Area

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Bridge Area	4700	28SEP2008 1336	400.00	14.00	15.72		15.86	0.002918	3.00	140.93	135.62	0.49
Bridge Area	4700	28SEP2008 1354	400.00	14.00	15.73		15.87	0.002800	2.97	142.90	136.08	0.48
Bridge Area	4266.66*	28SEP2008 1336	399.33	13.17	14.60		14.70	0.002497	2.59	157.21	159.93	0.44
Bridge Area	4266.66*	28SEP2008 1354	400.44	13.17	14.57		14.68	0.002778	2.68	152.14	158.82	0.46
Bridge Area	3833.33*	28SEP2008 1336	401.69	12.33	13.53		13.62	0.002588	2.42	166.42	184.10	0.44
Bridge Area	3833.33*	28SEP2008 1354	393.67	12.33	13.62		13.69	0.001828	2.17	183.34	188.07	0.38
Bridge Area	3400.*	28SEP2008 1336	391.66	11.50	12.61		12.67	0.001899	2.04	191.86	213.07	0.38
Bridge Area	3400.*	28SEP2008 1354	345.28	11.50	13.23		13.24	0.000262	1.07	340.92	273.39	0.15
Bridge Area	2966.66*	28SEP2008 1336	308.51	10.67	12.22		12.23	0.000211	0.91	354.75	300.17	0.13
Bridge Area	2966.66*	28SEP2008 1354	7.27	10.67	13.19		13.19	0.000000	0.01	1355.65	1516.06	0.00
Bridge Area	2533.33*	28SEP2008 1336	-110.45	9.83	12.18		12.18	0.000003	-0.14	1769.23	1495.01	0.02
Bridge Area	2533.33*	28SEP2008 1354	-579.19	9.83	13.19		13.20	0.000015	-0.42	3485.37	1834.78	0.04
Bridge Area	2100	28SEP2008 1336	-809.97	9.00	12.17		12.18	0.000025	-0.53	3530.13	1557.89	0.05
Bridge Area	2100	28SEP2008 1354	-1237.17	9.00	13.20		13.20	0.000020	-0.57	5233.38	2034.83	0.05
Bridge Area	1682.5*	28SEP2008 1336	-1596.41	6.34	12.18		12.18	0.000030	-0.86	4678.81	1999.41	0.06
Bridge Area	1682.5*	28SEP2008 1354	-2204.75	6.34	13.21		13.21	0.000026	-0.88	7010.69	2609.18	0.06
Bridge Area	1265.*	28SEP2008 1336	-2670.61	3.68	12.18		12.20	0.000051	-1.41	5375.88	2563.36	0.09
Bridge Area	1265.*	28SEP2008 1354	-3614.73	3.68	13.21		13.24	0.000046	-1.45	8445.31	4585.16	0.09
Bridge Area	847.5*	28SEP2008 1336	-4278.66	1.03	12.18		12.26	0.000129	-2.58	5315.49	3965.95	0.14
Bridge Area	847.5*	28SEP2008 1354	-5220.55	1.03	13.23		13.29	0.000102	-2.44	7941.81	5253.48	0.13
Bridge Area	430	28SEP2008 1336	-6355.71	-1.63	12.24		12.53	0.000571	-5.56	4352.48	4658.55	0.30
Bridge Area	430	28SEP2008 1354	-6993.06	-1.63	13.28		13.45	0.000361	-4.70	5824.62	5948.41	0.24
Bridge Area	155	28SEP2008 1336	-7634.81	-2.60	12.30		12.84	0.000823	-7.43	3038.94	4816.16	0.37
Bridge Area	155	28SEP2008 1354	-8268.81	-2.60	13.29		13.73	0.000637	-6.88	3631.46	5957.82	0.33
Bridge Area	125	28SEP2008 1336	-7763.99	-2.68	12.28		12.91	0.000958	-7.91	2767.77	4687.00	0.40
Bridge Area	125	28SEP2008 1354	-8387.25	-2.68	13.27		13.79	0.000749	-7.37	3267.78	5946.38	0.36
Bridge Area	-23		Bridge									

