

**James Bay Native
Development Corporation**

Hydraulic Study

Hydraulic study of the bridge located at the 278th kilometer of route du Nord in the municipality of Eeyou Istchee, James Bay.

Preliminary Report



Prepared for:
James Bay Native
Development Corporation

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O/Réf. : 158100425

Sign-off sheet

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Table of contents

1.0	INTRODUCTION	2
2.0	INFORMATION GATHERING	3
2.1	PROJECT INPUTS	3
2.2	FIELD SURVEY	3
2.3	WATERSHED	3
2.3.1	Delimitation and average slope of the watershed	3
2.3.2	Soil type	4
2.3.3	Watershed surface occupancy.....	4
2.4	FLOW ASSESSMENT	4
2.4.1	Floods frequency analysis for Quebec (H.P. 33)	5
2.4.2	Estimation of daily flow of fall floods from meridional Quebec river method (H.P.40).....	5
2.4.3	Comparison by watershed transfer.....	5
2.4.4	Regional method	6
2.4.5	Retained flow values.....	6
3.0	HYDRAULIC ANALYSIS	7
3.1	DESIGN CRITERIA	7
3.2	HYDRAULIC MODELISATION	8
3.3	RESULT SIMULATION – UNDEVELOPED AREA.....	8
3.4	RESULT SIMULATION – ACTUAL CONDITIONS.....	9
4.0	PROTECTIVE STRUCTURE	12
5.0	CONCLUSION.....	12
6.0	BIBLIOGRAPHICAL REFERENCES	13

APPENDIX

APPENDIX 1 Watershed boundary
APPENDIX 2 Pictures of the studied site and field survey forms
APPENDIX 3 Flow calculation
APPENDIX 4 Hydraulic profiles
APPENDIX 5 Cross-sections
APPENDIX 6 Hydraulic Tables

1.0 INTRODUCTION

The James Bay Native Development Corporation mandated Stantec Expert-Conseil Itée to produce a hydraulic study of the bridge located at the 278th kilometer of route du Nord in the municipality of Eeyou Istchee, James Bay. The study will establish the requirements for the design of the future bridge if necessary. This investigation will define the flows and water levels for different return periods by modeling with HEC-RAS software. Simulations for natural and actual 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 septembre 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 Nemiscau river, at the crossing of the bridge, is straight and stable. 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 270.02 meters and an average width of 64.77 meters.

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 Nemiscau River, upstream of the bridge location, covers 1266 km². A map of this watershed is at the appendix 1.

IGO2's website supports the hypothesis made for the direction of the flow when delimiting the watershed. Its watershed has an average slope of 2,03 %.

2.3.2 Soil type

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

The watershed of this bridge is based on a soil composed of juxta-glacial deposits as well as spreading deposits, of type 2A and 2BE. These are deposits consisting of sand, gravel, pebbles, stones, sometimes rounded to subround blocks and blunt pebbles. These deposits frequently contain pockets of fill.

2.3.3 Watershed surface occupancy

Wetland occupancy was determined using data from the Northern Quebec Ecoforestry Inventory Project (ENIP) and Natural Resources Canada. The watershed of the bridge located at the 278th kilometer of route du Nord is occupied at 21,9% of lakes and 3,5% of wetlands.

Google Earth Pro's aerial pictures show that the territory is mostly occupied by forest. 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 Nemiscau 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 Nemiscau River – Area 1266 km²

RETURN PERIOD (Years)	Calculated PEAK FLOW (m ³ /s)	PEAK FLOW (Includes 15 % increase - m ³ /s)
2	111.9	128.7
10	160.6	184.7
20	180.0	207.0
25	185.5	213.3
50	204.0	234.6
100	223.0	256.4

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' 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 3.5% 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 analyses 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, one (1) station was selected: station 81101 located on Pontax river. Then the calculation of the floods flow by transposition to the studied site was done.

It is important to note the recommended boundaries of this method: a watershed area ratio between 0.5 and 2.0. This is respected for all selected stations. However, these stations are not in the same hydrometric region due to the localization of the studied site. There are zero stations in the region that present an area ratio close to 0.5 or 2.0. The values obtained with this method should be used with caution.

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, three methods were retained for modelling, HP33, HP40 and regional method. The average and median of the three methods were analyzed on HEC RAS and the average was closest to the data received from the field survey. The average of methods HP33, HP40 and regional method was used for the model.

3.0 HYDRAULIC ANALYSIS

3.1 DESIGN CRITERIA

According to the MTQ, 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	Requirements	Applicability
CAN/CSA S6-19 (art. 1.9.7.1)	Soffit located at least 300 mm above conception high watermark.	<input checked="" type="checkbox"/>
MTQ – 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 embarkations	Soffit located at 1.5 m above high watermark	<input checked="" 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	<input checked="" type="checkbox"/>

	roads, and 600mm for other roads.	
Free opening (Tome III, Chapter2, page22)	The high watermarks of a return period of 2 years correspond to the yearly water level average.	☑
Fishing and Oceans Canada	Conservation of natural flow conditions by maintaining the physical characteristics of the existing watercourse; the substrat, slope and width.	☑
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 3,4 m/s for the 100-year flood.	☑

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 0,035 for the waterbed and 0,065 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, it became clear that the downstream lake, *Lac des montagnes*, has an impact on the bridge hydraulic. The water level of the lake was set as a downstream condition in the modeling. When omitting to factor this in the HEC-RAS simulation, the simulated water level at the bridge for the 100-year flood was significantly lower than the one recorded during the field survey, which is considered to be close to the 2 years flood. In order to adjust the hydraulic model, the water level was imposed at the furthest cross section downstream of the bridge. This process was interpolated until the resulting water level under the bridge for the 2-year flood matched the one in the field survey.

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 modelized. The results of this section gives the reference conditions for further analysis

Table 3 presents flow characteristics in natural conditions in cross section 370 located 8.15m upstream of the studied bridge. The waterbed elevation at this cross section is 265.49 meters.

Table 3 - Flow characteristics in natural conditions – cross section 370

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)
269.84	0.92	269.93	1.29	269.98	1.39	270.02	1.48	270.06	1.57

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	Reinforced concrete and steel
Bias relative to the stream (degree)	0
Total width of opening (m)	55
Pier width - upper part - perpendicular to flow (m)	1.6
Pier width - lower part - perpendicular to flow (m)	1.2
Height of the structure (m)	1.8
Geodesic elevation of the road (m)	273
Geodesic elevation of the soffit upstream (m)	271.2
Geodesic elevation of the soffit downstream (m)	271.15
Apron elevation upstream (m)	265.51
Apron elevation downstream (m)	265.49

The actual conditions were simulated for recurrences of 2, 10, 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

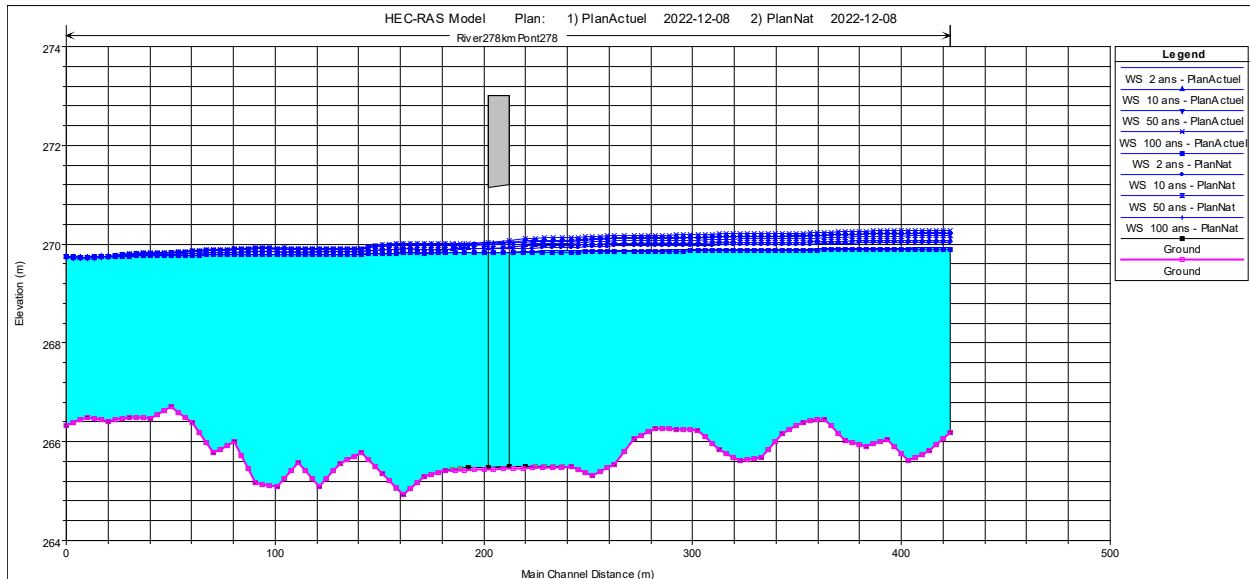


Table 5 - Flow characteristics - Cross section 370

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									
269.84	0.92	269.93	1.29	269.98	1.39	270.02	1.48	270.06	1.57
Actual conditions									
269.86	0.91	269.98	1.23	270.04	1.36	270.08	1.44	270.13	1.53

(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 70 mm (270.13– 270.06) for the 100-years flood. This is under the recommended maximum value of 300 mm. Therefore, the bridge is considered non-restrictive.

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 ¹ + 0.3	270.08 + 0.3 = 270.38	271.15	Yes
Without tide and without jams	Soffit minimum elevation > E.H ₁₀₀ + 0.3	270.13 + 0.3 =270.16		Yes
Navigable waterway	Soffit minimum elevation > 1.5 + High watermark line	1.5 + 270.02 =271.52		No
Road profile	Road profile elevation > E.H ₅₀ +0.6	270.08 + 0,6 = 270,68	273.53	Yes
Free opening	Minimum opening = 80% High watermark line	64.77 x 80% = 51.81	55	Yes
Velocity	Maximum velocity (m/s) – 100 years	< 3,4 m/s	0.97 ² -1.67 ³ m/s	Yes

¹ Water surface level for the conception high watermark (50 years) under the bridge for the actual condition simulation.

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

³ For the 100-year flood under the bridge in actual conditions simulation.

4.0 PROTECTIVE STRUCTURE

There is already rip rap under and around the bridge nevertheless considering the MTQ's norm (Tome III, chap.2, art. 2.18.2.2) the characteristic of the rip rap should be as follow:

- Rockfill slope of 1,5H : 1V.
- Rock size 300-500 mm for 800mm width, embedded 1m under the natural waterbed of the river and raising up to 300mm above high conception watermarks.
- Rock size 200-300 mm for 500mm width, from the 300-500 up to the top of the slope.

These characteristics are valid for flow velocities equal or inferior to 3.4m/s. For higher velocities, rock sizes must be changed to be higher.

5.0 CONCLUSION

The present hydraulic study aims to analyze the impact of the existing bridge at kilometer 278 of *route du nord* crossing *Nemiscau's river*.

Two scenarios were analysed: natural and actual conditions. The actual conditions simulation allows us to confirm that the steel-wood bridge respect most of the norms except for the norm related to navigable waterways for small embarkations.

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

6.0 BIBLIOGRAPHICAL REFERENCES

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MISTÈRE DES FORÊTS; SERVICE DES INVENTAIRES FORESTIERS. (2000). Carte de dépôts de surface- Document de travail : Lac des Montagnes Municipalité de la Baie-James, Québec 32O/12. https://diffusion.mffp.gouv.qc.ca/Diffusion/DonneeGratuite/Foret/DONNEES_FOR_ECO_SUD/Depots_surface/32O/

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MINISTÈRE DU TRANSPORT DU QUÉBEC. (2022). Tome III - Conception des ouvrages d'art. <https://www2.publicationsduquebec.gouv.qc.ca/transports/html/3c2.html>


APPENDIX 1

Watershed boundary

LGA

Km 237 and 278's bridges

Legend

 km278 and 237's bridge

Google Earth

Image Landsat / Copernicus



80 km

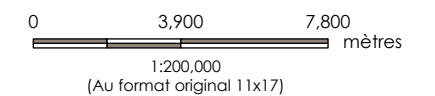
Superficie du bassin versant : 1 266 km²



: Watershed
 : Route du nord
● : Watershed exit



- Exutoire du bassin versant
- Route du Nord
- Courbes de niveau (20 m)
- Bassin versant
- Lacs
- Milieux humides
- Cours d'eau (Strahler)**
- 4
- 5
- 6
- 7



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 : PIEN, 2021
- (6) Système de coordonnées : NAD 1983 Québec Lambert



Localisation du projet 158100425-0003 REVA
 Baie-James, Québec Préparé par A. Prince le 2022-06-15
Vérfié par P. Charette le 2022-06-15

Client/Projet
 La Grande Alliance - Feasibility Study
 Phase 1

Carte No. **3**
CARTE DE TRAVAIL
 Titre
Bassin versant - Route du Nord - km278

\\c00119-PPFSS01\PROJETS\PARTAGEX\158100425\GOV\6_Geomedia\2_Carte\1_KXD\158100425-0003-REV3_BassinVersant_RteDuNord_km278_AP_20220615.mxd - Révision : 2022-06-15 Par : andrea

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APPENDIX 2

Pictures of the studied site and field survey forms

No.

Date.

Page

No. Relevé structure 2022

Date 2022-08-09

Page

Relevé Rivière Rupert km 278

2022-08-09

Francis Mathon, arpenteur

Jacintte Daoust, biologiste

Alexander Christiano, biologiste

GPS R12i, récepteur

GPS RB, base

Station totale 1203+

Température: 25°C \pm 0.1

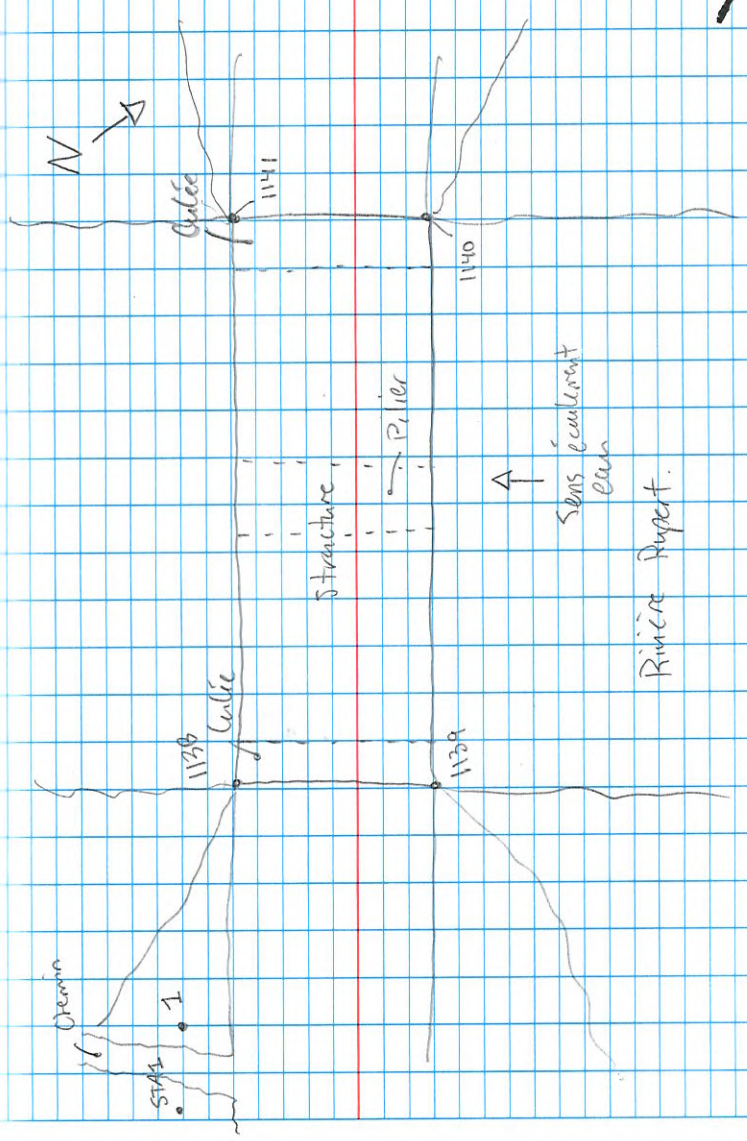
# point	Commentaires
1	Clou (station permanente)
1150	Bloc en dessus de poutre
1158	Intersection pilier / poutre (sur pilier)

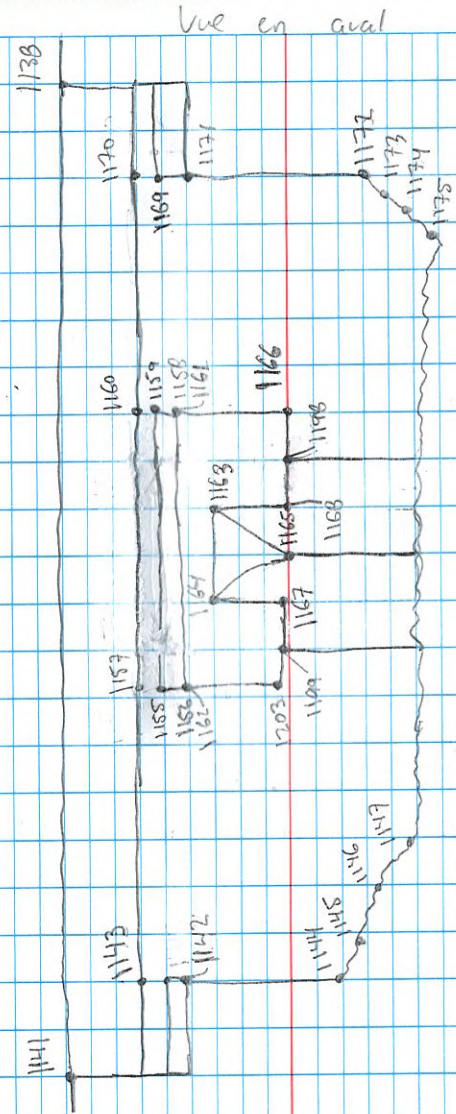
Pour le pilier central, voir photo pour plus de détail. Triangle en angle et structure complexe

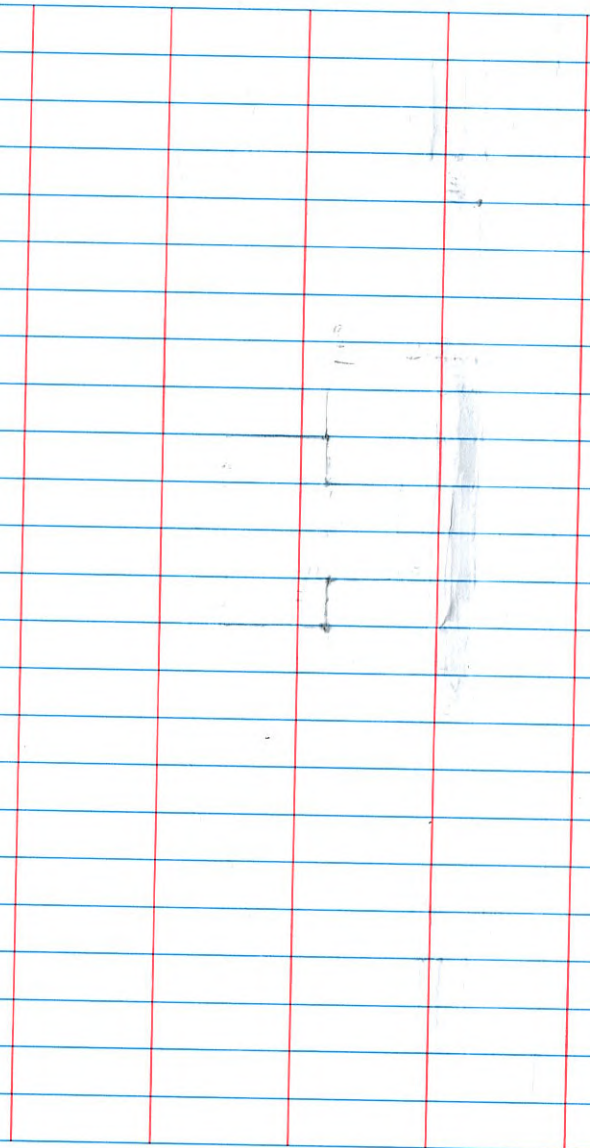
Dessus de tablier 0,28m plus bas que le dessus de tablier. Mesurer au ruban à mesurer. Trop haut pour capter au GPS, et peut pas voir avec station totale

2 même clou (fermeture).

Vue en plan







Vue en avant

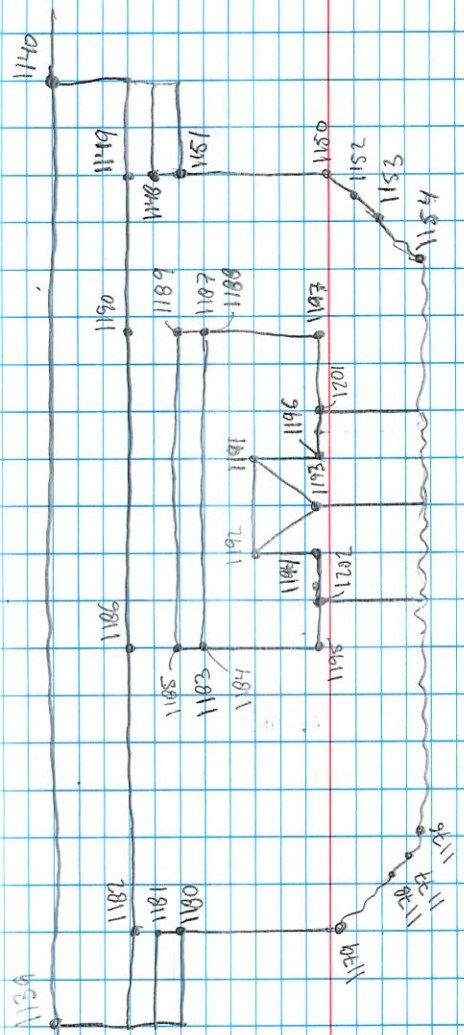




Photo : 1

West side of the bridge looking downstream

Date : 28th september 2022



Photo : 2

East side of the bridge looking downstream

Date : 28th september 2022



Photo : 3

Middle of the bridge looking downstream

Date : 28th september 2022



Photo : 4

East side of the bridge looking downstream

Date : 28th september 2022



Photo : 5

West side of the bridge looking downstream

Date : 28th september 2022



Photo : 6

West side of the bridge looking upstream

Date : 28th september 2022



Photo : 7

Middle of the bridge looking upstream

Date : 28th september 2022



Photo : 8

East side of the bridge looking upstream

Date : 28th september 2022



Photo : 9

West side of the bridge looking upstream

Date : 28th september 2022



Photo : 10

East side of the bridge looking upstream

Date : 28th september 2022

APPENDIX 3

Flow calculation

Méthode HP33

Réurrence (ans)	Débit (m ³ /s)
2	103.350
5	125.054
10	143.657
20	161.226
25	165.360
50	182.930
100	200.499

Méthode Transfert

Station respectant le critère de <u>région</u>			
Station :	81101	Région hydrographique :	Baies de Hannah et de Rup
St. fédérale :	03BF001	Régime d'écoulement :	Naturel
Nom :	Pontax	Distance station météo la + près :	Matagami A 197km
Bassin :	5970.0 km ²	Élévation station météo la + près :	± 281 m
Q2 :	594.0 m ³ /s	Élévation approx. de 081101 :	±98m - Google Earth
Q10 :	911.0 m ³ /s	Exemple :	Réurrence Débit (m ³ /s)
Q20 :	1028.0 m ³ /s	T :	25 ans 2 147.1
Q25 :	1065.0 m ³ /s	QTu :	263.7 m ³ /s 10 225.6
Q50 :	1178.0 m ³ /s	QTj :	1065.0 m ³ /s 20 254.6
Q100 :	1290.0 m ³ /s	Au :	1266 km ² 25 263.7
Période :	1976-2018, sans 1997,	Aj :	5970.0 km ² 50 291.7
		n :	0.9 100 319.5
		Au/Aj :	0.2121 NON APPLICABLE !

