

**James Bay Native
Development Corporation**

Hydraulic Study

Replacement of the bridge
located at the 237th kilometer
of the Northern Road in the
municipality of Eeyou Istchee,
James Bay

Preliminary report



Prepared for:
James Bay Native
Development Corporation

Prepared by:
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Sign-off sheet

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RECORD OF REVISIONS AND ISSUES		
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1.0 INTRODUCTION

The James Bay Native Development Corporation mandated Stantec Expert-Conseil Itée to produce a hydraulic study to replace the bridge located at the 237th kilometer of the Northern Road in the municipality of Eeyou Istchee, James Bay. The study will establish the requirements for the design of the future bridge. This investigation will define the flows and water levels for different return periods by modeling with HEC-RAS software. Simulations for actual and future conditions have been carried out.

This report presents the evaluation of the river flow, model inputs and simulation results necessary for the bridge design.

2.0 INFORMATION GATHERING

2.1 PROJECT INPUTS

The data used for this study are:

- IGO2's website [IGO2 - Données Québec \(gouv.qc.ca\)](http://IGO2-Données Québec (gouv.qc.ca))
- MELCC'S website [MELCC \(gouv.qc.ca\)](http://MELCC (gouv.qc.ca))
- Forêt ouverte's website [Forêt ouverte \(gouv.qc.ca\)](http://Forêt ouverte (gouv.qc.ca))
- Stantec's bridge and field survey done on 28th of September 2022. It is presented in appendix 2

2.2 FIELD SURVEY

There was no hydraulic field survey done for this report, consequently the information used comes from structural survey, land survey as well as the satellite pictures of Google earth, Bing maps and *Satellites.pro*. The following conclusions can be made.

The Rupert river, at the crossing of the bridge, is straight and presents a mix of stable and critical flow. No evidence of beaver dams nor debris jams can be observed. No evidence of scouring on the banks. The banks are composed mainly of medium vegetation and trees further inland.

The data provided in the field survey put the high watermark line at an average elevation of 280.26 meters and an average width of 24.38 meters.

During the field survey, the waterflow was too strong to allow a bathymetry survey. Therefore, the waterbed is absent from the terrain model. In order to modelize the terrain, every elevation point was lowered by 2000 mm. This is a rough estimate that had to be made since the bathymetry was unavailable. Lowering only the lower elevation points, which correspond to the water surface elevation, was not enough and lowering it more than 2000mm seemed too much to represent the reality. To ensure the validity of this assumption, simulations were done with a flow corresponding to 75% of the 2 years flood, which is close to the high watermark flow. The water surface elevation obtained from the model was compared to the high watermark elevation.

2.3 WATERSHED

2.3.1 Delimitation and average slope of the watershed

The limits of the watershed upstream of the bridge location, has been determined with ArcGIS software. The watershed of the Rupert River, upstream of the bridge location, covers 27 690 km². A map of this watershed is in annexe 1.

This watershed has an average slope of 2,45 % (Canada Ressources,1999).

2.3.2 Soil type

With the Minister of Forests, Wildlife and Parks' surface deposit maps, it was possible to characterize the soil.

This bridge is based on a soil composed of bedrock as well as glacial deposits with undifferentiated fill as well as spreading deposits i.e, type R and 1A. The rocky outcrop can be covered with loose material with an average thickness of less than 25 cm. Type 1A is defined by loose or compact deposits without sorting composed of rock floor with an average thickness greater than 1 meter. The particle size can vary from clay to block depending on the region.

2.3.3 Watershed surface occupancy

Wetland occupancy was determined using data from the Minister of Forests, Wildlife and Park and the Southern Quebec Ecoforestry Inventory (EQM). The watershed of the bridge located at the 237th kilometer of the Northern Road is occupied at 20,5% of lakes and 7,2% of wetlands.

Google Earth Pro's aerial pictures show that the territory is mostly occupied by forests. Paved surfaces are negligible. Google earth's satellite pictures are presented in appendix 1.

IGO2's website illustrates the disposition of possible wetlands in the watershed, this can be found in appendix 1.

2.4 FLOW ASSESSMENT

The peak flow of Rupert River was first assessed using regional, basin transfer, HP33 and HP40 methods since the area of the watersheds is greater than 25 km². The methods are described in the next paragraph. Detailed calculations are presented in appendix 3.

A flow increases of 15% was added to consider climate change as recommended by the Ministry of Transportation (MTQ, Tome III, ch. 2, section 2.3.1,2022) for watersheds over 400 km² in zone C – North of Quebec region. These peak flows are summarized in Table 1 and the calculation details are in appendix 3.

Table 1 Peak flows of the Rupert River – Area 27 690 km2

RETURN PERIOD (Years)	Calculated PEAK FLOW	PEAK FLOW
	(m ³ /s)	(Includes 15 % increase - m ³ /s)
2	954	1097
10	1172	1348
20	1244	1431
25	1266	1456
50	1331	1531
100	1393	1602

2.4.1 Floods frequency analysis for Quebec (H.P. 33)

Analysis method H.P. 33 uses the data from 76 hydrometric stations across 12 Quebec regions to determine the daily and instant flow rates of watersheds in these regions.

This method is limited to certain Quebec regions and, for each of them, the area of the watershed has to be inside the recommended limits. In the present case, the studied watershed is in a region covered by the method

2.4.2 Estimation of daily flow of fall floods from meridional Quebec river method (H.P.40)

H.P. 40 method is another statistical method, similar to H.P. 33 previously described. H.P. 40's method is an analysis carried out from 81 hydrometric stations divided in 6 Quebec regions.

H.P. 40's method considers a more detailed application zone compared to H.P. 33's method since it compares the length of the waterway, the slope of the watershed, the importance of the forest cover, the surface of the lakes and the marsh, the altitude, and annual precipitations in addition to the area of the watersheds used for H.P. 33.

The studied watershed is located in Region 6 and almost every criteria is respected. The average slope of 2.45% exceeds the upper limit of 0.95% and there is no data for the annual precipitations.

2.4.3 Comparison by watershed transfer

This method statistically analyzes the maximal flows registered at a hydrometric station of Quebec gage station network. The data from the gage station are used to determine a recurrence-flow relation.

An inventory of the existing hydrometric stations in the hydrographic region studied was conducted. The stations presenting a natural or lightly influenced flow regime and sufficient hydrometric data were retained. Other parameters were considered, including the topography, the watershed elevation, the precipitation intensity and more, to select the rivers that best match the studied site.

In this analysis, the bridge is located on the same river as two hydrometric stations, the basin transfer method becomes more reliable, so it was used for the peak flows calculations.

2.4.4 Regional method

The regional method is a statistical method that uses a mathematical equation based on the region (the province of Quebec is divided in three (3) regions). The necessary informations to obtain the floods flow are, the watershed area and the region of the watershed.

In the present case, the studied watershed is located in region III. This method comes from ANCTIL, François, Nicolas MARTEL et Van Diem HOANG (1998). « Analyse régionale des crues journalières de la province de Québec », Revue canadienne de génie civil, vol. 25, n° 2, p. 360-369.

2.4.5 Retained flow values

After analysis, the basin transfer method was used since the studied bridge crosses a river with two hydrometric stations.

3.0 HYDRAULIC ANALYSIS

3.1 DESIGN CRITERIA

According to the MTC, hydraulic criteria to be consider when modeling a bridge are the clearance of the structure above water surface, the increase of the water level compared to natural flow conditions, flow velocity as well as the flow surface width.

The table 2 presents the requirements related to each criteria as well as their applicability to this specific study.

Conception criteria are based on the 50 years flood. The annual average daily traffic (AADT) is not available for the structure. Therefore, an AADT over 200 is set so the bridge would not be considered as a low traffic road.

Table 2 - Hydraulic conception criterias of a bridge

Criteria	Requirement	Applicability
CAH/CDA 16-19 (art. 13.7.3)	Soffit located at least 300 mm above conception high watermark.	<input checked="" type="checkbox"/>
MTC - Tome III		
Presence of ice jams or debris (without tide)	Clearance under the bridge: 1 m above expected extreme ice or debris level.	<input type="checkbox"/>
Without tide and without jams	Clearance under the bridge: 1 m above conception high watermark (except low traffic road).	<input checked="" type="checkbox"/>
	Clearance under the bridge: 300 mm above centennial high watermark.	<input checked="" type="checkbox"/>
Without tide and without jams (low traffic road)	Clearance under the bridge for a low traffic road: 300 mm above conception high watermark.	<input type="checkbox"/>
Tides with ice jams or debris	1 m above expected extreme ice or debris level.	<input type="checkbox"/>
Navigable waterway for small embankations	Soffit located at 1.5 m above high watermark	<input type="checkbox"/>
Road profile elevation	The elevation of the road profile is fixed as anticipating a security margin sufficient above the conception high watermark (E.H.C). The minimal clearance is 1000mm for highways and national roads, and 600mm for other roads.	<input checked="" type="checkbox"/>
Free opening (Tome III, Chapter 2, page 22)	The high watermarks of a return period of 2 years correspond to the yearly water level average.	<input checked="" type="checkbox"/>
Fishing and Oceans Canada	Conservation of natural flow conditions by maintaining the physical characteristics of the existing watercourse: the substrate, slope and width.	<input checked="" type="checkbox"/>
Maximum flow velocity	It is recommended to limit the increase of the flow speeds compared to natural conditions. The protections usually support velocities inferior to 2.4 m/s for the 100-year flood.	<input checked="" type="checkbox"/>

3.2 HYDRAULIC MODELISATION

The numeric model Geo HEC-RAS was used to simulate the water flow regime. The use of this model allowed establishing the actual flow conditions as well as simulate the natural flow conditions.

Manning's n is considered to be 0,032 for the waterbed and 0,045 for the banks.

A sketch including the localisation of the vertical cross-sections used for the modelisation is available at the top of appendix 5 as well as hydraulic profiles and sections for both simulations.

The simulations results tables for both conditions are presented in appendix 6.

During the optimization of the model, the bridge skew angle from the flow was calculated, the result is a 36-degree skew angle. The calculation is presented in appendix 5.

3.3 RESULT SIMULATION – UNDEVELOPED AREA

In this scenario, the hydraulic model simulates the watercourse from the flow data presented in table 1. This model represents water flow without any human intervention. In this case, the bridge is not modeled. The results of this section gives the reference conditions for further analysis.

The table 3 presents flow characteristics in natural conditions in cross section 710 located 15m upstream of the studied bridge. The waterbed elevation at this cross section is 276.1 meters.

Table 3 - Flow characteristics in natural conditions – cross section 710

Recurrence									
2 years		10 years		25 years		50 years		100 years	
Water surface elevation (m)	Velocity (m/s)	Water surface elevation (m)	Velocity (m/s)	Water surface elevation (m)	Velocity (m/s)	Water surface elevation (m)	Velocity (m/s)	Water surface elevation (m)	Velocity (m/s)
282.06	6.52	282.91	6.66	283.21	6.76	283.39	6.84	283.58	6.88

3.4 RESULT SIMULATION – ACTUAL CONDITIONS

The hydraulic model for existing conditions was modeled from the characteristics presented in table 4:

Table 4 - Characteristic of the actual structure

Characteristic	Actual bridge
Type of structure	Steel beams bridge
Bias relative to the stream (degree)	36
Total width of opening (m)	58.06
Height of the structure (m)	2.89
Geodesic elevation of the road (m)	290.15
Geodesic elevation of the soffit upstream (m)	287.31
Geodesic elevation of the soffit downstream (m)	287.27

The actual conditions were simulated for recurrences of 2, 10, 20, 25, 50 and 100 years. Detailed results are presented in appendix 4, 5 and 6. The Figure 1 and the table 5 compare the flow characteristics from natural and actual conditions.

Figure 1 - Hydraulic profiles, actual vs natural conditions

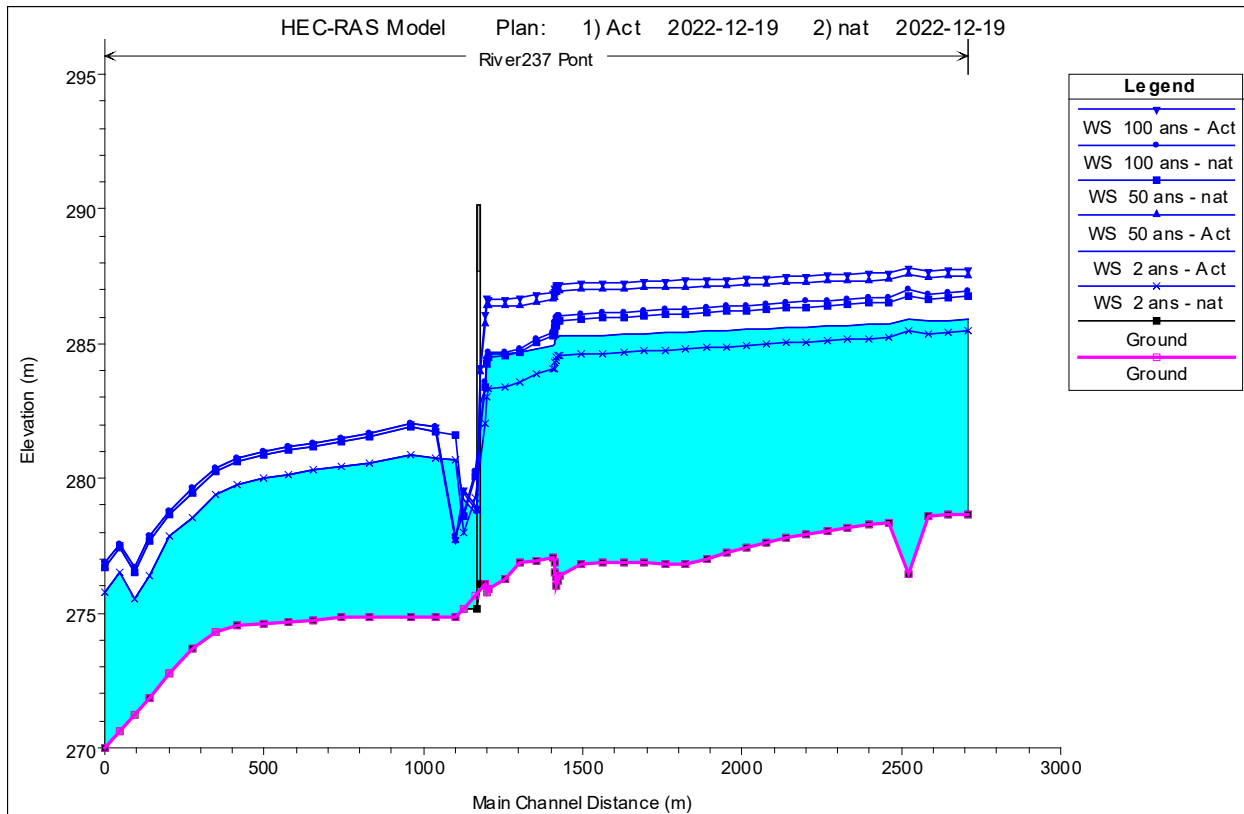


Table 5 - Flow characteristics - Cross section 275

Recurrence – Cross section 370									
2 years		10 years		25 years		50 years ⁽¹⁾		100 years	
Water surface elevation (m)	Velocity (m/s)	Water surface elevation (m)	Velocity (m/s)	Water surface elevation (m)	Velocity (m/s)	Water surface elevation (m)	Velocity (m/s)	Water surface elevation (m)	Velocity (m/s)
Natural conditions									
282.06	6.52	282.91	6.66	283.21	6.76	283.39	6.84	283.58	6.88
Actual conditions									
283.31	6.16	284.94	5.48	285.40	5.45	285.71	5.42	286.06	5.30

(1) The conception is based on the 50 years flood

The hydraulic profile analysis from natural and actual conditions indicates that the bridge causes a water rise of the order of 2.32 m (285.71– 283.39) for the 100-years flood. This is over the recommended maximum value of 300 mm. Therefore, the bridge is considered restrictive.

The speed at the exit of the bridge for the centennial flood is 5.30 m/s¹, which is over the maximum recommended of 3.4 m/s for rock lining of caliber 300-500 (mm). The speed at the entrance of the bridge for the centennial flood is 6.16 m/s. Those high velocities are created by the waterfall downstream of the bridge.

Table 6 - Bridge analysis

Norm	Conception criteria (geodesic meters)		Actual characteristic of the structure	Conformity
Soffit clearance above conception high watermark	Soffit minimum elevation = $E.H_{50}^2 + 0.3$	$285.71 + 0.3$ $= 286.01$	287.27	Yes
Without tide and without jams	Soffit minimum elevation > $E.H_{100} + 0.3$	$286.06 + 0.3$ $= 286.36$		Yes
Navigable waterway	Soffit minimum elevation > 1.5 + High watermark line	$1.5 + 280.26$ $= 281.76$		Yes
Road profile	Road profile elevation > $E.H_{50} + 0.6$	$285.71 + 0,6$ $= 286.31$	290.15	Yes
Free opening	Minimum opening = 80% High watermark line	$24.38 \times 80\% =$ 19.50	59.11	Yes
Velocity	Maximum velocity (m/s) 2 years – 100 years	< 3,4 m/s	$6.16^3 - 5.30^4$ m/s	No

¹ Velocity of the simulation for the actual conditions inside the bridge downstream. The table can be found in appendix 6.

² Water surface level for the conception high watermark (50 years) under the bridge for the actual condition simulation.

³ For the 2-year flood under the bridge in actual conditions simulation.

⁴ For the 100-year flood under the bridge in actual conditions simulation.

4.0 PROTECTIVE STRUCTURE

The channel under and at both ends of the bridge is made of resurgence of rock as presented on the picture in appendix 2. Considering the MTQ's norm (Tome III, chap.2, art. 2.18.2.2), a superior erosion resistance protection should be considered because the velocities at the edges of the bridge are over 3.4 m/s.

5.0 CONCLUSION

The present hydraulic study aims to analyze the impact of the existing bridge at kilometer 237 of Route du Nord crossing *Rupert's river*.

The generated terrain by the software is incomplete. Thereby, if the conception of a new bridge is intended, this analysis should be done again with a complete bathymetry.

Two scenarios were analysed: natural and actual conditions. The actual conditions simulation allows us to confirm that the actual steel beams bridge for all applicable norms except the norm concerning the velocity under the bridge.

Comparing the natural and actual condition simulations shows that the bridge is restrictive.

6.0 BIBLIOGRAPHICAL REFERENCES

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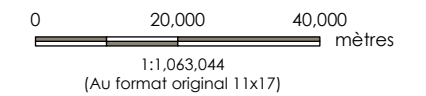
APPENDIX 1

Watershed boundary

Superficie du bassin versant : 27 690 km²

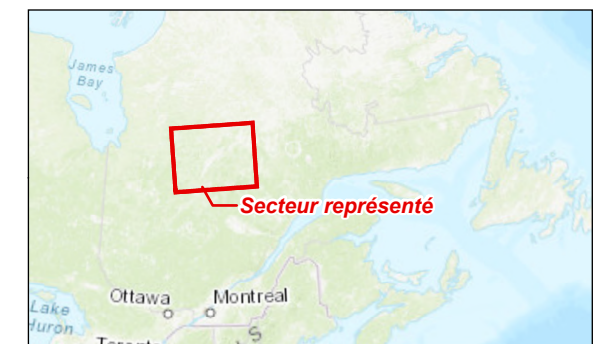


- Exutoire du bassin versant
 - Route du Nord
 - Courbes de niveau (50 m)
 - Bassin versant
 - Lacs
 - Milieux humides
- Cours d'eau (Strahler)**
- 6
 - 7
 - 8
 - 9



Sources

- (1) Données d'élévation : MFFP, 2022
- (2) Lacs : RNH - Canada, 2020
- (3) Bassin versant : Stantec, 2022
- (4) Fond de carte : ESRI, 2022
- (5) Milieux humides : IEQM, 2021; PIEN, 2021
- (6) Système de coordonnées : NAD 1983 Québec Lambert



Localisation du projet 158100425-0002 REVA
Baie-James, Québec Préparé par A. Prince le 2022-06-15
Véifié par P. Charette le 2022-06-15

Client/Projet
La Grande Alliance - Feasibility Study
Phase 1

Carte No. **2** **CARTE DE TRAVAIL**
Titre
Bassin versant - Route du Nord - km237


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LGA

Km 237 and 278's bridges

Legend

 km278 and 237's bridge

Google Earth

Image Landsat / Copernicus

80 km



APPENDIX 2

Pictures of the studied site and field survey forms



Photo : 1

Bridge (taken from upstream)

Date : 29 septembre 2022



Photo : 2

Upstream rocks

Date : 29 septembre 2022



Photo : 3

Rapids upstream

Date : 29 septembre 2022



Photo : 4

Bridge (picture taken from upstream)

Date : 29 septembre 2022



Photo : 5

Bridge (taken from upstream)

Date : 29 septembre 2022



Photo : 6

Top of the upstream rapids

Date : 29 septembre 2022



Photo : 7

Downstream

Date : 29 septembre 2022



Photo : 8

Rapids downstream

Date : 29 septembre 2022



Photo : 9

Bridge (from downstream)

Date : 29 septembre 2022



Photo : 10

Rapids downstream

Date : 29 septembre 2022



Photo : 11

Downstream

Date : 29 septembre 2022



Photo : 12

Rapids downstream

Date : 29 septembre 2022



Photo : 13

Bridge (from downstream)

Date : 29 septembre 2022

APPENDIX 3

Flow calculation

Récurrance	HP33	Transfert	HP40	Mrégionale
2	1454	954	1807	2018
5	1759	-	2140	2504
10	2021	1172	2386	2792
20	2268	1244	2632	3046
25	2327	1266	2702	3122
50	2574	1331	2912	3344
100	2821	1393	3158	3547

Retenue (Transfert) (15%inclus)		
Récurrance	Transfert	
2		1097
5	-	
10		1348
20		1431
25		1456
50		1531
100		1602

Pour estimation niveau du jour			
Récurrance	75% du transfert	50% Transfert	
2	715.2807383	477	
5			
10	879.0973727	586	
20	933.1699067	622	
25	949.3916669	633	
50	998.310829	666	
100	1045.06709	697	