HEC-RAS Plan: Pro4 100 ST only River: Thornhill Creek Reach: Bridge Area (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Bridge Area	-125	28SEP2008 1336	-7763.99	-2.54	12.42		12.73	0.000579	-6.09	3636.03	3441.97	0.31
Bridge Area	-125	28SEP2008 1354	-8387.25	-2.54	13.40		13.67	0.000467	-5.77	4177.62	6044.84	0.28
Bridge Area	-450.*	28SEP2008 1336	-8659.04	-3.96	12.49		13.10	0.000826	-7.77	3550.01	4283.75	0.37
Bridge Area	-450.*	28SEP2008 1354	-9532.41	-3.96	13.44		13.94	0.000667	-7.30	4263.11	4309.73	0.33
Bridge Area	-710	28SEP2008 1336	-8881.46	-3.78	12.70		13.01	0.000500	-6.32	7241.81	2564.46	0.28
Bridge Area	-710	28SEP2008 1354	-9742.43	-3.78	13.61		13.80	0.000336	-5.38	9349.87	2564.46	0.23
Bridge Area	-1170.*	28SEP2008 1336	-9384.43	-4.47	13.22		13.28	0.000196	-3.91	12602.32	2529.58	0.17
Bridge Area	-1170.*	28SEP2008 1354	-10077.30	-4.47	14.14		14.18	0.000139	-3.41	14912.16	2529.58	0.14
Bridge Area	-1630	28SEP2008 1336	-10122.70	-5.16	13.61		13.63	0.000103	-2.64	17133.46	2494.71	0.12
Bridge Area	-1630	28SEP2008 1354	-10551.20	-5.16	14.50		14.52	0.000076	-2.36	19352.19	2494.71	0.10
Bridge Area	-1990.*	28SEP2008 1336	-10998.60	-5.70	13.69		13.70	0.000066	-2.30	21041.17	2663.14	0.10
Bridge Area	-1990.*	28SEP2008 1354	-11134.50	-5.70	14.57		14.58	0.000048	-2.03	23383.87	2663.14	0.08
Bridge Area	-2350.*	28SEP2008 1336	-12099.20	-6.24	13.73		13.74	0.000048	-2.08	25011.34	2831.57	0.09
Bridge Area	-2350.*	28SEP2008 1354	-11878.50	-6.24	14.61		14.62	0.000034	-1.81	27485.16	2831.57	0.07
Bridge Area	-2710	28SEP2008 1336	-13255.00	-6.78	13.76		13.77	0.000037	-1.91	29084.89	3000.00	0.08
Bridge Area	-2710	28SEP2008 1354	-12672.40	-6.78	14.63		14.64	0.000026	-1.65	31693.75	3000.00	0.06
Bridge Area	-3152.5*	28SEP2008 1336	-14764.30	-7.44	13.78		13.79	0.000040	-1.99	31369.11	3211.17	0.08
Bridge Area	-3152.5*	28SEP2008 1354	-13695.70	-7.44	14.65		14.66	0.000026	-1.67	34151.46	3211.17	0.06
Bridge Area	-3595.*	28SEP2008 1336	-16328.80	-8.10	13.81		13.82	0.000042	-2.07	33710.12	3422.33	0.08
Bridge Area	-3595.*	28SEP2008 1354	-14769.60	-8.10	14.67		14.68	0.000026	-1.68	36658.41	3422.33	0.06
Bridge Area	-4037.5*	28SEP2008 1336	-17949.50	-8.77	13.84		13.85	0.000044	-2.14	36095.51	3633.50	0.08
Bridge Area	-4037.5*	28SEP2008 1354	-15918.50	-8.77	14.70		14.70	0.000027	-1.71	39200.88	3633.50	0.07
Bridge Area	-4480.*	28SEP2008 1336	-19599.70	-9.43	13.87		13.88	0.000046	-2.20	38496.84	3844.67	0.08
Bridge Area	-4480.*	28SEP2008 1354	-17132.80	-9.43	14.72		14.73	0.000027	-1.73	41752.82	3844.67	0.07
Bridge Area	-4922.5*	28SEP2008 1336	-21267.30	-10.09	13.91		13.92	0.000047	-2.25	40947.87	4055.84	0.09
Bridge Area	-4922.5*	28SEP2008 1354	-18409.60	-10.09	14.74		14.75	0.000028	-1.76	44343.30	4055.84	0.07

HEC-RAS Plan: Pro4 100 ST only River: Thornhill Creek Reach: Bridge Area (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Bridge Area	-5365.*	28SEP2008 1336	-22930.70	-10.76	13.94		13.96	0.000049	-2.30	43448.97	4267.00	0.09
Bridge Area	-5365.*	28SEP2008 1354	-19748.70	-10.76	14.77		14.78	0.000028	-1.79	46978.42	4267.00	0.07
Bridge Area	-5807.5*	28SEP2008 1336	-24576.30	-11.42	13.98		14.00	0.000050	-2.33	46005.06	4478.17	0.09
Bridge Area	-5807.5*	28SEP2008 1354	-21154.80	-11.42	14.80		14.81	0.000029	-1.82	49655.57	4478.17	0.07
Bridge Area	-6250	28SEP2008 1336	-26219.60	-12.09	14.02		14.03	0.000050	-2.36	48548.39	4689.34	0.09
Bridge Area	-6250	28SEP2008 1354	-22642.00	-12.09	14.82		14.83	0.000030	-1.85	52325.23	4689.34	0.07
Bridge Area	-6555.*	28SEP2008 1336	-27324.90	-12.54	14.04		14.05	0.000047	-2.32	50813.55	4689.34	0.09
Bridge Area	-6555.*	28SEP2008 1354	-23688.80	-12.54	14.84		14.85	0.000028	-1.84	54558.28	4689.34	0.07
Bridge Area	-6860	28SEP2008 1336	-28389.40	-13.00	14.07	5.45	14.08	0.000045	-2.28	53054.34	4689.34	0.08
Bridge Area	-6860	28SEP2008 1354	-24734.30	-13.00	14.86	5.23	14.86	0.000027	-1.83	56768.30	4689.34	0.07

HEC-RAS Plan: Pro4 100 ST only River: Thornhill Creek Reach: Bridge Area

Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Crit W.S.	Frctn Loss	C & E Loss	Top Width	Q Left	Q Channel	Q Right	Vel Chnl
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft/s)
Bridge Area	155	28SEP2008 1336	12.84	12.30		0.03		4816.16	-1919.50	-4769.64	-945.67	-7.43
Bridge Area	155	28SEP2008 1354	13.73	13.29		0.02		5957.82	-2196.83	-4781.58	-1290.40	-6.88
Bridge Area	125	28SEP2008 1336	12.91	12.28				4687.00	-1476.02	-4975.88	-1312.09	-7.91
Bridge Area	125	28SEP2008 1354	13.79	13.27				5946.38	-1715.79	-5014.32	-1657.14	-7.37
Bridge Area	-23 BR U	28SEP2008 1336	13.46	12.28				258.59	-816.94	-5924.71	-1022.34	-9.91
Bridge Area	-23 BR U	28SEP2008 1354	14.32	13.27				266.30	-929.63	-6145.83	-1311.79	-9.51
Bridge Area	-23 BR D	28SEP2008 1336	13.15	12.42				259.14	-224.16	-5053.76	-2486.07	-8.44
Bridge Area	-23 BR D	28SEP2008 1354	14.12	13.40				266.57	-261.61	-5412.50	-2713.14	-8.34
Bridge Area	-125	28SEP2008 1336	12.73	12.42		0.23		3441.97	-539.86	-4074.31	-3149.82	-6.09
Bridge Area	-125	28SEP2008 1354	13.67	13.40		0.18		6044.84	-727.68	-4175.18	-3484.39	-5.77
Bridge Area	-450.*	28SEP2008 1336	13.10	12.49		0.16		4283.75	-1730.27	-5556.09	-1372.68	-7.77
Bridge Area	-450.*	28SEP2008 1354	13.94	13.44		0.12		4309.73	-2248.07	-5578.38	-1705.97	-7.30