Station respectant le critère de <u>Au/Aj</u>			
Station :	023401	Région hydrographique :	St-Laurent sud-est
St. fédérale :	02PJ007	Régime d'écoulement :	Naturel
Nom :	Beaurivage	Distance station météo la + près :	Saint-Flavien ±28 km
Bassin :	709.0 km ²	Élévation station météo la + près :	± 137 m
Q2 :	189.0 m ³ /s	Élévation approx. de 023401 :	±125 m - Google Earth
Q10 :	258.0 m ³ /s	Exemple :	Réurrence Débit (m ³ /s)
Q20 :	277.0 m ³ /s	T :	25 ans 2 318.5
Q25 :	283.0 m ³ /s	QTu :	476.9 m ³ /s 10 434.7
Q50 :	302.0 m ³ /s	QTj :	283 m ³ /s 20 466.8
Q100 :	320.0 m ³ /s	Au :	1266 km ² 25 476.9
Période :	1970-2011 sans 2005 et 2007	Aj :	709.0 km ² 50 508.9
		n :	0.9 100 539.2
		Au/Aj :	1.7856 OK

Méthode HP40

Réurrence	Constante	Q journalier	Q instantané
-	Région 6	m³/s	m³/s
2.33	1.03	85.209	103.398
5	1.22	100.927	122.472
10	1.36	112.509	136.526
20	1.5	124.091	150.580
25	1.54	127.400	154.595
50	1.66	137.327	166.642
100	1.8	148.909	180.696

Méthode régionale

RÉCURRENCES

2
5
10
20
25
50
100

III

232.81
288.91
322.15
351.40
360.17
385.77
409.18

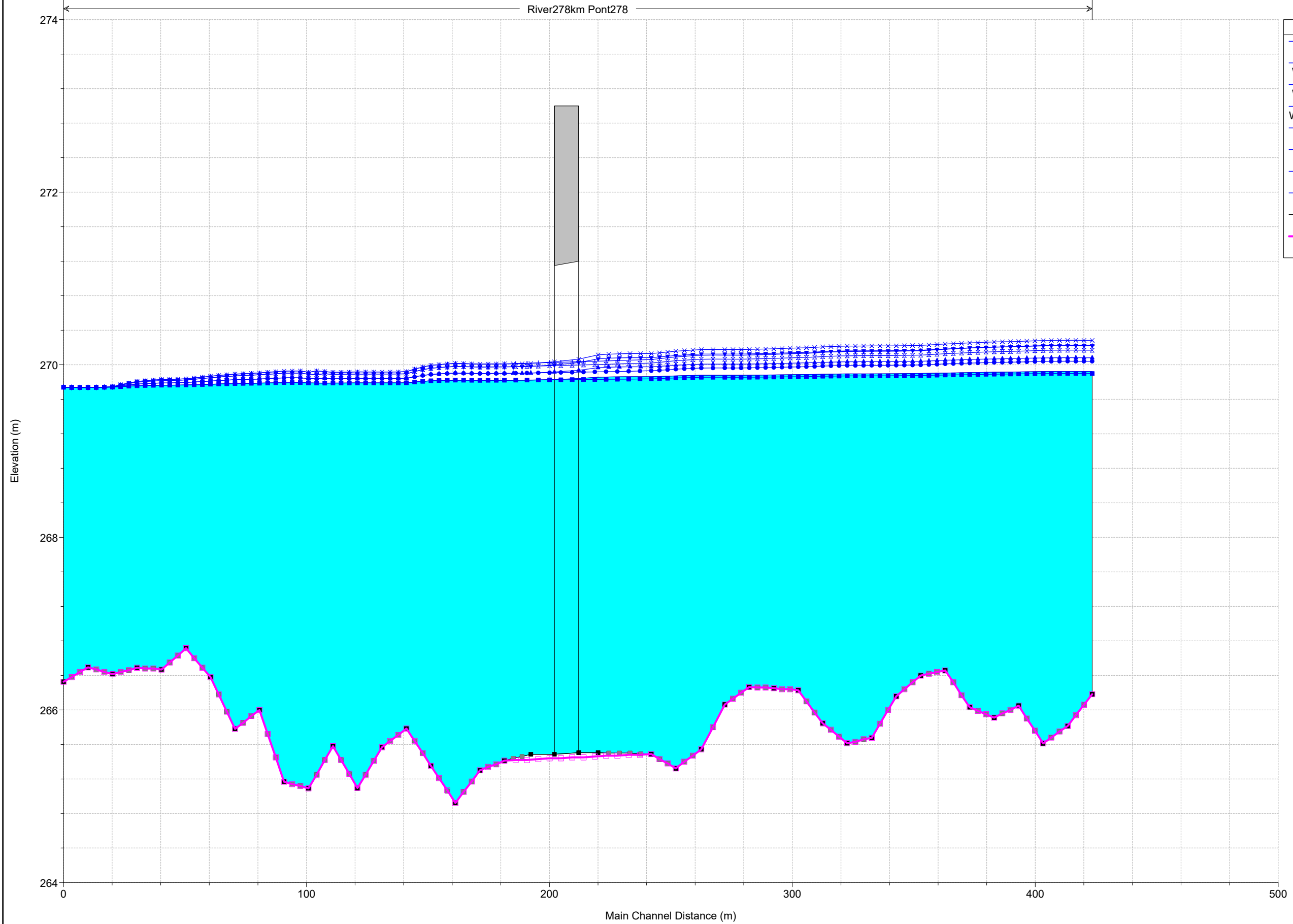
Moyenne HP33, HP40 et Régionale (15% inclus)		Médiane HP33, HP40 et régionale (15% inclus)	
Réurrence	Débit (m³/s)	Réurrence	Débit (m³/s)
2	156.90	2	118.85
5	197.37	5	143.81
10	221.69	10	165.21
20	244.07	20	185.41
25	250.29	25	190.16
50	270.64	50	210.37
100	290.79	100	230.57

APPENDIX 4

Hydraulic profiles

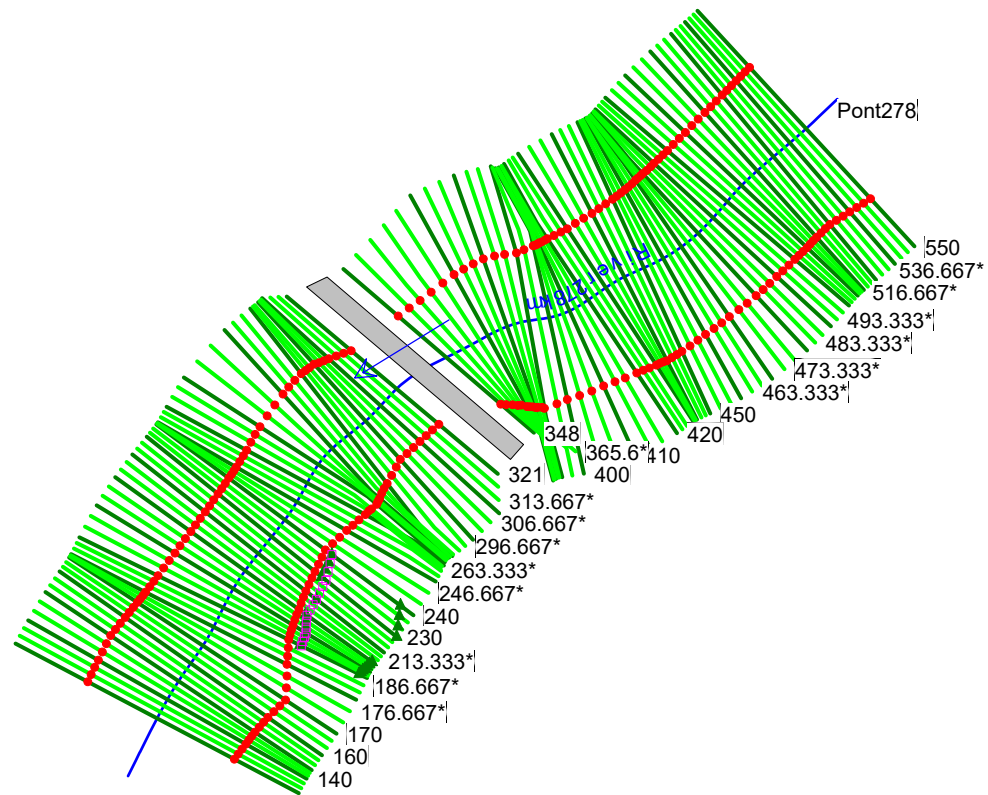
HEC-RAS Model Plan: 1) PlanActuel 2022-12-08 2) PlanNat 2022-12-08

River278km Pont278



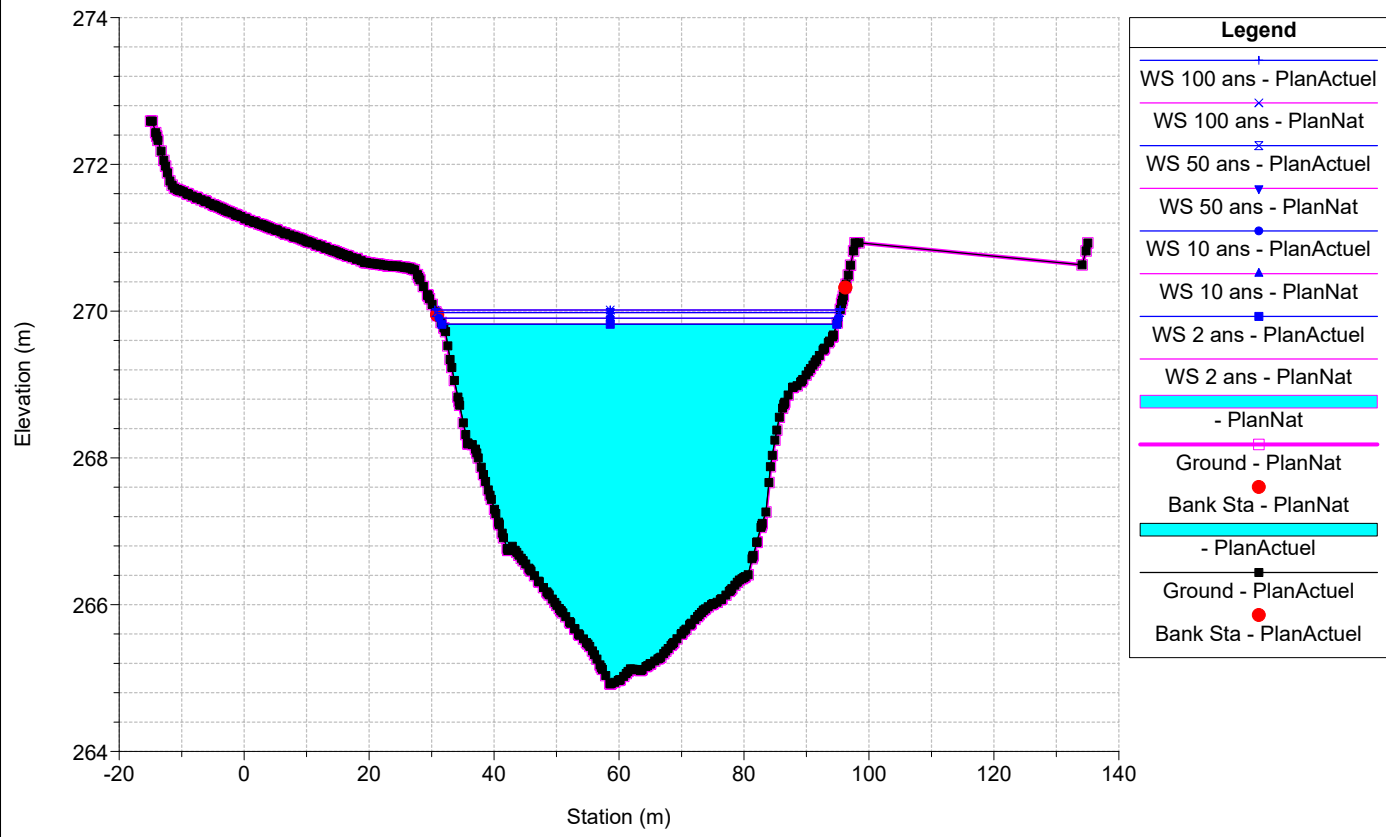
APPENDIX 5

Cross-sections

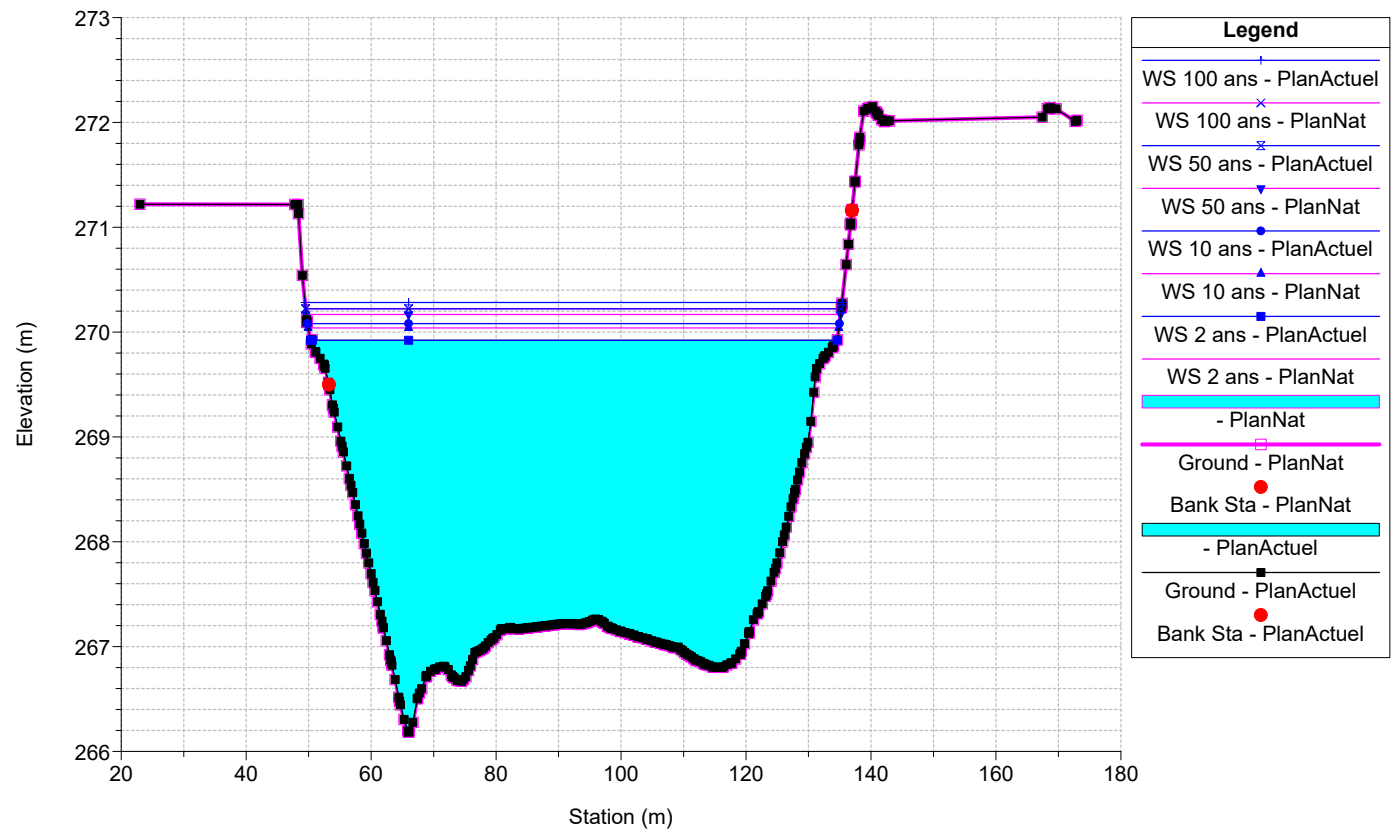


Some schematic data outside default extents (see View/Set Schematic Plot Extents...)

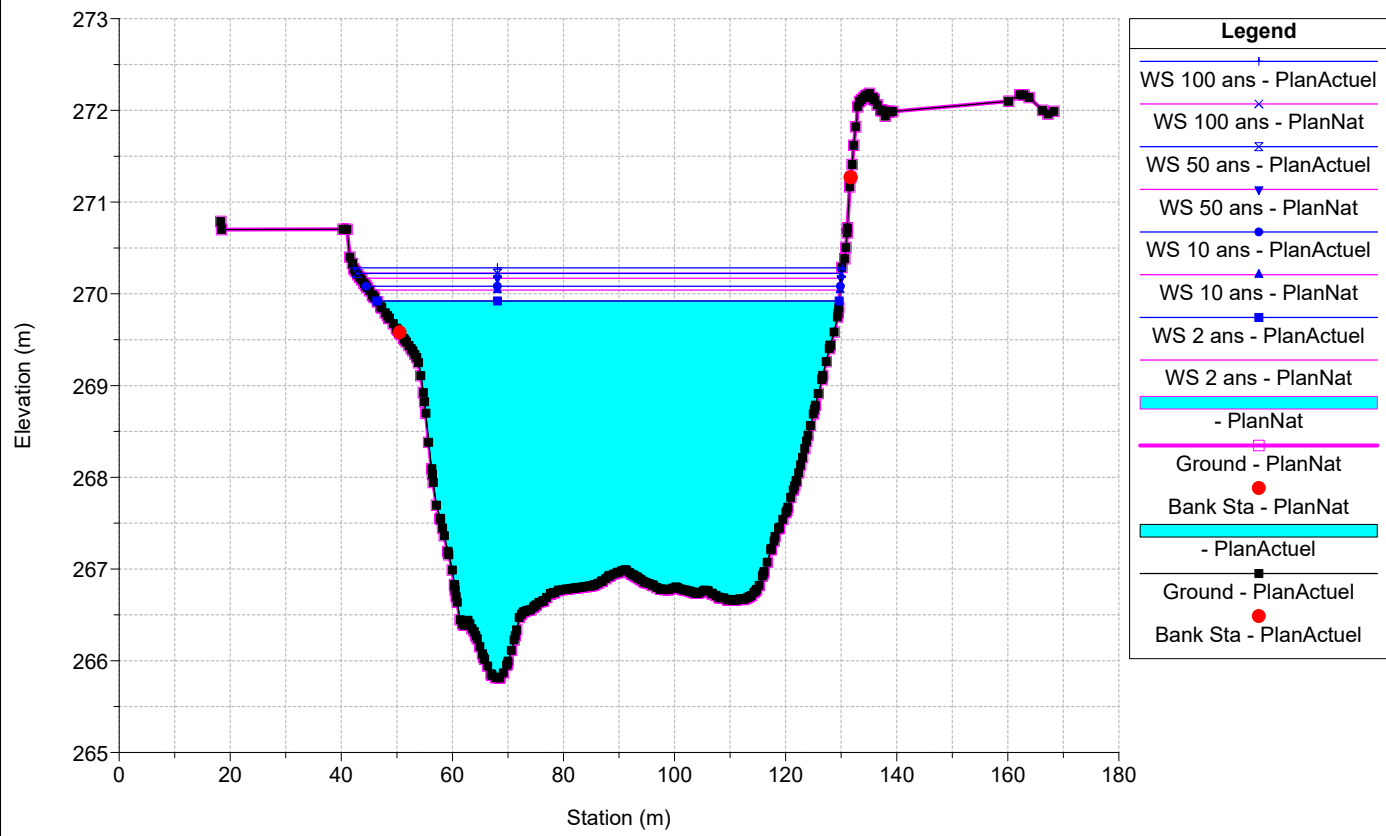
HEC-RAS Model Plan: 1) PlanActuel 2) PlanNat
RS = 290



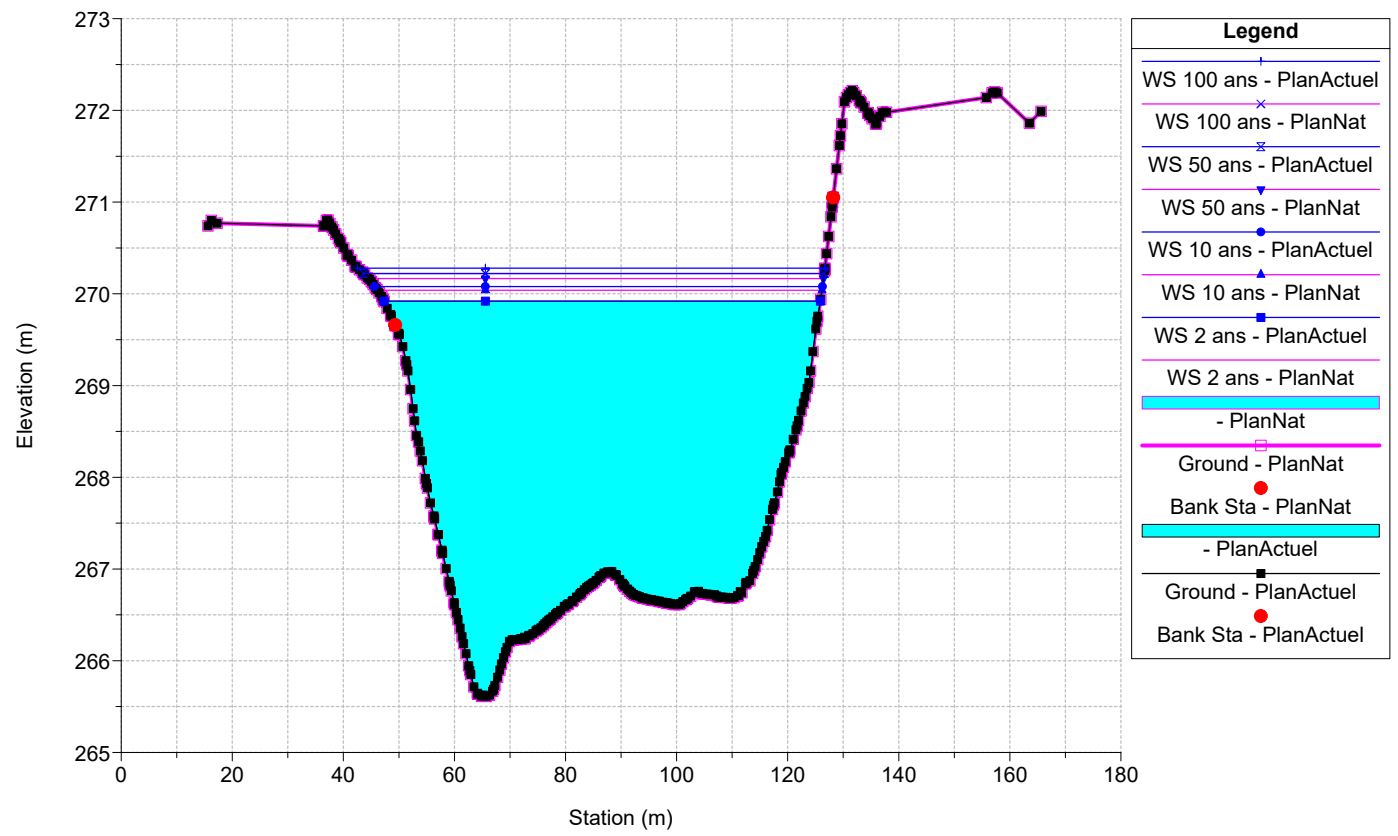
HEC-RAS Model Plan: 1) PlanActuel 2) PlanNat
RS = 550