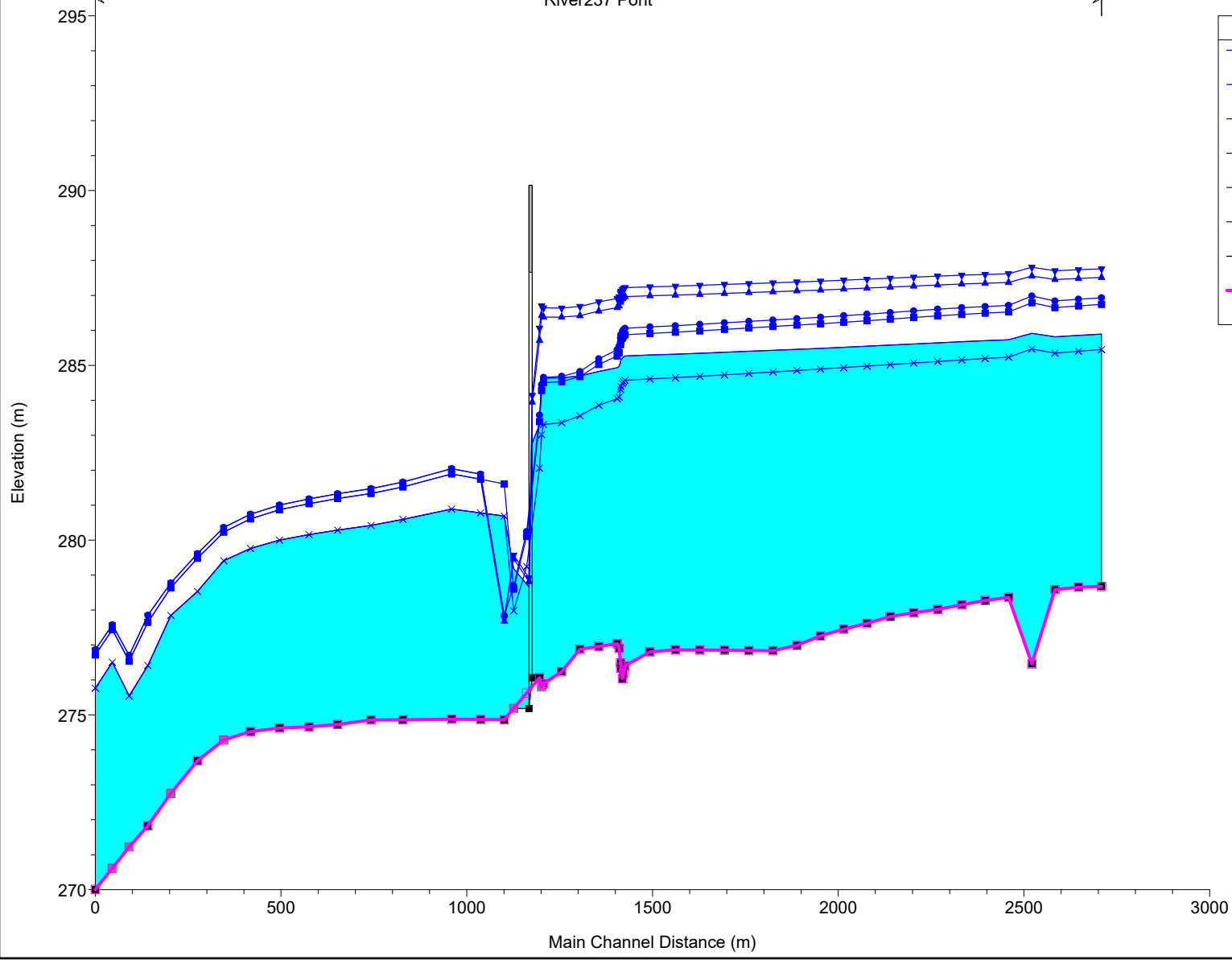
APPENDIX 4

Hydraulic profiles

HEC-RAS Model Plan: 1) Act 2022-12-19 2) nat 2022-12-19

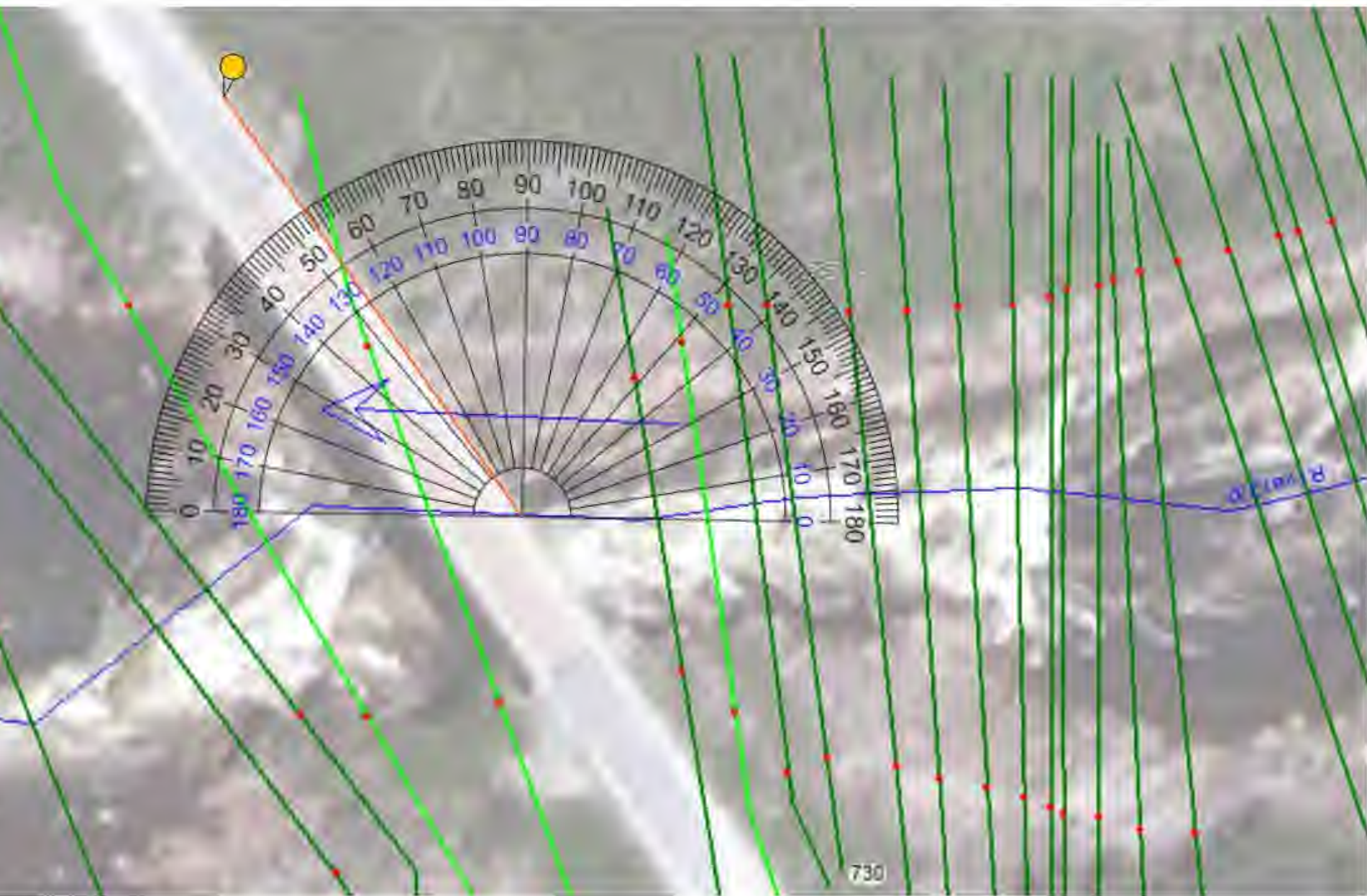
River237 Pont

Legend	
WS 100 ans - Act	▼
WS 100 ans - nat	●
WS 50 ans - nat	■
WS 50 ans - Act	▲
WS 2 ans - Act	×
WS 2 ans - nat	×
Ground	■
Ground	□



APPENDIX 5

Cross-sections



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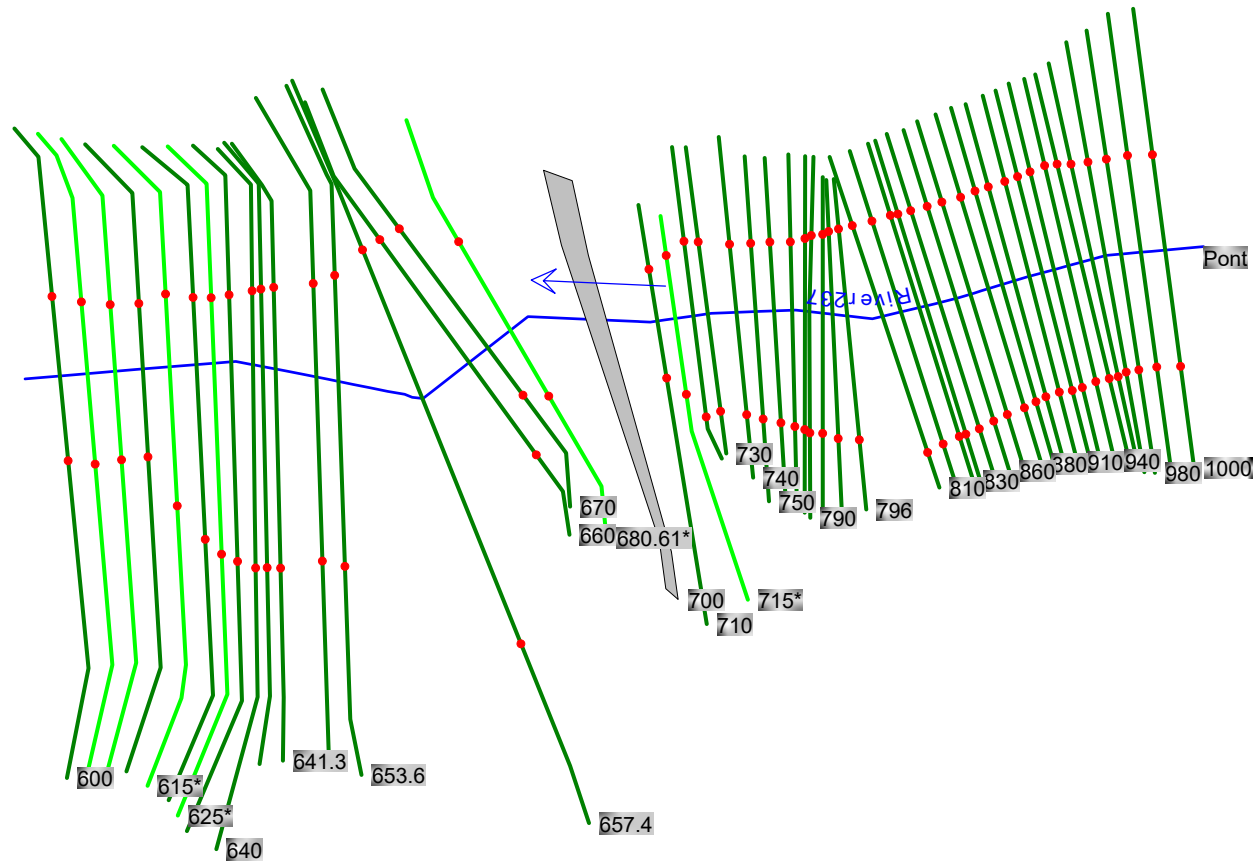
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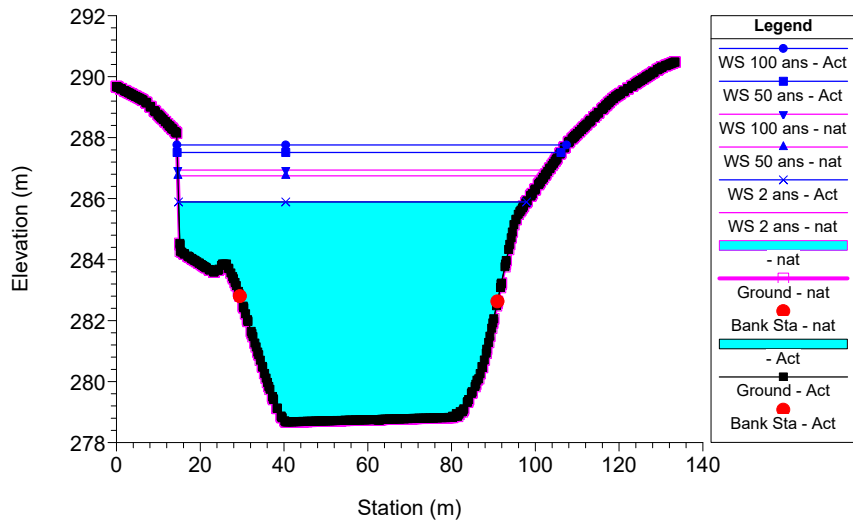
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Download your design

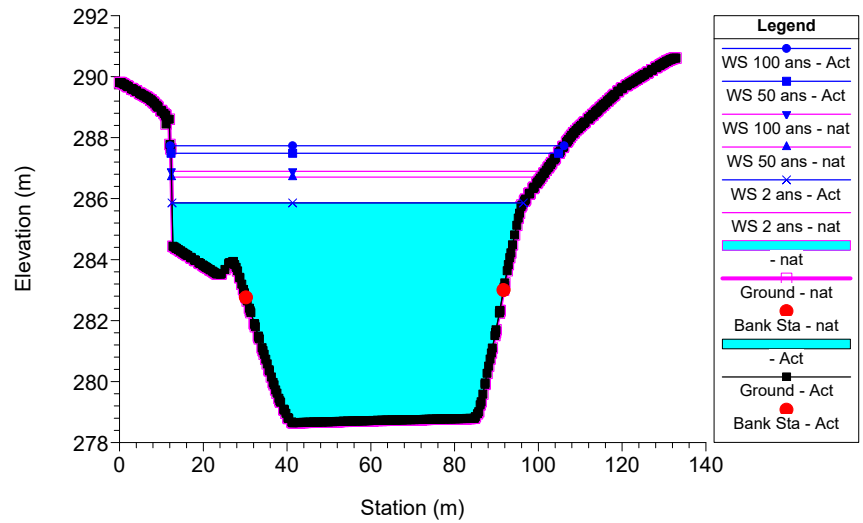
ps you measure angles in a picture, you can easily measure the angle of any object around you, taking a picture and uploading it, then dragging the midpoint of the protract



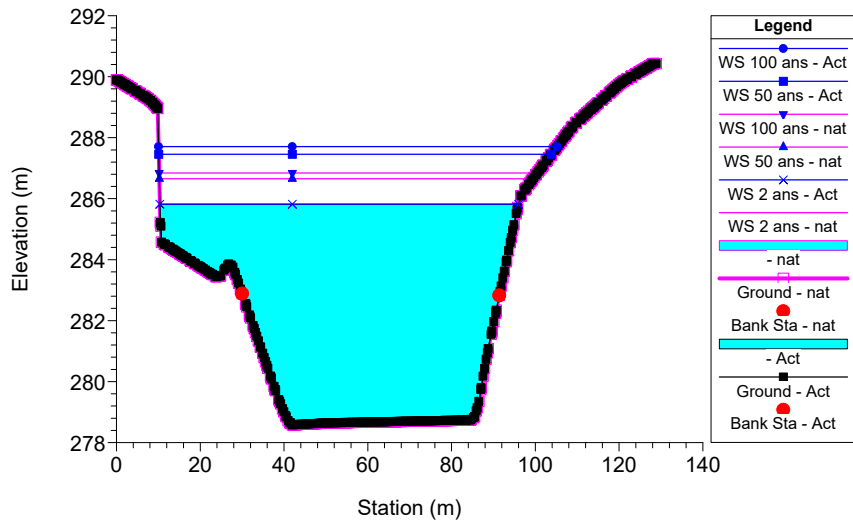
HEC-RAS Model Plan: 1) Act 2) nat



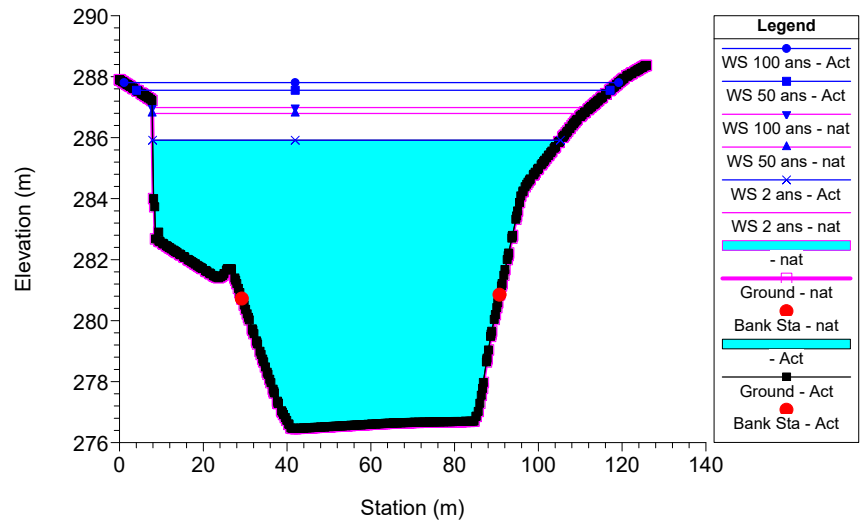
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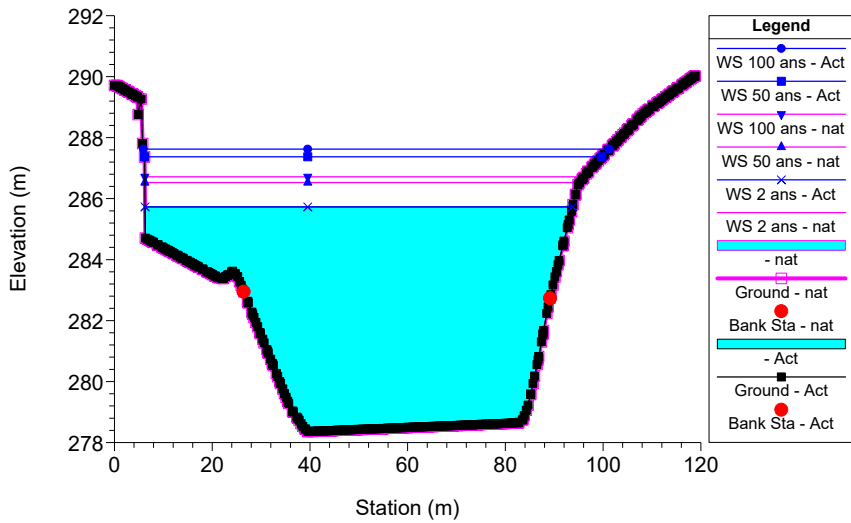
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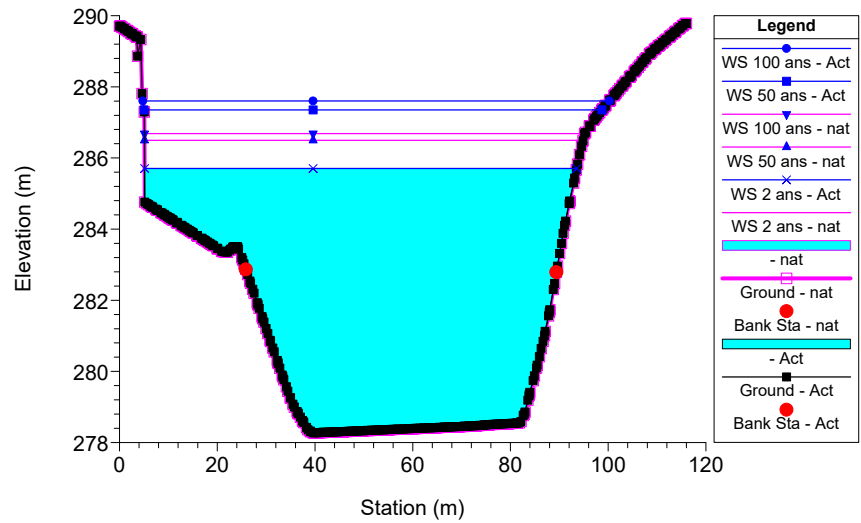
HEC-RAS Model Plan: 1) Act 2) nat