Plan: Pro4 100 ST only Thornhill Creek Bridge Area RS: -23 Profile: 28SEP2008 1336

E.G. US. (ft)	12.91	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	12.28	E.G. Elev (ft)	13.46	13.15
Q Total (cfs)	-7763.99	W.S. Elev (ft)	12.28	12.42
Q Bridge (cfs)		Crit W.S. (ft)		
Q Weir (cfs)		Max Chl Dpth (ft)	14.96	14.96
Weir Sta Lft (ft)		Vel Total (ft/s)	-4.90	-3.45
Weir Sta Rgt (ft)		Flow Area (sq ft)	1583.64	2252.64
Weir Submerg		Froude # Chl	0.50	0.43
Weir Max Depth (ft)		Specif Force (cu ft)	8312.01	12347.48
Min El Weir Flow (ft)	14.40	Hydr Depth (ft)	6.12	8.69
Min El Prs (ft)	14.00	W.P. Total (ft)	321.40	349.91
Delta EG (ft)		Conv. Total (cfs)	160132.1	227658.8
Delta WS (ft)	-0.14	Top Width (ft)	258.59	259.14
BR Open Area (sq ft)		Frctn Loss (ft)		
BR Open Vel (ft/s)		C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	0.72	0.47
Br Sel Method	Energy/Weir	Power Total (lb/ft s)	53748.20	53748.20

Plan: Pro4 100 ST only Thornhill Creek Bridge Area RS: -23 Profile: 28SEP2008 1354

E.G. US. (ft)	13.79	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	13.27	E.G. Elev (ft)	14.32	14.12
Q Total (cfs)	-8387.25	W.S. Elev (ft)	13.27	13.40
Q Bridge (cfs)		Crit W.S. (ft)		
Q Weir (cfs)		Max Chl Dpth (ft)	15.95	15.94
Weir Sta Lft (ft)		Vel Total (ft/s)	-4.55	-3.34
Weir Sta Rgt (ft)		Flow Area (sq ft)	1842.10	2510.71
Weir Submerg		Froude # Chl	0.46	0.41
Weir Max Depth (ft)		Specif Force (cu ft)	10022.46	14779.22
Min El Weir Flow (ft)	14.40	Hydr Depth (ft)	6.92	9.42
Min El Prs (ft)	14.00	W.P. Total (ft)	339.58	367.85
Delta EG (ft)		Conv. Total (cfs)	186447.8	262603.8
Delta WS (ft)	-0.13	Top Width (ft)	266.30	266.57
BR Open Area (sq ft)		Frctn Loss (ft)		
BR Open Vel (ft/s)		C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	0.69	0.43
Br Sel Method	Energy/Weir	Power Total (lb/ft s)	53748.20	53748.20

25 Year Proposed 280' Bridge

(Storm Tide + Creek Flood)