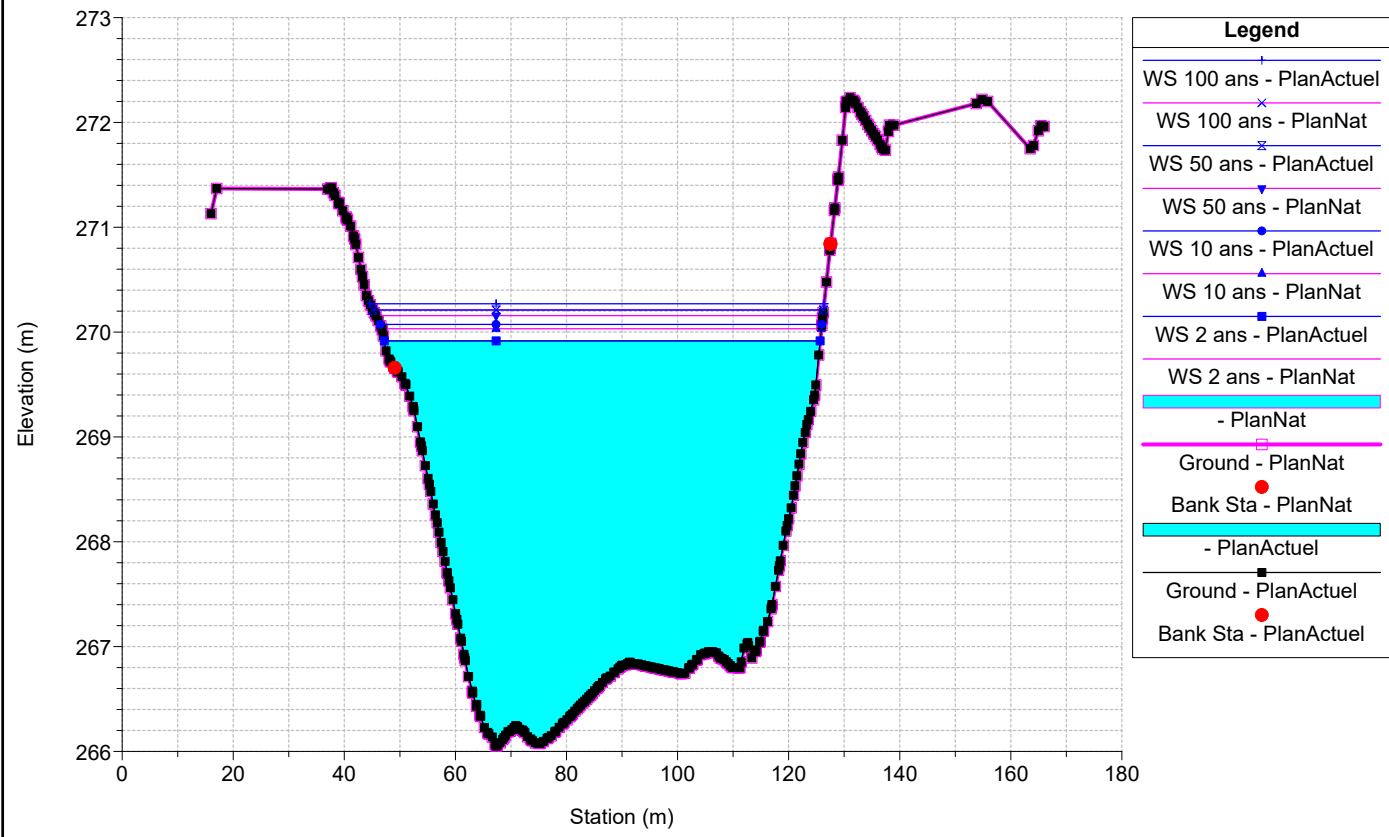
HEC-RAS Model Plan: 1) PlanActuel 2) PlanNat
RS = 540



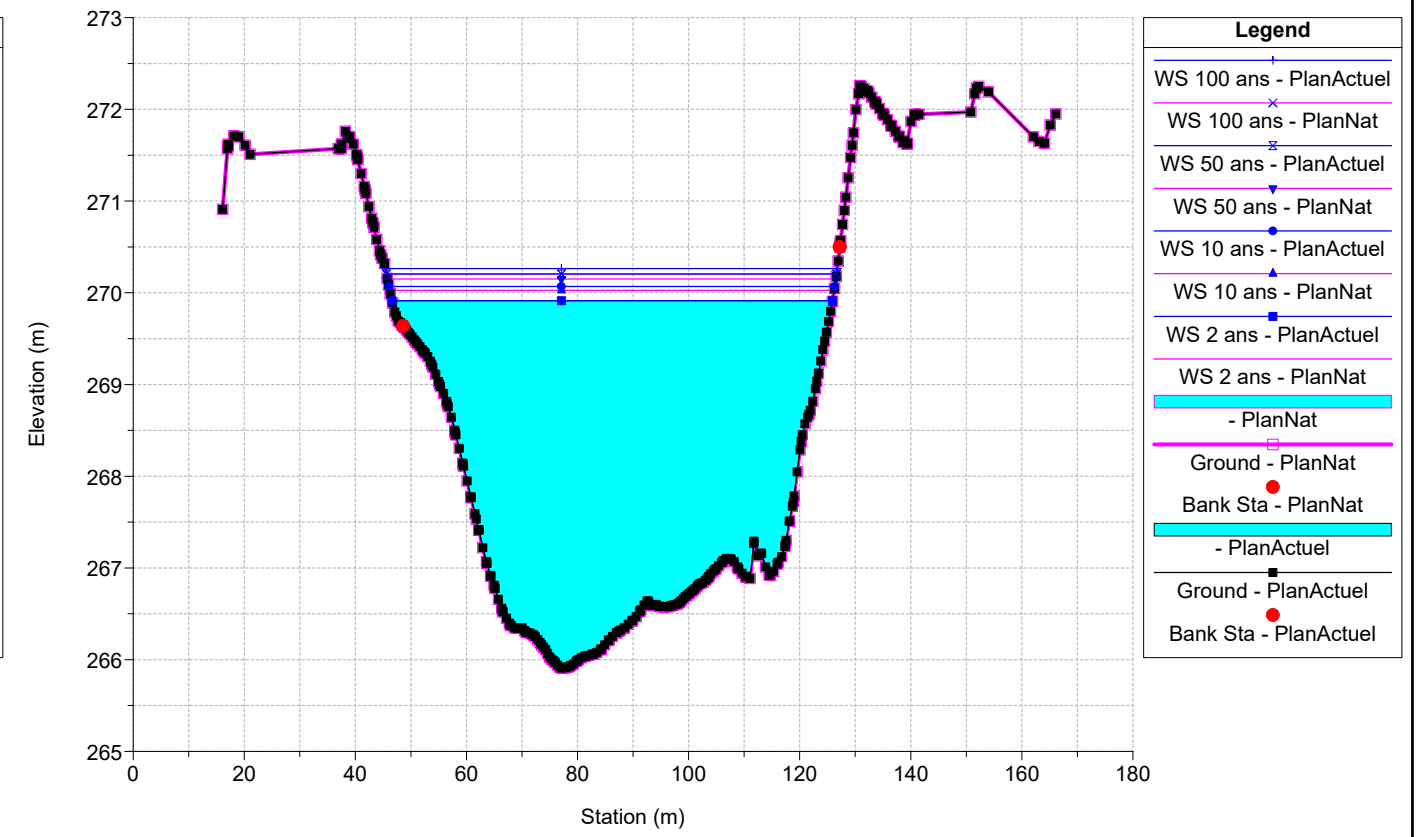
HEC-RAS Model Plan: 1) PlanActuel 2) PlanNat
RS = 530



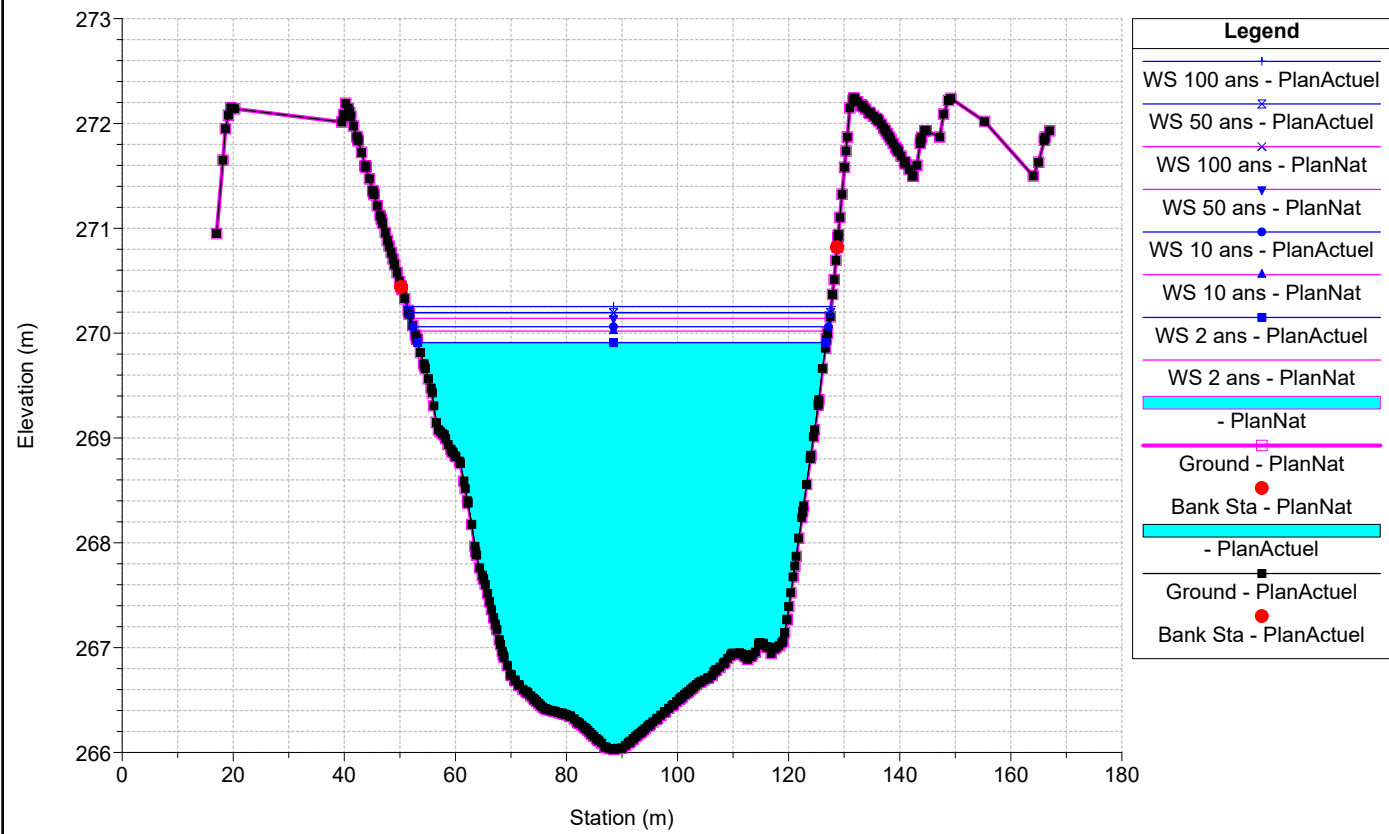
HEC-RAS Model Plan: 1) PlanActuel 2) PlanNat
RS = 520



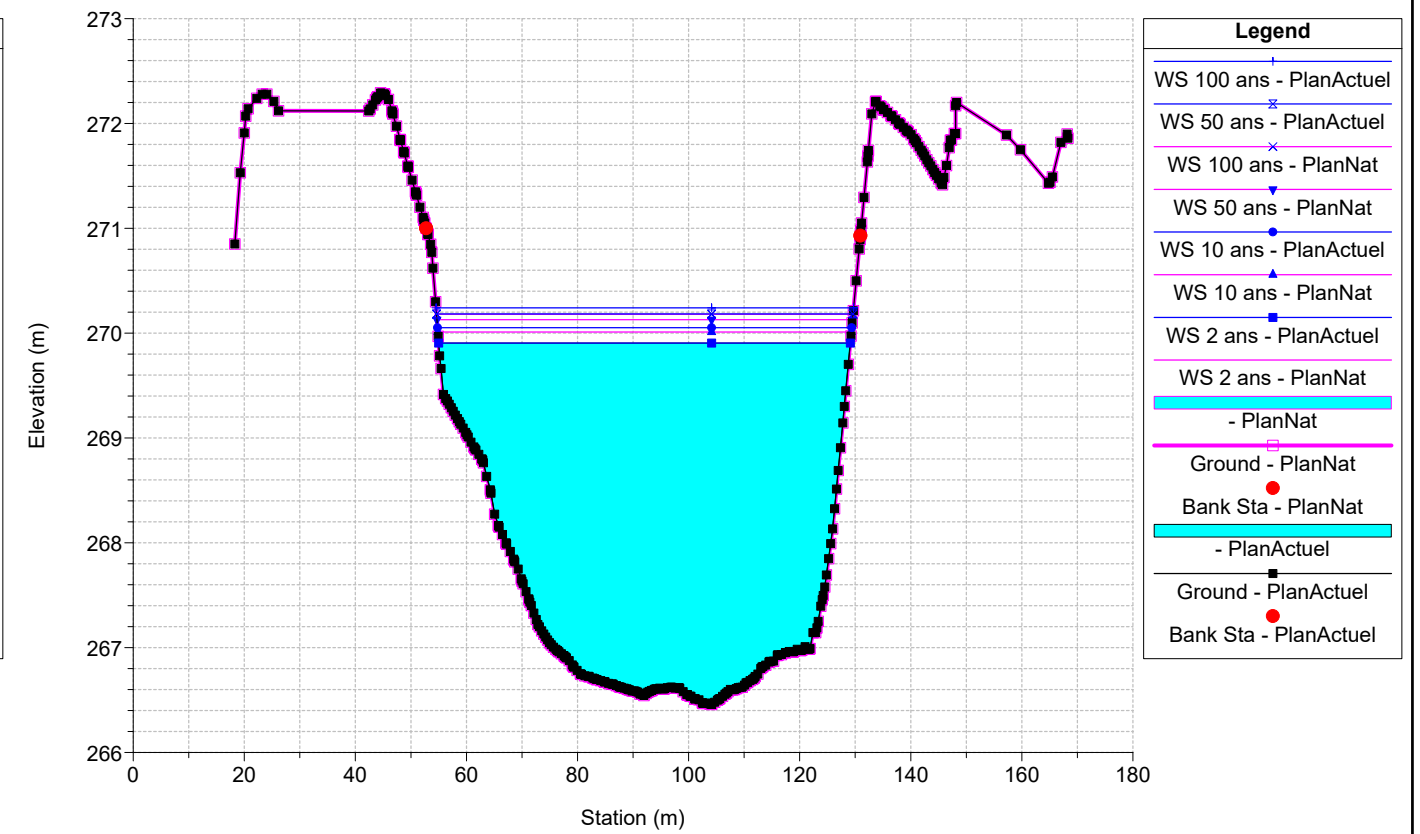
HEC-RAS Model Plan: 1) PlanActuel 2) PlanNat
RS = 510



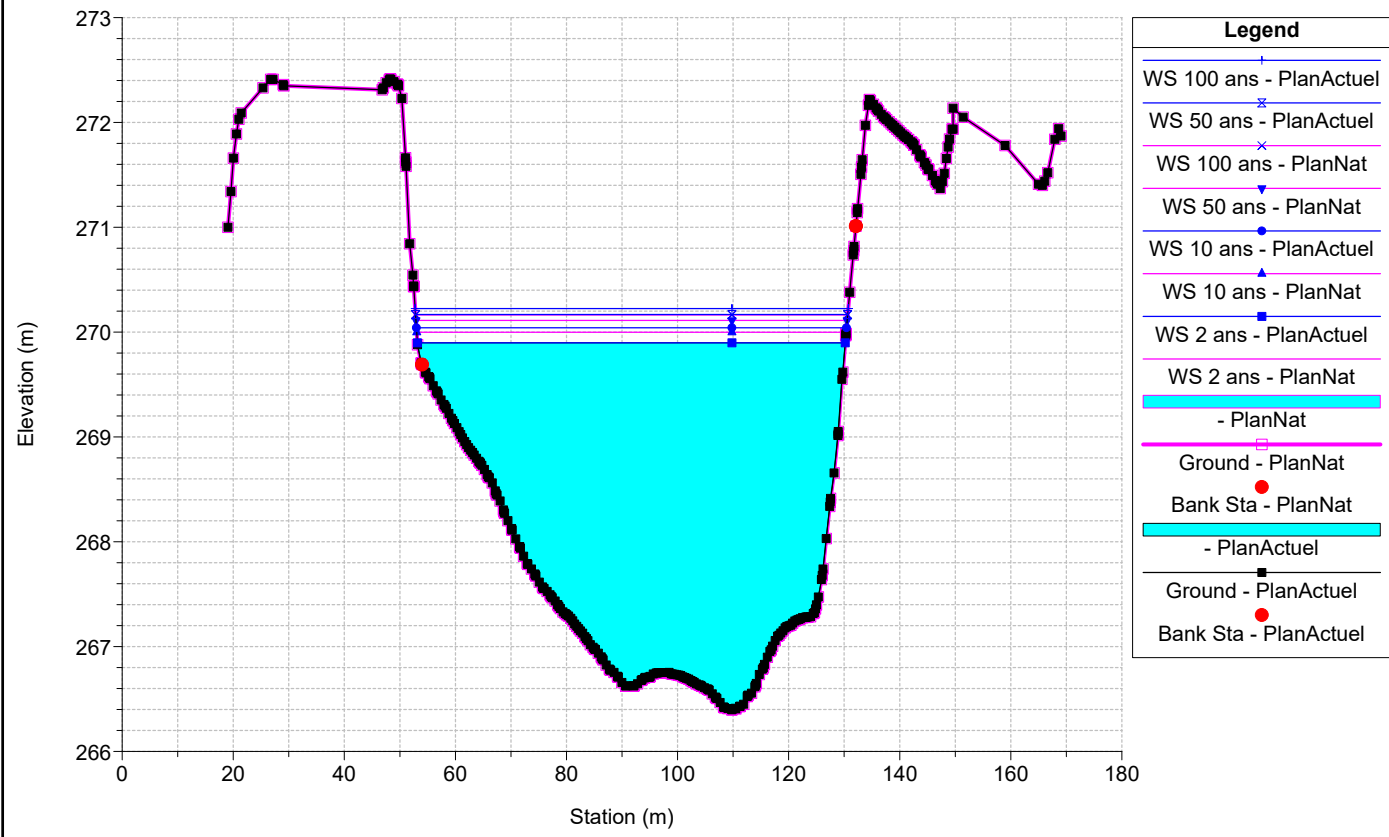
HEC-RAS Model Plan: 1) PlanActuel 2) PlanNat
RS = 500



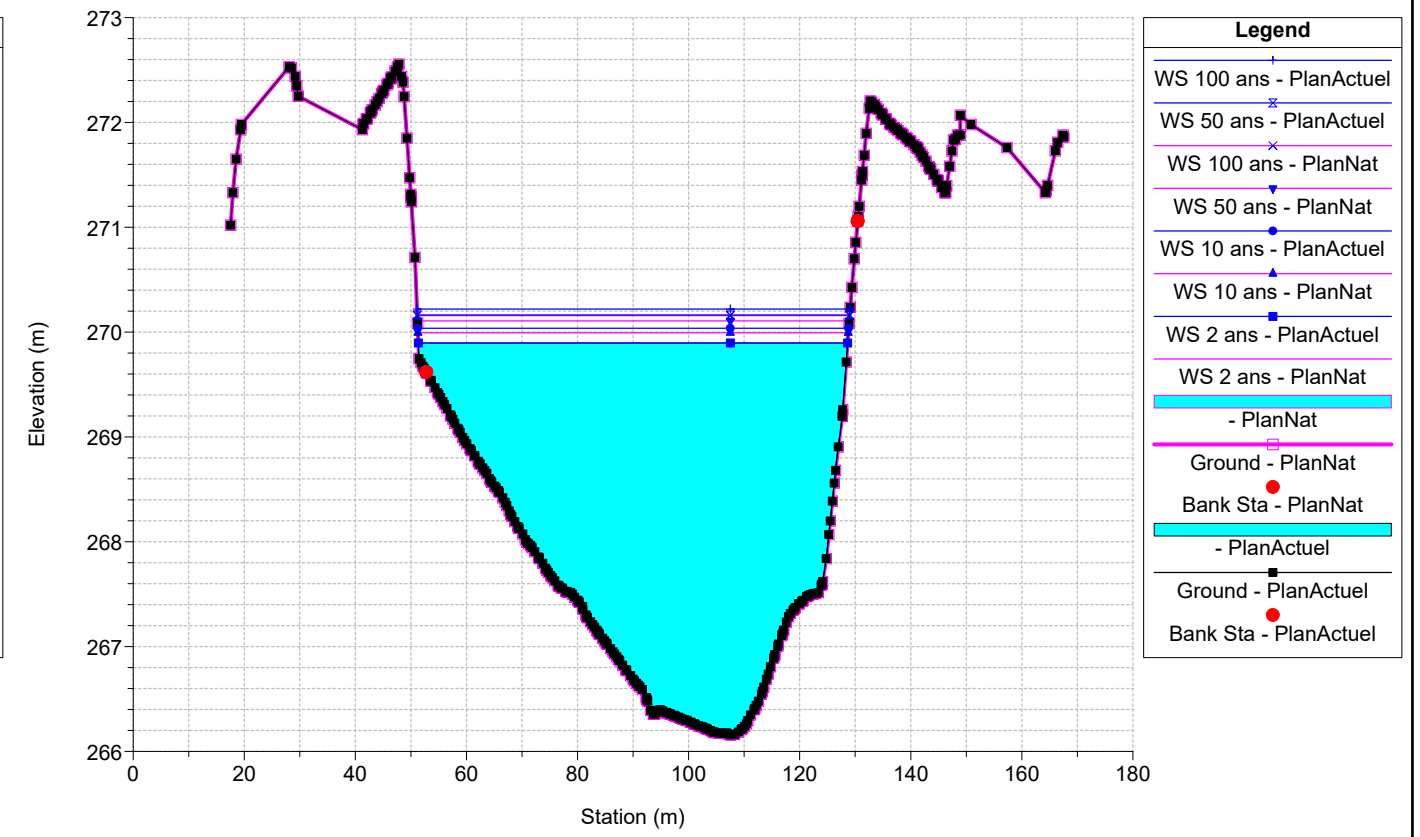
HEC-RAS Model Plan: 1) PlanActuel 2) PlanNat
RS = 490