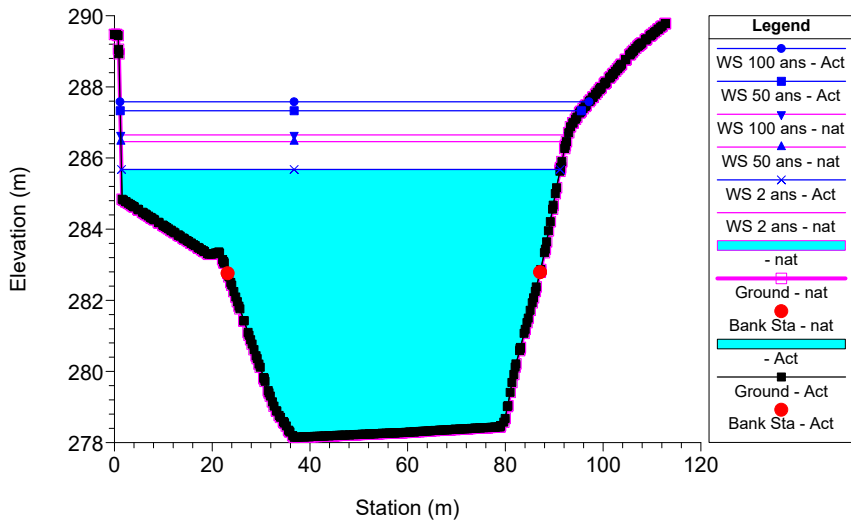
HEC-RAS Model Plan: 1) Act 2) nat



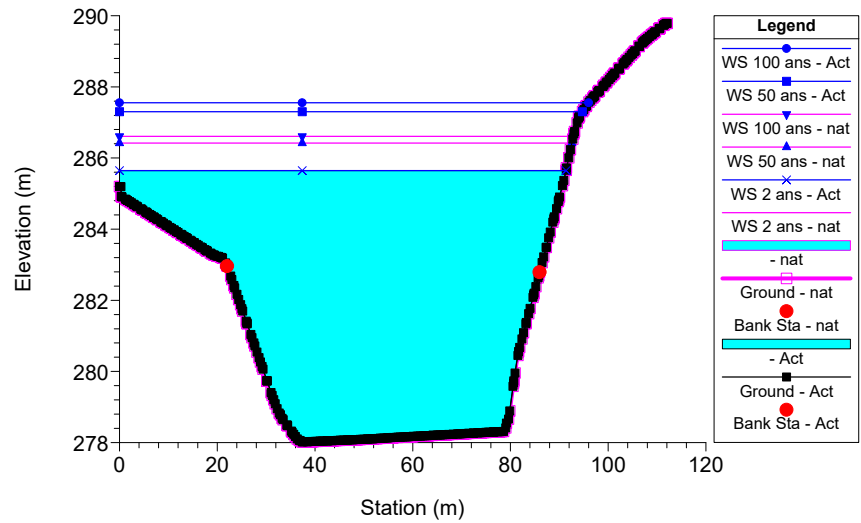
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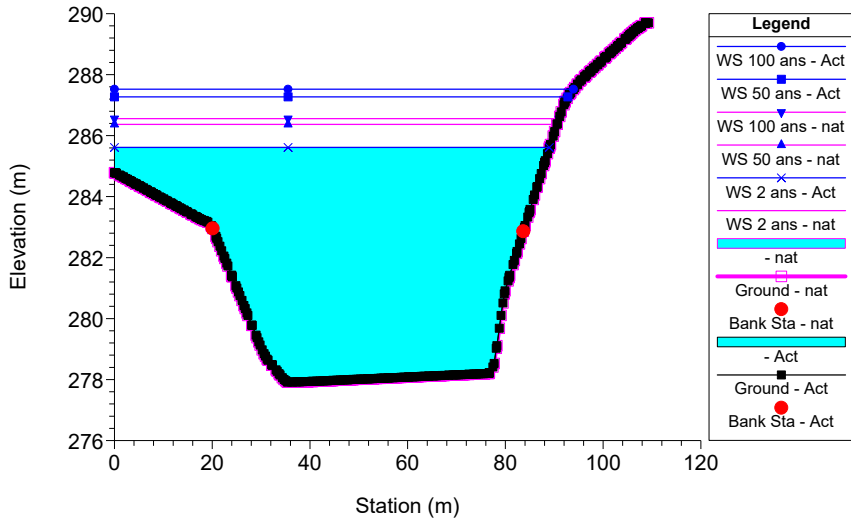
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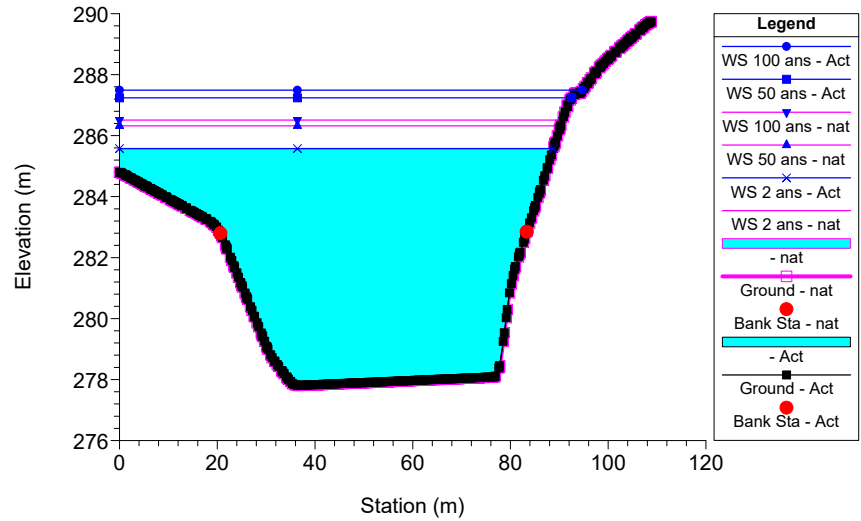
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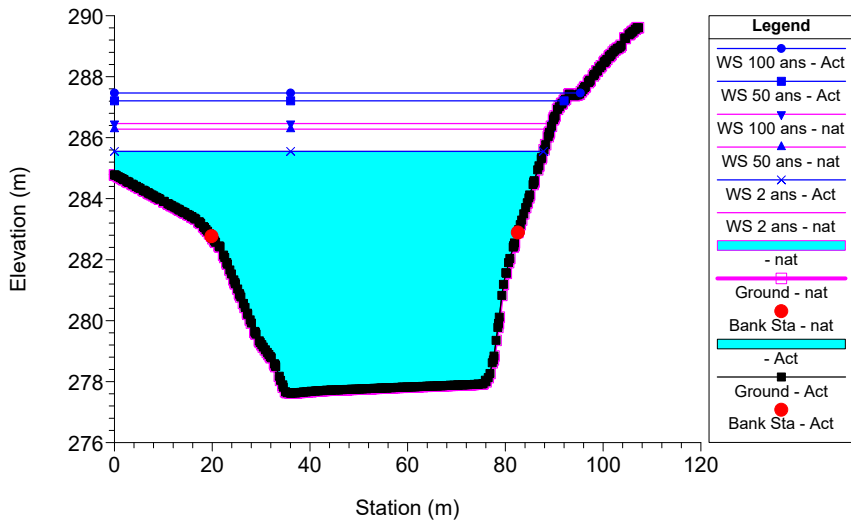
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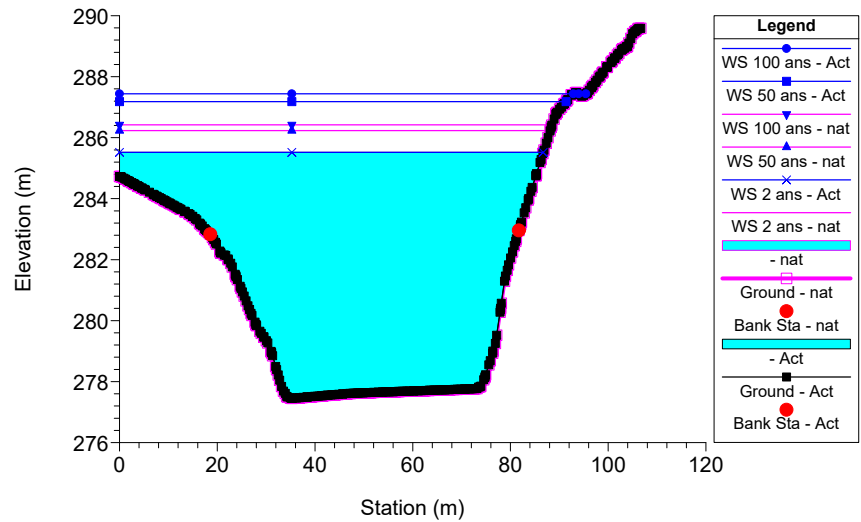
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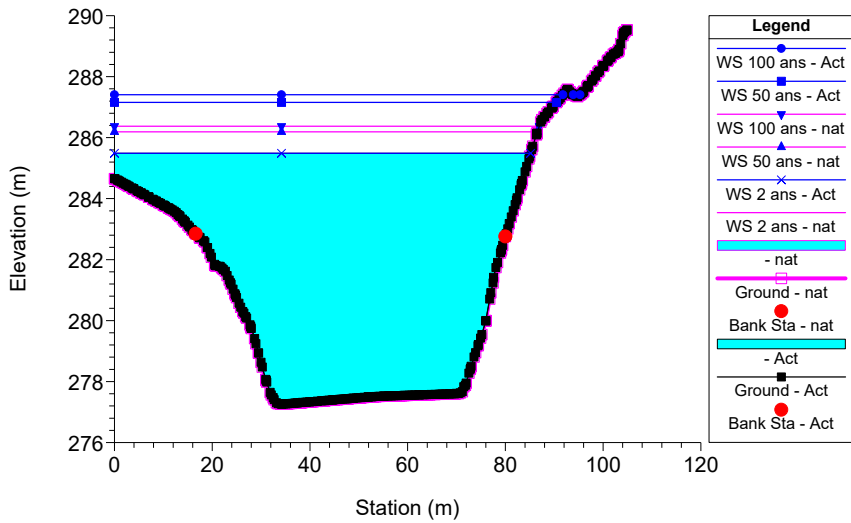
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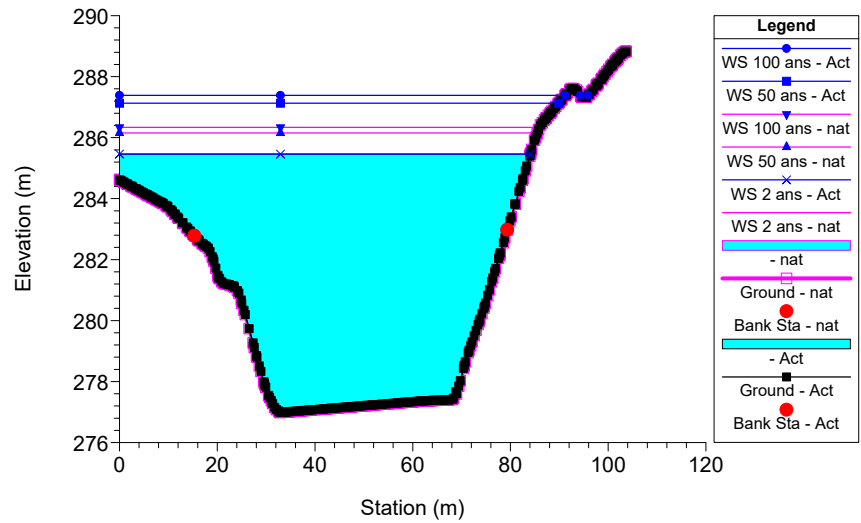
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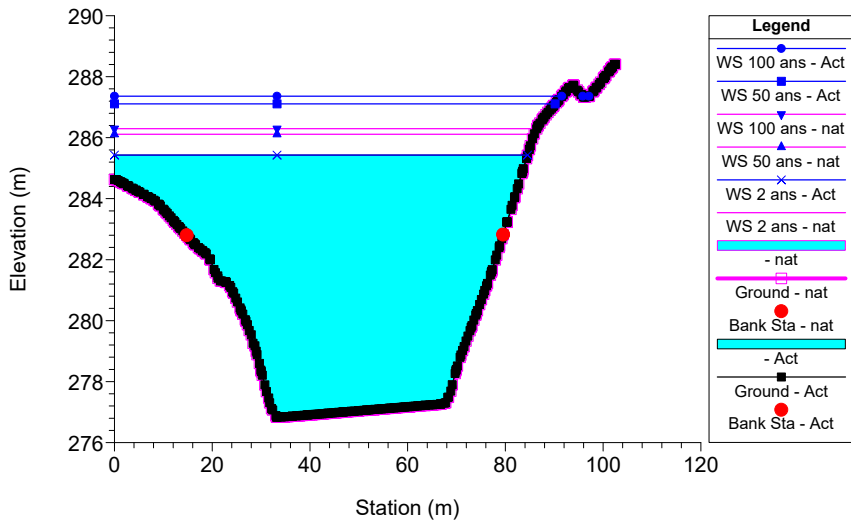
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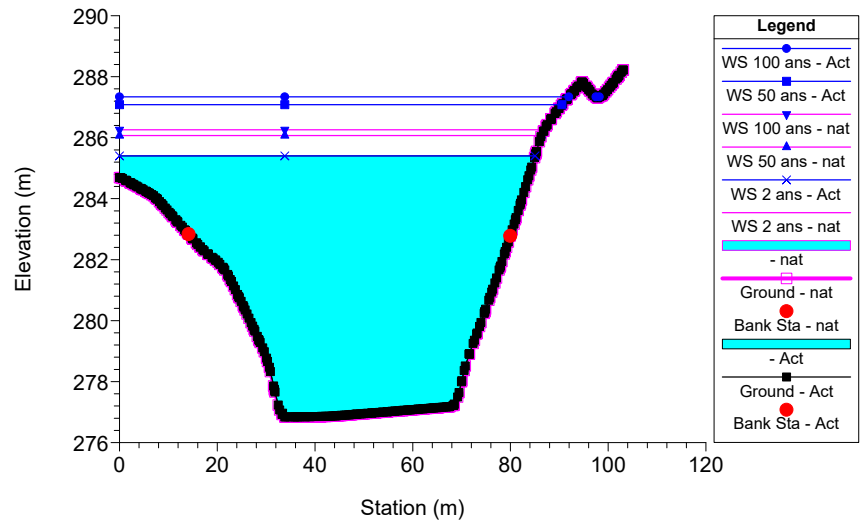
HEC-RAS Model Plan: 1) Act 2) nat



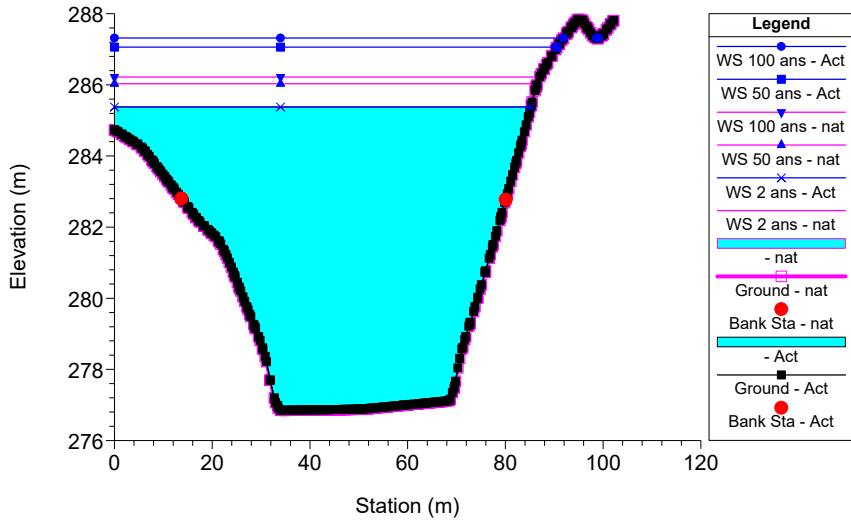
HEC-RAS Model Plan: 1) Act 2) nat



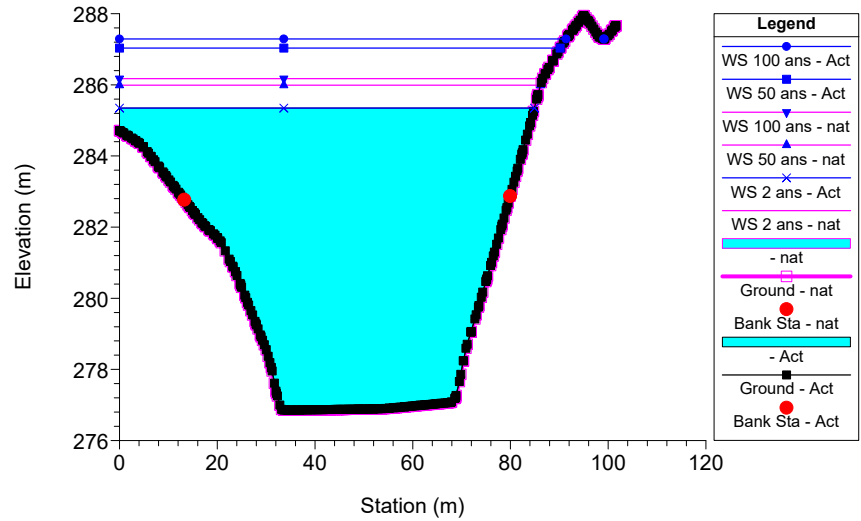
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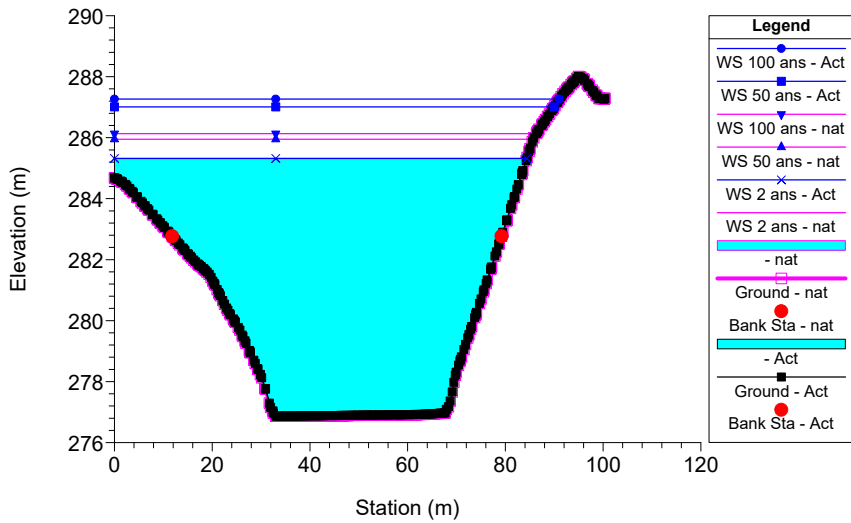
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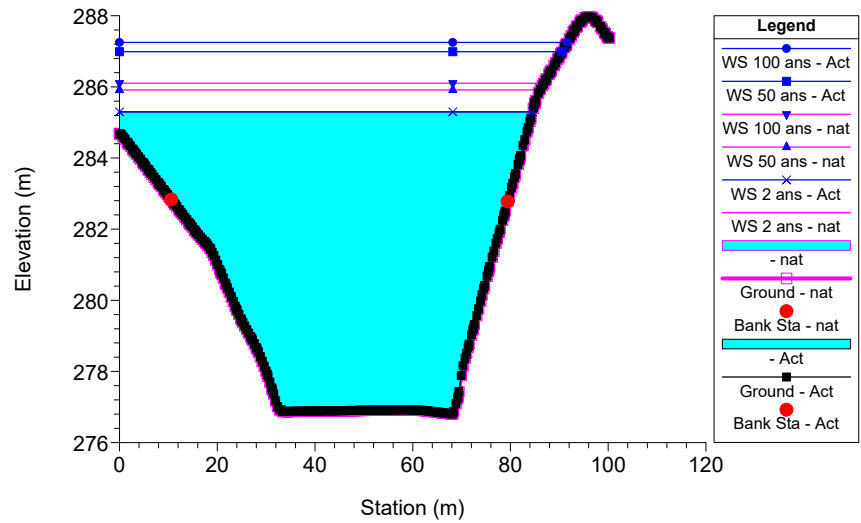
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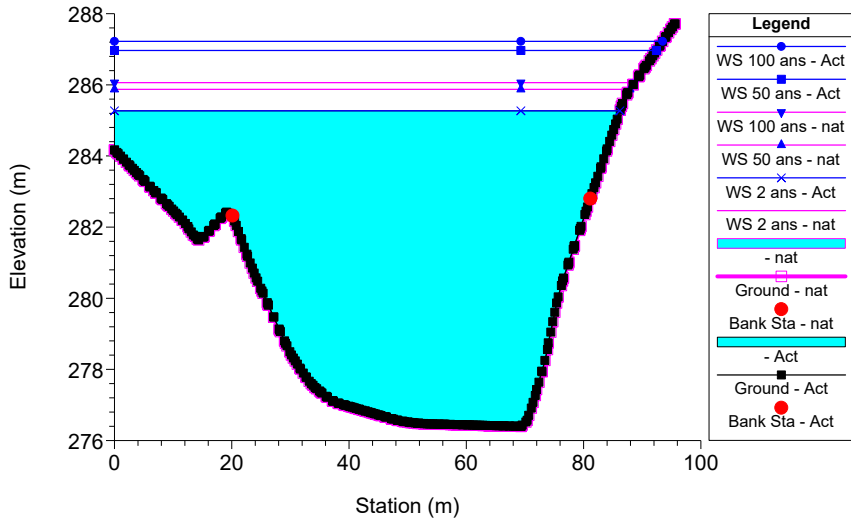
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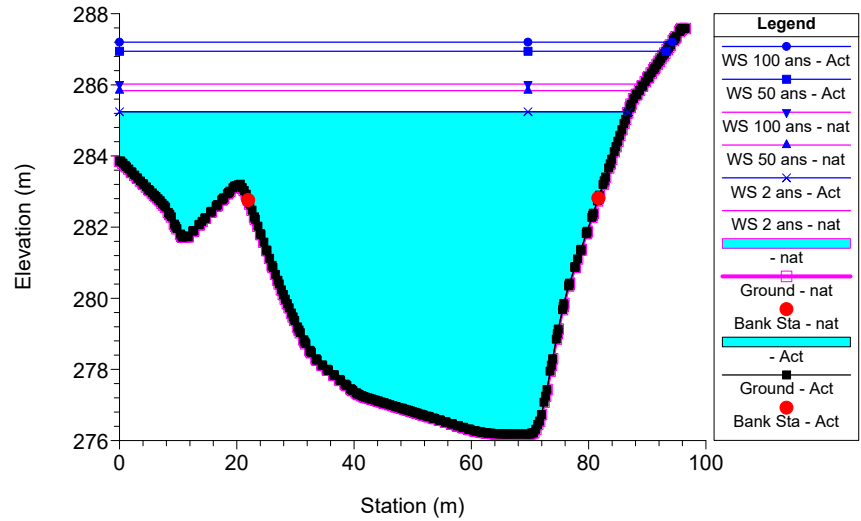
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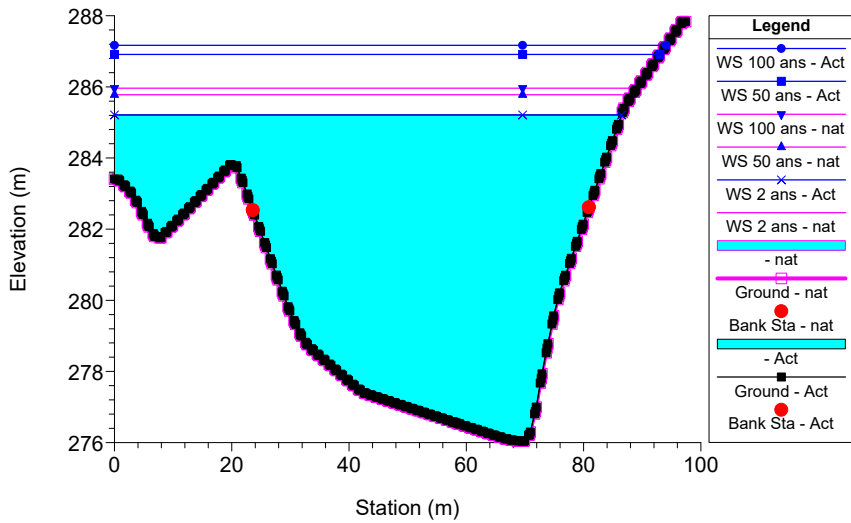
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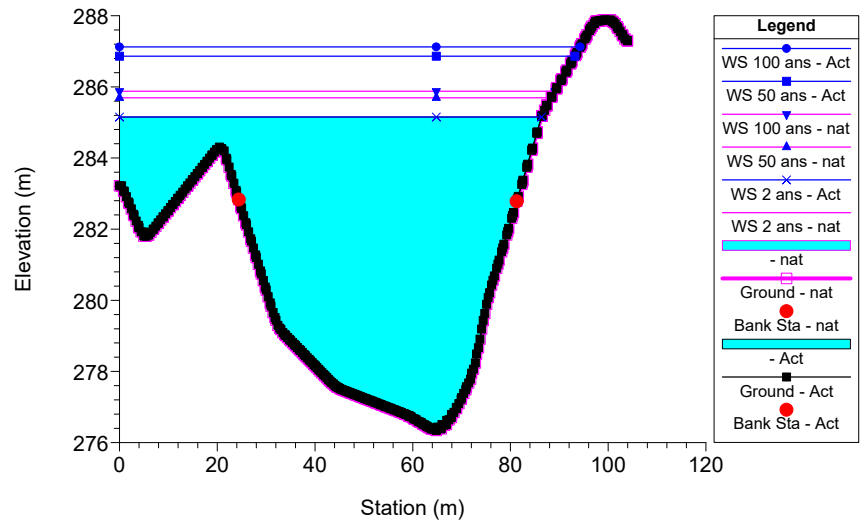
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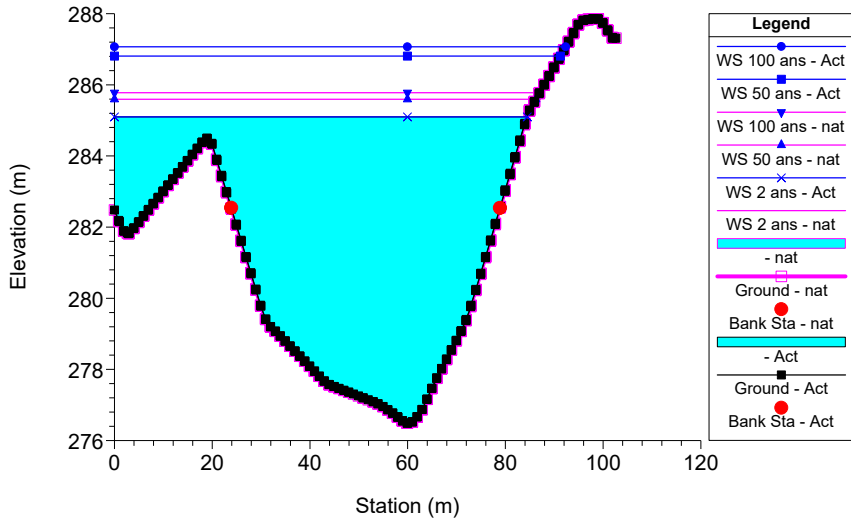
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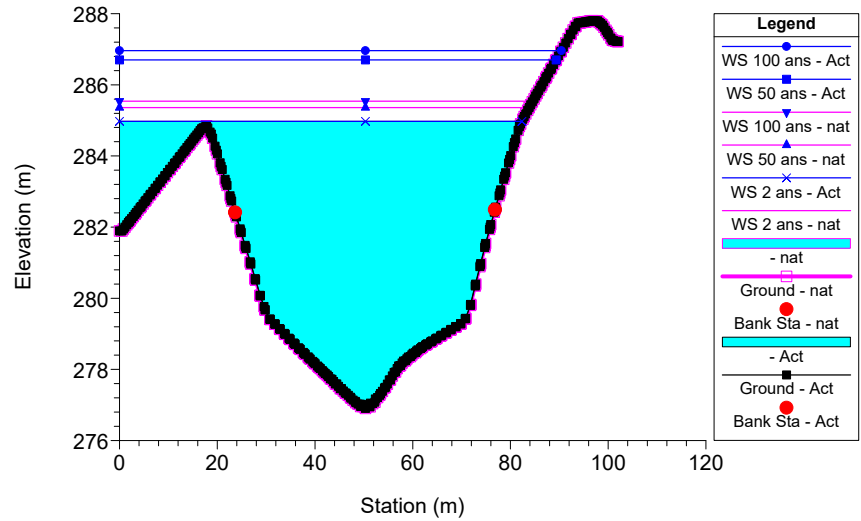
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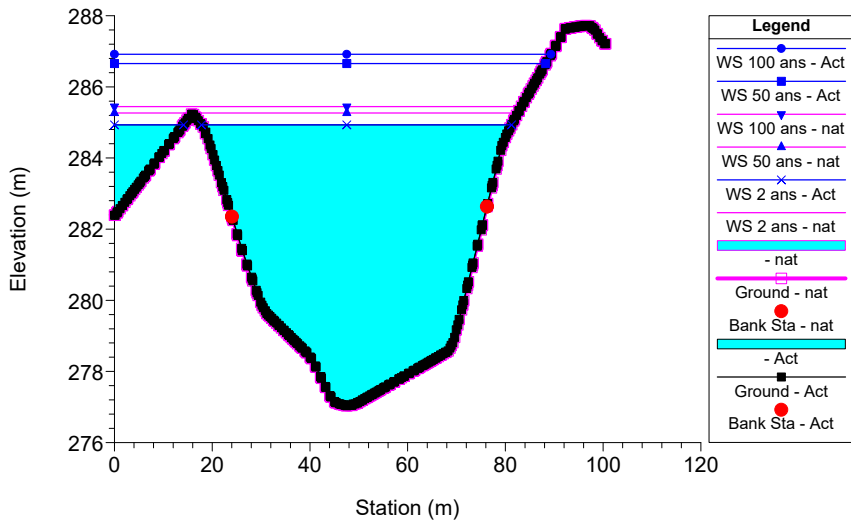
HEC-RAS Model Plan: 1) Act 2) nat