HEC-RAS Output

HEC-RAS Plan: pro4 25 STRF River: Thornhill Creek Reach: Bridge Area

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Bridge Area	4700	28SEP2008 0918	834.00	14.00	16.33		16.58	0.003027	4.04	245.71	199.35	0.53
Bridge Area	4700	28SEP2008 1448	834.00	14.00	16.33		16.58	0.003027	4.04	245.71	199.35	0.53
Bridge Area	4266.66*	28SEP2008 0918	834.00	13.17	15.14		15.34	0.002715	3.56	255.75	219.43	0.49
Bridge Area	4266.66*	28SEP2008 1448	834.00	13.17	15.14		15.34	0.002716	3.56	255.71	219.43	0.49
Bridge Area	3833.33*	28SEP2008 0918	834.00	12.33	14.06		14.21	0.002508	3.21	271.67	241.79	0.47
Bridge Area	3833.33*	28SEP2008 1448	833.90	12.33	14.06		14.22	0.002506	3.21	271.75	241.80	0.47
Bridge Area	3400.*	28SEP2008 0918	834.00	11.50	13.06		13.19	0.002268	2.91	295.09	266.95	0.44
Bridge Area	3400.*	28SEP2008 1448	834.70	11.50	13.06		13.19	0.002266	2.91	295.40	267.00	0.44
Bridge Area	2966.66*	28SEP2008 0918	834.00	10.67	12.02		12.15	0.002559	2.85	296.71	290.52	0.46
Bridge Area	2966.66*	28SEP2008 1448	833.21	10.67	12.02		12.14	0.002583	2.86	295.57	290.33	0.46
Bridge Area	2533.33*	28SEP2008 0918	834.00	9.83	11.13		11.21	0.001794	2.37	503.27	717.57	0.38
Bridge Area	2533.33*	28SEP2008 1448	830.10	9.83	11.18		11.25	0.001532	2.24	538.69	775.14	0.35
Bridge Area	2100	28SEP2008 0918	834.00	9.00	9.84		9.93	0.004187	2.72	478.66	616.23	0.54
Bridge Area	2100	28SEP2008 1448	859.05	9.00	10.83		10.84	0.000242	1.12	1560.36	1219.78	0.15
Bridge Area	1682.5*	28SEP2008 0918	834.00	6.34	7.33		7.60	0.007402	4.11	202.89	213.91	0.74
Bridge Area	1682.5*	28SEP2008 1448	933.84	6.34	10.76		10.77	0.000039	0.81	2162.84	1426.45	0.07
Bridge Area	1265.*	28SEP2008 0918	834.02	3.68	5.48		5.65	0.002186	3.25	256.40	153.40	0.44
Bridge Area	1265.*	28SEP2008 1448	1025.87	3.68	10.75		10.76	0.000020	0.77	2523.22	1528.88	0.05
Bridge Area	847.5*	28SEP2008 0918	834.06	1.03	5.00		5.08	0.000551	2.36	353.84	121.88	0.24
Bridge Area	847.5*	28SEP2008 1448	1113.57	1.03	10.73		10.74	0.000021	0.94	2604.72	1698.83	0.06
Bridge Area	430	28SEP2008 0918	834.12	-1.63	4.14		4.50	0.002461	4.80	175.77	64.34	0.50
Bridge Area	430	28SEP2008 1448	1219.07	-1.63	10.70		10.73	0.000060	1.62	2249.30	1791.57	0.09
Bridge Area	155	28SEP2008 0918	834.19	-2.60	3.59	2.02	3.90	0.001572	4.48	193.36	60.60	0.42
Bridge Area	155	28SEP2008 1448	1299.04	-2.60	10.68	2.74	10.71	0.000051	1.68	2072.88	1874.57	0.09
Bridge Area	125	28SEP2008 0918	834.20	-2.68	3.59	2.17	3.92	0.001767	4.63	193.41	62.37	0.44
Bridge Area	125	28SEP2008 1448	1305.71	-2.68	10.68	2.86	10.71	0.000057	1.76	1956.38	1266.91	0.10
Bridge Area	-23		Bridge									
Bridge Area	-125	28SEP2008 0918	834.20	-2.54	4.12	1.50	3.90	0.000755	3.44	382.13	134.66	0.30

HEC-RAS Plan: pro4 25 STRF River: Thornhill Creek Reach: Bridge Area (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Bridge Area	-125	28SEP2008 1448	1305.71	-2.54	10.71	2.62	10.70	0.000034	1.33	2710.13	1663.73	0.07
Bridge Area	-450.*	28SEP2008 0918	834.37	-3.96	3.44		3.61	0.000593	3.34	254.48	61.66	0.26
Bridge Area	-450.*	28SEP2008 1448	1358.23	-3.96	10.66		10.69	0.000050	1.73	2185.09	860.89	0.09
Bridge Area	-710	28SEP2008 0918	834.50	-3.78	3.35		3.49	0.000352	2.91	301.59	102.63	0.20
Bridge Area	-710	28SEP2008 1448	1380.92	-3.78	10.64		10.67	0.000037	1.57	3088.52	1122.27	0.07
Bridge Area	-1170.*	28SEP2008 0918	834.69	-4.47	3.02		3.25	0.000683	3.86	216.24	34.48	0.27
Bridge Area	-1170.*	28SEP2008 1448	1408.53	-4.47	10.62		10.63	0.000029	1.35	6011.38	2529.58	0.06
Bridge Area	-1630	28SEP2008 0918	835.10	-5.16	0.98		2.07	0.004987	8.36	99.85	20.87	0.67
Bridge Area	-1630	28SEP2008 1448	1427.91	-5.16	10.61		10.61	0.000012	0.78	9631.76	2494.71	0.04
Bridge Area	-1990.*	28SEP2008 0918	836.04	-5.70	0.25		0.78	0.002096	5.86	142.79	28.47	0.46
Bridge Area	-1990.*	28SEP2008 1448	1430.23	-5.70	10.60		10.60	0.000005	0.56	12814.71	2663.14	0.03
Bridge Area	-2350.*	28SEP2008 0918	837.80	-6.24	-0.05		0.23	0.000941	4.22	198.58	36.72	0.32
Bridge Area	-2350.*	28SEP2008 1448	1415.04	-6.24	10.60		10.60	0.000003	0.42	16143.28	2831.57	0.02
Bridge Area	-2710	28SEP2008 0918	840.36	-6.78	-0.19		-0.03	0.000463	3.17	265.39	45.22	0.23
Bridge Area	-2710	28SEP2008 1448	1381.55	-6.78	10.60		10.60	0.000001	0.33	19609.28	3000.00	0.01
Bridge Area	-3152.5*	28SEP2008 0918	844.11	-7.44	-0.36		-0.22	0.000390	3.01	280.74	44.96	0.21
Bridge Area	-3152.5*	28SEP2008 1448	1318.70	-7.44	10.60		10.60	0.000001	0.29	21153.90	3211.17	0.01
Bridge Area	-3595.*	28SEP2008 0918	848.12	-8.10	-0.51		-0.38	0.000331	2.86	296.39	44.74	0.20
Bridge Area	-3595.*	28SEP2008 1448	1236.73	-8.10	10.60		10.60	0.000001	0.26	22732.78	3422.33	0.01
Bridge Area	-4037.5*	28SEP2008 0918	852.37	-8.77	-0.63		-0.52	0.000281	2.72	312.92	44.55	0.18
Bridge Area	-4037.5*	28SEP2008 1448	1139.91	-8.77	10.60		10.60	0.000001	0.22	24332.27	3633.50	0.01
Bridge Area	-4480.*	28SEP2008 0918	856.83	-9.43	-0.74		-0.63	0.000242	2.60	329.20	44.39	0.17
Bridge Area	-4480.*	28SEP2008 1448	1034.24	-9.43	10.60		10.60	0.000000	0.19	25933.54	3844.67	0.01
Bridge Area	-4922.5*	28SEP2008 0918	861.41	-10.09	-0.83		-0.73	0.000211	2.49	345.34	44.25	0.16
Bridge Area	-4922.5*	28SEP2008 1448	924.27	-10.09	10.60		10.61	0.000000	0.16	27553.38	4055.84	0.01
Bridge Area	-5365.*	28SEP2008 0918	866.14	-10.76	-0.91		-0.82	0.000185	2.39	361.86	44.13	0.15
Bridge Area	-5365.*	28SEP2008 1448	813.91	-10.76	10.61		10.61	0.000000	0.14	29208.84	4267.00	0.01
Bridge Area	-5807.5*	28SEP2008 0918	871.00	-11.42	-0.98		-0.90	0.000164	2.31	377.76	44.02	0.14