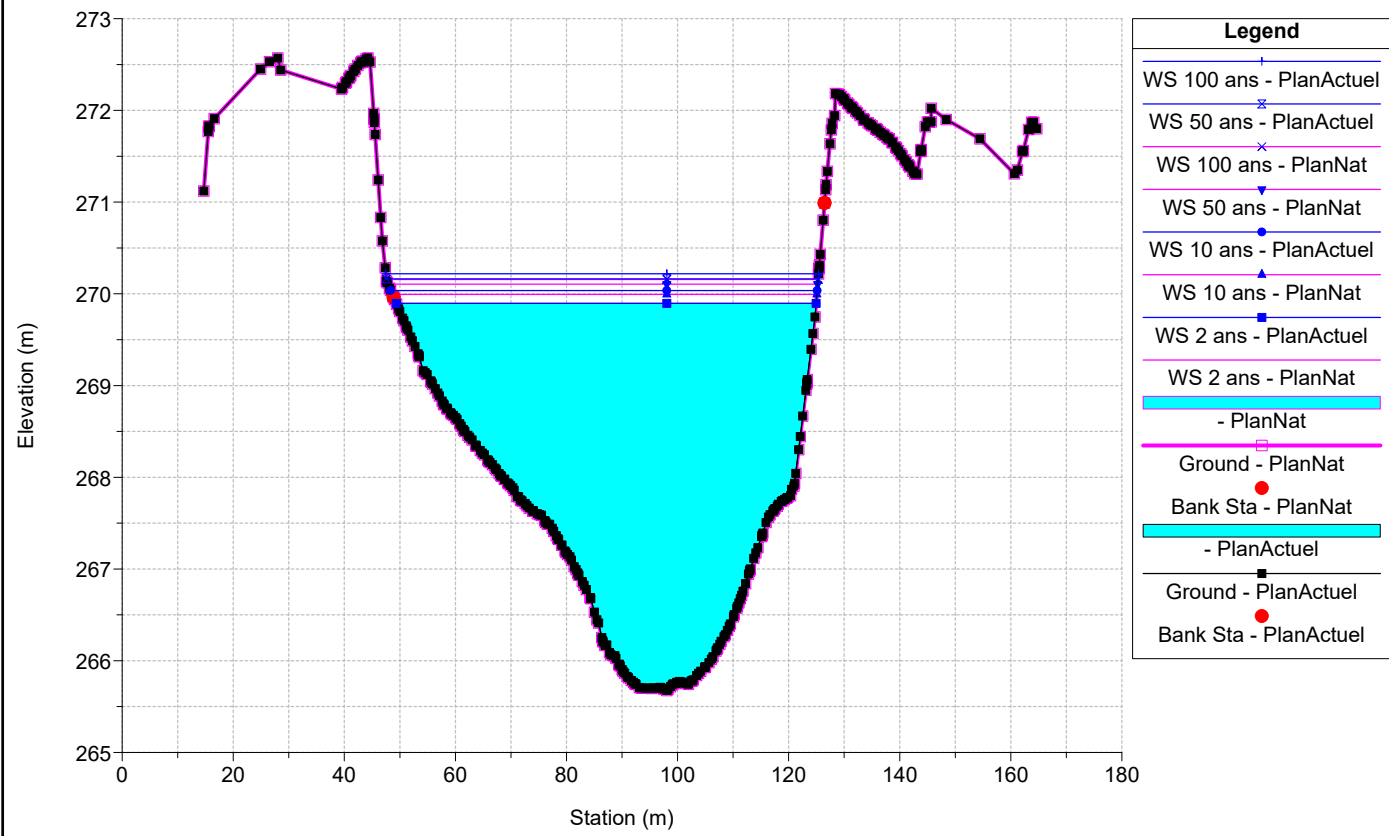
HEC-RAS Model Plan: 1) PlanActuel 2) PlanNat
RS = 480



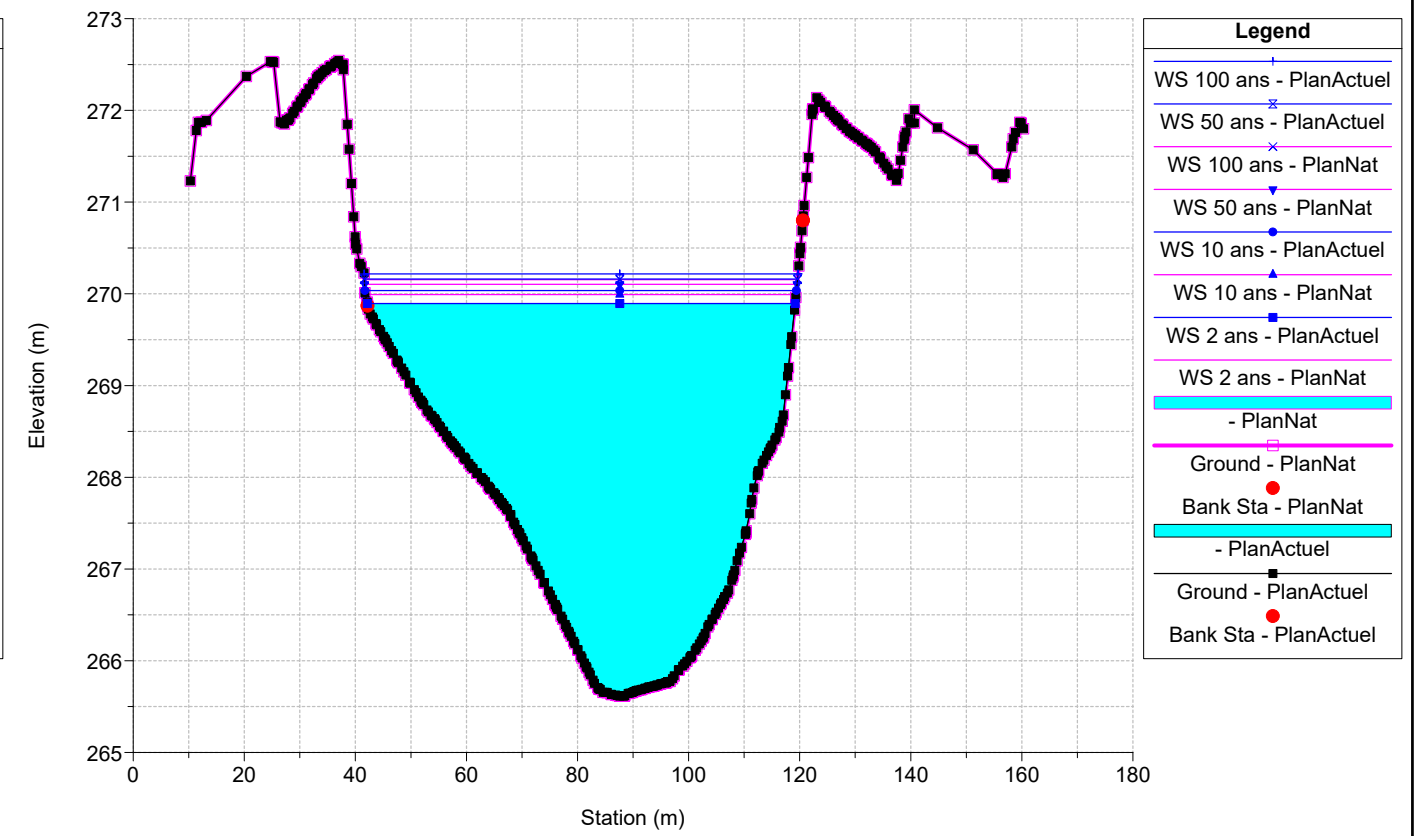
HEC-RAS Model Plan: 1) PlanActuel 2) PlanNat
RS = 470

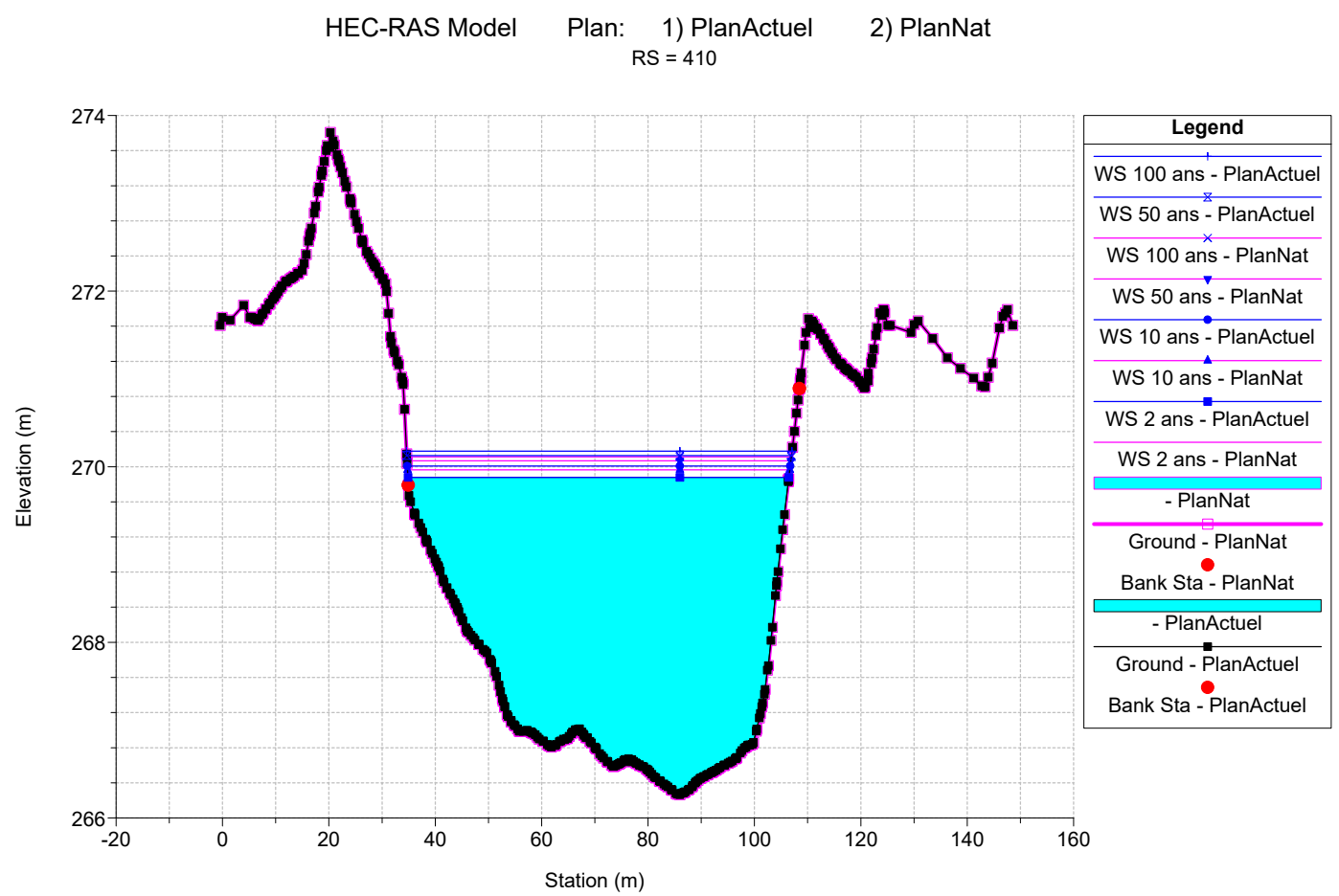
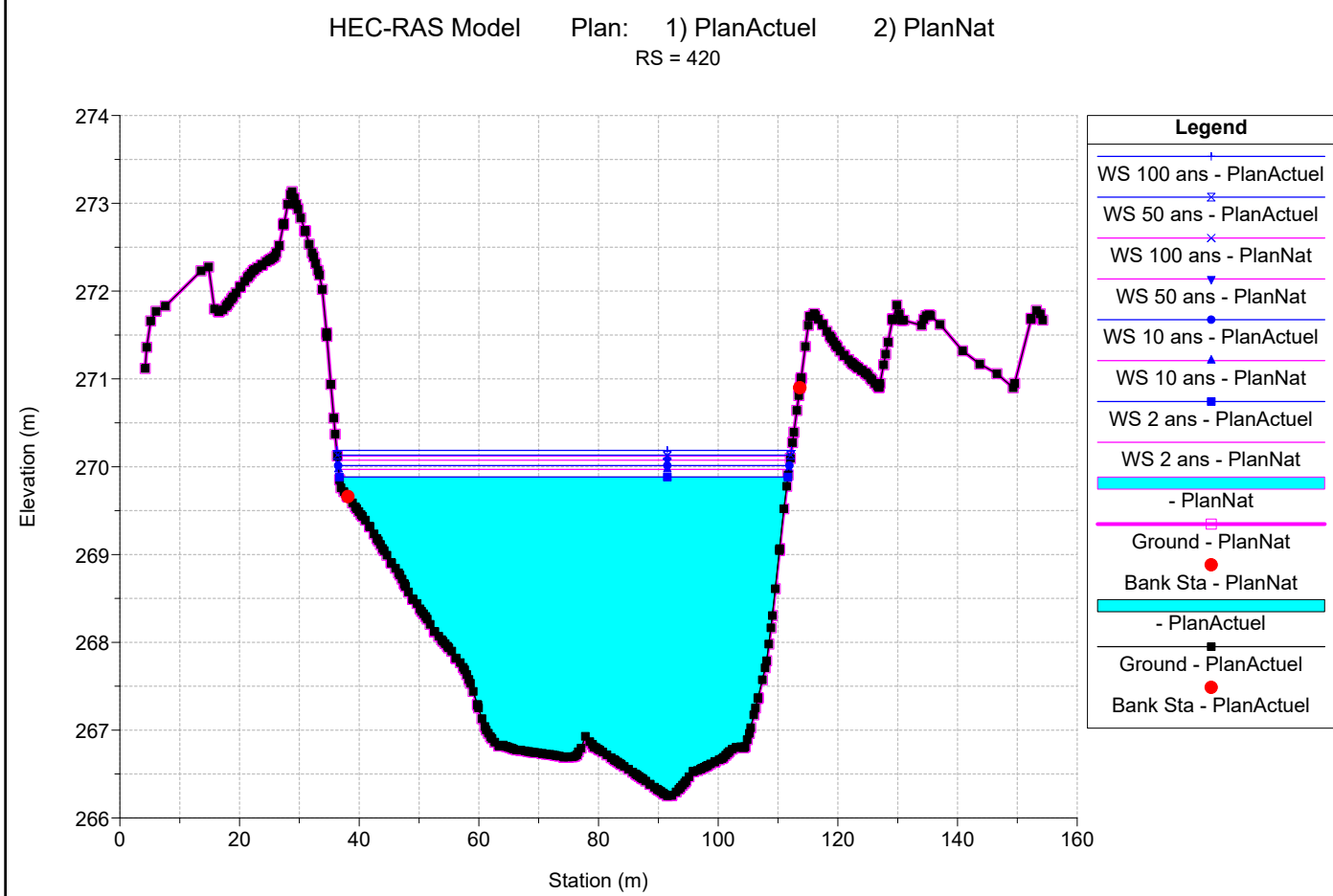
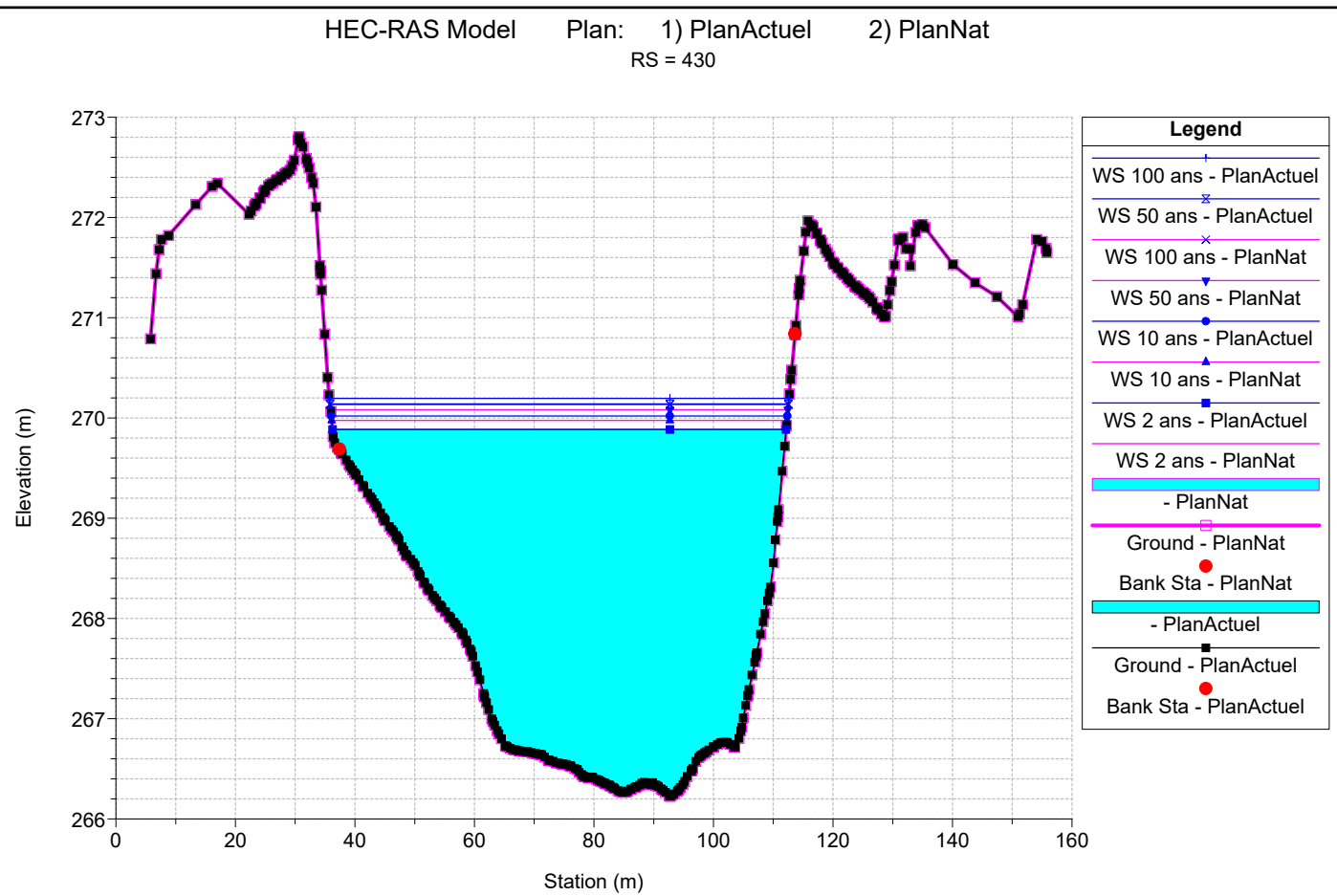
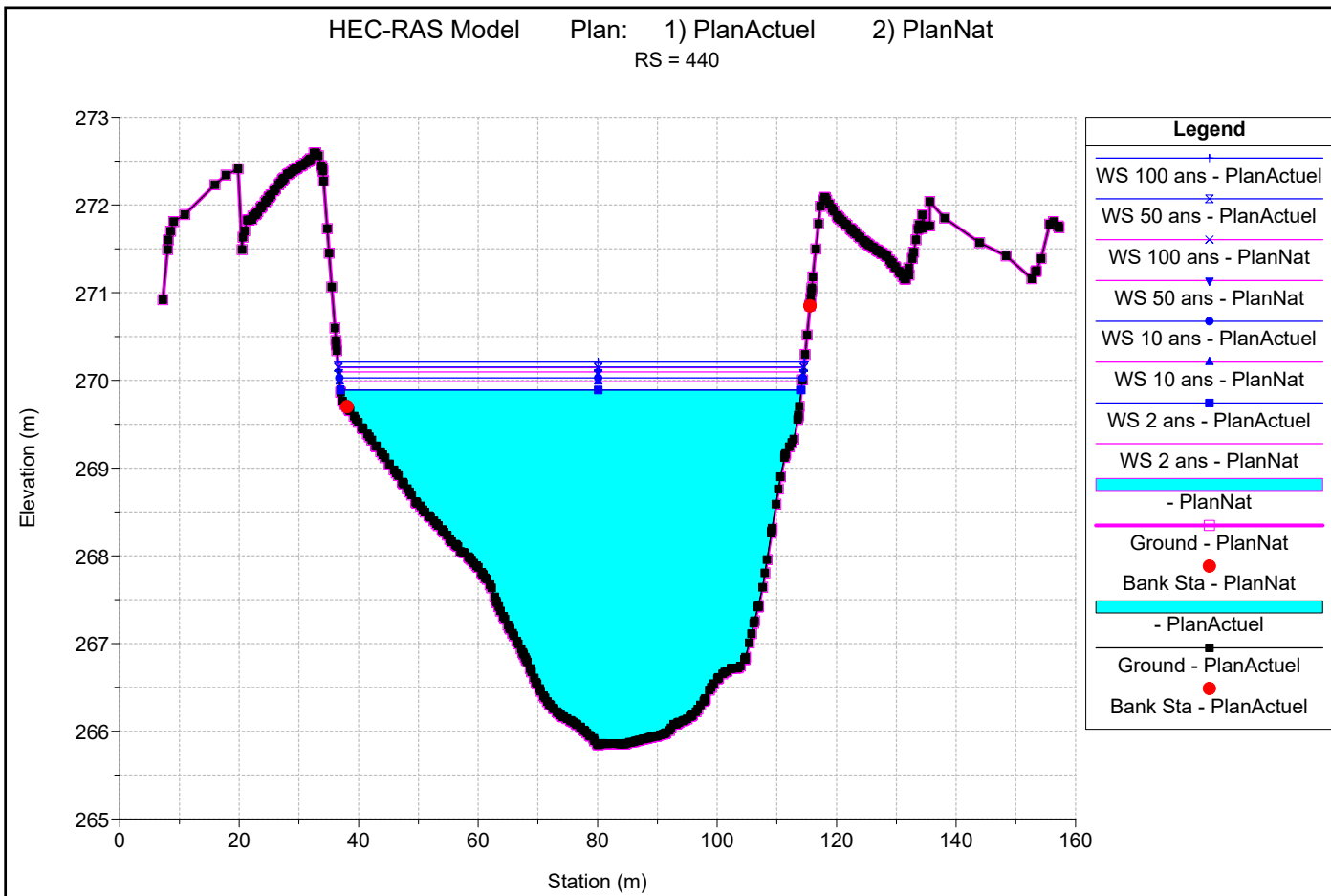