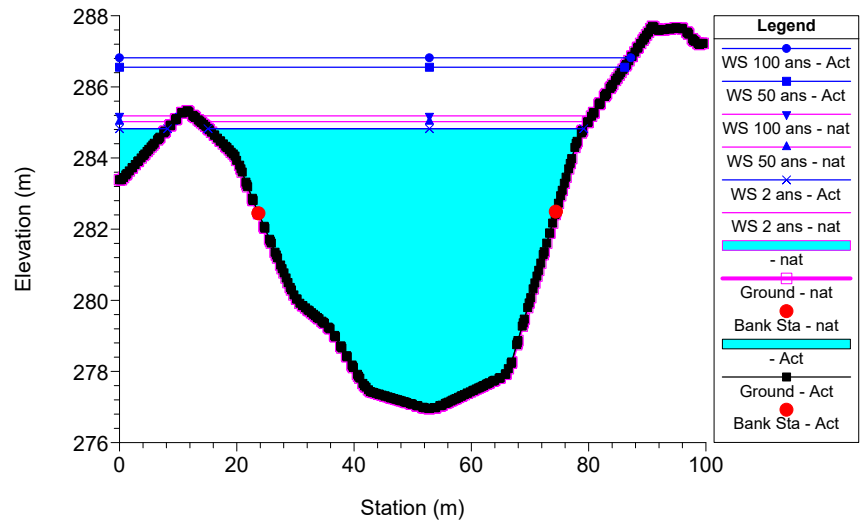
HEC-RAS Model Plan: 1) Act 2) nat



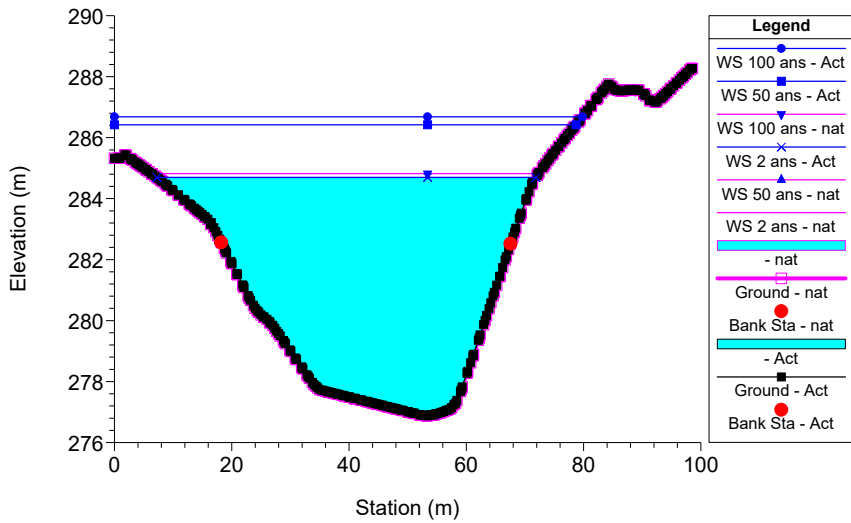
HEC-RAS Model Plan: 1) Act 2) nat



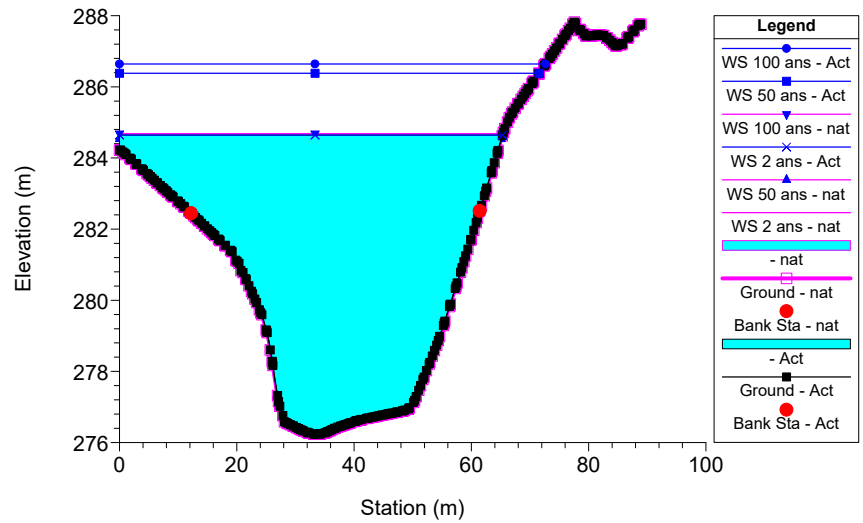
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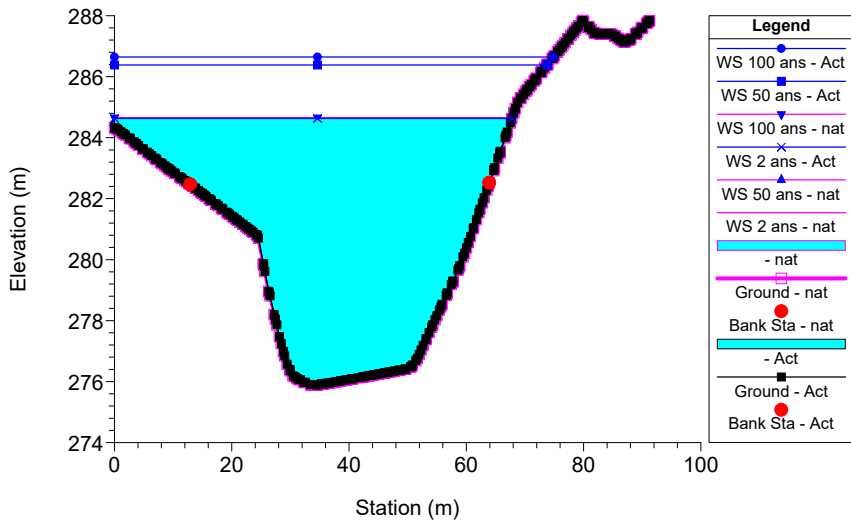
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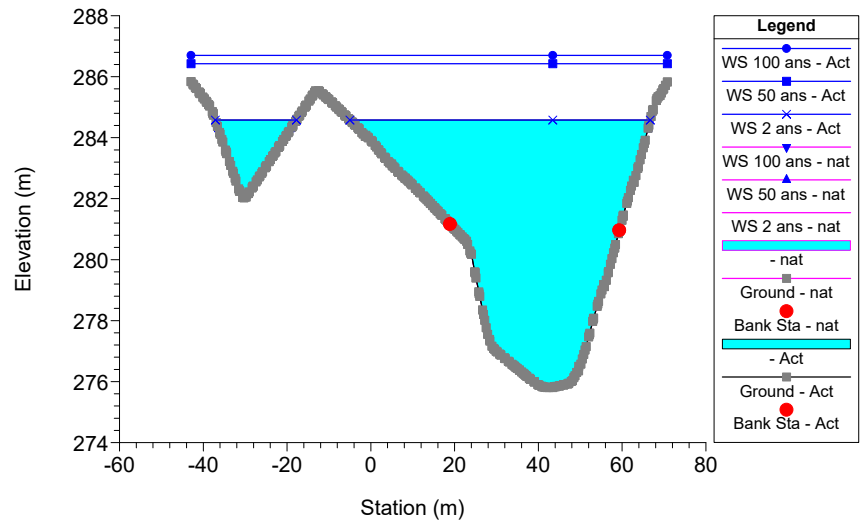
HEC-RAS Model Plan: 1) Act 2) nat



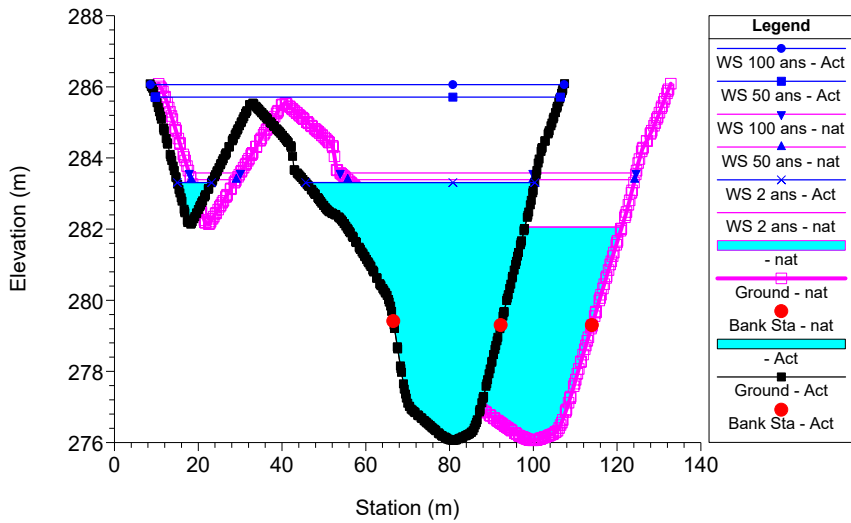
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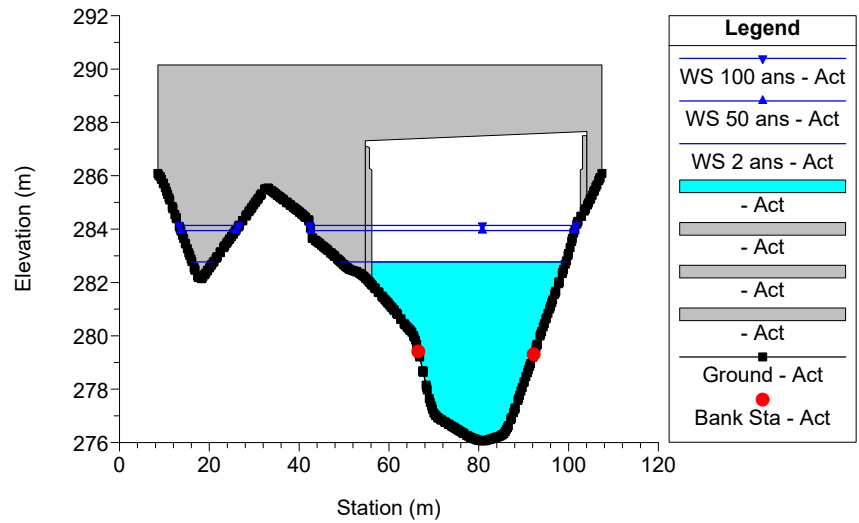
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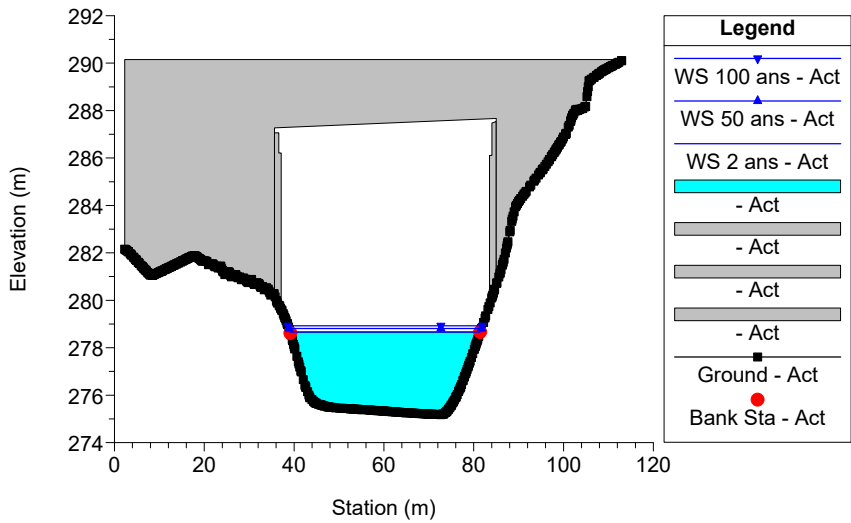
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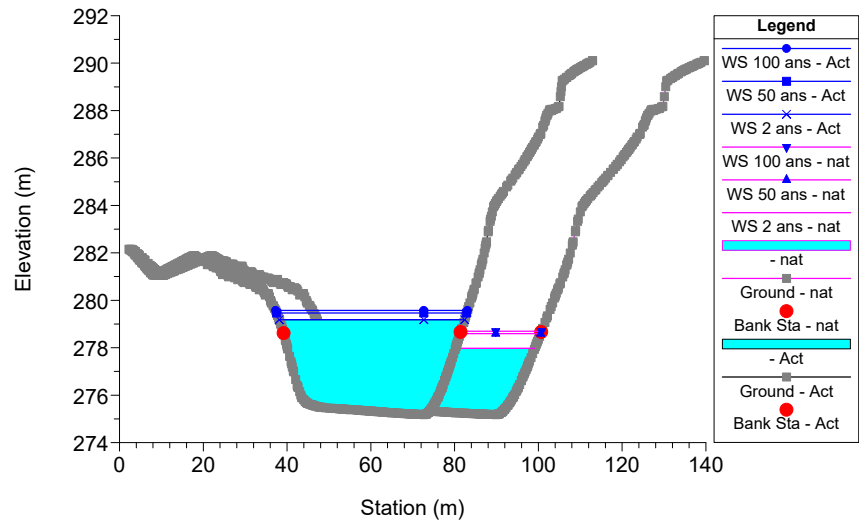
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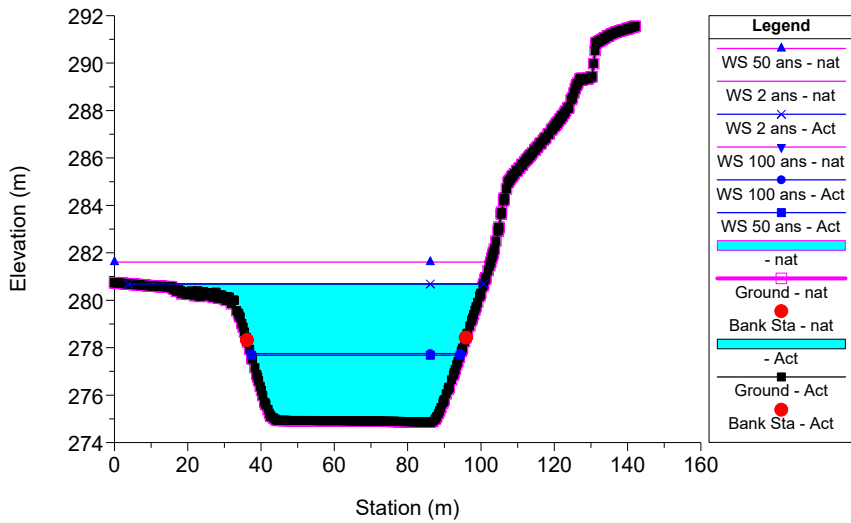
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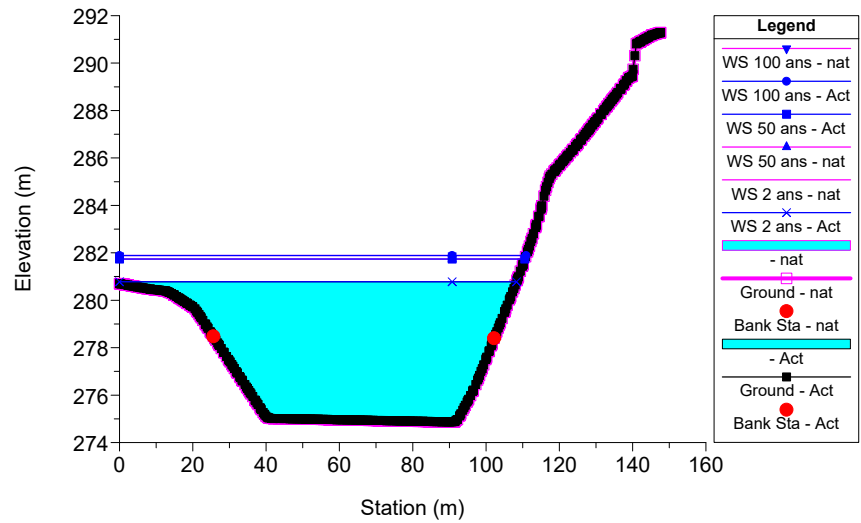
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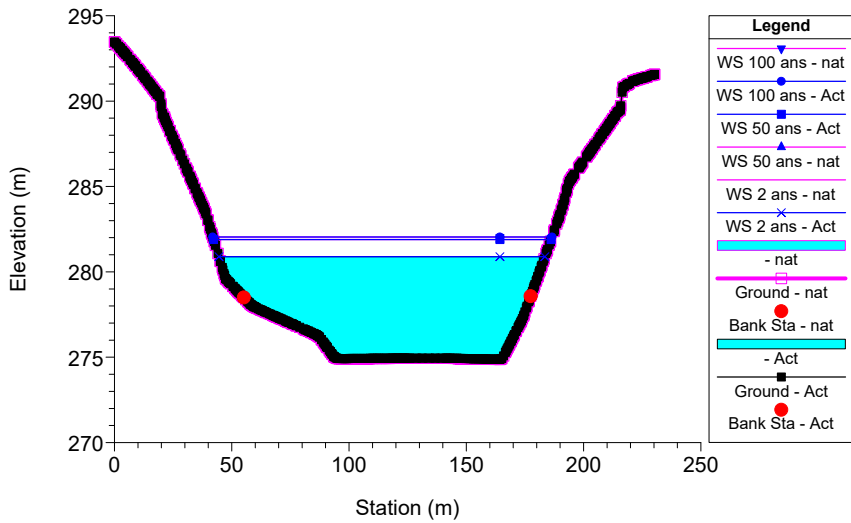
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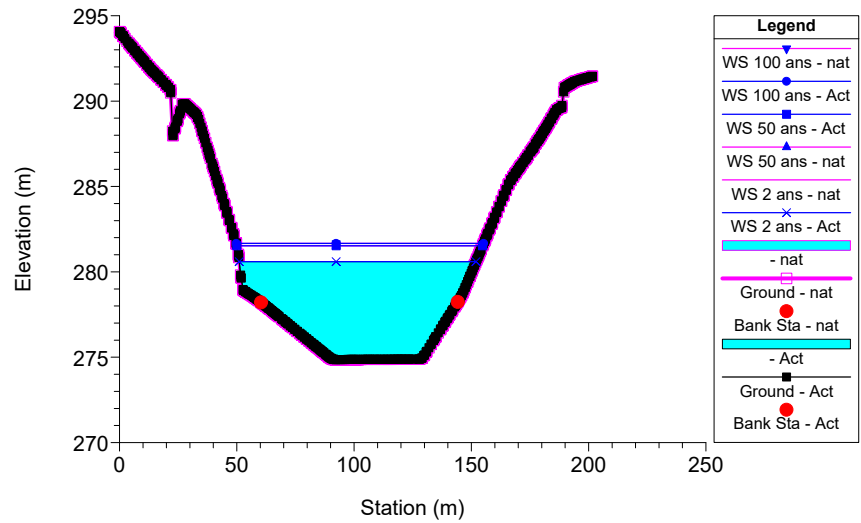
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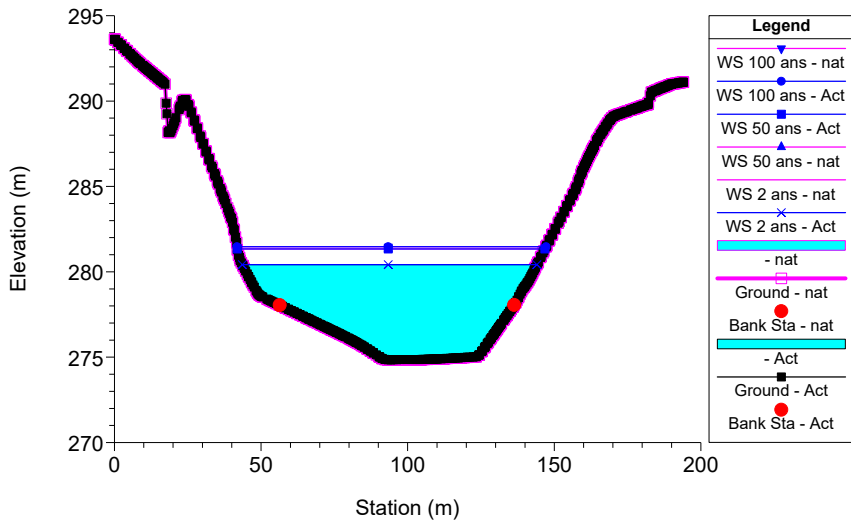
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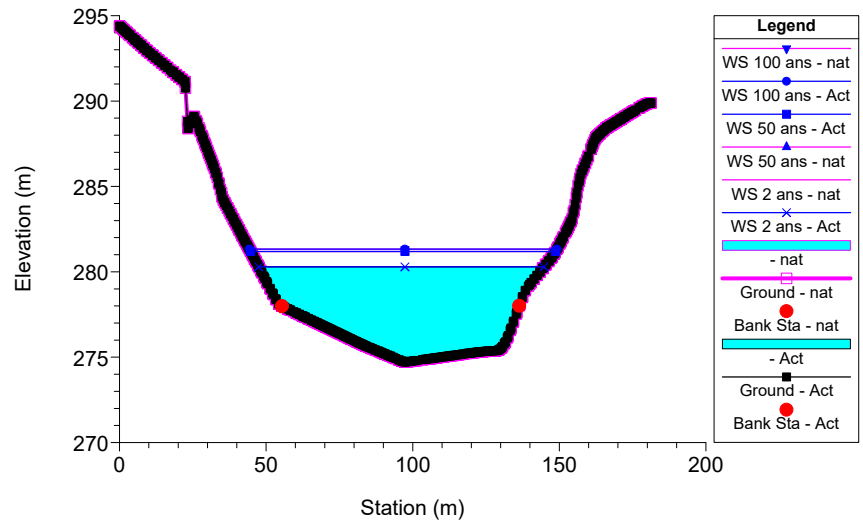
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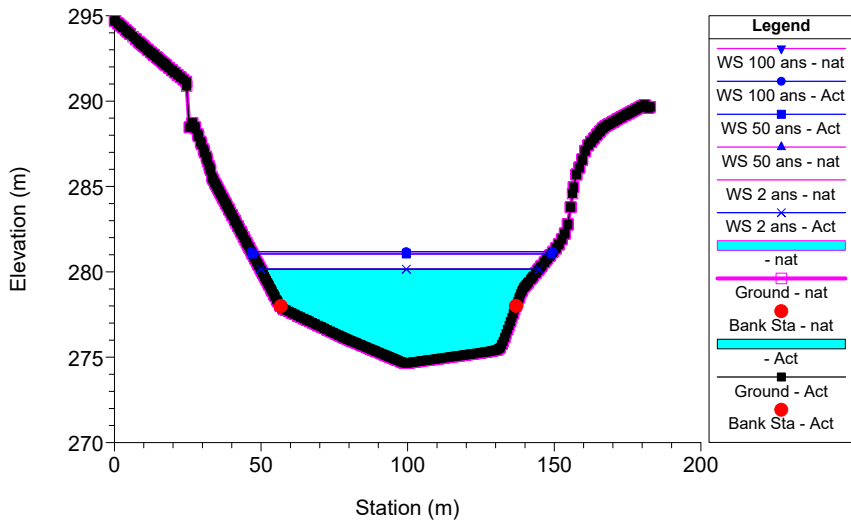
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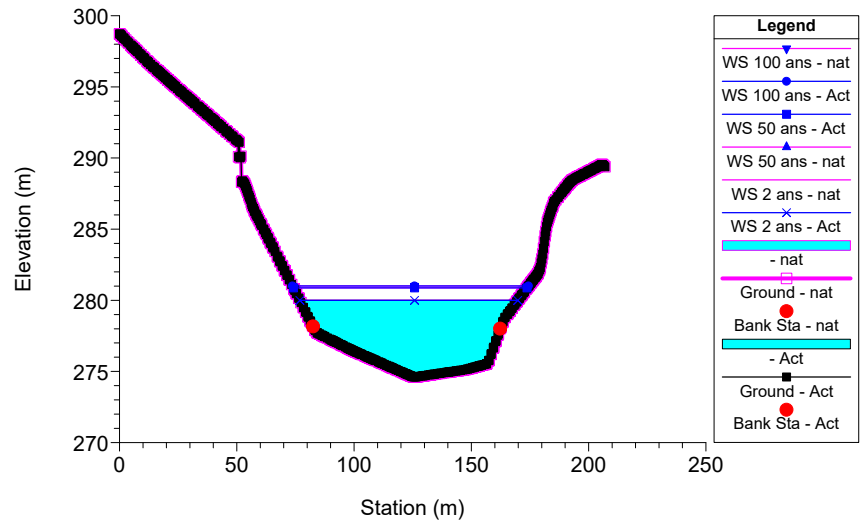
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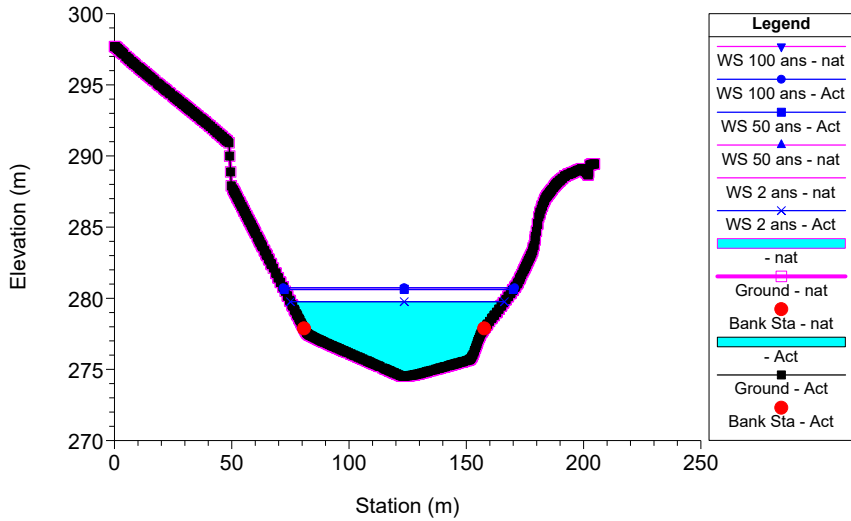
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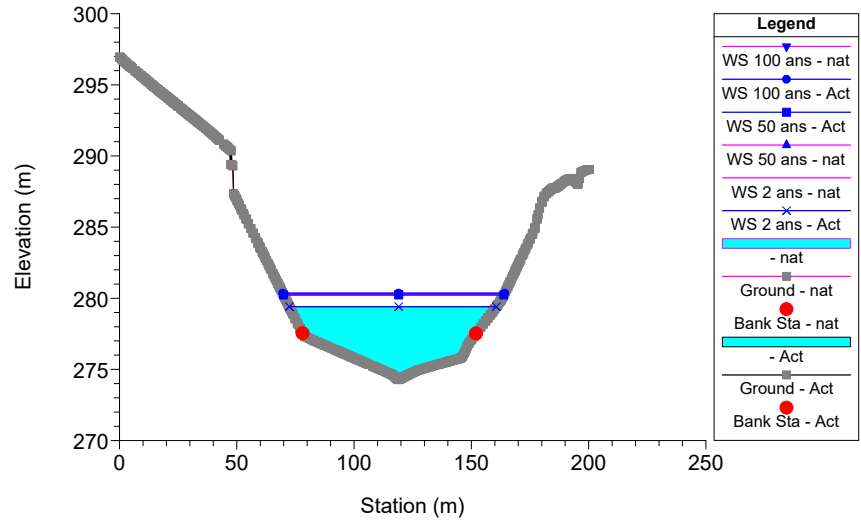
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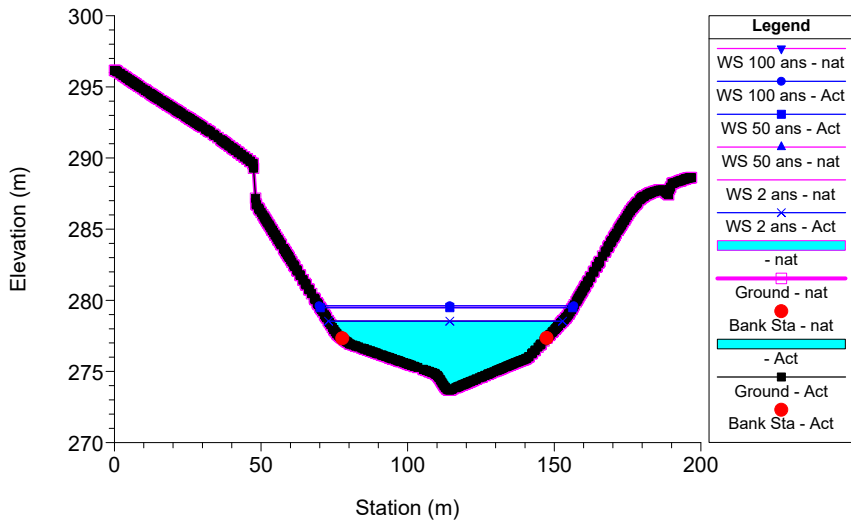
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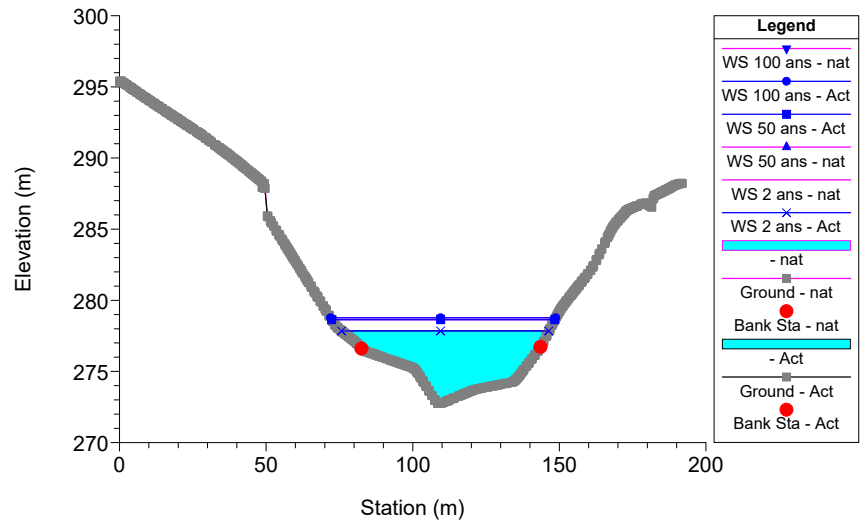
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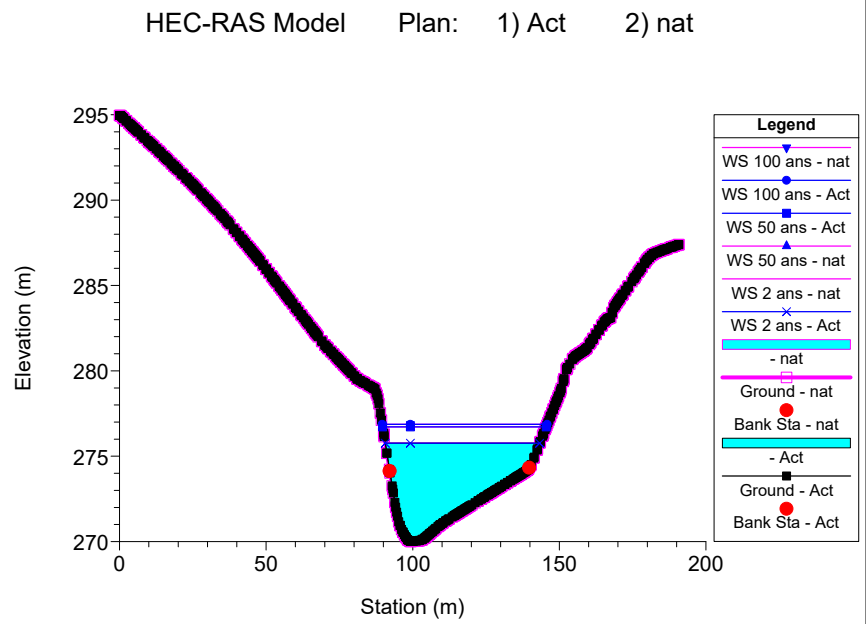
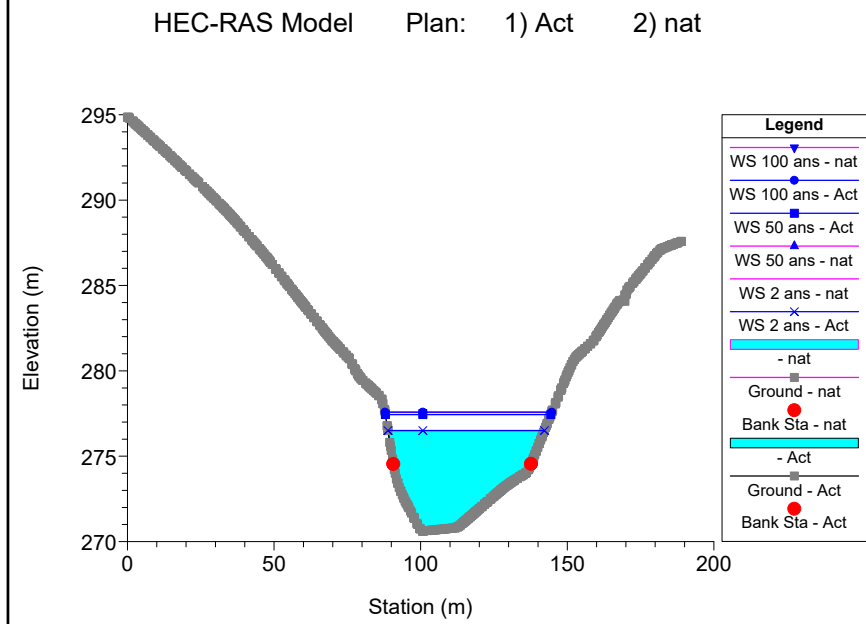
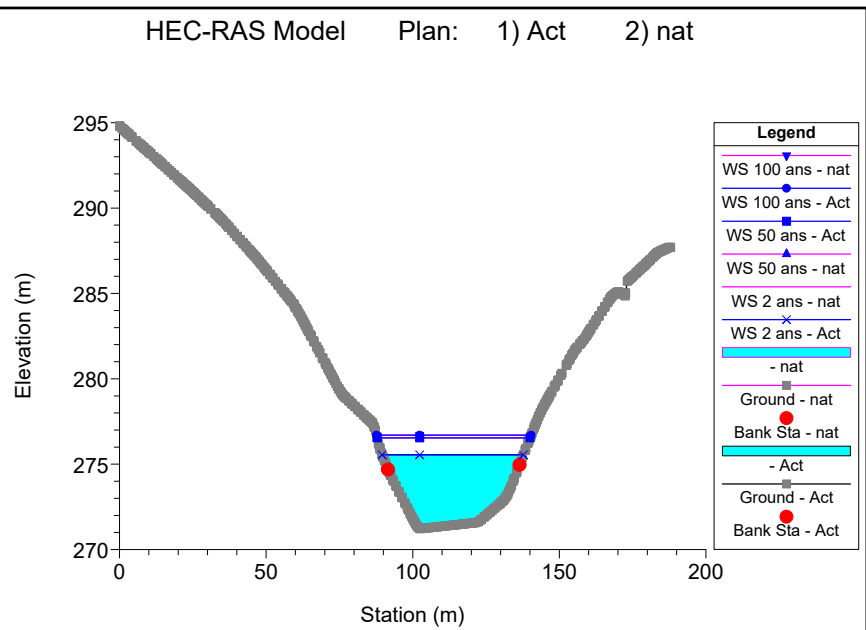
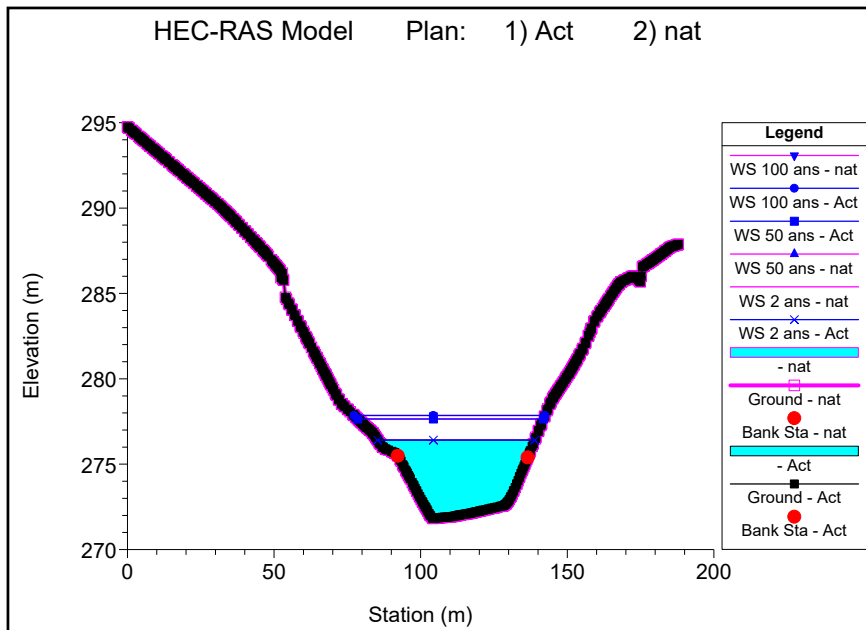