HEC-RAS Plan: pro4 25 STRF River: Thornhill Creek Reach: Bridge Area (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Bridge Area	-5807.5*	28SEP2008 1448	705.36	-11.42	10.61		10.61	0.000000	0.11	30882.02	4478.17	0.00
Bridge Area	-6250	28SEP2008 0918	875.91	-12.09	-1.05		-0.97	0.000146	2.23	393.48	43.93	0.13
Bridge Area	-6250	28SEP2008 1448	598.81	-12.09	10.61		10.61	0.000000	0.09	32554.60	4689.34	0.00
Bridge Area	-6555.*	28SEP2008 0918	879.38	-12.54	-1.09		-1.01	0.000134	2.16	407.01	44.39	0.13
Bridge Area	-6555.*	28SEP2008 1448	529.01	-12.54	10.61		10.61	0.000000	0.07	34708.16	4689.34	0.00
Bridge Area	-6860	28SEP2008 0918	882.93	-13.00	-1.12	-9.82	-1.05	0.000123	2.10	421.06	44.90	0.12
Bridge Area	-6860	28SEP2008 1448	463.51	-13.00	10.61	-10.91	10.61	0.000000	0.06	36838.61	4689.34	0.00

HEC-RAS Plan: pro4 25 STRF River: Thornhill Creek Reach: Bridge Area

Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Crit W.S.	Frctn Loss	C & E Loss	Top Width	Q Left	Q Channel	Q Right	Vel Chnl
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft/s)
Bridge Area	155	28SEP2008 0918	3.90	3.59	2.02	0.06	0.00	60.60	4.35	829.11	0.74	4.48
Bridge Area	155	28SEP2008 1448	10.71	10.68	2.74	0.00	0.00	1874.57	281.65	935.75	81.64	1.68
Bridge Area	125	28SEP2008 0918	3.92	3.59	2.17	0.11	0.00	62.37	4.33	822.34	7.52	4.63
Bridge Area	125	28SEP2008 1448	10.71	10.68	2.86			1266.91	204.09	959.81	141.81	1.76
Bridge Area	-23 BR U	28SEP2008 0918	4.37	4.11	2.14	0.10	0.00	61.27	6.00	818.98	9.23	4.13
Bridge Area	-23 BR U	28SEP2008 1448	10.72	10.67	2.87			252.12	117.29	1079.00	109.42	2.08
Bridge Area	-23 BR D	28SEP2008 0918	4.27	4.19	2.19	0.08	0.00	131.12		699.44	134.76	3.83
Bridge Area	-23 BR D	28SEP2008 1448	10.72	10.71	3.01			252.29	28.38	869.89	407.43	1.70
Bridge Area	-125	28SEP2008 0918	3.90	4.12	1.50	0.30	0.00	134.66		720.88	113.32	3.44
Bridge Area	-125	28SEP2008 1448	10.70	10.71	2.62			1663.73	52.98	761.63	491.10	1.33
Bridge Area	-450.*	28SEP2008 0918	3.61	3.44		0.12		61.66		833.24	1.13	3.34
Bridge Area	-450.*	28SEP2008 1448	10.69	10.66		0.01		860.89	145.02	1074.33	138.88	1.73

Plan: pro4 25 STRF Thornhill Creek Bridge Area RS: -23 Profile: 28SEP2008 0918

E.G. US. (ft)	3.92	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	3.59	E.G. Elev (ft)	4.37	4.27
Q Total (cfs)	834.20	W.S. Elev (ft)	4.11	4.19
Q Bridge (cfs)	834.20	Crit W.S. (ft)	2.14	2.19
Q Weir (cfs)		Max Chl Dpth (ft)	6.79	6.73
Weir Sta Lft (ft)		Vel Total (ft/s)	3.79	2.30
Weir Sta Rgt (ft)		Flow Area (sq ft)	219.83	362.06
Weir Submerg		Froude # Chl	0.36	0.34
Weir Max Depth (ft)		Specif Force (cu ft)	583.09	720.96
Min El Weir Flow (ft)	14.40	Hydr Depth (ft)	3.59	2.76
Min El Prs (ft)	14.00	W.P. Total (ft)	69.13	142.88
Delta EG (ft)	0.02	Conv. Total (cfs)	23513.0	26184.9
Delta WS (ft)	-0.53	Top Width (ft)	61.27	131.12
BR Open Area (sq ft)	2440.83	Frctn Loss (ft)	0.10	0.08
BR Open Vel (ft/s)	3.79	C & E Loss (ft)	0.00	0.00
Coef of Q	1.00	Shear Total (lb/sq ft)	0.25	0.16
Br Sel Method	WSPRO	Power Total (lb/ft s)	53748.20	53748.20