HEC-RAS Model Plan: 1) PlanActuel 2) PlanNat
RS = 460

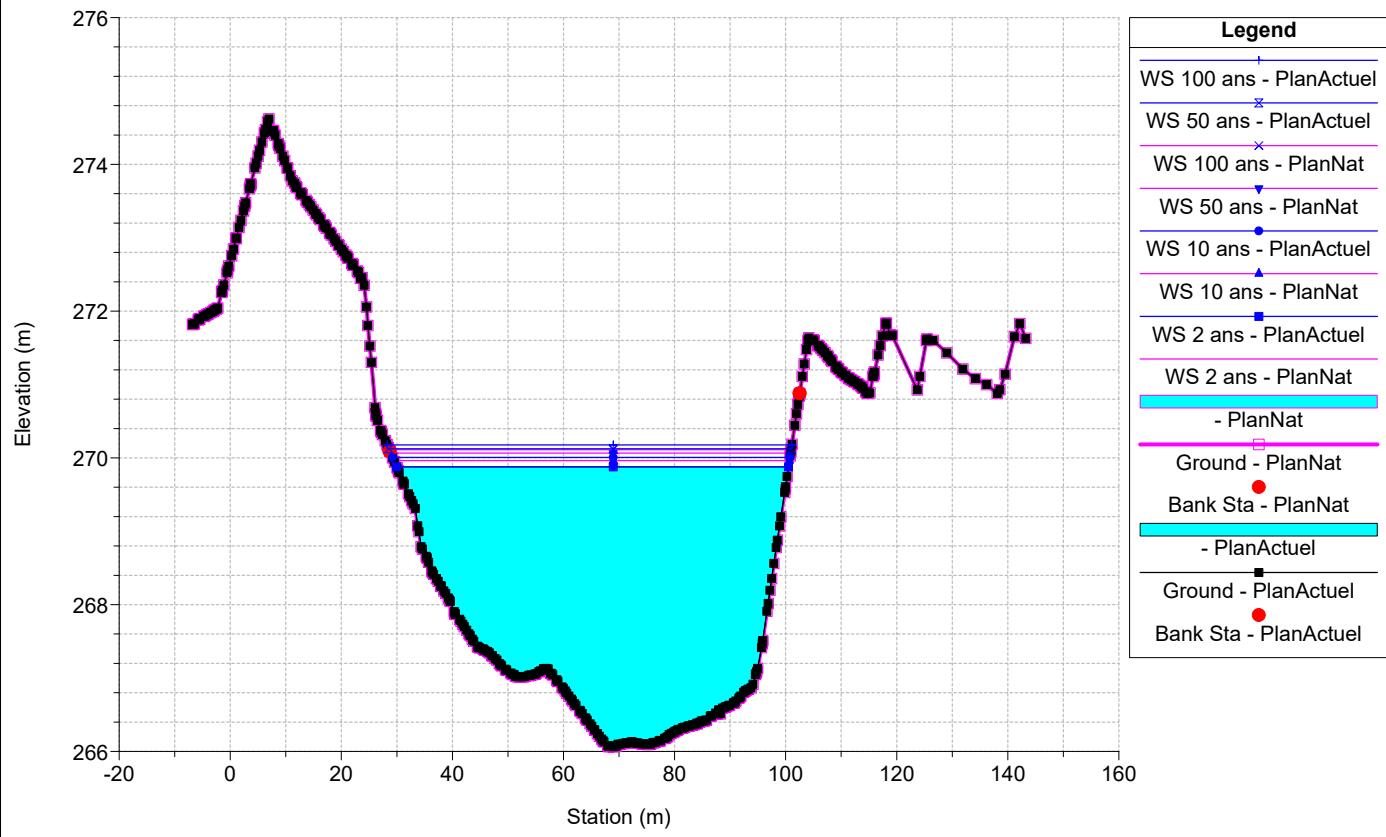


HEC-RAS Model Plan: 1) PlanActuel 2) PlanNat
RS = 450

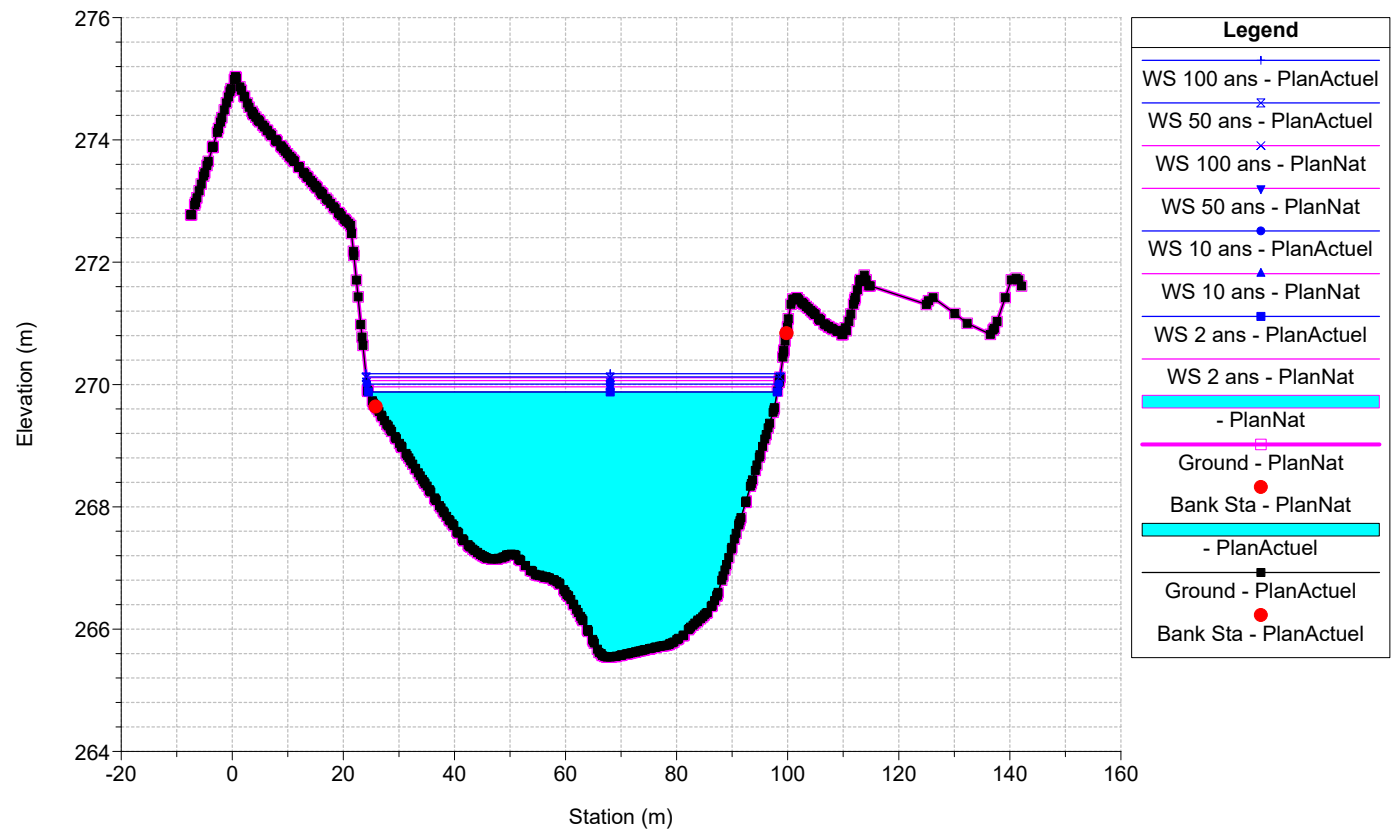




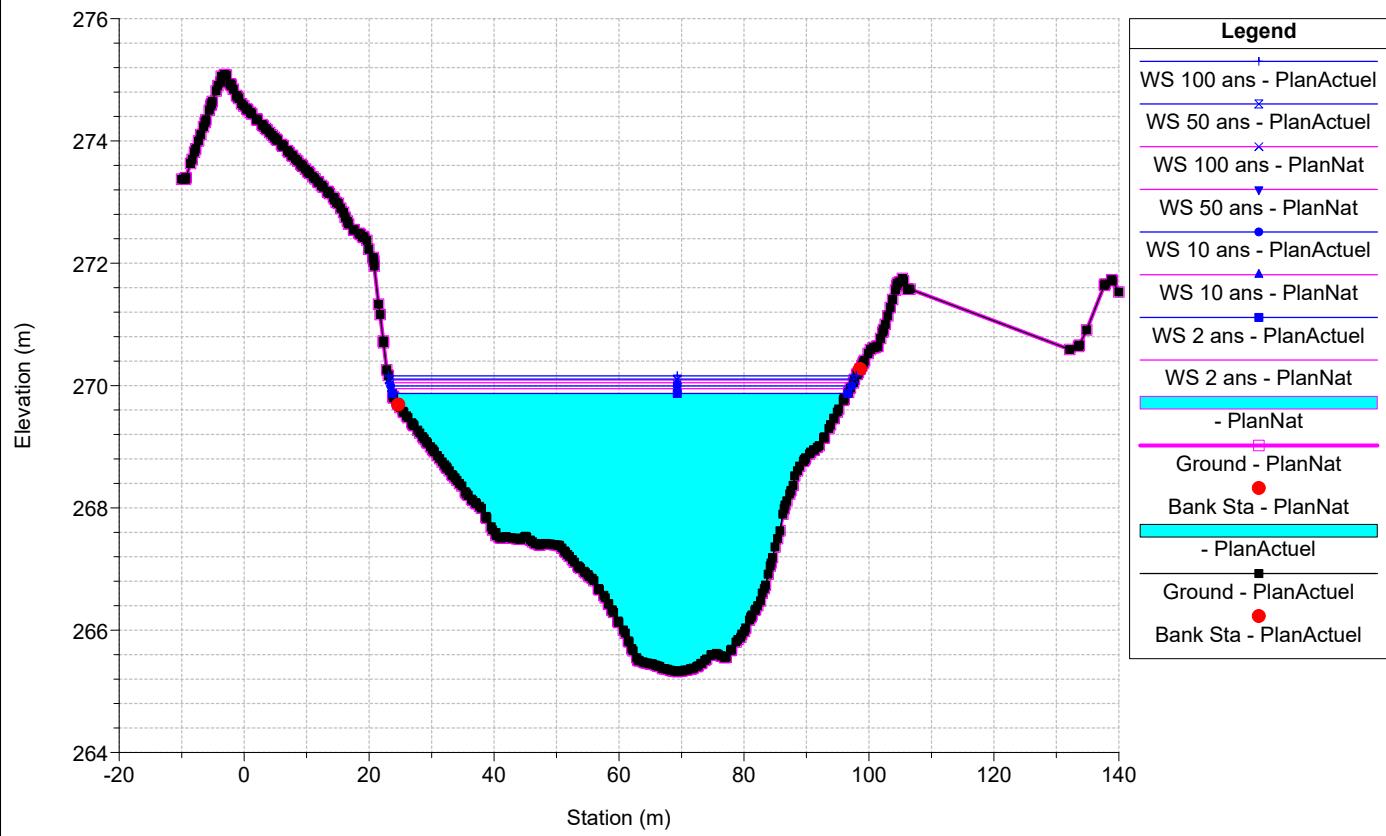
HEC-RAS Model Plan: 1) PlanActuel 2) PlanNat
RS = 400



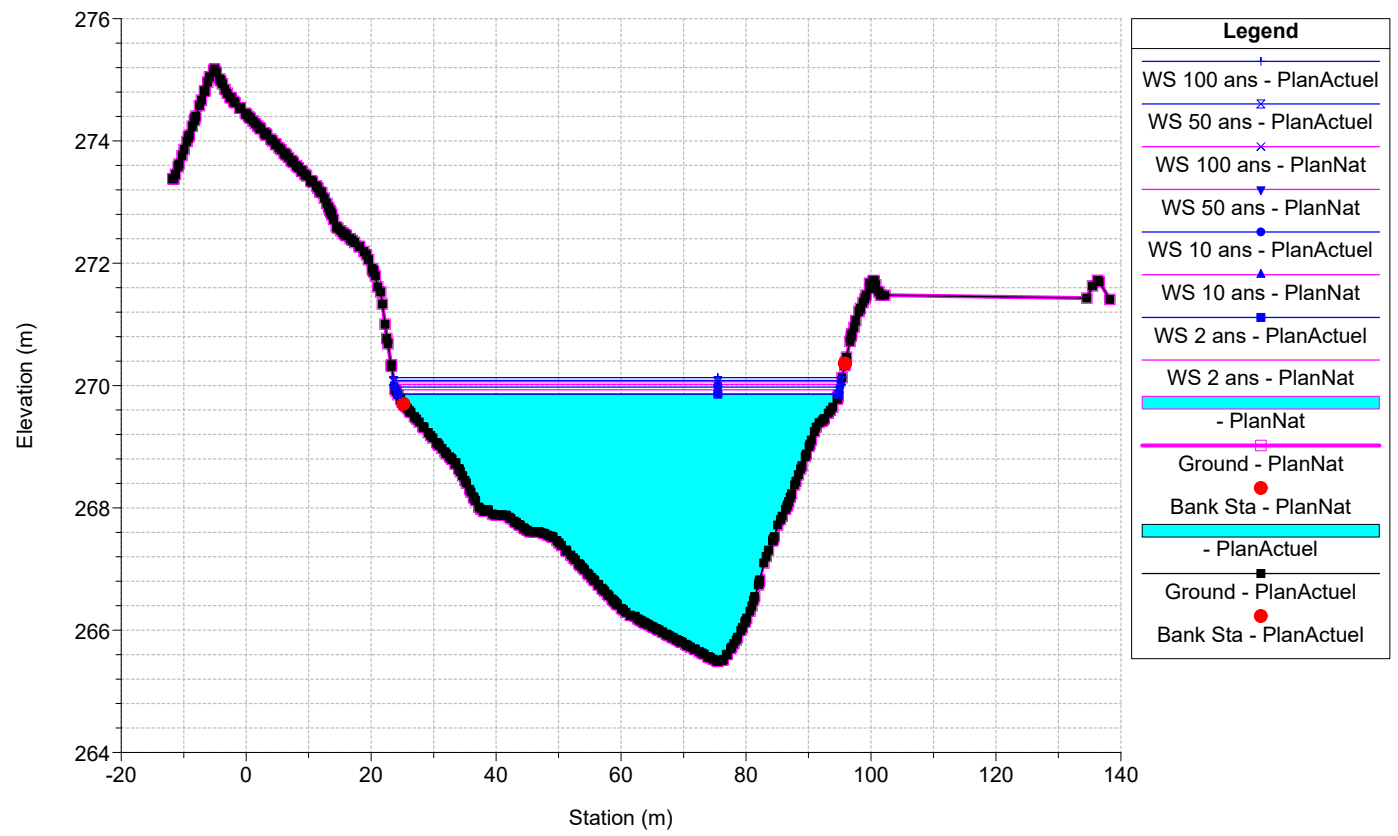
HEC-RAS Model Plan: 1) PlanActuel 2) PlanNat
RS = 390



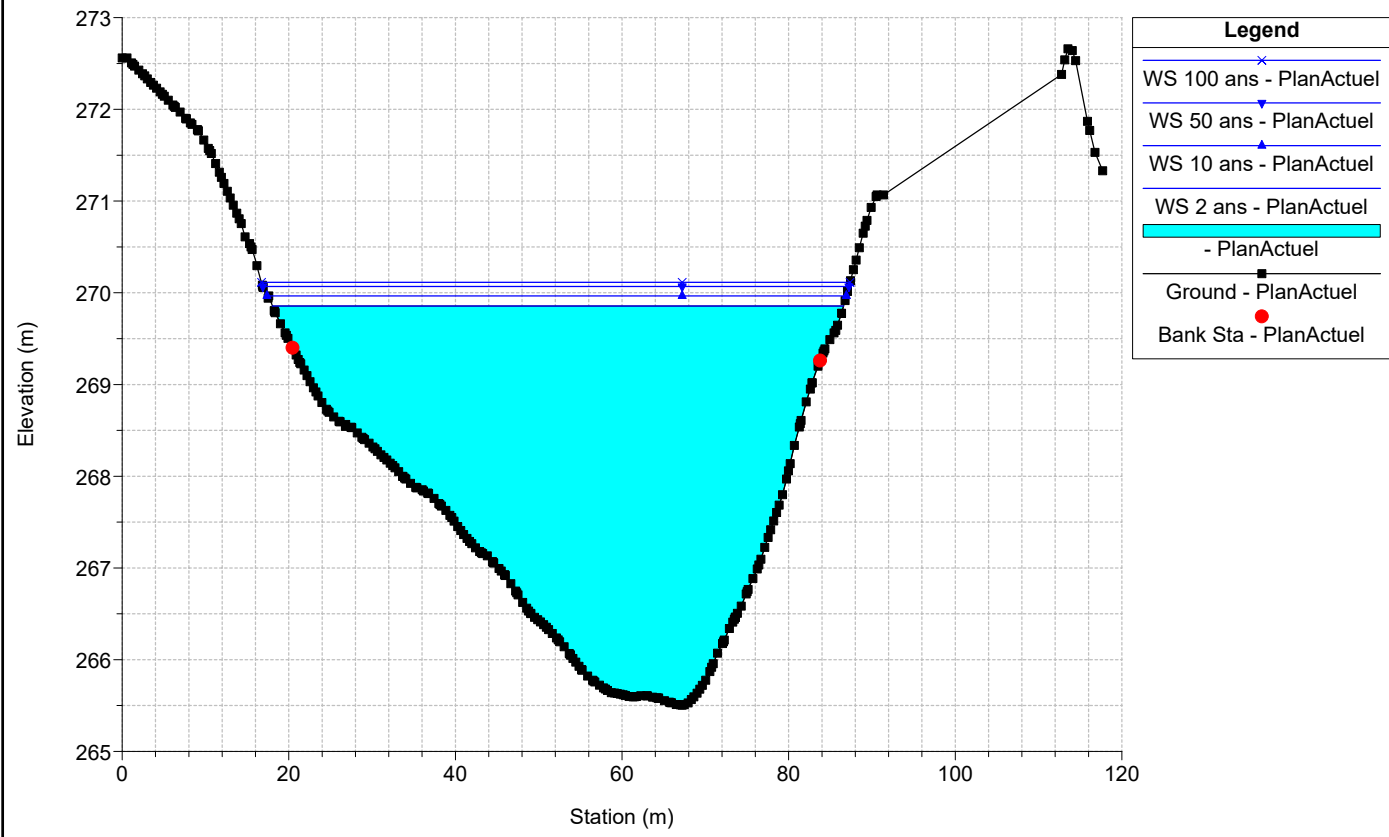
HEC-RAS Model Plan: 1) PlanActuel 2) PlanNat
RS = 380



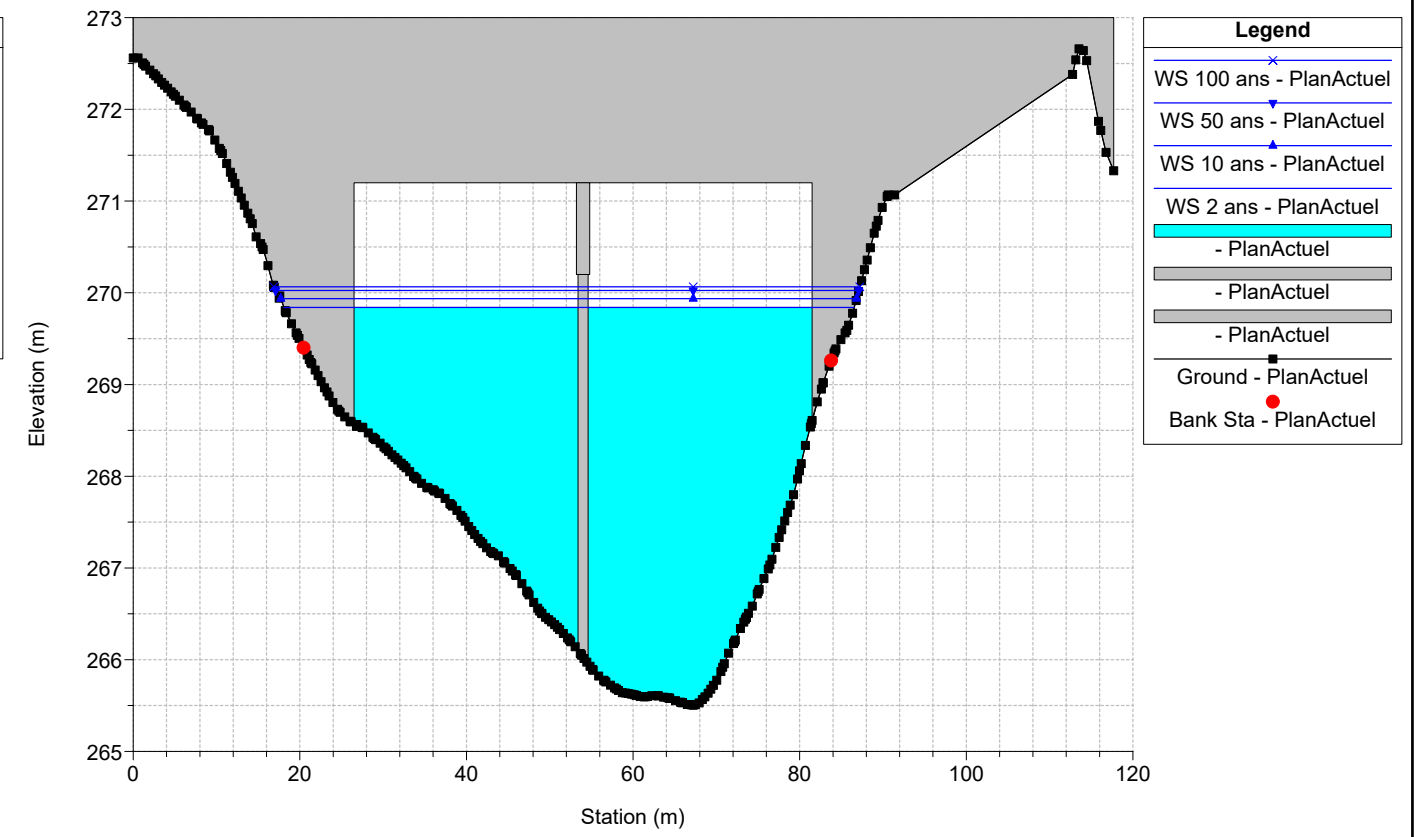
HEC-RAS Model Plan: 1) PlanActuel 2) PlanNat
RS = 370



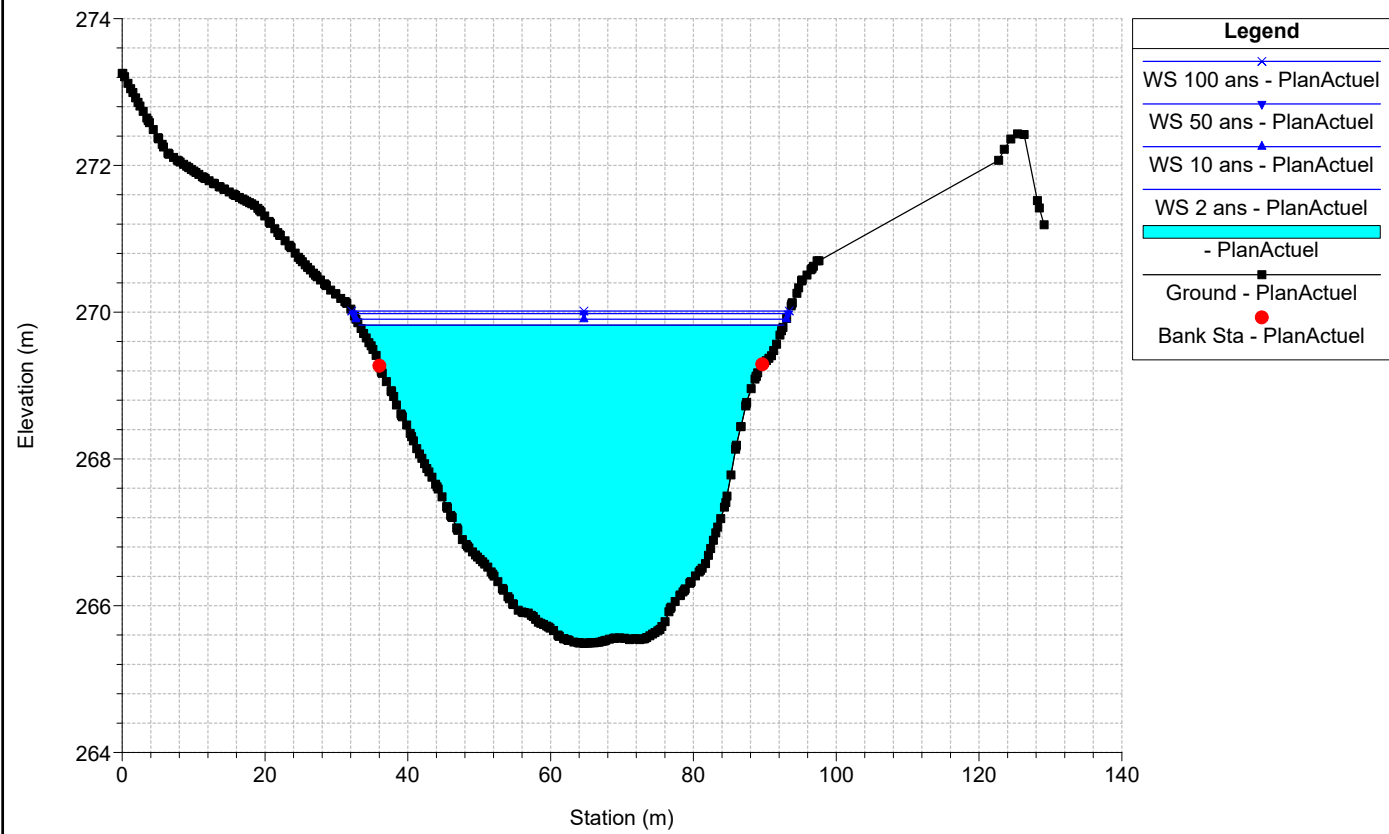
HEC-RAS Model Plan: 1) PlanActuel 2) PlanNat
RS = 348