HEC-RAS Model Plan: 1) Act 2) nat



HEC-RAS Model Plan: 1) Act 2) nat





APPENDIX 6

Hydraulic Tables

HEC-RAS River: River237 Reach: Pont

Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Pont	1000	2 ans	Act	1096.76	278.68	285.89	282.46	286.24	0.000597	2.63	444.36	83.05	0.33
Pont	1000	2 ans	nat	1096.76	278.68	285.45	282.46	285.85	0.000762	2.84	408.18	80.86	0.37
Pont	1000	10 ans	Act	1347.95	278.68	286.87	282.97	287.25	0.000553	2.78	527.96	88.21	0.32
Pont	1000	10 ans	nat	1347.95	278.68	286.24	282.97	286.70	0.000754	3.06	473.12	84.86	0.37
Pont	1000	20 ans	Act	1430.86	278.68	287.16	283.12	287.56	0.000543	2.83	554.26	89.78	0.32
Pont	1000	20 ans	nat	1430.86	278.68	286.47	283.12	286.96	0.000755	3.13	493.33	86.11	0.37
Pont	1000	25 ans	Act	1455.73	278.68	287.25	283.17	287.65	0.000540	2.84	562.23	90.25	0.32
Pont	1000	25 ans	nat	1455.73	278.68	286.54	283.17	287.03	0.000755	3.15	499.22	86.47	0.37
Pont	1000	50 ans	Act	1530.74	278.68	287.51	283.30	287.92	0.000532	2.88	585.89	91.62	0.32
Pont	1000	50 ans	nat	1530.74	278.68	286.75	283.30	287.25	0.000756	3.21	517.06	87.55	0.38
Pont	1000	100 ans	Act	1602.44	278.68	287.76	283.41	288.17	0.000524	2.91	608.87	93.00	0.32
Pont	1000	100 ans	nat	1602.44	278.68	286.93	283.41	287.46	0.000758	3.27	533.73	88.56	0.38
Pont	990	2 ans	Act	1096.76	278.65	285.86	285.81	286.20	0.000593	2.62	447.58	83.87	0.33
Pont	990	2 ans	nat	1096.76	278.65	285.41	285.81	285.81	0.000764	2.84	409.85	82.68	0.37
Pont	990	10 ans	Act	1347.95	278.65	286.84	287.21	287.21	0.000548	2.76	532.29	89.02	0.32
Pont	990	10 ans	nat	1347.95	278.65	286.19	287.21	286.65	0.000753	3.05	475.80	85.53	0.37
Pont	990	20 ans	Act	1430.86	278.65	287.14	287.52	287.52	0.000538	2.81	558.92	90.63	0.32
Pont	990	20 ans	nat	1430.86	278.65	286.43	287.52	286.91	0.000753	3.12	496.20	86.81	0.37
Pont	990	25 ans	Act	1455.73	278.65	287.23	287.61	287.61	0.000535	2.82	567.00	91.12	0.32
Pont	990	25 ans	nat	1455.73	278.65	286.50	287.61	286.98	0.000753	3.14	502.15	87.18	0.37
Pont	990	50 ans	Act	1530.74	278.65	287.49	287.88	287.88	0.000527	2.86	590.96	92.53	0.32
Pont	990	50 ans	nat	1530.74	278.65	286.70	287.88	287.21	0.000754	3.20	520.16	88.28	0.37
Pont	990	100 ans	Act	1602.44	278.65	287.74	288.14	288.14	0.000519	2.90	614.25	94.04	0.32
Pont	990	100 ans	nat	1602.44	278.65	286.89	288.14	287.41	0.000755	3.26	537.00	89.31	0.38
Pont	980	2 ans	Act	1096.76	278.58	285.82	285.82	286.16	0.000603	2.63	447.81	85.63	0.33
Pont	980	2 ans	nat	1096.76	278.58	285.35	285.82	285.76	0.000787	2.86	407.77	84.73	0.37
Pont	980	10 ans	Act	1347.95	278.58	286.81	287.18	287.18	0.000552	2.77	534.27	90.05	0.32
Pont	980	10 ans	nat	1347.95	278.58	286.14	287.18	286.60	0.000768	3.07	475.54	86.52	0.37
Pont	980	20 ans	Act	1430.86	278.58	287.10	287.49	287.49	0.000541	2.81	561.33	91.74	0.32
Pont	980	20 ans	nat	1430.86	278.58	286.38	287.49	286.86	0.000766	3.14	496.22	87.69	0.38
Pont	980	25 ans	Act	1455.73	278.58	287.19	287.58	287.58	0.000538	2.82	569.54	92.25	0.32
Pont	980	25 ans	nat	1455.73	278.58	286.45	287.58	286.94	0.000767	3.16	502.25	88.05	0.38
Pont	980	50 ans	Act	1530.74	278.58	287.46	287.85	287.85	0.000529	2.86	593.90	93.72	0.32
Pont	980	50 ans	nat	1530.74	278.58	286.65	287.85	287.16	0.000766	3.22	520.49	89.19	0.38
Pont	980	100 ans	Act	1602.44	278.58	287.71	288.11	288.11	0.000520	2.89	617.58	95.15	0.32
Pont	980	100 ans	nat	1602.44	278.58	286.84	288.11	287.36	0.000767	3.27	537.55	90.26	0.38
Pont	970	2 ans	Act	1096.76	276.46	285.92	285.92	286.09	0.000214	1.90	648.95	97.37	0.20
Pont	970	2 ans	nat	1096.76	276.46	285.47	285.92	285.67	0.000258	2.02	606.11	94.76	0.22
Pont	970	10 ans	Act	1347.95	276.46	286.91	287.11	287.11	0.000219	2.06	748.30	103.92	0.21
Pont	970	10 ans	nat	1347.95	276.46	286.27	287.11	286.51	0.000279	2.23	683.95	99.46	0.24
Pont	970	20 ans	Act	1430.86	276.46	287.21	287.42	287.42	0.000221	2.11	779.71	106.44	0.21
Pont	970	20 ans	nat	1430.86	276.46	286.51	287.42	286.77	0.000286	2.30	708.08	100.89	0.24
Pont	970	25 ans	Act	1455.73	276.46	287.30	287.51	287.51	0.000222	2.13	789.24	107.88	0.21
Pont	970	25 ans	nat	1455.73	276.46	286.58	287.51	286.84	0.000288	2.32	715.13	101.33	0.24
Pont	970	50 ans	Act	1530.74	276.46	287.56	287.78	287.78	0.000225	2.18	818.08	113.06	0.22
Pont	970	50 ans	nat	1530.74	276.46	286.79	287.78	287.06	0.000294	2.37	736.46	102.96	0.24
Pont	970	100 ans	Act	1602.44	276.46	287.81	288.04	288.04	0.000227	2.23	846.97	118.08	0.22
Pont	970	100 ans	nat	1602.44	276.46	286.99	288.04	287.27	0.000300	2.43	756.49	104.58	0.25
Pont	960	2 ans	Act	1096.76	278.36	285.73	285.73	286.06	0.000560	2.56	460.26	87.47	0.32
Pont	960	2 ans	nat	1096.76	278.36	285.24	285.73	285.62	0.000740	2.79	417.01	86.67	0.36
Pont	960	10 ans	Act	1347.95	278.36	286.72	287.07	287.07	0.000515	2.69	547.73	89.93	0.31
Pont	960	10 ans	nat	1347.95	278.36	286.02	287.07	286.46	0.000726	2.99	485.70	87.94	0.36
Pont	960	20 ans	Act	1430.86	278.36	287.02	287.38	287.38	0.000506	2.73	574.68	91.50	0.31
Pont	960	20 ans	nat	1430.86	278.36	286.26	287.38	286.72	0.000726	3.06	506.45	88.33	0.37
Pont	960	25 ans	Act	1455.73	278.36	287.11	287.48	287.48	0.000503	2.75	582.88	92.02	0.31
Pont	960	25 ans	nat	1455.73	278.36	286.33	287.48	286.79	0.000727	3.08	512.45	88.44	0.37
Pont	960	50 ans	Act	1530.74	278.36	287.37	287.75	287.75	0.000496	2.79	607.23	93.58	0.31
Pont	960	50 ans	nat	1530.74	278.36	286.53	287.75	287.01	0.000728	3.14	530.51	89.01	0.37
Pont	960	100 ans	Act	1602.44	278.36	287.62	288.01	288.01	0.000488	2.82	630.94	95.32	0.31
Pont	960	100 ans	nat	1602.44	278.36	286.72	288.01	287.22	0.000729	3.20	547.30	89.91	0.37
Pont	950	2 ans	Act	1096.76	278.27	285.71	285.71	286.02	0.000538	2.52	466.84	88.41	0.31
Pont	950	2 ans	nat	1096.76	278.27	285.20	285.71	285.58	0.000714	2.75	422.18	87.61	0.35
Pont	950	10 ans	Act	1347.95	278.27	286.70	287.04	287.04	0.000494	2.64	555.51	90.18	0.31
Pont	950	10 ans	nat	1347.95	278.27	285.99	287.04	286.42	0.000701	2.95	491.81	88.86	0.36
Pont	950	20 ans	Act	1430.86	278.27	287.00	287.35	287.35	0.000486	2.69	582.60	91.64	0.30
Pont	950	20 ans	nat	1430.86	278.27	286.22	287.35	286.67	0.000701	3.02	512.82	89.26	0.36
Pont	950	25 ans	Act	1455.73	278.27	287.09	287.44	287.44	0.000483	2.70	590.83	92.08	0.30
Pont	950	25 ans	nat	1455.73	278.27	286.29	287.44	286.75	0.000701	3.04	518.90	89.38	0.36
Pont	950	50 ans	Act	1530.74	278.27	287.35	287.71	287.71	0.000476	2.74	615.25	93.69	0.30
Pont	950	50 ans	nat	1530.74	278.27	286.49	287.71	286.97	0.000702	3.10	537.19	89.76	0.36
Pont	950	100 ans	Act	1602.44	278.27	287.60	287.97	287.97	0.000469	2.78	639.05	95.45	0.30
Pont	950	100 ans	nat	1602.44	278.27	286.68	287.97	287.17	0.000703	3.15	554.12	90.11	0.36
Pont	940	2 ans	Act	1096.76	278.15	285.68	285.68	285.99	0.000524	2.49	472.26	89.78	0.31
Pont	940	2 ans	nat	1096.76	278.15	285.16	285.68	285.53	0.000699	2.73	425.91	88.94	0.35
Pont	940	10 ans	Act	1347.95	278.15	286.67	287.01	287.01	0.000480	2.62	562.70	91.62	0.30
Pont	940	10 ans	nat	1347.95	278.15	285.95	287.01	286.37	0.000685	2.93	496.82	90.24	0.35
Pont	940	20 ans	Act	1430.86	278.15	286.97	287.32	287.32	0.000472	2.66	590.21	92.53	0.30

HEC-RAS River: River237 Reach: Pont (Continued)

Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Pont	940	20 ans	nat	1430.86	278.15	286.19		286.63	0.000685	2.99	518.21	90.65	0.36
Pont	940	25 ans	Act	1455.73	278.15	287.06		287.41	0.000469	2.67	598.54	92.98	0.30
Pont	940	25 ans	nat	1455.73	278.15	286.25		286.70	0.000685	3.01	524.39	90.77	0.36
Pont	940	50 ans	Act	1530.74	278.15	287.33		287.68	0.000463	2.71	623.24	94.35	0.30
Pont	940	50 ans	nat	1530.74	278.15	286.46		286.92	0.000686	3.07	543.01	91.17	0.36
Pont	940	100 ans	Act	1602.44	278.15	287.58		287.94	0.000456	2.74	647.26	95.96	0.30
Pont	940	100 ans	nat	1602.44	278.15	286.65		287.12	0.000687	3.12	560.24	91.56	0.36
Pont	930	2 ans	Act	1096.76	278.02	285.65		285.95	0.000518	2.48	474.49	91.38	0.31
Pont	930	2 ans	nat	1096.76	278.02	285.11		285.49	0.000696	2.72	426.22	90.12	0.35
Pont	930	10 ans	Act	1347.95	278.02	286.65		286.98	0.000475	2.60	566.79	92.93	0.30
Pont	930	10 ans	nat	1347.95	278.02	285.91		286.33	0.000682	2.92	498.51	91.78	0.35
Pont	930	20 ans	Act	1430.86	278.02	286.95		287.29	0.000466	2.65	594.76	93.55	0.30
Pont	930	20 ans	nat	1430.86	278.02	286.15		286.58	0.000682	2.98	520.30	92.15	0.35
Pont	930	25 ans	Act	1455.73	278.02	287.04		287.38	0.000464	2.66	603.20	93.75	0.30
Pont	930	25 ans	nat	1455.73	278.02	286.21		286.66	0.000682	3.00	526.59	92.25	0.35
Pont	930	50 ans	Act	1530.74	278.02	287.30		287.65	0.000457	2.70	628.10	94.74	0.30
Pont	930	50 ans	nat	1530.74	278.02	286.42		286.88	0.000682	3.06	545.54	92.57	0.36
Pont	930	100 ans	Act	1602.44	278.02	287.56		287.91	0.000450	2.73	652.23	95.99	0.30
Pont	930	100 ans	nat	1602.44	278.02	286.61		287.08	0.000684	3.11	563.05	92.87	0.36
Pont	920	2 ans	Act	1096.76	277.92	285.61		285.92	0.000517	2.48	472.01	89.01	0.30
Pont	920	2 ans	nat	1096.76	277.92	285.07		285.44	0.000697	2.72	423.93	87.92	0.35
Pont	920	10 ans	Act	1347.95	277.92	286.61		286.95	0.000476	2.61	562.29	91.08	0.30
Pont	920	10 ans	nat	1347.95	277.92	285.86		286.29	0.000686	2.93	494.22	89.52	0.35
Pont	920	20 ans	Act	1430.86	277.92	286.92		287.26	0.000468	2.66	589.71	91.74	0.30
Pont	920	20 ans	nat	1430.86	277.92	286.10		286.54	0.000687	3.00	515.41	90.01	0.35
Pont	920	25 ans	Act	1455.73	277.92	287.01		287.35	0.000466	2.67	598.00	91.95	0.30
Pont	920	25 ans	nat	1455.73	277.92	286.17		286.61	0.000688	3.02	521.53	90.15	0.36
Pont	920	50 ans	Act	1530.74	277.92	287.27		287.63	0.000459	2.71	622.42	92.78	0.30
Pont	920	50 ans	nat	1530.74	277.92	286.37		286.83	0.000689	3.07	540.00	90.58	0.36
Pont	920	100 ans	Act	1602.44	277.92	287.52		287.89	0.000453	2.74	646.03	93.94	0.30
Pont	920	100 ans	nat	1602.44	277.92	286.56		287.04	0.000691	3.13	557.07	90.96	0.36
Pont	910	2 ans	Act	1096.76	277.81	285.58		285.89	0.000513	2.49	471.64	88.80	0.30
Pont	910	2 ans	nat	1096.76	277.81	285.02		285.40	0.000695	2.74	422.48	87.69	0.35
Pont	910	10 ans	Act	1347.95	277.81	286.58		286.92	0.000474	2.62	561.90	90.78	0.30
Pont	910	10 ans	nat	1347.95	277.81	285.81		286.24	0.000687	2.94	492.60	89.26	0.35
Pont	910	20 ans	Act	1430.86	277.81	286.88		287.23	0.000466	2.66	589.27	91.40	0.30
Pont	910	20 ans	nat	1430.86	277.81	286.05		286.50	0.000688	3.01	513.71	89.72	0.36
Pont	910	25 ans	Act	1455.73	277.81	286.98		287.32	0.000464	2.68	597.54	91.65	0.30
Pont	910	25 ans	nat	1455.73	277.81	286.12		286.57	0.000689	3.03	519.81	89.86	0.36
Pont	910	50 ans	Act	1530.74	277.81	287.24		287.60	0.000458	2.72	621.91	92.53	0.30
Pont	910	50 ans	nat	1530.74	277.81	286.32		286.79	0.000691	3.09	538.19	90.26	0.36
Pont	910	100 ans	Act	1602.44	277.81	287.49		287.86	0.000452	2.75	645.56	94.71	0.30
Pont	910	100 ans	nat	1602.44	277.81	286.51		287.00	0.000693	3.15	555.18	90.64	0.36
Pont	900	2 ans	Act	1096.76	277.62	285.55		285.86	0.000512	2.48	470.50	87.79	0.30
Pont	900	2 ans	nat	1096.76	277.62	284.98		285.35	0.000697	2.74	420.80	86.66	0.35
Pont	900	10 ans	Act	1347.95	277.62	286.55		286.89	0.000474	2.62	559.93	89.78	0.30
Pont	900	10 ans	nat	1347.95	277.62	285.77		286.20	0.000690	2.95	490.08	88.23	0.35
Pont	900	20 ans	Act	1430.86	277.62	286.86		287.20	0.000467	2.66	587.04	90.51	0.30
Pont	900	20 ans	nat	1430.86	277.62	286.01		286.46	0.000692	3.02	510.92	88.70	0.36
Pont	900	25 ans	Act	1455.73	277.62	286.95		287.30	0.000464	2.68	595.23	90.74	0.30
Pont	900	25 ans	nat	1455.73	277.62	286.07		286.53	0.000693	3.04	516.93	88.83	0.36
Pont	900	50 ans	Act	1530.74	277.62	287.21		287.57	0.000459	2.72	619.43	92.02	0.30
Pont	900	50 ans	nat	1530.74	277.62	286.28		286.75	0.000695	3.10	535.07	89.23	0.36
Pont	900	100 ans	Act	1602.44	277.62	287.46		287.83	0.000453	2.75	642.96	95.33	0.30
Pont	900	100 ans	nat	1602.44	277.62	286.46		286.95	0.000698	3.15	551.82	89.60	0.36
Pont	890	2 ans	Act	1096.76	277.45	285.52		285.82	0.000511	2.48	469.07	86.71	0.30
Pont	890	2 ans	nat	1096.76	277.45	284.93		285.31	0.000700	2.74	418.90	85.55	0.35
Pont	890	10 ans	Act	1347.95	277.45	286.53		286.86	0.000473	2.61	557.62	88.74	0.30
Pont	890	10 ans	nat	1347.95	277.45	285.73		286.16	0.000693	2.95	487.31	87.13	0.35
Pont	890	20 ans	Act	1430.86	277.45	286.83		287.18	0.000466	2.66	584.44	89.54	0.30
Pont	890	20 ans	nat	1430.86	277.45	285.96		286.41	0.000695	3.02	507.86	87.59	0.36
Pont	890	25 ans	Act	1455.73	277.45	286.92		287.27	0.000464	2.67	592.56	90.00	0.30
Pont	890	25 ans	nat	1455.73	277.45	286.03		286.49	0.000696	3.04	513.78	87.73	0.36
Pont	890	50 ans	Act	1530.74	277.45	287.18		287.54	0.000458	2.71	616.60	91.37	0.30
Pont	890	50 ans	nat	1530.74	277.45	286.23		286.71	0.000698	3.10	531.66	88.13	0.36
Pont	890	100 ans	Act	1602.44	277.45	287.44		287.81	0.000452	2.75	640.02	94.36	0.30
Pont	890	100 ans	nat	1602.44	277.45	286.42		286.91	0.000702	3.16	548.17	88.50	0.36
Pont	880	2 ans	Act	1096.76	277.26	285.49		285.79	0.000505	2.47	468.66	85.15	0.30
Pont	880	2 ans	nat	1096.76	277.26	284.89		285.27	0.000695	2.73	418.36	84.03	0.35
Pont	880	10 ans	Act	1347.95	277.26	286.50		286.83	0.000469	2.61	555.78	87.19	0.30
Pont	880	10 ans	nat	1347.95	277.26	285.68		286.12	0.000690	2.94	485.51	85.53	0.35
Pont	880	20 ans	Act	1430.86	277.26	286.80		287.15	0.000462	2.66	582.20	88.57	0.30
Pont	880	20 ans	nat	1430.86	277.26	285.92		286.37	0.000692	3.01	505.63	86.00	0.36
Pont	880	25 ans	Act	1455.73	277.26	286.89		287.24	0.000460	2.67	590.24	89.05	0.30
Pont	880	25 ans	nat	1455.73	277.26	285.99		286.44	0.000694	3.04	511.43	86.13	0.36
Pont	880	50 ans	Act	1530.74	277.26	287.15		287.52	0.000455	2.71	614.03	90.43	0.30
Pont	880	50 ans	nat	1530.74	277.26	286.19		286.67	0.000697	3.10	528.93	86.54	0.36

HEC-RAS River: River237 Reach: Pont (Continued)

Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Pont	880	100 ans	Act	1602.44	277.26	287.41		287.78	0.000449	2.75	637.24	93.16	0.30
Pont	880	100 ans	nat	1602.44	277.26	286.38		286.87	0.000700	3.16	545.09	86.93	0.37
Pont	870	2 ans	Act	1096.76	276.99	285.46		285.76	0.000489	2.44	472.30	84.07	0.30
Pont	870	2 ans	nat	1096.76	276.99	284.86		285.22	0.000675	2.69	421.75	82.93	0.34
Pont	870	10 ans	Act	1347.95	276.99	286.47		286.80	0.000456	2.58	558.54	86.46	0.29
Pont	870	10 ans	nat	1347.95	276.99	285.65		286.07	0.000673	2.91	488.05	84.43	0.35
Pont	870	20 ans	Act	1430.86	276.99	286.78		287.12	0.000450	2.63	584.80	87.98	0.29
Pont	870	20 ans	nat	1430.86	276.99	285.88		286.33	0.000676	2.98	507.90	84.88	0.35
Pont	870	25 ans	Act	1455.73	276.99	286.87		287.21	0.000449	2.64	592.80	88.46	0.29
Pont	870	25 ans	nat	1455.73	276.99	285.95		286.40	0.000677	3.00	513.62	85.01	0.35
Pont	870	50 ans	Act	1530.74	276.99	287.13		287.49	0.000444	2.68	616.47	89.87	0.29
Pont	870	50 ans	nat	1530.74	276.99	286.15		286.62	0.000681	3.07	530.88	85.51	0.36
Pont	870	100 ans	Act	1602.44	276.99	287.39		287.75	0.000439	2.72	639.58	92.79	0.29
Pont	870	100 ans	nat	1602.44	276.99	286.34		286.82	0.000685	3.13	546.82	85.95	0.36
Pont	860	2 ans	Act	1096.76	276.83	285.43		285.73	0.000488	2.43	473.32	84.53	0.30
Pont	860	2 ans	nat	1096.76	276.83	284.81		285.18	0.000679	2.69	421.38	83.35	0.34
Pont	860	10 ans	Act	1347.95	276.83	286.45		286.78	0.000453	2.57	560.29	86.91	0.29
Pont	860	10 ans	nat	1347.95	276.83	285.61		286.03	0.000675	2.91	488.13	84.87	0.35
Pont	860	20 ans	Act	1430.86	276.83	286.75		287.09	0.000447	2.62	586.72	88.30	0.29
Pont	860	20 ans	nat	1430.86	276.83	285.84		286.28	0.000677	2.98	508.09	85.32	0.35
Pont	860	25 ans	Act	1455.73	276.83	286.84		287.18	0.000445	2.63	594.76	88.75	0.29
Pont	860	25 ans	nat	1455.73	276.83	285.91		286.36	0.000679	3.00	513.83	85.45	0.35
Pont	860	50 ans	Act	1530.74	276.83	287.11		287.46	0.000441	2.67	618.55	90.18	0.29
Pont	860	50 ans	nat	1530.74	276.83	286.11		286.58	0.000682	3.06	531.18	85.88	0.36
Pont	860	100 ans	Act	1602.44	276.83	287.36		287.72	0.000435	2.71	641.75	92.84	0.29
Pont	860	100 ans	nat	1602.44	276.83	286.30		286.78	0.000686	3.12	547.20	86.42	0.36
Pont	850	2 ans	Act	1096.76	276.84	285.40		285.69	0.000480	2.40	476.85	85.04	0.29
Pont	850	2 ans	nat	1096.76	276.84	284.77		285.13	0.000673	2.67	423.53	83.82	0.34
Pont	850	10 ans	Act	1347.95	276.84	286.42		286.74	0.000445	2.54	564.60	87.51	0.29
Pont	850	10 ans	nat	1347.95	276.84	285.57		285.98	0.000667	2.88	490.77	85.35	0.35
Pont	850	20 ans	Act	1430.86	276.84	286.73		287.06	0.000439	2.59	591.26	88.83	0.29
Pont	850	20 ans	nat	1430.86	276.84	285.80		286.24	0.000669	2.95	510.86	85.80	0.35
Pont	850	25 ans	Act	1455.73	276.84	286.82		287.15	0.000437	2.60	599.36	89.23	0.29
Pont	850	25 ans	nat	1455.73	276.84	285.87		286.31	0.000671	2.97	516.63	85.93	0.35
Pont	850	50 ans	Act	1530.74	276.84	287.08		287.43	0.000432	2.64	623.32	90.54	0.29
Pont	850	50 ans	nat	1530.74	276.84	286.07		286.53	0.000673	3.03	534.08	86.35	0.35
Pont	850	100 ans	Act	1602.44	276.84	287.34		287.69	0.000426	2.68	646.64	92.63	0.29
Pont	850	100 ans	nat	1602.44	276.84	286.26		286.73	0.000677	3.09	550.18	86.96	0.36
Pont	840	2 ans	Act	1096.76	276.85	285.38		285.66	0.000472	2.39	479.69	85.20	0.29
Pont	840	2 ans	nat	1096.76	276.85	284.73		285.09	0.000667	2.66	425.15	83.84	0.34
Pont	840	10 ans	Act	1347.95	276.85	286.40		286.71	0.000438	2.52	567.85	87.72	0.29
Pont	840	10 ans	nat	1347.95	276.85	285.53		285.94	0.000661	2.86	492.59	85.49	0.35
Pont	840	20 ans	Act	1430.86	276.85	286.70		287.03	0.000432	2.57	594.63	89.01	0.29
Pont	840	20 ans	nat	1430.86	276.85	285.76		286.19	0.000663	2.93	512.71	85.95	0.35
Pont	840	25 ans	Act	1455.73	276.85	286.79		287.12	0.000430	2.58	602.76	89.40	0.29
Pont	840	25 ans	nat	1455.73	276.85	285.83		286.27	0.000664	2.96	518.49	86.08	0.35
Pont	840	50 ans	Act	1530.74	276.85	287.06		287.40	0.000425	2.62	626.78	90.55	0.29
Pont	840	50 ans	nat	1530.74	276.85	286.03		286.49	0.000667	3.02	535.98	86.53	0.35
Pont	840	100 ans	Act	1602.44	276.85	287.32		287.66	0.000419	2.66	650.13	92.35	0.29
Pont	840	100 ans	nat	1602.44	276.85	286.22		286.69	0.000671	3.07	552.10	87.03	0.35
Pont	830	2 ans	Act	1096.76	276.85	285.35		285.63	0.000472	2.38	479.63	84.89	0.29
Pont	830	2 ans	nat	1096.76	276.85	284.69		285.04	0.000673	2.66	424.09	83.22	0.34
Pont	830	10 ans	Act	1347.95	276.85	286.37		286.69	0.000437	2.52	567.68	87.39	0.29
Pont	830	10 ans	nat	1347.95	276.85	285.48		285.90	0.000665	2.87	491.32	85.15	0.35
Pont	830	20 ans	Act	1430.86	276.85	286.67		287.00	0.000431	2.56	594.39	88.67	0.29
Pont	830	20 ans	nat	1430.86	276.85	285.72		286.15	0.000668	2.94	511.35	85.61	0.35
Pont	830	25 ans	Act	1455.73	276.85	286.77		287.09	0.000429	2.58	602.51	89.07	0.29
Pont	830	25 ans	nat	1455.73	276.85	285.78		286.22	0.000669	2.96	517.10	85.74	0.35
Pont	830	50 ans	Act	1530.74	276.85	287.03		287.37	0.000424	2.62	626.48	90.19	0.29
Pont	830	50 ans	nat	1530.74	276.85	285.99		286.44	0.000672	3.02	534.50	86.14	0.35
Pont	830	100 ans	Act	1602.44	276.85	287.29		287.64	0.000419	2.65	649.74	91.52	0.29
Pont	830	100 ans	nat	1602.44	276.85	286.17		286.65	0.000675	3.08	550.53	86.56	0.36
Pont	820	2 ans	Act	1096.76	276.86	285.32		285.60	0.000461	2.36	483.59	84.38	0.29
Pont	820	2 ans	nat	1096.76	276.86	284.65		285.00	0.000661	2.63	427.34	82.47	0.34
Pont	820	10 ans	Act	1347.95	276.86	286.35		286.66	0.000428	2.49	571.45	87.18	0.28
Pont	820	10 ans	nat	1347.95	276.86	285.44		285.85	0.000654	2.84	494.19	84.63	0.34
Pont	820	20 ans	Act	1430.86	276.86	286.65		286.97	0.000422	2.54	598.14	88.45	0.28
Pont	820	20 ans	nat	1430.86	276.86	285.68		286.10	0.000657	2.91	514.11	85.11	0.35
Pont	820	25 ans	Act	1455.73	276.86	286.74		287.07	0.000420	2.55	606.25	88.84	0.28
Pont	820	25 ans	nat	1455.73	276.86	285.75		286.18	0.000658	2.93	519.82	85.25	0.35
Pont	820	50 ans	Act	1530.74	276.86	287.01		287.34	0.000415	2.59	630.19	89.97	0.28
Pont	820	50 ans	nat	1530.74	276.86	285.95		286.40	0.000661	2.99	537.12	85.70	0.35
Pont	820	100 ans	Act	1602.44	276.86	287.27		287.61	0.000410	2.63	653.43	91.06	0.28
Pont	820	100 ans	nat	1602.44	276.86	286.13		286.60	0.000665	3.05	553.06	86.36	0.35
Pont	810	2 ans	Act	1096.76	276.80	285.30		285.57	0.000443	2.31	491.33	84.51	0.28
Pont	810	2 ans	nat	1096.76	276.80	284.61		284.95	0.000639	2.59	433.94	82.48	0.33

HEC-RAS River: River237 Reach: Pont (Continued)

Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Pont	810	10 ans	Act	1347.95	276.80	286.33		286.63	0.000411	2.45	579.77	87.78	0.28
Pont	810	10 ans	nat	1347.95	276.80	285.41		285.80	0.000632	2.79	500.99	84.74	0.34
Pont	810	20 ans	Act	1430.86	276.80	286.63		286.94	0.000406	2.49	606.69	89.06	0.28
Pont	810	20 ans	nat	1430.86	276.80	285.65		286.06	0.000635	2.86	520.95	85.29	0.34
Pont	810	25 ans	Act	1455.73	276.80	286.72		287.03	0.000404	2.51	614.87	89.45	0.28
Pont	810	25 ans	nat	1455.73	276.80	285.71		286.13	0.000636	2.88	526.67	85.46	0.34
Pont	810	50 ans	Act	1530.74	276.80	286.99		287.31	0.000400	2.55	639.02	90.58	0.28
Pont	810	50 ans	nat	1530.74	276.80	285.91		286.35	0.000639	2.94	544.03	86.05	0.34
Pont	810	100 ans	Act	1602.44	276.80	287.25		287.58	0.000395	2.58	662.46	91.66	0.28
Pont	810	100 ans	nat	1602.44	276.80	286.10		286.55	0.000643	3.00	560.06	86.82	0.35
Pont	796	2 ans	Act	1096.76	276.40	285.27		285.54	0.000411	2.33	508.68	86.20	0.27
Pont	796	2 ans	nat	1096.76	276.40	284.57		284.91	0.000586	2.61	448.98	84.76	0.32
Pont	796	10 ans	Act	1347.95	276.40	286.30		286.60	0.000388	2.48	599.18	89.67	0.27
Pont	796	10 ans	nat	1347.95	276.40	285.37		285.76	0.000591	2.83	517.43	86.40	0.33
Pont	796	20 ans	Act	1430.86	276.40	286.61		286.91	0.000385	2.52	626.71	90.93	0.27
Pont	796	20 ans	nat	1430.86	276.40	285.61		286.02	0.000596	2.90	537.77	87.01	0.33
Pont	796	25 ans	Act	1455.73	276.40	286.70		287.01	0.000384	2.54	635.07	91.31	0.27
Pont	796	25 ans	nat	1455.73	276.40	285.67		286.09	0.000598	2.92	543.60	87.21	0.33
Pont	796	50 ans	Act	1530.74	276.40	286.97		287.29	0.000381	2.58	659.75	92.42	0.27
Pont	796	50 ans	nat	1530.74	276.40	285.87		286.31	0.000603	2.98	561.30	87.91	0.34
Pont	796	100 ans	Act	1602.44	276.40	287.22		287.55	0.000377	2.62	683.70	93.49	0.27
Pont	796	100 ans	nat	1602.44	276.40	286.06		286.51	0.000609	3.04	577.65	88.67	0.34
Pont	793.6	2 ans	Act	1096.76	276.18	285.24		285.53	0.000462	2.43	492.19	86.76	0.29
Pont	793.6	2 ans	nat	1096.76	276.18	284.53		284.90	0.000673	2.74	431.04	85.23	0.34
Pont	793.6	10 ans	Act	1347.95	276.18	286.28		286.59	0.000431	2.57	583.58	90.45	0.29
Pont	793.6	10 ans	nat	1347.95	276.18	285.33		285.76	0.000669	2.95	499.85	87.00	0.35
Pont	793.6	20 ans	Act	1430.86	276.18	286.58		286.91	0.000425	2.61	611.38	91.71	0.29
Pont	793.6	20 ans	nat	1430.86	276.18	285.57		286.01	0.000672	3.02	520.30	87.56	0.35
Pont	793.6	25 ans	Act	1455.73	276.18	286.67		287.01	0.000424	2.63	619.82	92.09	0.29
Pont	793.6	25 ans	nat	1455.73	276.18	285.63		286.08	0.000674	3.04	526.15	87.78	0.35
Pont	793.6	50 ans	Act	1530.74	276.18	286.94		287.28	0.000419	2.67	644.74	93.20	0.29
Pont	793.6	50 ans	nat	1530.74	276.18	285.83		286.30	0.000678	3.10	543.95	88.62	0.35
Pont	793.6	100 ans	Act	1602.44	276.18	287.20		287.55	0.000414	2.70	668.93	94.27	0.28
Pont	793.6	100 ans	nat	1602.44	276.18	286.02		286.50	0.000683	3.16	560.40	89.38	0.36
Pont	792.1	2 ans	Act	1096.76	276.04	285.21		285.53	0.000519	2.56	472.50	86.47	0.31
Pont	792.1	2 ans	nat	1096.76	276.04	284.48		284.90	0.000767	2.89	410.19	84.90	0.36
Pont	792.1	10 ans	Act	1347.95	276.04	286.24		286.59	0.000478	2.69	563.72	90.24	0.30
Pont	792.1	10 ans	nat	1347.95	276.04	285.28		285.75	0.000756	3.11	478.53	86.61	0.37
Pont	792.1	20 ans	Act	1430.86	276.04	286.55		286.91	0.000471	2.73	591.46	91.52	0.30
Pont	792.1	20 ans	nat	1430.86	276.04	285.51		286.00	0.000759	3.18	498.79	87.32	0.37
Pont	792.1	25 ans	Act	1455.73	276.04	286.64		287.00	0.000469	2.74	599.89	91.89	0.30
Pont	792.1	25 ans	nat	1455.73	276.04	285.58		286.08	0.000760	3.20	504.60	87.56	0.37
Pont	792.1	50 ans	Act	1530.74	276.04	286.91		287.28	0.000463	2.78	624.76	93.01	0.30
Pont	792.1	50 ans	nat	1530.74	276.04	285.78		286.29	0.000764	3.26	522.26	88.32	0.38
Pont	792.1	100 ans	Act	1602.44	276.04	287.17		287.54	0.000457	2.82	648.91	94.08	0.30
Pont	792.1	100 ans	nat	1602.44	276.04	285.96		286.50	0.000768	3.32	538.56	89.08	0.38
Pont	790	2 ans	Act	1096.76	276.34	285.15		285.52	0.000641	2.74	440.85	86.38	0.34
Pont	790	2 ans	nat	1096.76	276.34	284.39		284.89	0.000992	3.14	375.76	84.74	0.41
Pont	790	10 ans	Act	1347.95	276.34	286.19		286.58	0.000573	2.85	532.66	90.42	0.33
Pont	790	10 ans	nat	1347.95	276.34	285.19		285.74	0.000948	3.34	444.08	86.48	0.41
Pont	790	20 ans	Act	1430.86	276.34	286.50		286.90	0.000560	2.89	560.55	91.69	0.32
Pont	790	20 ans	nat	1430.86	276.34	285.42		285.99	0.000945	3.41	464.31	87.26	0.41
Pont	790	25 ans	Act	1455.73	276.34	286.59		286.99	0.000556	2.90	569.04	92.07	0.32
Pont	790	25 ans	nat	1455.73	276.34	285.49		286.06	0.000945	3.43	470.09	87.50	0.41
Pont	790	50 ans	Act	1530.74	276.34	286.86		287.27	0.000545	2.94	594.04	93.20	0.32
Pont	790	50 ans	nat	1530.74	276.34	285.69		286.28	0.000943	3.50	487.72	88.33	0.41
Pont	790	100 ans	Act	1602.44	276.34	287.12		287.54	0.000535	2.97	618.32	94.27	0.32
Pont	790	100 ans	nat	1602.44	276.34	285.88		286.49	0.000944	3.56	503.98	89.09	0.42
Pont	780	2 ans	Act	1096.76	276.49	285.10		285.52	0.000741	2.91	414.63	84.46	0.36
Pont	780	2 ans	nat	1096.76	276.49	284.31		284.88	0.001177	3.37	349.02	80.15	0.45
Pont	780	10 ans	Act	1347.95	276.49	286.14		286.58	0.000653	3.02	504.58	88.50	0.35
Pont	780	10 ans	nat	1347.95	276.49	285.10		285.73	0.001119	3.58	414.71	84.46	0.45
Pont	780	20 ans	Act	1430.86	276.49	286.45		286.89	0.000636	3.06	531.88	89.76	0.35
Pont	780	20 ans	nat	1430.86	276.49	285.33		285.98	0.001111	3.65	434.29	85.14	0.45
Pont	780	25 ans	Act	1455.73	276.49	286.54		286.99	0.000631	3.07	540.19	90.15	0.35
Pont	780	25 ans	nat	1455.73	276.49	285.40		286.05	0.001111	3.67	439.88	85.41	0.45
Pont	780	50 ans	Act	1530.74	276.49	286.81		287.27	0.000618	3.10	564.67	91.26	0.34
Pont	780	50 ans	nat	1530.74	276.49	285.60		286.27	0.001106	3.74	456.93	86.23	0.45
Pont	780	100 ans	Act	1602.44	276.49	287.07		287.53	0.000604	3.13	588.47	92.33	0.34
Pont	780	100 ans	nat	1602.44	276.49	285.78		286.48	0.001105	3.80	472.65	86.98	0.45
Pont	770	2 ans	Act	1096.76	276.91	284.97		285.50	0.001035	3.27	366.44	82.33	0.42
Pont	770	2 ans	nat	1096.76	276.91	284.09		284.85	0.001794	3.89	298.15	73.26	0.54
Pont	770	10 ans	Act	1347.95	276.91	286.03		286.57	0.000870	3.34	455.50	86.57	0.40
Pont	770	10 ans	nat	1347.95	276.91	284.87		285.70	0.001663	4.10	358.01	81.97	0.54
Pont	770	20 ans	Act	1430.86	276.91	286.33		286.88	0.000839	3.37	482.43	87.84	0.39
Pont	770	20 ans	nat	1430.86	276.91	285.10		285.96	0.001633	4.17	376.95	82.79	0.53
Pont	770	25 ans	Act	1455.73	276.91	286.43		286.98	0.000830	3.38	490.63	88.23	0.39