Plan: pro4 25 STRF Thornhill Creek Bridge Area RS: -23 Profile: 28SEP2008 1448

E.G. US. (ft)	10.71	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	10.68	E.G. Elev (ft)	10.72	10.72
Q Total (cfs)	1305.71	W.S. Elev (ft)	10.67	10.71
Q Bridge (cfs)	1305.71	Crit W.S. (ft)	2.87	3.01
Q Weir (cfs)		Max Chl Dpth (ft)	13.35	13.25
Weir Sta Lft (ft)		Vel Total (ft/s)	1.11	0.72
Weir Sta Rgt (ft)		Flow Area (sq ft)	1171.17	1814.21
Weir Submerg		Froude # Chl	0.11	0.09
Weir Max Depth (ft)		Specif Force (cu ft)	4230.00	7430.92
Min El Weir Flow (ft)	14.40	Hydr Depth (ft)	4.65	7.19
Min El Prs (ft)	14.00	W.P. Total (ft)	298.02	325.10
Delta EG (ft)	0.01	Conv. Total (cfs)	120421.5	171000.9
Delta WS (ft)	-0.03	Top Width (ft)	252.12	252.29
BR Open Area (sq ft)	2440.83	Frctn Loss (ft)		
BR Open Vel (ft/s)	1.11	C & E Loss (ft)		
Coef of Q	0.92	Shear Total (lb/sq ft)	0.03	0.02
Br Sel Method	WSPRO	Power Total (lb/ft s)	53748.20	53748.20

100 Year Proposed 280' Bridge

(Storm Tide + Creek Flood)

HEC-RAS Output

HEC-RAS Plan: pro4 100 STRF River: Thornhill Creek Reach: Bridge Area

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Bridge Area	4700	28SEP2008 1336	1200.00	14.00	16.73		17.05	0.003097	4.66	326.59	209.77	0.55
Bridge Area	4700	28SEP2008 1354	1200.00	14.00	16.73		17.05	0.003096	4.66	326.65	209.78	0.55
Bridge Area	4266.66*	28SEP2008 1336	1200.90	13.17	15.51		15.76	0.002792	4.13	336.84	229.73	0.52
Bridge Area	4266.66*	28SEP2008 1354	1201.14	13.17	15.51		15.76	0.002786	4.12	337.15	229.77	0.52
Bridge Area	3833.33*	28SEP2008 1336	1199.53	12.33	14.41		14.61	0.002494	3.69	358.33	253.07	0.48
Bridge Area	3833.33*	28SEP2008 1354	1197.06	12.33	14.39		14.60	0.002581	3.73	353.23	252.43	0.49
Bridge Area	3400.*	28SEP2008 1336	1199.76	11.50	13.30		13.50	0.002677	3.53	361.96	276.25	0.49
Bridge Area	3400.*	28SEP2008 1354	1146.90	11.50	13.66		13.78	0.001237	2.74	474.21	357.25	0.34
Bridge Area	2966.66*	28SEP2008 1336	1082.85	10.67	12.60		12.69	0.001090	2.42	610.81	846.23	0.32
Bridge Area	2966.66*	28SEP2008 1354	804.30	10.67	13.44		13.45	0.000119	1.03	1749.13	1702.61	0.11
Bridge Area	2533.33*	28SEP2008 1336	645.70	9.83	12.41		12.42	0.000057	0.69	2122.84	1525.06	0.08
Bridge Area	2533.33*	28SEP2008 1354	183.15	9.83	13.42		13.42	0.000001	0.12	3898.26	1850.58	0.01
Bridge Area	2100	28SEP2008 1336	-33.18	9.00	12.41		12.41	0.000000	-0.02	3896.47	1568.36	0.00
Bridge Area	2100	28SEP2008 1354	-503.80	9.00	13.42		13.42	0.000003	-0.22	5679.15	2069.04	0.02
Bridge Area	1682.5*	28SEP2008 1336	-848.39	6.34	12.41		12.42	0.000007	-0.42	5156.08	2011.91	0.03
Bridge Area	1682.5*	28SEP2008 1354	-1414.25	6.34	13.42		13.42	0.000009	-0.54	7599.22	3778.65	0.04
Bridge Area	1265.*	28SEP2008 1336	-1919.29	3.68	12.42		12.43	0.000022	-0.95	6017.15	2898.48	0.06
Bridge Area	1265.*	28SEP2008 1354	-2750.41	3.68	13.42		13.43	0.000023	-1.04	9104.36	4632.70	0.06
Bridge Area	847.5*	28SEP2008 1336	-3555.31	1.03	12.42		12.47	0.000078	-2.04	5888.71	4608.32	0.11
Bridge Area	847.5*	28SEP2008 1354	-4499.08	1.03	13.42		13.46	0.000067	-2.00	8455.57	5603.55	0.11
Bridge Area	430	28SEP2008 1336	-5769.82	-1.63	12.46		12.66	0.000408	-4.76	4660.68	5027.87	0.25
Bridge Area	430	28SEP2008 1354	-6426.48	-1.63	13.45		13.59	0.000276	-4.15	6071.89	6018.20	0.21
Bridge Area	155	28SEP2008 1336	-7298.13	-2.60	12.48		12.94	0.000696	-6.89	3146.03	5054.77	0.34
Bridge Area	155	28SEP2008 1354	-7655.54	-2.60	13.46		13.81	0.000512	-6.22	3730.88	6037.86	0.30
Bridge Area	125	28SEP2008 1336	-7447.59	-2.68	12.46		13.00	0.000818	-7.38	2857.66	4934.39	0.37
Bridge Area	125	28SEP2008 1354	-7766.06	-2.68	13.44		13.86	0.000602	-6.66	3353.87	6013.49	0.32
Bridge Area	-23		Bridge									