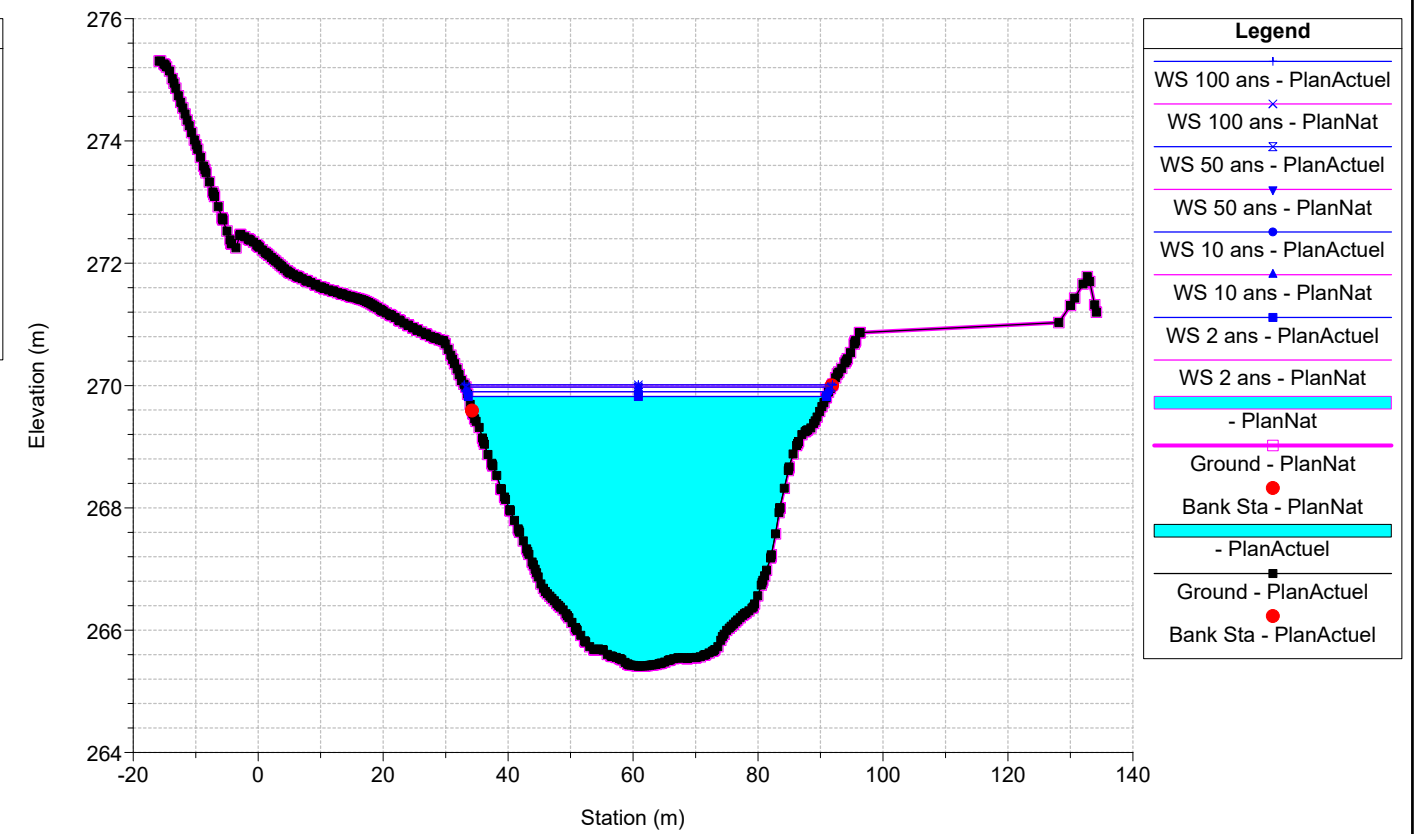
HEC-RAS Model Plan: 1) PlanActuel 2) PlanNat
RS = 325 BR



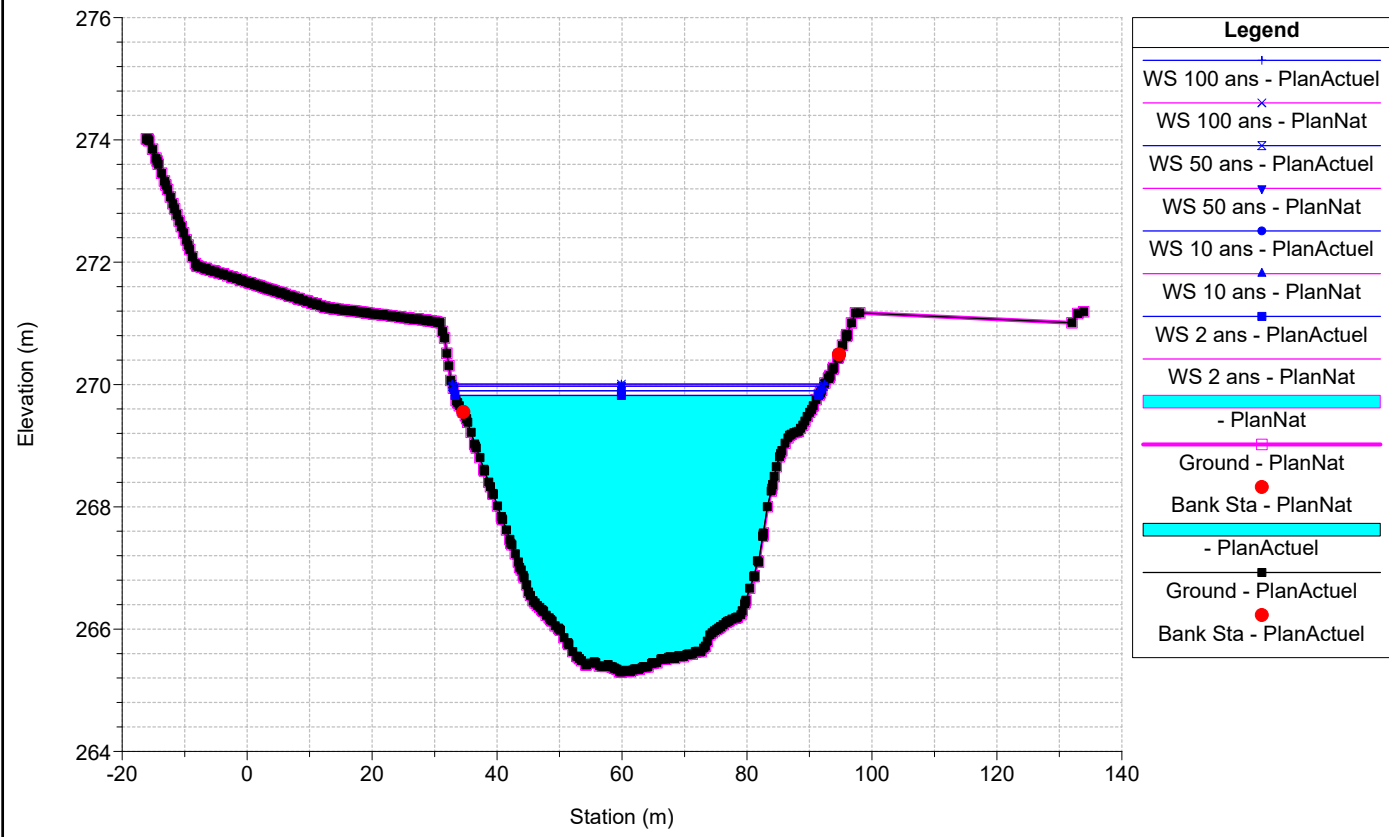
HEC-RAS Model Plan: 1) PlanActuel 2) PlanNat
RS = 321



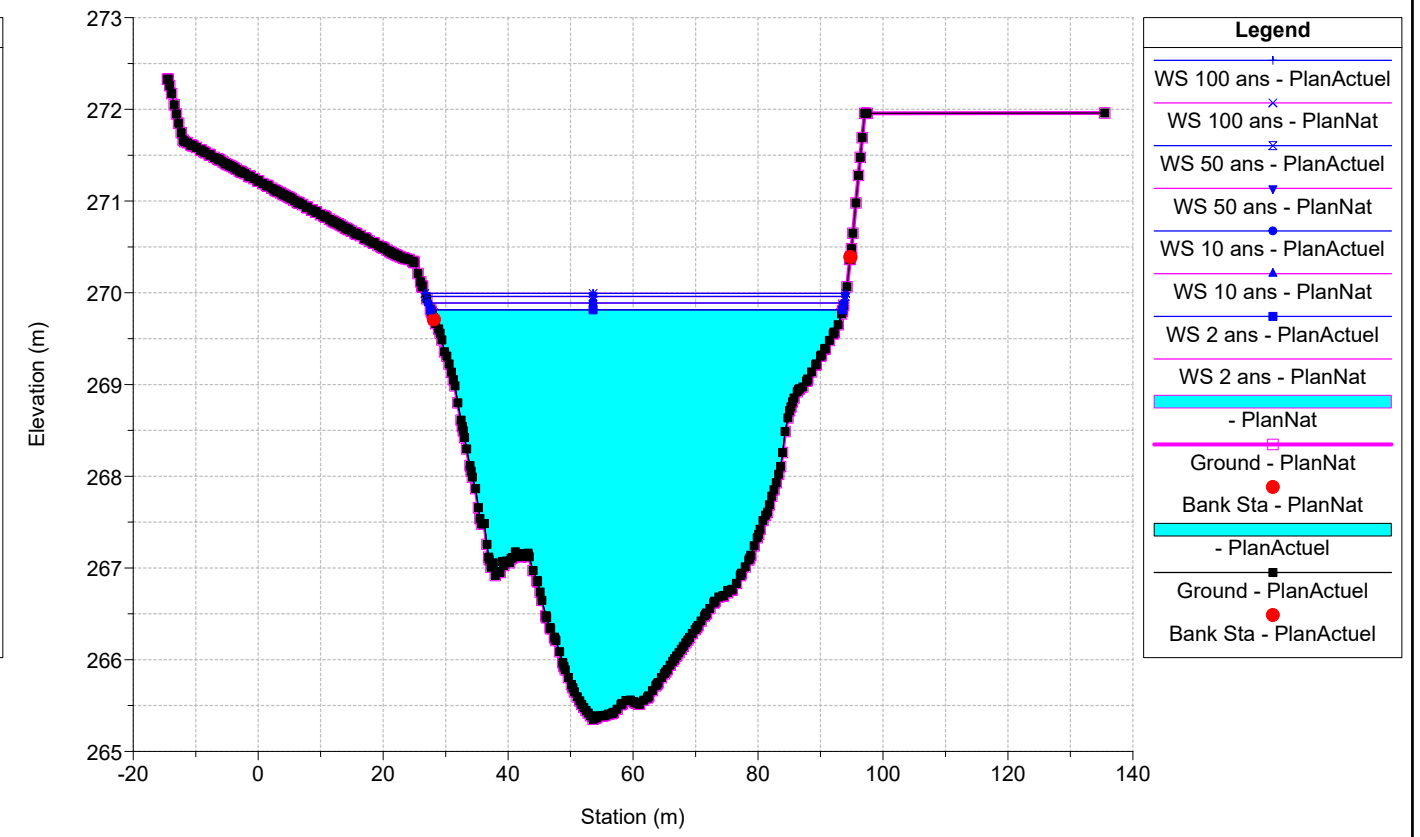
HEC-RAS Model Plan: 1) PlanActuel 2) PlanNat
RS = 310



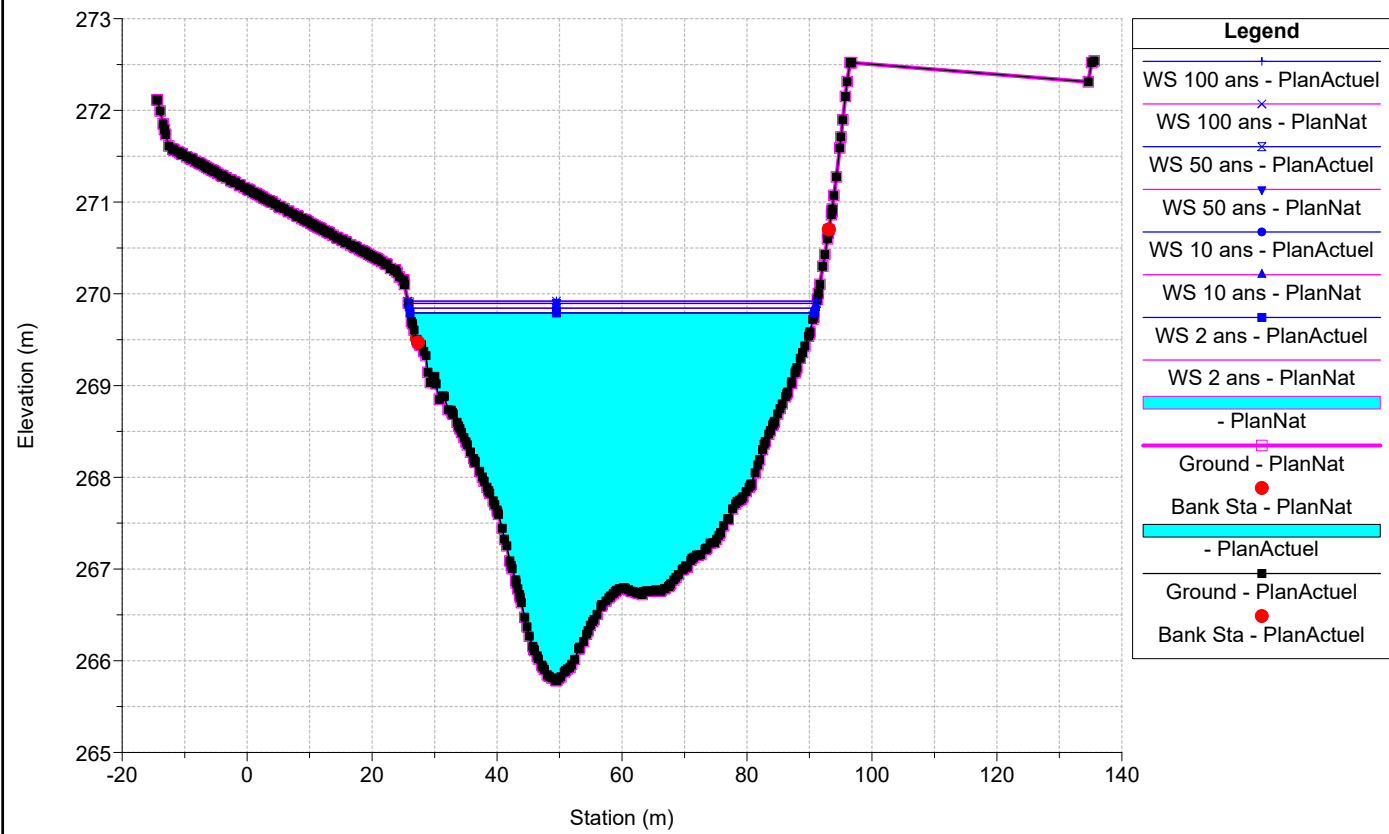
HEC-RAS Model Plan: 1) PlanActuel 2) PlanNat
RS = 300



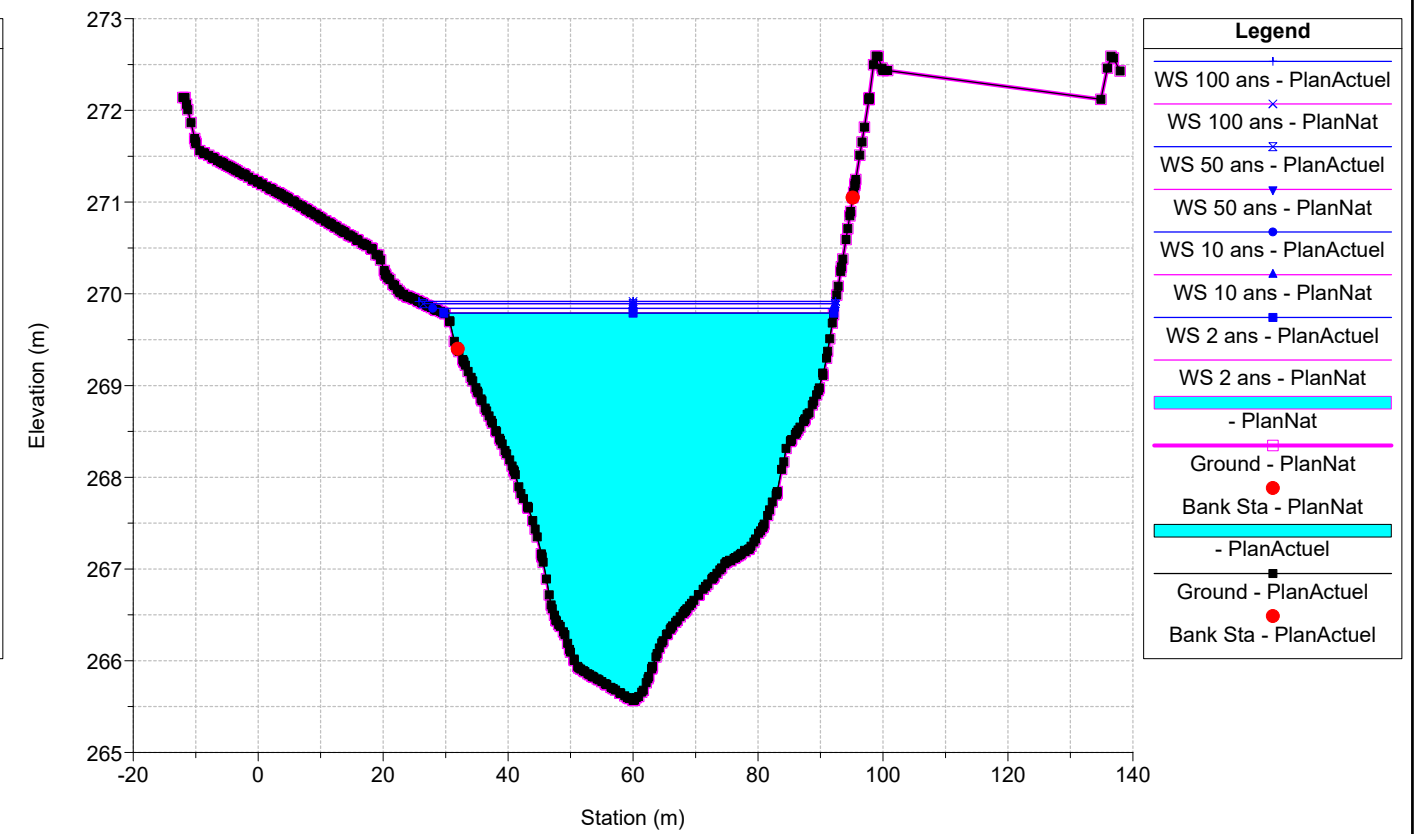
HEC-RAS Model Plan: 1) PlanActuel 2) PlanNat
RS = 280