HEC-RAS River: River237 Reach: Pont (Continued)

Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Pont	770	25 ans	nat	1455.73	276.91	285.16		286.03	0.001628	4.19	382.33	83.04	0.53
Pont	770	50 ans	Act	1530.74	276.91	286.70		287.26	0.000805	3.41	514.77	89.35	0.39
Pont	770	50 ans	nat	1530.74	276.91	285.36		286.25	0.001607	4.25	398.85	83.82	0.53
Pont	770	100 ans	Act	1602.44	276.91	286.96		287.52	0.000781	3.44	538.26	90.43	0.39
Pont	770	100 ans	nat	1602.44	276.91	285.54		286.45	0.001593	4.31	414.00	84.56	0.53
Pont	760	2 ans	Act	1096.76	277.03	284.93		285.49	0.001065	3.35	351.55	77.58	0.43
Pont	760	2 ans	nat	1096.76	277.03	284.05		284.84	0.001832	3.96	287.54	67.73	0.55
Pont	760	10 ans	Act	1347.95	277.03	285.98		286.56	0.000909	3.43	438.25	85.46	0.41
Pont	760	10 ans	nat	1347.95	277.03	284.80		285.69	0.001736	4.21	341.43	75.84	0.55
Pont	760	20 ans	Act	1430.86	277.03	286.29		286.87	0.000877	3.47	464.81	86.74	0.40
Pont	760	20 ans	nat	1430.86	277.03	285.02		285.94	0.001727	4.30	358.16	78.86	0.55
Pont	760	25 ans	Act	1455.73	277.03	286.38		286.97	0.000867	3.48	472.90	87.12	0.40
Pont	760	25 ans	nat	1455.73	277.03	285.08		286.01	0.001727	4.33	363.01	79.78	0.55
Pont	760	50 ans	Act	1530.74	277.03	286.65		287.25	0.000841	3.51	496.74	88.25	0.40
Pont	760	50 ans	nat	1530.74	277.03	285.27		286.23	0.001720	4.40	378.31	82.55	0.55
Pont	760	100 ans	Act	1602.44	277.03	286.92		287.51	0.000817	3.53	519.95	89.32	0.40
Pont	760	100 ans	nat	1602.44	277.03	285.44		286.43	0.001708	4.47	392.93	83.24	0.55
Pont	750	2 ans	Act	1096.76	276.96	284.83		285.43	0.001150	3.47	331.39	72.26	0.45
Pont	750	2 ans	nat	1096.76	276.96	283.86		284.73	0.002070	4.16	267.95	59.47	0.58
Pont	750	10 ans	Act	1347.95	276.96	285.87		286.51	0.000988	3.57	414.62	83.31	0.43
Pont	750	10 ans	nat	1347.95	276.96	284.58		285.59	0.001998	4.46	314.26	68.65	0.59
Pont	750	20 ans	Act	1430.86	276.96	286.19		286.83	0.000951	3.61	440.86	84.61	0.42
Pont	750	20 ans	nat	1430.86	276.96	284.79		285.84	0.001999	4.56	328.70	71.68	0.59
Pont	750	25 ans	Act	1455.73	276.96	286.28		286.92	0.000941	3.62	448.80	84.99	0.42
Pont	750	25 ans	nat	1455.73	276.96	284.85		285.91	0.002002	4.59	332.86	72.56	0.59
Pont	750	50 ans	Act	1530.74	276.96	286.55		287.20	0.000912	3.65	472.16	86.13	0.41
Pont	750	50 ans	nat	1530.74	276.96	285.02		286.13	0.002004	4.68	346.02	75.43	0.59
Pont	750	100 ans	Act	1602.44	276.96	286.82		287.47	0.000884	3.67	494.96	87.21	0.41
Pont	750	100 ans	nat	1602.44	276.96	285.19		286.33	0.002010	4.77	358.45	78.12	0.60
Pont	740	2 ans	Act	1096.76	276.88	284.70		285.37	0.001304	3.64	312.52	64.64	0.47
Pont	740	2 ans	nat	1096.76	276.88	283.56		284.60	0.002655	4.52	244.64	54.95	0.65
Pont	740	10 ans	Act	1347.95	276.88	285.74		286.45	0.001123	3.76	386.60	75.89	0.45
Pont	740	10 ans	nat	1347.95	276.88	284.27		285.46	0.002534	4.83	285.81	60.79	0.65
Pont	740	20 ans	Act	1430.86	276.88	286.06		286.77	0.001082	3.80	410.50	77.19	0.45
Pont	740	20 ans	nat	1430.86	276.88	284.46		285.70	0.002544	4.95	297.65	62.36	0.66
Pont	740	25 ans	Act	1455.73	276.88	286.15		286.87	0.001070	3.81	417.74	77.58	0.44
Pont	740	25 ans	nat	1455.73	276.88	284.51		285.78	0.002553	4.99	300.92	62.80	0.66
Pont	740	50 ans	Act	1530.74	276.88	286.42		287.15	0.001038	3.84	439.05	78.71	0.44
Pont	740	50 ans	nat	1530.74	276.88	284.68		285.99	0.002568	5.10	311.28	64.44	0.66
Pont	740	100 ans	Act	1602.44	276.88	286.68		287.42	0.001006	3.87	459.88	79.80	0.44
Pont	740	100 ans	nat	1602.44	276.88	284.82		286.19	0.002592	5.21	320.73	65.96	0.67
Pont	730	2 ans	Act	1096.76	276.24	284.64		285.30	0.001292	3.61	319.05	65.31	0.47
Pont	730	2 ans	nat	1096.76	276.24	283.36		284.46	0.002922	4.63	239.65	56.95	0.68
Pont	730	10 ans	Act	1347.95	276.24	285.70		286.39	0.001107	3.72	389.79	68.71	0.44
Pont	730	10 ans	nat	1347.95	276.24	284.11		285.32	0.002692	4.90	284.53	63.31	0.66
Pont	730	20 ans	Act	1430.86	276.24	286.01		286.71	0.001072	3.76	411.36	70.01	0.44
Pont	730	20 ans	nat	1430.86	276.24	284.31		285.57	0.002685	5.01	297.24	64.70	0.67
Pont	730	25 ans	Act	1455.73	276.24	286.11		286.81	0.001061	3.77	417.90	70.40	0.44
Pont	730	25 ans	nat	1455.73	276.24	284.36		285.64	0.002689	5.04	300.75	64.80	0.67
Pont	730	50 ans	Act	1530.74	276.24	286.38		287.09	0.001035	3.82	437.14	71.53	0.44
Pont	730	50 ans	nat	1530.74	276.24	284.53		285.86	0.002684	5.14	311.88	65.11	0.67
Pont	730	100 ans	Act	1602.44	276.24	286.64		287.37	0.001008	3.85	455.98	72.62	0.43
Pont	730	100 ans	nat	1602.44	276.24	284.68		286.06	0.002695	5.23	321.70	65.38	0.68
Pont	720	2 ans	Act	1096.76	275.89	284.63		285.22	0.001132	3.41	336.46	67.76	0.44
Pont	720	2 ans	nat	1096.76	275.89	283.31		284.29	0.002590	4.40	251.91	58.27	0.64
Pont	720	10 ans	Act	1347.95	275.89	285.70		286.32	0.000975	3.52	410.25	70.90	0.42
Pont	720	10 ans	nat	1347.95	275.89	284.07		285.17	0.002377	4.65	299.10	64.78	0.62
Pont	720	20 ans	Act	1430.86	275.89	286.02		286.64	0.000946	3.57	432.66	72.21	0.41
Pont	720	20 ans	nat	1430.86	275.89	284.28		285.42	0.002373	4.75	312.32	66.58	0.63
Pont	720	25 ans	Act	1455.73	275.89	286.11		286.74	0.000938	3.58	439.45	72.61	0.41
Pont	720	25 ans	nat	1455.73	275.89	284.33		285.49	0.002379	4.79	315.97	67.21	0.63
Pont	720	50 ans	Act	1530.74	275.89	286.38		287.03	0.000916	3.62	459.42	73.75	0.41
Pont	720	50 ans	nat	1530.74	275.89	284.50		285.70	0.002374	4.88	327.74	67.53	0.63
Pont	720	100 ans	Act	1602.44	275.89	286.64		287.30	0.000893	3.66	478.95	74.85	0.41
Pont	720	100 ans	nat	1602.44	275.89	284.66		285.90	0.002383	4.97	338.13	67.81	0.64
Pont	715*	2 ans	Act	1096.76	275.80	284.58		285.21	0.001107	3.64	359.90	91.06	0.44
Pont	715*	2 ans	nat	1096.76	275.80	283.02	281.93	284.25	0.002896	4.96	237.39	66.16	0.68
Pont	715*	10 ans	Act	1347.95	275.80	285.70		286.31	0.000916	3.66	473.96	112.43	0.41
Pont	715*	10 ans	nat	1347.95	275.80	283.83	282.64	285.13	0.002603	5.17	295.98	78.65	0.66
Pont	715*	20 ans	Act	1430.86	275.80	286.03		286.63	0.000864	3.65	511.63	113.72	0.40
Pont	715*	20 ans	nat	1430.86	275.80	284.04	282.90	285.38	0.002581	5.26	312.97	82.02	0.67
Pont	715*	25 ans	Act	1455.73	275.80	286.13		286.72	0.000848	3.65	522.97	113.72	0.40
Pont	715*	25 ans	nat	1455.73	275.80	284.09	282.96	285.45	0.002591	5.30	317.34	83.26	0.67
Pont	715*	50 ans	Act	1530.74	275.80	286.42		287.00	0.000808	3.64	555.87	113.72	0.39
Pont	715*	50 ans	nat	1530.74	275.80	284.28	283.15	285.67	0.002561	5.37	333.35	86.13	0.67
Pont	715*	100 ans	Act	1602.44	275.80	286.70		287.27	0.000771	3.63	587.43	113.72	0.39
Pont	715*	100 ans	nat	1602.44	275.80	284.45	283.36	285.87	0.002550	5.45	347.82	88.83	0.67

HEC-RAS River: River237 Reach: Pont (Continued)

Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Pont	710	2 ans	Act	1096.76	276.06	283.31	282.91	285.09	0.003558	6.16	217.26	62.89	0.78
Pont	710	2 ans	nat	1096.76	276.06	282.06	282.06	284.15	0.005229	6.52	186.47	52.66	0.92
Pont	710	10 ans	Act	1347.95	276.06	284.94	283.85	286.23	0.002081	5.48	336.50	84.99	0.62
Pont	710	10 ans	nat	1347.95	276.06	282.91	282.91	285.03	0.004431	6.66	239.15	70.47	0.87
Pont	710	20 ans	Act	1430.86	276.06	285.29	284.03	286.55	0.001947	5.46	367.62	91.02	0.60
Pont	710	20 ans	nat	1430.86	276.06	283.11	283.11	285.28	0.004385	6.77	253.65	74.11	0.87
Pont	710	25 ans	Act	1455.73	276.06	285.40	284.06	286.65	0.001906	5.45	377.47	92.82	0.60
Pont	710	25 ans	nat	1455.73	276.06	283.21	283.21	285.36	0.004280	6.76	260.54	75.79	0.86
Pont	710	50 ans	Act	1530.74	276.06	285.71	284.25	286.93	0.001796	5.42	407.55	96.69	0.59
Pont	710	50 ans	nat	1530.74	276.06	283.39	283.39	285.57	0.004217	6.84	274.75	79.22	0.86
Pont	710	100 ans	Act	1602.44	276.06	286.06	284.34	287.21	0.001633	5.30	441.79	98.77	0.56
Pont	710	100 ans	nat	1602.44	276.06	283.58	283.58	285.77	0.004111	6.88	290.11	82.84	0.86
Pont	700			Bridge									
Pont	695.31*	2 ans	nat	1096.76	275.62	279.25	280.58	283.59	0.022622	9.23	118.92	43.03	1.75
Pont	695.31*	10 ans	nat	1347.95	275.62	279.74	281.20	284.48	0.019990	9.66	140.65	45.64	1.69
Pont	695.31*	20 ans	nat	1430.86	275.62	279.90	281.42	284.74	0.019099	9.75	148.35	46.74	1.67
Pont	695.31*	25 ans	nat	1455.73	275.62	279.95	281.41	284.81	0.018811	9.77	150.77	47.07	1.66
Pont	695.31*	50 ans	nat	1530.74	275.62	280.10	281.63	285.04	0.018109	9.85	157.81	48.11	1.64
Pont	695.31*	100 ans	nat	1602.44	275.62	280.25	281.88	285.24	0.017442	9.92	164.74	49.08	1.62
Pont	680.61*	2 ans	Act	1096.76	275.18	279.18	279.92	282.17	0.012413	7.66	143.65	44.25	1.33
Pont	680.61*	2 ans	nat	1096.76	275.18	277.98	279.36	282.63	0.031360	9.56	114.75	49.56	2.01
Pont	680.61*	10 ans	Act	1347.95	275.18	279.18	280.54	283.70	0.018722	9.41	143.71	44.25	1.63
Pont	680.61*	10 ans	nat	1347.95	275.18	278.34	279.90	283.58	0.030301	10.14	132.90	51.03	2.01
Pont	680.61*	20 ans	Act	1430.86	275.18	279.32	280.71	284.03	0.018583	9.61	149.53	44.79	1.64
Pont	680.61*	20 ans	nat	1430.86	275.18	278.46	280.08	283.86	0.029820	10.30	138.99	51.52	2.00
Pont	680.61*	25 ans	Act	1455.73	275.18	279.35	280.81	284.12	0.018560	9.68	151.22	44.95	1.64
Pont	680.61*	25 ans	nat	1455.73	275.18	278.49	280.11	283.94	0.029647	10.34	140.85	51.67	2.00
Pont	680.61*	50 ans	Act	1530.74	275.18	279.47	281.02	284.42	0.018474	9.86	156.33	45.39	1.64
Pont	680.61*	50 ans	nat	1530.74	275.18	278.60	280.26	284.18	0.029234	10.46	146.30	52.10	1.99
Pont	680.61*	100 ans	Act	1602.44	275.18	279.57	281.20	284.69	0.018423	10.03	161.09	45.78	1.65
Pont	680.61*	100 ans	nat	1602.44	275.18	278.70	280.41	284.40	0.028636	10.58	151.52	52.51	1.98
Pont	670	2 ans	Act	1096.76	274.86	280.69	278.57	281.27	0.001303	3.40	338.90	96.90	0.47
Pont	670	2 ans	nat	1096.76	274.86	280.69	278.57	281.27	0.001303	3.40	338.90	96.90	0.47
Pont	670	10 ans	Act	1347.95	274.86	281.23	279.06	281.93	0.001382	3.73	393.99	101.93	0.49
Pont	670	10 ans	nat	1347.95	274.86	281.23	279.06	281.93	0.001382	3.73	393.99	101.93	0.49
Pont	670	20 ans	Act	1430.86	274.86	277.58	279.23	283.29	0.036782	10.59	135.17	56.48	2.19
Pont	670	20 ans	nat	1430.86	274.86	281.41	279.23	282.13	0.001399	3.83	411.53	102.30	0.50
Pont	670	25 ans	Act	1455.73	274.86	277.60	279.28	283.39	0.036798	10.65	136.67	56.59	2.19
Pont	670	25 ans	nat	1455.73	274.86	281.46	279.28	282.19	0.001404	3.86	416.69	102.41	0.50
Pont	670	50 ans	Act	1530.74	274.86	277.68	279.40	283.68	0.036831	10.84	141.15	56.90	2.20
Pont	670	50 ans	nat	1530.74	274.86	281.61	279.40	282.37	0.001416	3.94	432.33	102.66	0.50
Pont	670	100 ans	Act	1602.44	274.86	277.75	279.54	283.95	0.036882	11.02	145.35	57.20	2.21
Pont	670	100 ans	nat	1602.44	274.86	277.85	279.54	283.62	0.033072	10.64	150.61	57.56	2.10
Pont	660	2 ans	Act	1096.76	274.87	280.78		281.14	0.000814	2.68	429.07	108.31	0.37
Pont	660	2 ans	nat	1096.76	274.87	280.78		281.14	0.000814	2.68	429.07	108.31	0.37
Pont	660	10 ans	Act	1347.95	274.87	281.35		281.78	0.000851	2.94	491.40	109.70	0.39
Pont	660	10 ans	nat	1347.95	274.87	281.35		281.78	0.000851	2.94	491.40	109.70	0.39
Pont	660	20 ans	Act	1430.86	274.87	281.53	278.78	281.98	0.000861	3.01	511.09	110.14	0.39
Pont	660	20 ans	nat	1430.86	274.87	281.53		281.98	0.000861	3.01	511.09	110.14	0.39
Pont	660	25 ans	Act	1455.73	274.87	281.58	278.82	282.04	0.000863	3.03	516.89	110.26	0.39
Pont	660	25 ans	nat	1455.73	274.87	281.58		282.04	0.000863	3.03	516.89	110.26	0.39
Pont	660	50 ans	Act	1530.74	274.87	281.74	278.93	282.22	0.000870	3.10	534.39	110.60	0.40
Pont	660	50 ans	nat	1530.74	274.87	281.74		282.22	0.000870	3.10	534.39	110.60	0.40
Pont	660	100 ans	Act	1602.44	274.87	281.89	279.06	282.38	0.000877	3.16	550.62	110.93	0.40
Pont	660	100 ans	nat	1602.44	274.87	281.89	279.06	282.38	0.000877	3.16	550.62	110.93	0.40
Pont	657.4	2 ans	Act	1096.76	274.88	280.89		281.04	0.000346	1.73	652.15	138.94	0.24
Pont	657.4	2 ans	nat	1096.76	274.88	280.89		281.04	0.000346	1.73	652.15	138.94	0.24
Pont	657.4	10 ans	Act	1347.95	274.88	281.49		281.67	0.000359	1.89	735.97	141.89	0.25
Pont	657.4	10 ans	nat	1347.95	274.88	281.49		281.67	0.000359	1.89	735.97	141.89	0.25
Pont	657.4	20 ans	Act	1430.86	274.88	281.67		281.86	0.000363	1.94	762.57	142.81	0.25
Pont	657.4	20 ans	nat	1430.86	274.88	281.67		281.86	0.000363	1.94	762.57	142.81	0.25
Pont	657.4	25 ans	Act	1455.73	274.88	281.73		281.92	0.000364	1.96	770.41	143.08	0.26
Pont	657.4	25 ans	nat	1455.73	274.88	281.73		281.92	0.000364	1.96	770.41	143.08	0.26
Pont	657.4	50 ans	Act	1530.74	274.88	281.89		282.09	0.000366	2.00	794.11	143.88	0.26
Pont	657.4	50 ans	nat	1530.74	274.88	281.89		282.09	0.000366	2.00	794.11	143.88	0.26
Pont	657.4	100 ans	Act	1602.44	274.88	282.05		282.25	0.000369	2.04	816.15	144.63	0.26
Pont	657.4	100 ans	nat	1602.44	274.88	282.05		282.25	0.000369	2.04	816.15	144.63	0.26
Pont	653.6	2 ans	Act	1096.76	274.86	280.59		280.95	0.000908	2.67	428.97	100.90	0.39
Pont	653.6	2 ans	nat	1096.76	274.86	280.59		280.95	0.000908	2.67	428.97	100.90	0.39
Pont	653.6	10 ans	Act	1347.95	274.86	281.15		281.57	0.000942	2.92	485.21	103.12	0.40
Pont	653.6	10 ans	nat	1347.95	274.86	281.15		281.57	0.000942	2.92	485.21	103.12	0.40
Pont	653.6	20 ans	Act	1430.86	274.86	281.32		281.76	0.000952	3.00	503.06	103.90	0.41
Pont	653.6	20 ans	nat	1430.86	274.86	281.32		281.76	0.000952	3.00	503.06	103.90	0.41
Pont	653.6	25 ans	Act	1455.73	274.86	281.37		281.82	0.000955	3.02	508.31	104.13	0.41
Pont	653.6	25 ans	nat	1455.73	274.86	281.37		281.82	0.000955	3.02	508.31	104.13	0.41

HEC-RAS River: River237 Reach: Pont (Continued)

Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Pont	653.6	50 ans	Act	1530.74	274.86	281.52		281.99	0.000961	3.09	524.27	104.82	0.41
Pont	653.6	50 ans	nat	1530.74	274.86	281.52		281.99	0.000961	3.09	524.27	104.82	0.41
Pont	653.6	100 ans	Act	1602.44	274.86	281.66		282.15	0.000969	3.15	539.07	105.44	0.42
Pont	653.6	100 ans	nat	1602.44	274.86	281.66		282.15	0.000969	3.15	539.07	105.44	0.42
Pont	643.6	2 ans	Act	1096.76	274.85	280.42		280.85	0.001199	2.95	391.44	100.49	0.44
Pont	643.6	2 ans	nat	1096.76	274.85	280.42		280.85	0.001199	2.95	391.44	100.49	0.44
Pont	643.6	10 ans	Act	1347.95	274.85	280.96		281.47	0.001222	3.21	446.63	103.39	0.46
Pont	643.6	10 ans	nat	1347.95	274.85	280.96		281.47	0.001222	3.21	446.63	103.39	0.46
Pont	643.6	20 ans	Act	1430.86	274.85	281.13		281.67	0.001227	3.29	464.29	104.14	0.46
Pont	643.6	20 ans	nat	1430.86	274.85	281.13		281.67	0.001227	3.29	464.29	104.14	0.46
Pont	643.6	25 ans	Act	1455.73	274.85	281.18		281.72	0.001228	3.31	469.49	104.35	0.46
Pont	643.6	25 ans	nat	1455.73	274.85	281.18		281.72	0.001228	3.31	469.49	104.35	0.46
Pont	643.6	50 ans	Act	1530.74	274.85	281.33		281.90	0.001230	3.38	485.30	104.96	0.46
Pont	643.6	50 ans	nat	1530.74	274.85	281.33		281.90	0.001230	3.38	485.30	104.96	0.46
Pont	643.6	100 ans	Act	1602.44	274.85	281.47		282.05	0.001234	3.44	499.94	105.45	0.46
Pont	643.6	100 ans	nat	1602.44	274.85	281.47		282.05	0.001234	3.44	499.94	105.45	0.46
Pont	641.3	2 ans	Act	1096.76	274.73	280.29		280.74	0.001275	3.00	378.15	97.28	0.45
Pont	641.3	2 ans	nat	1096.76	274.73	280.29		280.74	0.001275	3.00	378.15	97.28	0.45
Pont	641.3	10 ans	Act	1347.95	274.73	280.82		281.36	0.001303	3.28	431.25	101.48	0.47
Pont	641.3	10 ans	nat	1347.95	274.73	280.82		281.36	0.001303	3.28	431.25	101.48	0.47
Pont	641.3	20 ans	Act	1430.86	274.73	280.99		281.55	0.001310	3.36	448.25	102.68	0.47
Pont	641.3	20 ans	nat	1430.86	274.73	280.99		281.55	0.001310	3.36	448.25	102.68	0.47
Pont	641.3	25 ans	Act	1455.73	274.73	281.04		281.61	0.001312	3.38	453.31	103.02	0.47
Pont	641.3	25 ans	nat	1455.73	274.73	281.04		281.61	0.001312	3.38	453.31	103.02	0.47
Pont	641.3	50 ans	Act	1530.74	274.73	281.19		281.78	0.001315	3.45	468.81	104.04	0.48
Pont	641.3	50 ans	nat	1530.74	274.73	281.19		281.78	0.001315	3.45	468.81	104.04	0.48
Pont	641.3	100 ans	Act	1602.44	274.73	281.33		281.94	0.001319	3.51	483.18	104.90	0.48
Pont	641.3	100 ans	nat	1602.44	274.73	281.33		281.94	0.001319	3.51	483.18	104.90	0.48
Pont	640.6	2 ans	Act	1096.76	274.66	280.16		280.64	0.001380	3.09	365.87	94.93	0.47
Pont	640.6	2 ans	nat	1096.76	274.66	280.16		280.64	0.001380	3.09	365.87	94.93	0.47
Pont	640.6	10 ans	Act	1347.95	274.66	280.69		281.26	0.001411	3.37	417.00	99.08	0.49
Pont	640.6	10 ans	nat	1347.95	274.66	280.69		281.26	0.001411	3.37	417.00	99.08	0.49
Pont	640.6	20 ans	Act	1430.86	274.66	280.85		281.45	0.001418	3.45	433.40	100.38	0.49
Pont	640.6	20 ans	nat	1430.86	274.66	280.85		281.45	0.001418	3.45	433.40	100.38	0.49
Pont	640.6	25 ans	Act	1455.73	274.66	280.90		281.51	0.001420	3.48	438.28	100.76	0.49
Pont	640.6	25 ans	nat	1455.73	274.66	280.90		281.51	0.001420	3.48	438.28	100.76	0.49
Pont	640.6	50 ans	Act	1530.74	274.66	281.04		281.68	0.001426	3.55	452.95	101.90	0.49
Pont	640.6	50 ans	nat	1530.74	274.66	281.04		281.68	0.001426	3.55	452.95	101.90	0.49
Pont	640.6	100 ans	Act	1602.44	274.66	281.18		281.83	0.001430	3.62	466.85	102.96	0.50
Pont	640.6	100 ans	nat	1602.44	274.66	281.18		281.83	0.001430	3.62	466.85	102.96	0.50
Pont	640	2 ans	Act	1096.76	274.62	280.00		280.52	0.001560	3.21	350.05	92.95	0.50
Pont	640	2 ans	nat	1096.76	274.62	280.00		280.52	0.001560	3.21	350.05	92.95	0.50
Pont	640	10 ans	Act	1347.95	274.62	280.52		281.13	0.001590	3.50	399.01	96.88	0.51
Pont	640	10 ans	nat	1347.95	274.62	280.52		281.13	0.001590	3.50	399.01	96.88	0.51
Pont	640	20 ans	Act	1430.86	274.62	280.68		281.33	0.001596	3.59	414.79	98.10	0.52
Pont	640	20 ans	nat	1430.86	274.62	280.68		281.33	0.001596	3.59	414.79	98.10	0.52
Pont	640	25 ans	Act	1455.73	274.62	280.73		281.38	0.001598	3.62	419.49	98.47	0.52
Pont	640	25 ans	nat	1455.73	274.62	280.73		281.38	0.001598	3.62	419.49	98.47	0.52
Pont	640	50 ans	Act	1530.74	274.62	280.87		281.55	0.001602	3.69	433.63	99.57	0.52
Pont	640	50 ans	nat	1530.74	274.62	280.87		281.55	0.001602	3.69	433.63	99.57	0.52
Pont	640	100 ans	Act	1602.44	274.62	281.00		281.71	0.001606	3.76	447.02	100.61	0.52
Pont	640	100 ans	nat	1602.44	274.62	281.00		281.71	0.001606	3.76	447.02	100.61	0.52
Pont	630	2 ans	Act	1096.76	274.53	279.76		280.38	0.001965	3.50	323.77	91.23	0.56
Pont	630	2 ans	nat	1096.76	274.53	279.76		280.38	0.001965	3.50	323.77	91.23	0.56
Pont	630	10 ans	Act	1347.95	274.53	280.26		280.99	0.001985	3.80	370.48	95.03	0.57
Pont	630	10 ans	nat	1347.95	274.53	280.26		280.99	0.001985	3.80	370.48	95.03	0.57
Pont	630	20 ans	Act	1430.86	274.53	280.42		281.18	0.001987	3.89	385.60	96.23	0.57
Pont	630	20 ans	nat	1430.86	274.53	280.42		281.18	0.001987	3.89	385.60	96.23	0.57
Pont	630	25 ans	Act	1455.73	274.53	280.47		281.24	0.001987	3.91	390.11	96.58	0.57
Pont	630	25 ans	nat	1455.73	274.53	280.47		281.24	0.001987	3.91	390.11	96.58	0.57
Pont	630	50 ans	Act	1530.74	274.53	280.61		281.40	0.001986	3.99	403.69	97.63	0.58
Pont	630	50 ans	nat	1530.74	274.53	280.61		281.40	0.001986	3.99	403.69	97.63	0.58
Pont	630	100 ans	Act	1602.44	274.53	280.74		281.56	0.001985	4.06	416.58	98.63	0.58
Pont	630	100 ans	nat	1602.44	274.53	280.74		281.56	0.001985	4.06	416.58	98.63	0.58
Pont	625*	2 ans	Act	1096.76	274.28	279.41		280.20	0.002804	3.95	287.60	88.24	0.65
Pont	625*	2 ans	nat	1096.76	274.28	279.41		280.20	0.002804	3.95	287.60	88.24	0.65
Pont	625*	10 ans	Act	1347.95	274.28	279.89		280.80	0.002781	4.27	330.98	91.80	0.67
Pont	625*	10 ans	nat	1347.95	274.28	279.89		280.80	0.002781	4.27	330.98	91.80	0.67
Pont	625*	20 ans	Act	1430.86	274.28	280.05		281.00	0.002764	4.36	345.21	92.77	0.67
Pont	625*	20 ans	nat	1430.86	274.28	280.05		281.00	0.002764	4.36	345.21	92.77	0.67
Pont	625*	25 ans	Act	1455.73	274.28	280.09		281.05	0.002759	4.38	349.46	93.03	0.67
Pont	625*	25 ans	nat	1455.73	274.28	280.09		281.05	0.002759	4.38	349.46	93.03	0.67
Pont	625*	50 ans	Act	1530.74	274.28	280.23		281.22	0.002742	4.46	362.26	93.93	0.67
Pont	625*	50 ans	nat	1530.74	274.28	280.23		281.22	0.002742	4.46	362.26	93.93	0.67
Pont	625*	100 ans	Act	1602.44	274.28	280.36		281.38	0.002724	4.53	374.46	94.68	0.67
Pont	625*	100 ans	nat	1602.44	274.28	280.36		281.38	0.002724	4.53	374.46	94.68	0.67

HEC-RAS River: River237 Reach: Pont (Continued)

Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Pont	620	2 ans	Act	1096.76	273.69	278.53	278.44	279.86	0.006164	5.13	218.66	79.81	0.94
Pont	620	2 ans	nat	1096.76	273.69	278.53	278.44	279.86	0.006164	5.13	218.66	79.81	0.94
Pont	620	10 ans	Act	1347.95	273.69	279.10	278.87	280.50	0.005151	5.26	265.74	83.87	0.88
Pont	620	10 ans	nat	1347.95	273.69	279.10	278.87	280.50	0.005151	5.26	265.74	83.87	0.88
Pont	620	20 ans	Act	1430.86	273.69	279.27	279.01	280.69	0.004968	5.33	279.84	84.88	0.87
Pont	620	20 ans	nat	1430.86	273.69	279.27	279.01	280.69	0.004968	5.33	279.84	84.88	0.87
Pont	620	25 ans	Act	1455.73	273.69	279.33	279.04	280.75	0.004893	5.34	284.51	85.20	0.87
Pont	620	25 ans	nat	1455.73	273.69	279.33	279.04	280.75	0.004893	5.34	284.51	85.20	0.87
Pont	620	50 ans	Act	1530.74	273.69	279.48	279.17	280.93	0.004721	5.38	297.75	86.10	0.86
Pont	620	50 ans	nat	1530.74	273.69	279.48	279.17	280.93	0.004721	5.38	297.75	86.10	0.86
Pont	620	100 ans	Act	1602.44	273.69	279.61	279.27	281.09	0.004619	5.44	309.26	86.88	0.85
Pont	620	100 ans	nat	1602.44	273.69	279.61	279.27	281.09	0.004619	5.44	309.26	86.88	0.85
Pont	615*	2 ans	Act	1096.76	272.75	277.85	277.85	279.39	0.006607	5.51	203.29	70.71	0.98
Pont	615*	2 ans	nat	1096.76	272.75	277.85	277.85	279.39	0.006607	5.51	203.29	70.71	0.98
Pont	615*	10 ans	Act	1347.95	272.75	278.31	278.31	280.06	0.006291	5.88	237.16	74.16	0.98
Pont	615*	10 ans	nat	1347.95	272.75	278.31	278.31	280.06	0.006291	5.88	237.16	74.16	0.98
Pont	615*	20 ans	Act	1430.86	272.75	278.47	278.47	280.27	0.006147	5.98	248.83	75.08	0.97
Pont	615*	20 ans	nat	1430.86	272.75	278.47	278.47	280.27	0.006147	5.98	248.83	75.08	0.97
Pont	615*	25 ans	Act	1455.73	272.75	278.51	278.51	280.33	0.006145	6.02	251.76	75.31	0.97
Pont	615*	25 ans	nat	1455.73	272.75	278.51	278.51	280.33	0.006145	6.02	251.76	75.31	0.97
Pont	615*	50 ans	Act	1530.74	272.75	278.64	278.64	280.51	0.006072	6.11	261.51	76.04	0.97
Pont	615*	50 ans	nat	1530.74	272.75	278.64	278.64	280.51	0.006072	6.11	261.51	76.04	0.97
Pont	615*	100 ans	Act	1602.44	272.75	278.77	278.77	280.68	0.005919	6.17	272.06	76.82	0.97
Pont	615*	100 ans	nat	1602.44	272.75	278.77	278.77	280.68	0.005919	6.17	272.06	76.82	0.97
Pont	610	2 ans	Act	1096.76	271.83	276.41	276.88	278.82	0.009213	6.90	162.98	53.60	1.17
Pont	610	2 ans	nat	1096.76	271.83	276.41	276.88	278.82	0.009213	6.90	162.98	53.60	1.17
Pont	610	10 ans	Act	1347.95	271.83	277.14	277.47	279.57	0.007357	6.97	203.49	58.92	1.07
Pont	610	10 ans	nat	1347.95	271.83	277.14	277.47	279.57	0.007357	6.97	203.49	58.92	1.07
Pont	610	20 ans	Act	1430.86	271.83	277.38	277.66	279.80	0.006827	6.97	218.18	61.09	1.04
Pont	610	20 ans	nat	1430.86	271.83	277.38	277.66	279.80	0.006827	6.97	218.18	61.09	1.04
Pont	610	25 ans	Act	1455.73	271.83	277.45	277.72	279.87	0.006720	6.98	222.20	61.66	1.04
Pont	610	25 ans	nat	1455.73	271.83	277.45	277.72	279.87	0.006720	6.98	222.20	61.66	1.04
Pont	610	50 ans	Act	1530.74	271.83	277.65	277.88	280.08	0.006376	6.99	234.93	63.39	1.02
Pont	610	50 ans	nat	1530.74	271.83	277.65	277.88	280.08	0.006376	6.99	234.93	63.39	1.02
Pont	610	100 ans	Act	1602.44	271.83	277.85	278.03	280.27	0.006040	7.00	247.85	65.11	1.00
Pont	610	100 ans	nat	1602.44	271.83	277.85	278.03	280.27	0.006040	7.00	247.85	65.11	1.00
Pont	606.667*	2 ans	Act	1096.76	271.22	275.54	276.19	278.28	0.011399	7.33	150.65	48.17	1.28
Pont	606.667*	2 ans	nat	1096.76	271.22	275.54	276.19	278.28	0.011399	7.33	150.65	48.17	1.28
Pont	606.667*	10 ans	Act	1347.95	271.22	276.12	276.76	279.10	0.010064	7.66	179.07	50.58	1.24
Pont	606.667*	10 ans	nat	1347.95	271.22	276.12	276.76	279.10	0.010064	7.66	179.07	50.58	1.24
Pont	606.667*	20 ans	Act	1430.86	271.22	276.31	276.94	279.34	0.009616	7.73	188.98	51.33	1.22
Pont	606.667*	20 ans	nat	1430.86	271.22	276.31	276.94	279.34	0.009616	7.73	188.98	51.33	1.22
Pont	606.667*	25 ans	Act	1455.73	271.22	276.37	276.99	279.42	0.009506	7.76	191.85	51.52	1.21
Pont	606.667*	25 ans	nat	1455.73	271.22	276.37	276.99	279.42	0.009506	7.76	191.85	51.52	1.21
Pont	606.667*	50 ans	Act	1530.74	271.22	276.54	277.16	279.64	0.009166	7.83	200.68	52.11	1.20
Pont	606.667*	50 ans	nat	1530.74	271.22	276.54	277.16	279.64	0.009166	7.83	200.68	52.11	1.20
Pont	606.667*	100 ans	Act	1602.44	271.22	276.70	277.28	279.84	0.008858	7.88	209.21	52.74	1.19
Pont	606.667*	100 ans	nat	1602.44	271.22	276.70	277.28	279.84	0.008858	7.88	209.21	52.74	1.19
Pont	603.333*	2 ans	Act	1096.76	270.61	276.51	275.90	277.88	0.003928	5.21	215.18	53.34	0.79
Pont	603.333*	2 ans	nat	1096.76	270.61	276.51	275.90	277.88	0.003928	5.21	215.18	53.34	0.79
Pont	603.333*	10 ans	Act	1347.95	270.61	277.08	276.45	278.69	0.003916	5.65	246.54	55.22	0.80
Pont	603.333*	10 ans	nat	1347.95	270.61	277.08	276.45	278.69	0.003916	5.65	246.54	55.22	0.80
Pont	603.333*	20 ans	Act	1430.86	270.61	277.24	276.63	278.94	0.003969	5.80	255.34	55.75	0.81
Pont	603.333*	20 ans	nat	1430.86	270.61	277.24	276.63	278.94	0.003969	5.80	255.34	55.75	0.81
Pont	603.333*	25 ans	Act	1455.73	270.61	277.29	276.68	279.01	0.003976	5.85	258.12	55.91	0.82
Pont	603.333*	25 ans	nat	1455.73	270.61	277.29	276.68	279.01	0.003976	5.85	258.12	55.91	0.82
Pont	603.333*	50 ans	Act	1530.74	270.61	277.44	276.85	279.23	0.004000	5.97	266.35	56.40	0.82
Pont	603.333*	50 ans	nat	1530.74	270.61	277.44	276.85	279.23	0.004000	5.97	266.35	56.40	0.82
Pont	603.333*	100 ans	Act	1602.44	270.61	277.58	277.01	279.44	0.004019	6.09	274.16	56.87	0.83
Pont	603.333*	100 ans	nat	1602.44	270.61	277.58	277.01	279.44	0.004019	6.09	274.16	56.87	0.83
Pont	600	2 ans	Act	1096.76	270.01	275.77	275.77	277.61	0.006539	6.03	185.18	52.69	0.99
Pont	600	2 ans	nat	1096.76	270.01	275.77	275.77	277.61	0.006539	6.03	185.18	52.69	0.99
Pont	600	10 ans	Act	1347.95	270.01	276.30	276.30	278.42	0.006307	6.46	214.06	54.46	0.99
Pont	600	10 ans	nat	1347.95	270.01	276.30	276.30	278.42	0.006307	6.46	214.06	54.46	0.99
Pont	600	20 ans	Act	1430.86	270.01	276.50	276.50	278.67	0.006120	6.55	224.76	55.09	0.98
Pont	600	20 ans	nat	1430.86	270.01	276.50	276.50	278.67	0.006120	6.55	224.76	55.09	0.98
Pont	600	25 ans	Act	1455.73	270.01	276.55	276.55	278.74	0.006084	6.59	227.74	55.27	0.98
Pont	600	25 ans	nat	1455.73	270.01	276.55	276.55	278.74	0.006084	6.59	227.74	55.27	0.98
Pont	600	50 ans	Act	1530.74	270.01	276.71	276.71	278.97	0.005983	6.68	236.67	55.80	0.98
Pont	600	50 ans	nat	1530.74	270.01	276.71	276.71	278.97	0.005983	6.68	236.67	55.80	0.98
Pont	600	100 ans	Act	1602.44	270.01	276.86	276.86	279.18	0.005899	6.78	245.04	56.29	0.98
Pont	600	100 ans	nat	1602.44	270.01	276.86	276.86	279.18	0.005899	6.78	245.04	56.29	0.98

Plan: Act River237 Pont RS: 700 Profile: 2 ans

E.G. US. (m)	285.09	Element	Inside BR US	Inside BR DS
W.S. US. (m)	283.31	E.G. Elev (m)	285.05	282.85
Q Total (m3/s)	1096.76	W.S. Elev (m)	282.77	278.66
Q Bridge (m3/s)	1096.76	Crit W.S. (m)	282.77	279.92
Q Weir (m3/s)		Max Chl Dpth (m)	6.71	3.48
Weir Sta Lft (m)		Vel Total (m/s)	6.06	9.06
Weir Sta Rgt (m)		Flow Area (m2)	181.11	121.00
Weir Submerg		Froude # Chl	0.91	1.71
Weir Max Depth (m)		Specif Force (m3)	1214.96	1202.89
Min El Weir Flow (m)	290.15	Hydr Depth (m)	4.19	2.86
Min El Prs (m)	287.66	W.P. Total (m)	46.70	43.95
Delta EG (m)	2.91	Conv. Total (m3/s)	15477.7	7437.3
Delta WS (m)	4.13	Top Width (m)	43.26	42.35
BR Open Area (m2)	398.55	Frctn Loss (m)		
BR Open Vel (m/s)	9.06	C & E Loss (m)		
BR Sluice Coef		Shear Total (N/m2)	190.95	587.12
BR Sel Method	Momentum	Power Total (N/m s)	1156.34	5321.81

Plan: Act River237 Pont RS: 700 Profile: 10 ans

E.G. US. (m)	286.23	Element	Inside BR US	Inside BR DS
W.S. US. (m)	284.94	E.G. Elev (m)	286.05	285.51
Q Total (m3/s)	1347.95	W.S. Elev (m)	283.49	278.52
Q Bridge (m3/s)	1347.95	Crit W.S. (m)	283.49	280.51
Q Weir (m3/s)		Max Chl Dpth (m)	7.42	3.34
Weir Sta Lft (m)		Vel Total (m/s)	6.34	11.71
Weir Sta Rgt (m)		Flow Area (m2)	212.45	115.10
Weir Submerg		Froude # Chl	0.92	2.26
Weir Max Depth (m)		Specif Force (m3)	1575.19	1561.67
Min El Weir Flow (m)	290.15	Hydr Depth (m)	4.78	2.75
Min El Prs (m)	287.66	W.P. Total (m)	48.78	43.41
Delta EG (m)	2.54	Conv. Total (m3/s)	19218.2	6890.3
Delta WS (m)	5.75	Top Width (m)	44.41	41.89
BR Open Area (m2)	398.55	Frctn Loss (m)	0.03	1.07
BR Open Vel (m/s)	11.71	C & E Loss (m)	0.30	0.74
BR Sluice Coef		Shear Total (N/m2)	210.12	995.13
BR Sel Method	Energy only	Power Total (N/m s)	1333.19	11654.49

Plan: Act River237 Pont RS: 700 Profile: 20 ans

E.G. US. (m)	286.55	Element	Inside BR US	Inside BR DS
W.S. US. (m)	285.29	E.G. Elev (m)	286.36	285.82
Q Total (m3/s)	1430.86	W.S. Elev (m)	283.71	278.65
Q Bridge (m3/s)	1430.86	Crit W.S. (m)	283.71	280.70
Q Weir (m3/s)		Max Chl Dpth (m)	7.65	3.47
Weir Sta Lft (m)		Vel Total (m/s)	6.43	11.85
Weir Sta Rgt (m)		Flow Area (m2)	222.37	120.71
Weir Submerg		Froude # Chl	0.92	2.24
Weir Max Depth (m)		Specif Force (m3)	1698.87	1684.90
Min El Weir Flow (m)	290.15	Hydr Depth (m)	4.97	2.85
Min El Prs (m)	287.66	W.P. Total (m)	49.40	43.92
Delta EG (m)	2.53	Conv. Total (m3/s)	20458.1	7409.5
Delta WS (m)	5.97	Top Width (m)	44.74	42.33
BR Open Area (m2)	398.55	Frctn Loss (m)	0.03	1.06
BR Open Vel (m/s)	11.85	C & E Loss (m)	0.30	0.74

Plan: Act River237 Pont RS: 700 Profile: 20 ans (Continued)

BR Sluice Coef		Shear Total (N/m2)	215.94	1005.02
BR Sel Method	Energy only	Power Total (N/m s)	1389.50	11912.89

Plan: Act River237 Pont RS: 700 Profile: 25 ans

E.G. US. (m)	286.65	Element	Inside BR US	Inside BR DS
W.S. US. (m)	285.40	E.G. Elev (m)	286.45	285.91
Q Total (m3/s)	1455.73	W.S. Elev (m)	283.78	278.69
Q Bridge (m3/s)	1455.73	Crit W.S. (m)	283.78	280.75
Q Weir (m3/s)		Max Chl Dpth (m)	7.71	3.51
Weir Sta Lft (m)		Vel Total (m/s)	6.46	11.89
Weir Sta Rgt (m)		Flow Area (m2)	225.37	122.39
Weir Submerg		Froude # Chl	0.93	2.23
Weir Max Depth (m)		Specif Force (m3)	1736.45	1722.34
Min El Weir Flow (m)	290.15	Hydr Depth (m)	5.03	2.88
Min El Prs (m)	287.66	W.P. Total (m)	49.59	44.08
Delta EG (m)	2.53	Conv. Total (m3/s)	20837.9	7579.7
Delta WS (m)	6.04	Top Width (m)	44.84	42.46
BR Open Area (m2)	398.55	Frctn Loss (m)	0.03	1.05
BR Open Vel (m/s)	11.89	C & E Loss (m)	0.30	0.73
BR Sluice Coef		Shear Total (N/m2)	217.52	1004.39
BR Sel Method	Energy only	Power Total (N/m s)	1405.03	11946.70

Plan: Act River237 Pont RS: 700 Profile: 50 ans

E.G. US. (m)	286.93	Element	Inside BR US	Inside BR DS
W.S. US. (m)	285.71	E.G. Elev (m)	286.73	286.17
Q Total (m3/s)	1530.74	W.S. Elev (m)	283.95	278.81
Q Bridge (m3/s)	1530.74	Crit W.S. (m)	283.95	280.92
Q Weir (m3/s)		Max Chl Dpth (m)	7.89	3.63
Weir Sta Lft (m)		Vel Total (m/s)	6.57	12.01
Weir Sta Rgt (m)		Flow Area (m2)	233.11	127.45
Weir Submerg		Froude # Chl	0.93	2.21
Weir Max Depth (m)		Specif Force (m3)	1850.46	1835.87
Min El Weir Flow (m)	290.15	Hydr Depth (m)	5.16	2.97
Min El Prs (m)	287.66	W.P. Total (m)	50.11	44.54
Delta EG (m)	2.52	Conv. Total (m3/s)	21824.5	8105.1
Delta WS (m)	6.25	Top Width (m)	45.16	42.86
BR Open Area (m2)	398.55	Frctn Loss (m)	0.04	1.03
BR Open Vel (m/s)	12.01	C & E Loss (m)	0.30	0.72
BR Sluice Coef		Shear Total (N/m2)	224.40	1000.94
BR Sel Method	Energy only	Power Total (N/m s)	1473.57	12021.68

Plan: Act River237 Pont RS: 700 Profile: 100 ans

E.G. US. (m)	287.21	Element	Inside BR US	Inside BR DS
W.S. US. (m)	286.06	E.G. Elev (m)	286.98	286.43
Q Total (m3/s)	1602.44	W.S. Elev (m)	284.14	278.92
Q Bridge (m3/s)	1602.44	Crit W.S. (m)	284.14	281.07
Q Weir (m3/s)		Max Chl Dpth (m)	8.08	3.74
Weir Sta Lft (m)		Vel Total (m/s)	6.63	12.12
Weir Sta Rgt (m)		Flow Area (m2)	241.83	132.21
Weir Submerg		Froude # Chl	0.93	2.19
Weir Max Depth (m)		Specif Force (m3)	1961.96	1946.99
Min El Weir Flow (m)	290.15	Hydr Depth (m)	5.31	3.06
Min El Prs (m)	287.66	W.P. Total (m)	50.74	45.00

Plan: Act River237 Pont RS: 700 Profile: 100 ans (Continued)

Delta EG (m)	2.51	Conv. Total (m3/s)	22950.6	8606.7
Delta WS (m)	6.49	Top Width (m)	45.54	43.27
BR Open Area (m2)	398.55	Frctn Loss (m)	0.04	1.02
BR Open Vel (m/s)	12.12	C & E Loss (m)	0.29	0.71
BR Sluice Coef		Shear Total (N/m2)	227.86	998.66
BR Sel Method	Energy only	Power Total (N/m s)	1509.87	12104.55