HEC-RAS Plan: pro4 100 STRF River: Thornhill Creek Reach: Bridge Area (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Bridge Area	-125	28SEP2008 1336	-7447.59	-2.54	12.57		12.85	0.000501	-5.72	3721.11	4163.40	0.29
Bridge Area	-125	28SEP2008 1354	-7766.06	-2.54	13.61		13.82	0.000373	-5.21	4288.25	6055.00	0.25
Bridge Area	-450.*	28SEP2008 1336	-8295.75	-3.96	12.63		13.16	0.000710	-7.26	3659.66	4309.73	0.34
Bridge Area	-450.*	28SEP2008 1354	-8850.34	-3.96	13.64		14.03	0.000532	-6.57	4407.47	4309.73	0.30
Bridge Area	-710	28SEP2008 1336	-8533.20	-3.78	12.81		13.08	0.000427	-5.87	7508.55	2564.46	0.26
Bridge Area	-710	28SEP2008 1354	-9064.67	-3.78	13.77		13.92	0.000265	-4.81	9718.14	2564.46	0.21
Bridge Area	-1170.*	28SEP2008 1336	-9005.31	-4.47	13.29		13.34	0.000174	-3.69	12769.68	2529.58	0.16
Bridge Area	-1170.*	28SEP2008 1354	-9453.05	-4.47	14.21		14.25	0.000118	-3.15	15105.09	2529.58	0.13
Bridge Area	-1630	28SEP2008 1336	-9740.09	-5.16	13.64		13.66	0.000094	-2.53	17208.91	2494.71	0.11
Bridge Area	-1630	28SEP2008 1354	-9991.68	-5.16	14.53		14.54	0.000067	-2.22	19418.84	2494.71	0.09
Bridge Area	-1990.*	28SEP2008 1336	-10605.00	-5.70	13.72		13.73	0.000060	-2.21	21104.46	2663.14	0.09
Bridge Area	-1990.*	28SEP2008 1354	-10602.10	-5.70	14.59		14.60	0.000043	-1.93	23433.91	2663.14	0.08
Bridge Area	-2350.*	28SEP2008 1336	-11674.40	-6.24	13.75		13.76	0.000044	-2.00	25069.97	2831.57	0.08
Bridge Area	-2350.*	28SEP2008 1354	-11356.30	-6.24	14.62		14.63	0.000031	-1.73	27528.32	2831.57	0.07
Bridge Area	-2710	28SEP2008 1336	-12809.70	-6.78	13.78		13.79	0.000034	-1.85	29140.67	3000.00	0.07
Bridge Area	-2710	28SEP2008 1354	-12158.00	-6.78	14.64		14.65	0.000024	-1.58	31733.29	3000.00	0.06
Bridge Area	-3152.5*	28SEP2008 1336	-14290.40	-7.44	13.80		13.81	0.000037	-1.93	31423.06	3211.17	0.08
Bridge Area	-3152.5*	28SEP2008 1354	-13205.20	-7.44	14.66		14.67	0.000024	-1.60	34187.68	3211.17	0.06
Bridge Area	-3595.*	28SEP2008 1336	-15835.90	-8.10	13.82		13.83	0.000039	-2.00	33760.35	3422.33	0.08
Bridge Area	-3595.*	28SEP2008 1354	-14305.70	-8.10	14.68		14.69	0.000025	-1.63	36690.58	3422.33	0.06
Bridge Area	-4037.5*	28SEP2008 1336	-17437.60	-8.77	13.85		13.86	0.000041	-2.07	36140.75	3633.50	0.08
Bridge Area	-4037.5*	28SEP2008 1354	-15467.80	-8.77	14.70		14.71	0.000025	-1.66	39229.18	3633.50	0.06
Bridge Area	-4480.*	28SEP2008 1336	-19071.20	-9.43	13.88		13.89	0.000043	-2.14	38536.48	3844.67	0.08
Bridge Area	-4480.*	28SEP2008 1354	-16688.00	-9.43	14.73		14.73	0.000026	-1.69	41777.61	3844.67	0.06
Bridge Area	-4922.5*	28SEP2008 1336	-20721.50	-10.09	13.92		13.93	0.000045	-2.19	40980.64	4055.84	0.08
Bridge Area	-4922.5*	28SEP2008 1354	-17971.20	-10.09	14.75		14.76	0.000026	-1.72	44363.81	4055.84	0.06