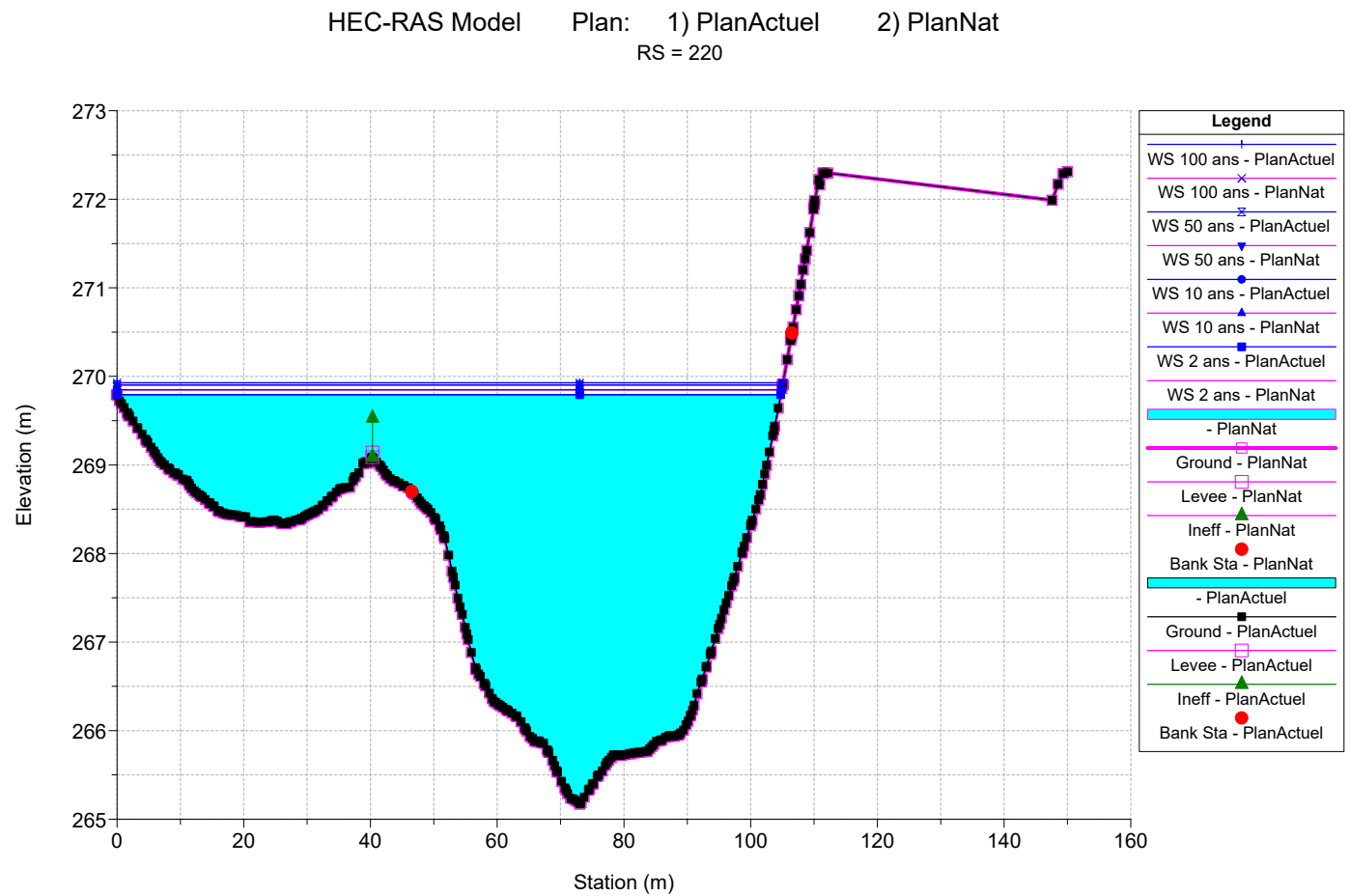
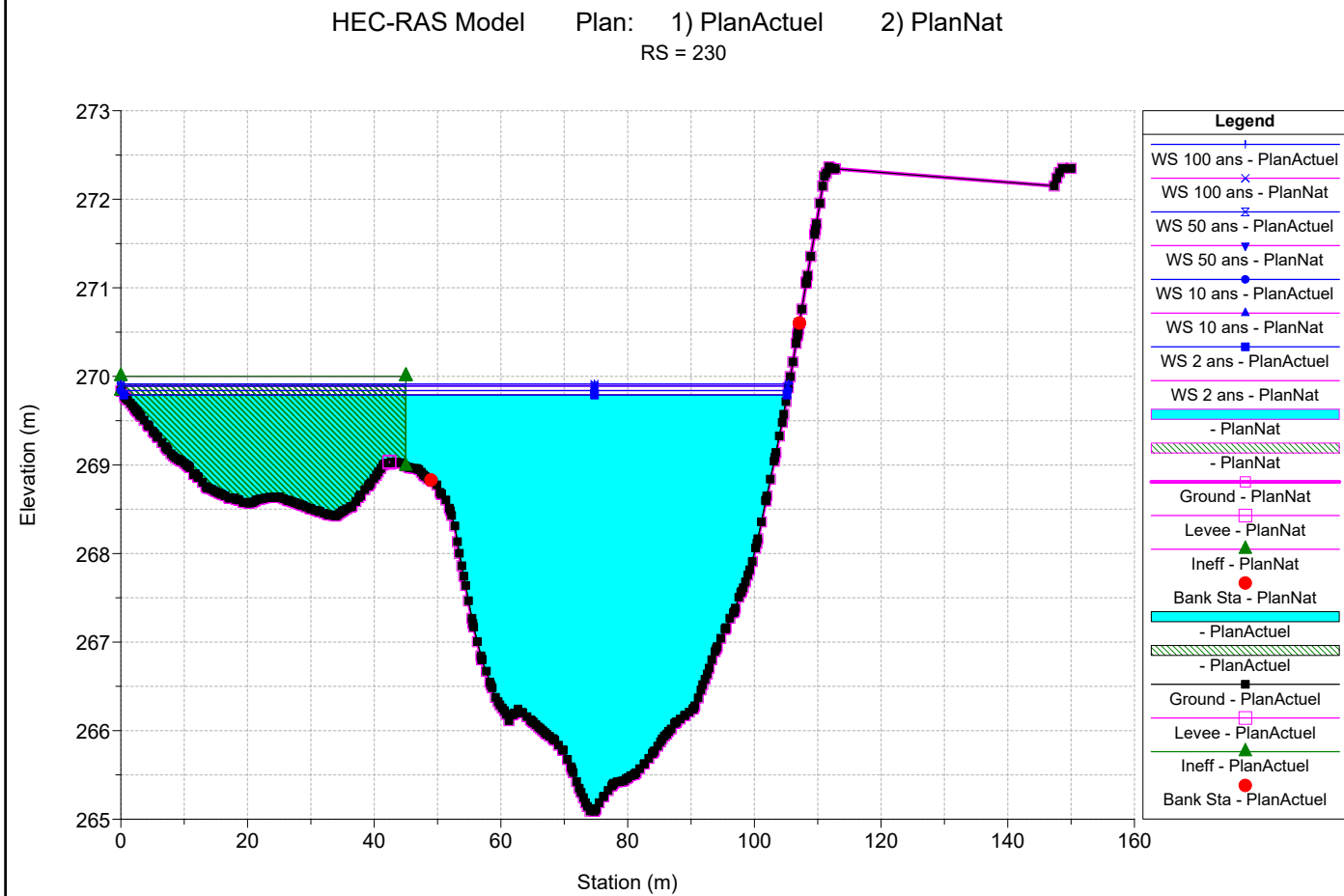
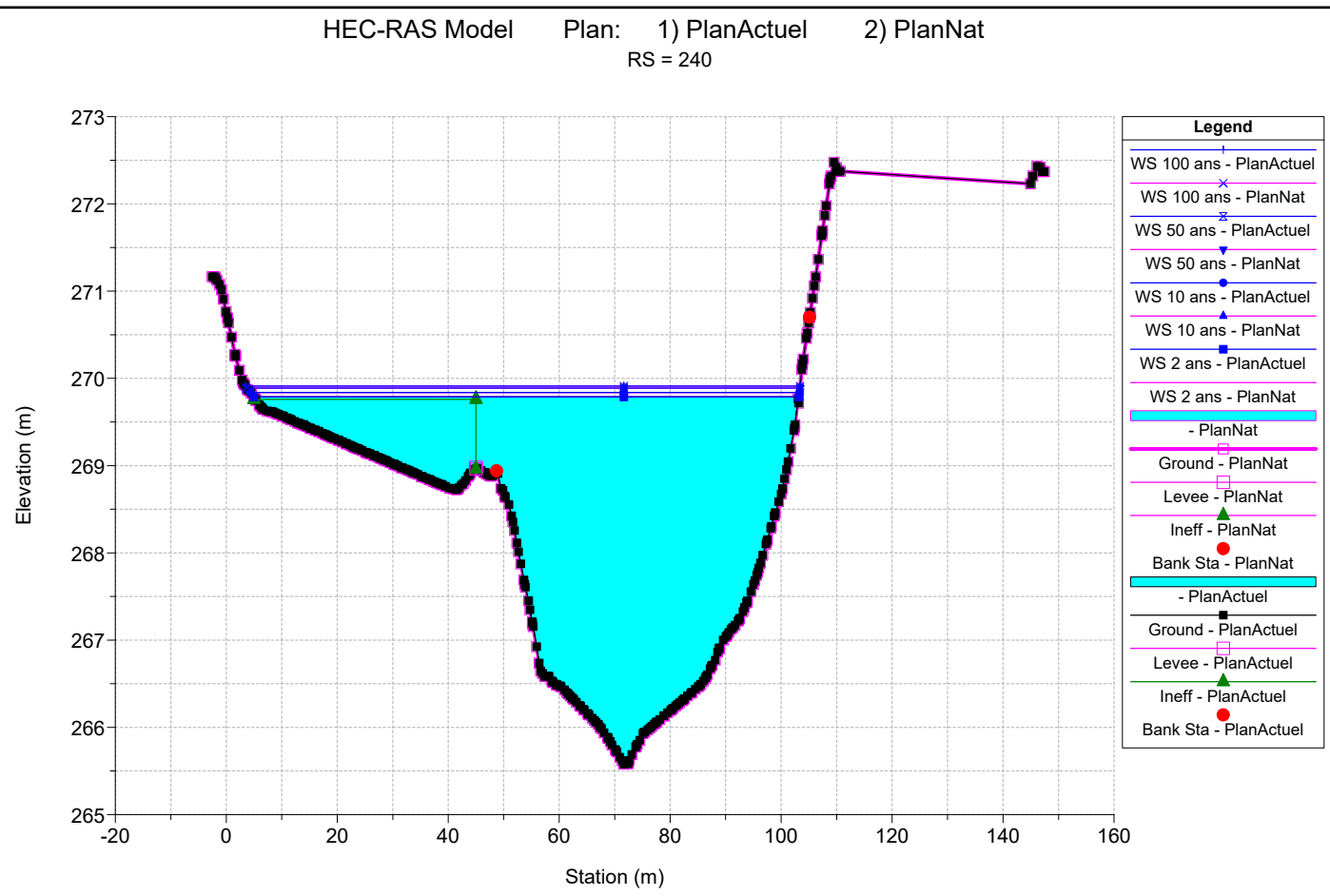
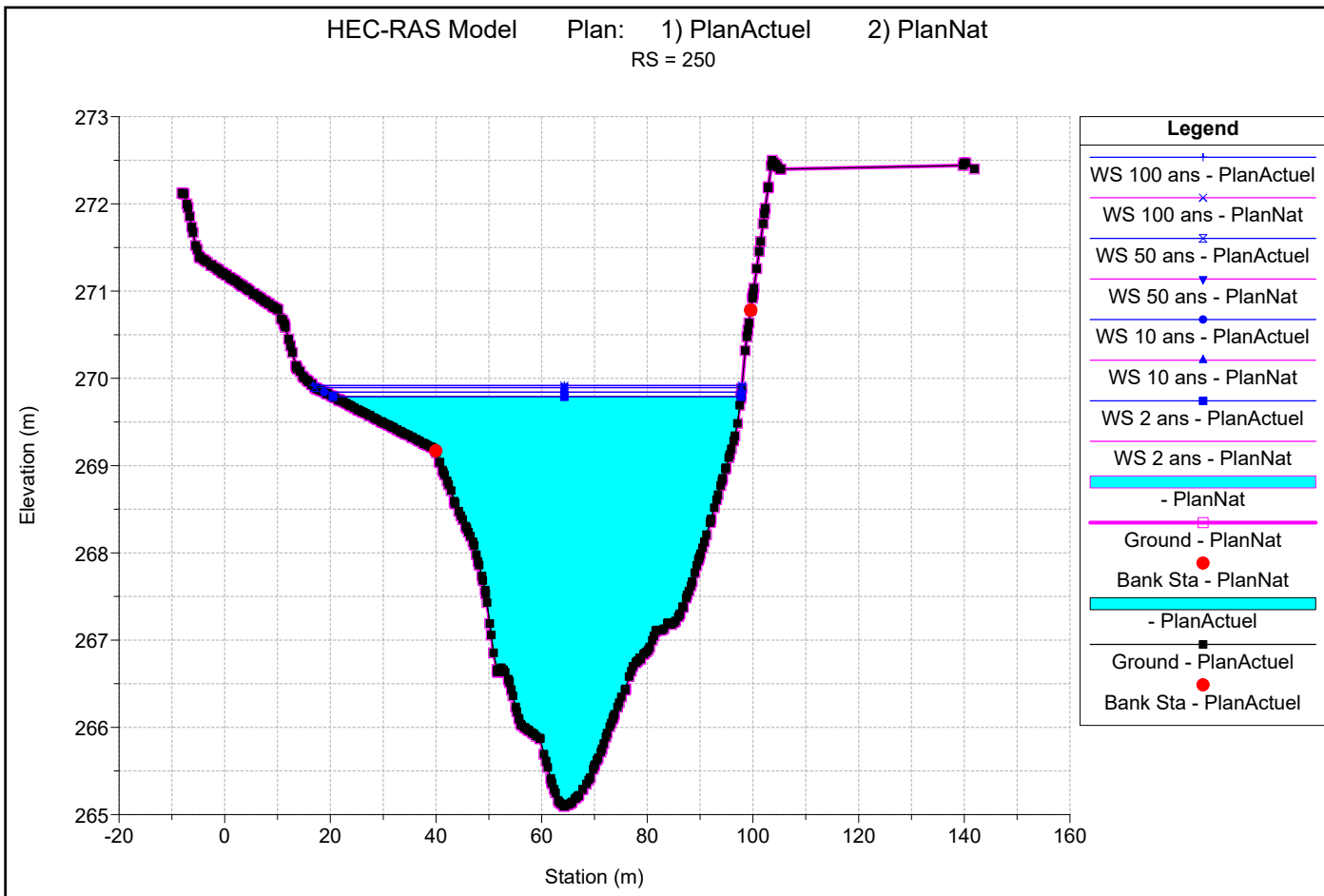


HEC-RAS Model Plan: 1) PlanActuel 2) PlanNat
RS = 270

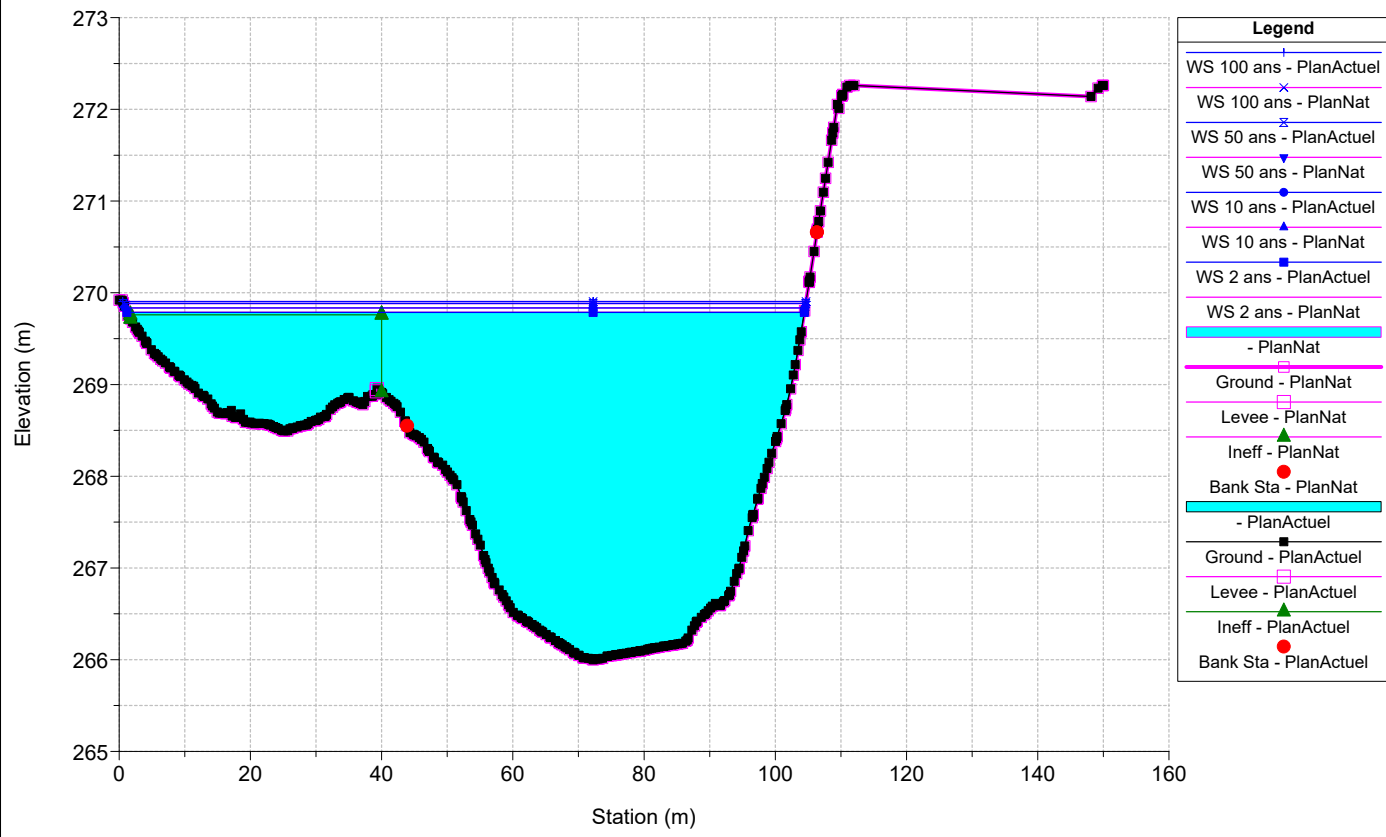


HEC-RAS Model Plan: 1) PlanActuel 2) PlanNat
RS = 260

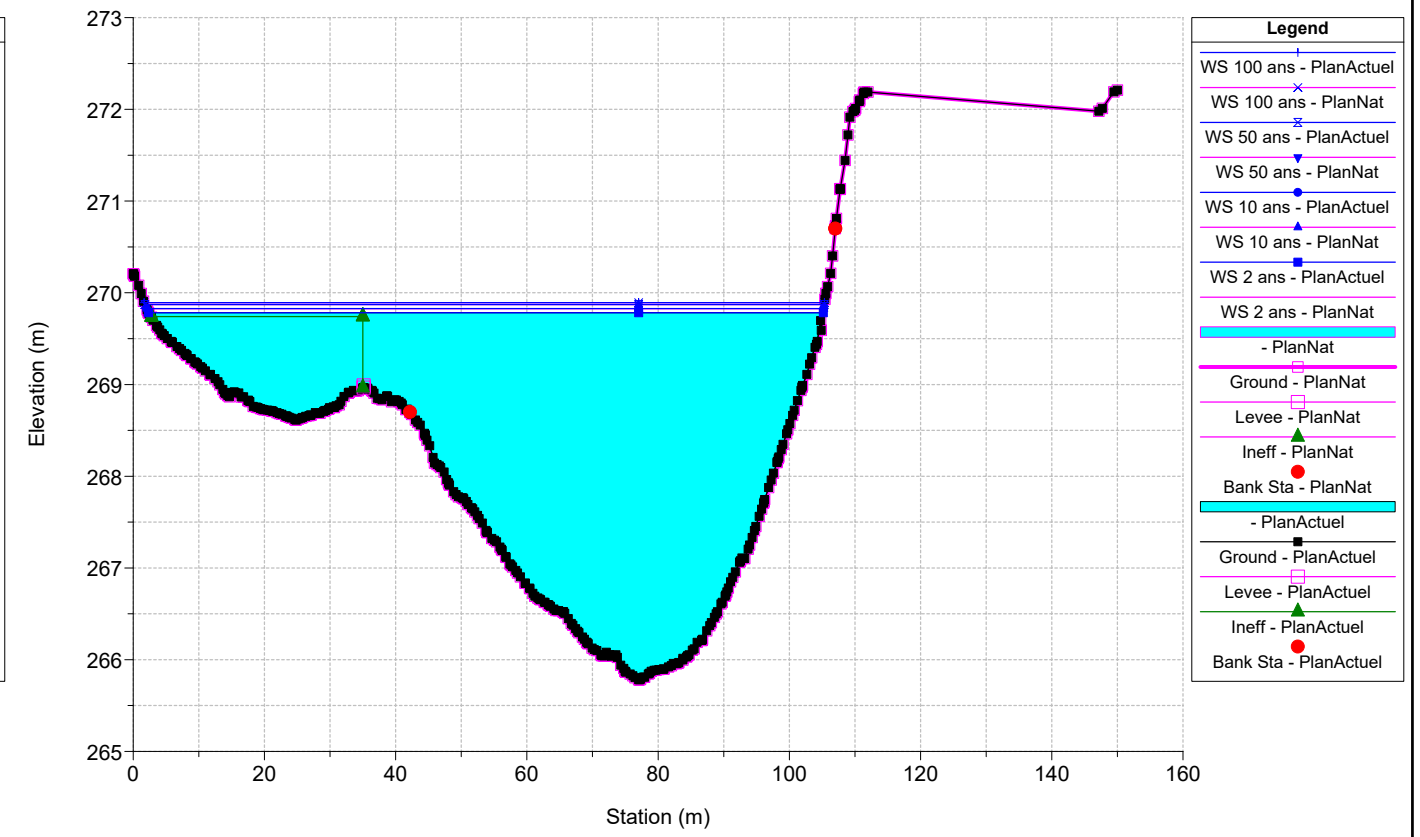




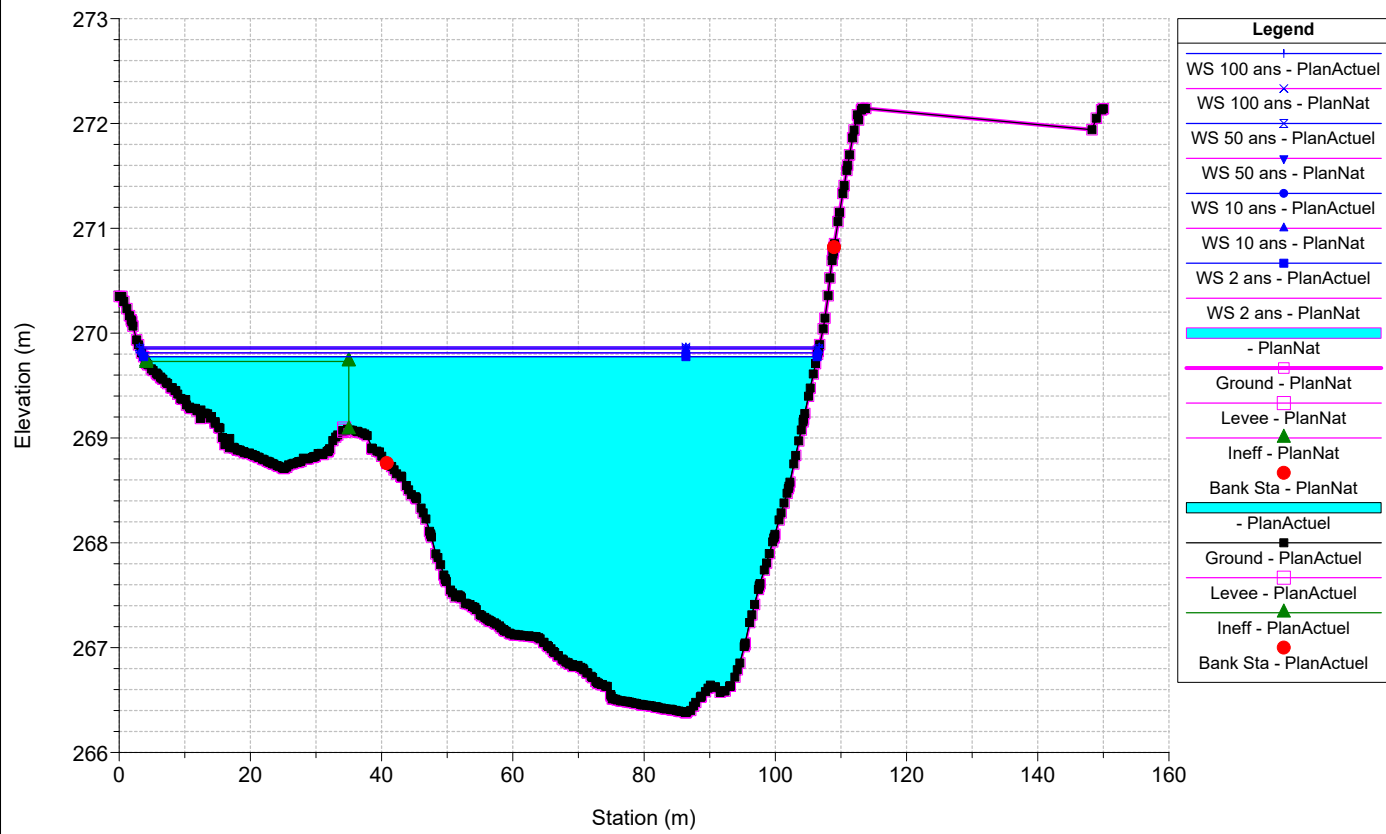
HEC-RAS Model Plan: 1) PlanActuel 2) PlanNat
RS = 210