HEC-RAS Plan: pro4 100 STRF River: Thornhill Creek Reach: Bridge Area (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Bridge Area	-5365.*	28SEP2008 1336	-22369.30	-10.76	13.95		13.96	0.000046	-2.24	43474.83	4267.00	0.08
Bridge Area	-5365.*	28SEP2008 1354	-19314.10	-10.76	14.77		14.78	0.000027	-1.75	46994.72	4267.00	0.06
Bridge Area	-5807.5*	28SEP2008 1336	-24004.50	-11.42	13.99		14.00	0.000047	-2.28	46022.70	4478.17	0.08
Bridge Area	-5807.5*	28SEP2008 1354	-20722.20	-11.42	14.80		14.81	0.000028	-1.78	49666.86	4478.17	0.07
Bridge Area	-6250	28SEP2008 1336	-25644.20	-12.09	14.02		14.03	0.000048	-2.31	48558.80	4689.34	0.09
Bridge Area	-6250	28SEP2008 1354	-22213.10	-12.09	14.82		14.83	0.000028	-1.82	52331.94	4689.34	0.07
Bridge Area	-6555.*	28SEP2008 1336	-26749.40	-12.54	14.04		14.05	0.000045	-2.27	50818.66	4689.34	0.08
Bridge Area	-6555.*	28SEP2008 1354	-23261.70	-12.54	14.84		14.85	0.000027	-1.81	54561.50	4689.34	0.07
Bridge Area	-6860	28SEP2008 1336	-27814.00	-13.00	14.07	5.42	14.08	0.000043	-2.24	53054.34	4689.34	0.08
Bridge Area	-6860	28SEP2008 1354	-24307.60	-13.00	14.86	5.20	14.86	0.000026	-1.79	56768.30	4689.34	0.06

HEC-RAS Plan: pro4 100 STRF River: Thornhill Creek Reach: Bridge Area

Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Crit W.S.	Frctn Loss	C & E Loss	Top Width	Q Left	Q Channel	Q Right	Vel Chnl
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft/s)
Bridge Area	155	28SEP2008 1336	12.94	12.48		0.02		5054.77	-1856.18	-4492.39	-949.56	-6.89
Bridge Area	155	28SEP2008 1354	13.81	13.46		0.02		6037.86	-2049.16	-4374.49	-1231.89	-6.22
Bridge Area	125	28SEP2008 1336	13.00	12.46				4934.39	-1437.35	-4710.13	-1300.10	-7.38
Bridge Area	125	28SEP2008 1354	13.86	13.44				6013.49	-1605.34	-4592.36	-1568.36	-6.66
Bridge Area	-23 BR U	28SEP2008 1336	13.49	12.46				259.30	-794.28	-5637.95	-1015.36	-9.29
Bridge Area	-23 BR U	28SEP2008 1354	14.30	13.44				266.64	-871.92	-5649.94	-1244.21	-8.63
Bridge Area	-23 BR D	28SEP2008 1336	13.23	12.57				259.76	-219.34	-4839.60	-2388.65	-7.98
Bridge Area	-23 BR D	28SEP2008 1354	14.19	13.61				266.97	-249.35	-5001.49	-2515.23	-7.59
Bridge Area	-125	28SEP2008 1336	12.85	12.57		0.19		4163.40	-539.23	-3873.98	-3034.39	-5.72
Bridge Area	-125	28SEP2008 1354	13.82	13.61		0.15		6055.00	-698.82	-3828.04	-3239.21	-5.21
Bridge Area	-450.*	28SEP2008 1336	13.16	12.63		0.14		4309.73	-1707.82	-5244.03	-1343.91	-7.26
Bridge Area	-450.*	28SEP2008 1354	14.03	13.64		0.09		4309.73	-2143.98	-5090.79	-1615.57	-6.57

Plan: pro4 100 STRF Thornhill Creek Bridge Area RS: -23 Profile: 28SEP2008 1336

E.G. US. (ft)	13.00	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	12.46	E.G. Elev (ft)	13.49	13.23
Q Total (cfs)	-7447.59	W.S. Elev (ft)	12.46	12.57
Q Bridge (cfs)		Crit W.S. (ft)		
Q Weir (cfs)		Max Chl Dpth (ft)	15.14	15.11
Weir Sta Lft (ft)		Vel Total (ft/s)	-4.57	-3.25
Weir Sta Rgt (ft)		Flow Area (sq ft)	1629.73	2292.77
Weir Submerg		Froude # Chl	0.46	0.41
Weir Max Depth (ft)		Specif Force (cu ft)	8394.77	12560.58
Min El Weir Flow (ft)	14.40	Hydr Depth (ft)	6.29	8.83
Min El Prs (ft)	14.00	W.P. Total (ft)	323.98	352.15
Delta EG (ft)		Conv. Total (cfs)	164808.8	233071.6
Delta WS (ft)	-0.11	Top Width (ft)	259.30	259.76
BR Open Area (sq ft)		Frctn Loss (ft)		
BR Open Vel (ft/s)		C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	0.64	0.42
Br Sel Method	Energy/Weir	Power Total (lb/ft s)	53748.20	53748.20

Plan: pro4 100 STRF Thornhill Creek Bridge Area RS: -23 Profile: 28SEP2008 1354

E.G. US. (ft)	13.86	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	13.44	E.G. Elev (ft)	14.30	14.19
Q Total (cfs)	-7766.06	W.S. Elev (ft)	13.44	13.61
Q Bridge (cfs)		Crit W.S. (ft)		
Q Weir (cfs)		Max Chl Dpth (ft)	16.12	16.15
Weir Sta Lft (ft)		Vel Total (ft/s)	-4.11	-3.03
Weir Sta Rgt (ft)		Flow Area (sq ft)	1887.52	2564.37
Weir Submerg		Froude # Chl	0.42	0.37
Weir Max Depth (ft)		Specif Force (cu ft)	10021.97	15042.92
Min El Weir Flow (ft)	14.40	Hydr Depth (ft)	7.08	9.61
Min El Prs (ft)	14.00	W.P. Total (ft)	341.83	370.51
Delta EG (ft)		Conv. Total (cfs)	191254.4	270101.4
Delta WS (ft)	-0.16	Top Width (ft)	266.64	266.97
BR Open Area (sq ft)		Frctn Loss (ft)		
BR Open Vel (ft/s)		C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	0.57	0.36
Br Sel Method	Energy/Weir	Power Total (lb/ft s)	53748.20	53748.20