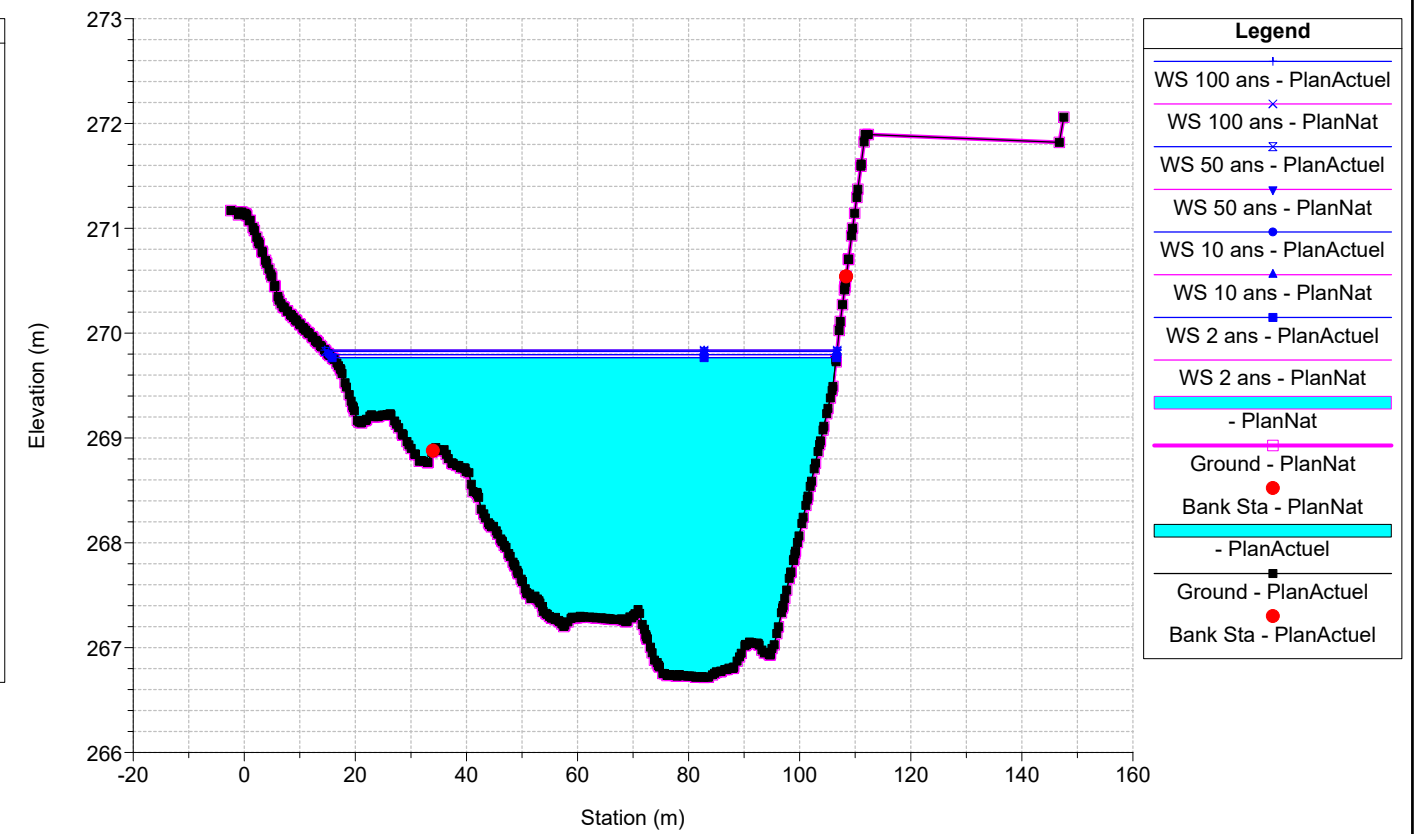
HEC-RAS Model Plan: 1) PlanActuel 2) PlanNat
RS = 200



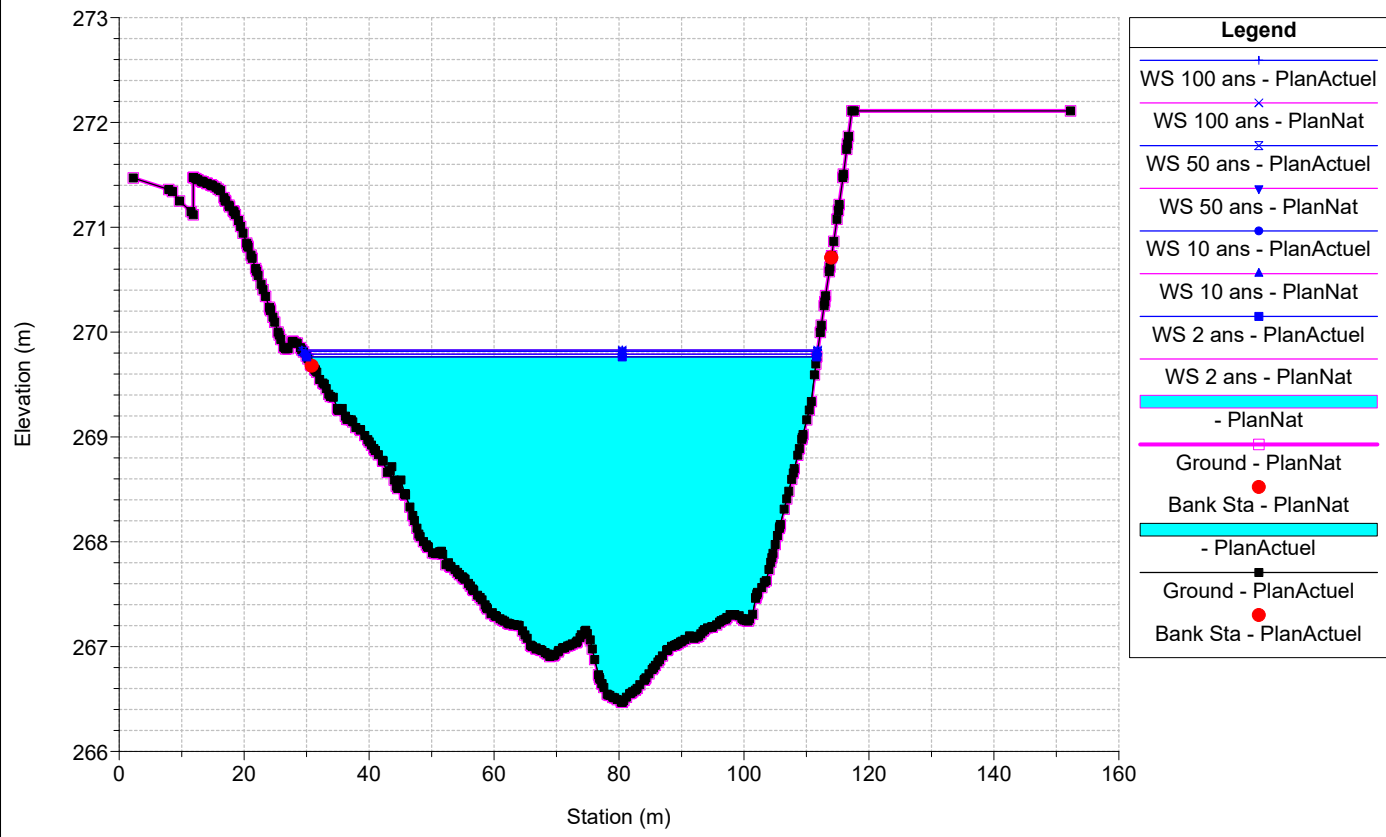
HEC-RAS Model Plan: 1) PlanActuel 2) PlanNat
RS = 190



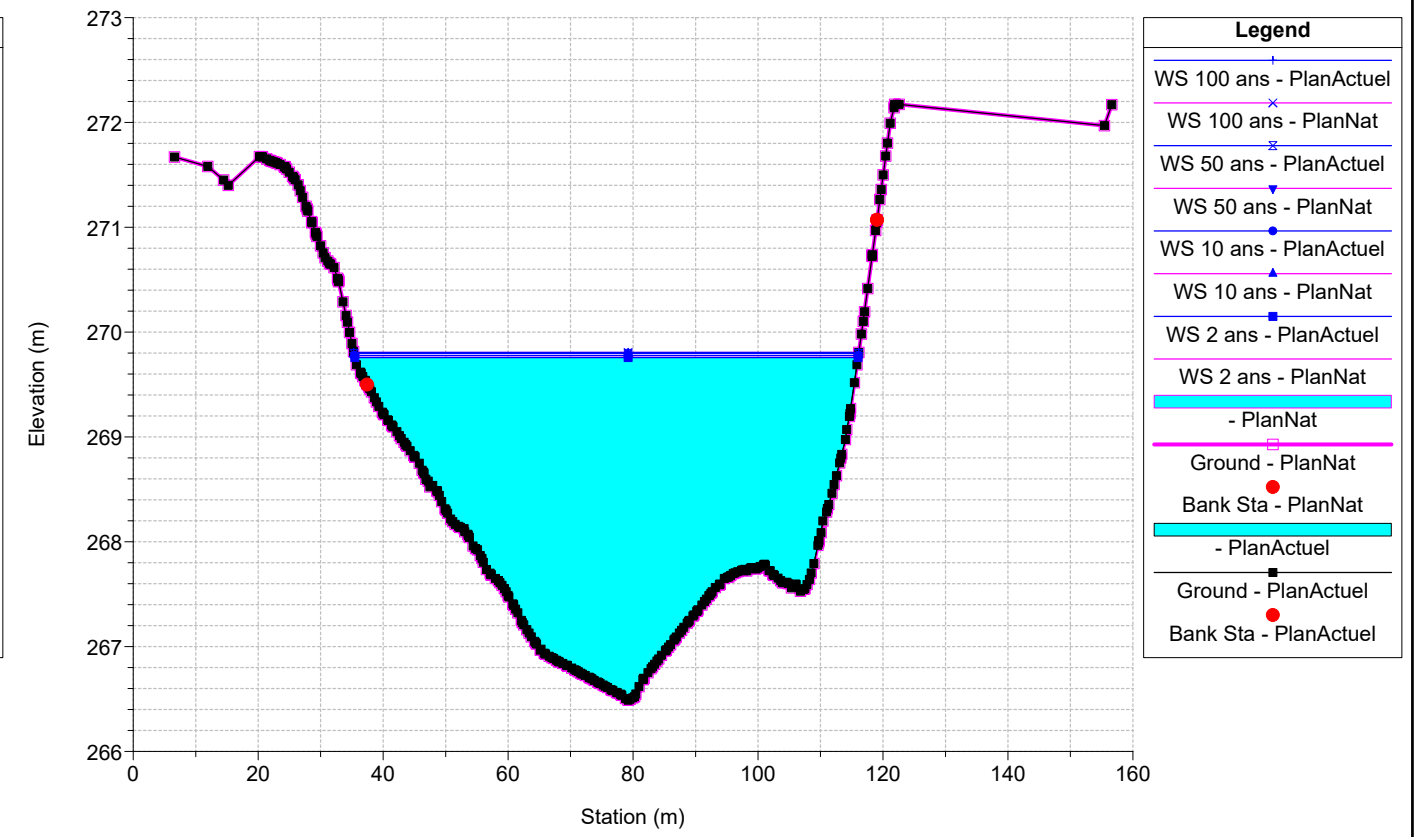
HEC-RAS Model Plan: 1) PlanActuel 2) PlanNat
RS = 180



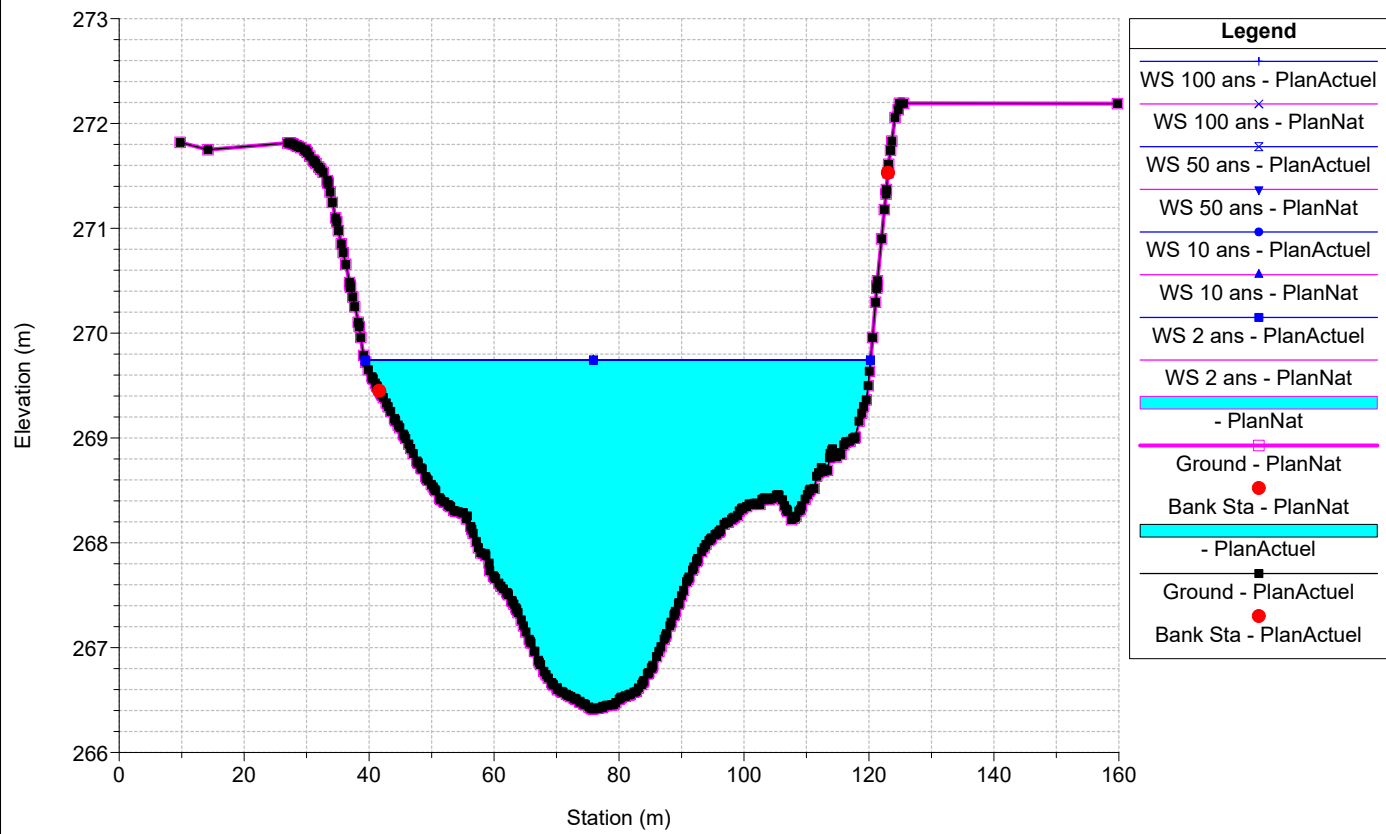
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RS = 170



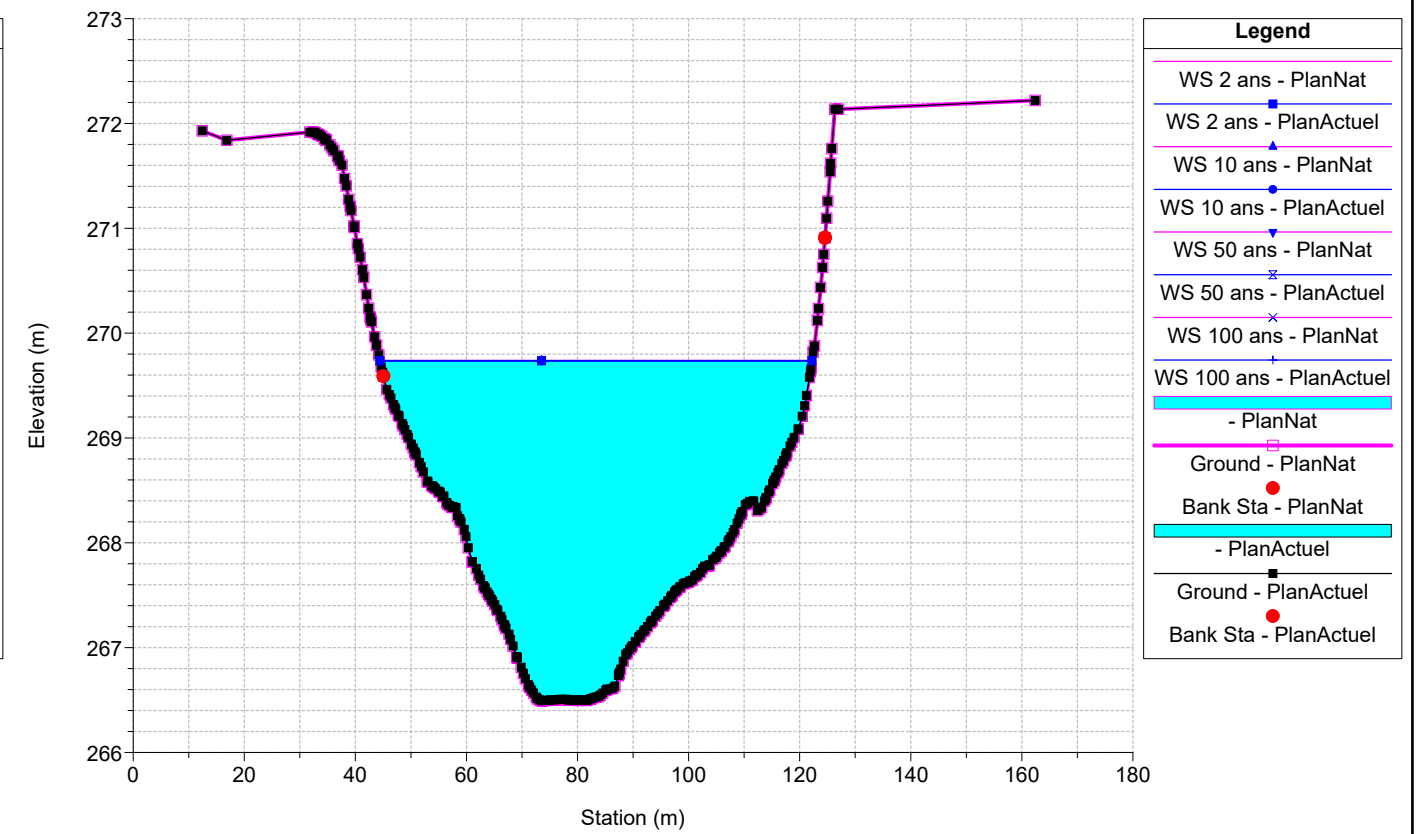
HEC-RAS Model Plan: 1) PlanActuel 2) PlanNat
RS = 160



HEC-RAS Model Plan: 1) PlanActuel 2) PlanNat
RS = 150



HEC-RAS Model Plan: 1) PlanActuel 2) PlanNat
RS = 140



APPENDIX 6

Summary Tables

Plan: PlanActuel River278km Pont278 RS: 325 Profile: 2 ans

E.G. US. (m)	269.90	Element	Inside BR US	Inside BR DS
W.S. US. (m)	269.86	E.G. Elev (m)	269.89	269.88
Q Total (m3/s)	156.90	W.S. Elev (m)	269.84	269.83
Q Bridge (m3/s)	156.90	Crit W.S. (m)	267.49	267.27
Q Weir (m3/s)		Max Chl Dpth (m)	4.34	4.34
Weir Sta Lft (m)		Vel Total (m/s)	0.97	0.96
Weir Sta Rgt (m)		Flow Area (m2)	162.20	164.20
Weir Submerg		Froude # Chl	0.15	0.15
Weir Max Depth (m)		Specif Force (m3)	286.74	306.81
Min El Weir Flow (m)	273.00	Hydr Depth (m)	3.01	3.05
Min El Prs (m)	271.20	W.P. Total (m)	64.46	64.07
Delta EG (m)	0.03	Conv. Total (m3/s)	4616.4	4797.6
Delta WS (m)	0.03	Top Width (m)	53.80	53.80
BR Open Area (m2)	234.87	Frctn Loss (m)	0.01	0.01
BR Open Vel (m/s)	0.97	C & E Loss (m)	0.00	0.00
BR Sluice Coef		Shear Total (N/m2)	28.50	26.88
BR Sel Method	Energy only	Power Total (N/m s)	27.57	25.68

Plan: PlanActuel River278km Pont278 RS: 325 Profile: 5 ans

E.G. US. (m)	269.98	Element	Inside BR US	Inside BR DS
W.S. US. (m)	269.92	E.G. Elev (m)	269.97	269.95
Q Total (m3/s)	197.37	W.S. Elev (m)	269.90	269.88
Q Bridge (m3/s)	197.37	Crit W.S. (m)	267.72	267.48
Q Weir (m3/s)		Max Chl Dpth (m)	4.39	4.39
Weir Sta Lft (m)		Vel Total (m/s)	1.19	1.18
Weir Sta Rgt (m)		Flow Area (m2)	165.19	166.90
Weir Submerg		Froude # Chl	0.18	0.18
Weir Max Depth (m)		Specif Force (m3)	304.41	323.66
Min El Weir Flow (m)	273.00	Hydr Depth (m)	3.07	3.10
Min El Prs (m)	271.20	W.P. Total (m)	64.68	64.28
Delta EG (m)	0.04	Conv. Total (m3/s)	4748.2	4919.4
Delta WS (m)	0.05	Top Width (m)	53.80	53.80
BR Open Area (m2)	234.87	Frctn Loss (m)	0.02	0.01
BR Open Vel (m/s)	1.19	C & E Loss (m)	0.00	0.00
BR Sluice Coef		Shear Total (N/m2)	43.27	40.99
BR Sel Method	Energy only	Power Total (N/m s)	51.70	48.47

Plan: PlanActuel River278km Pont278 RS: 325 Profile: 10 ans

E.G. US. (m)	270.04	Element	Inside BR US	Inside BR DS
W.S. US. (m)	269.97	E.G. Elev (m)	270.03	270.00
Q Total (m3/s)	221.69	W.S. Elev (m)	269.94	269.92
Q Bridge (m3/s)	221.69	Crit W.S. (m)	267.85	267.60
Q Weir (m3/s)		Max Chl Dpth (m)	4.43	4.43
Weir Sta Lft (m)		Vel Total (m/s)	1.32	1.31
Weir Sta Rgt (m)		Flow Area (m2)	167.35	168.88
Weir Submerg		Froude # Chl	0.20	0.20
Weir Max Depth (m)		Specif Force (m3)	316.99	335.71
Min El Weir Flow (m)	273.00	Hydr Depth (m)	3.11	3.14
Min El Prs (m)	271.20	W.P. Total (m)	64.84	64.42
Delta EG (m)	0.05	Conv. Total (m3/s)	4844.2	5009.2
Delta WS (m)	0.06	Top Width (m)	53.80	53.80
BR Open Area (m2)	234.87	Frctn Loss (m)	0.02	0.02
BR Open Vel (m/s)	1.32	C & E Loss (m)	0.00	0.00

Plan: PlanActuel River278km Pont278 RS: 325 Profile: 10 ans (Continued)

BR Sluice Coef		Shear Total (N/m2)	53.01	50.35
BR Sel Method	Energy only	Power Total (N/m s)	70.22	66.10

Plan: PlanActuel River278km Pont278 RS: 325 Profile: 20 ans

E.G. US. (m)	270.10	Element	Inside BR US	Inside BR DS
W.S. US. (m)	270.01	E.G. Elev (m)	270.08	270.06
Q Total (m3/s)	244.07	W.S. Elev (m)	269.97	269.95
Q Bridge (m3/s)	244.07	Crit W.S. (m)	267.97	267.71
Q Weir (m3/s)		Max Chl Dpth (m)	4.47	4.47
Weir Sta Lft (m)		Vel Total (m/s)	1.44	1.43
Weir Sta Rgt (m)		Flow Area (m2)	169.43	170.78
Weir Submerg		Froude # Chl	0.22	0.22
Weir Max Depth (m)		Specif Force (m3)	329.41	347.62
Min El Weir Flow (m)	273.00	Hydr Depth (m)	3.15	3.17
Min El Prs (m)	271.20	W.P. Total (m)	65.00	64.56
Delta EG (m)	0.06	Conv. Total (m3/s)	4937.2	5095.9
Delta WS (m)	0.07	Top Width (m)	53.80	53.80
BR Open Area (m2)	234.87	Frctn Loss (m)	0.02	0.02
BR Open Vel (m/s)	1.44	C & E Loss (m)	0.00	0.00
BR Sluice Coef		Shear Total (N/m2)	62.47	59.50
BR Sel Method	Energy only	Power Total (N/m s)	89.99	85.04

Plan: PlanActuel River278km Pont278 RS: 325 Profile: 25 ans

E.G. US. (m)	270.12	Element	Inside BR US	Inside BR DS
W.S. US. (m)	270.02	E.G. Elev (m)	270.10	270.07
Q Total (m3/s)	250.29	W.S. Elev (m)	269.99	269.96
Q Bridge (m3/s)	250.29	Crit W.S. (m)	268.01	267.74
Q Weir (m3/s)		Max Chl Dpth (m)	4.48	4.48
Weir Sta Lft (m)		Vel Total (m/s)	1.47	1.46
Weir Sta Rgt (m)		Flow Area (m2)	170.06	171.35
Weir Submerg		Froude # Chl	0.22	0.22
Weir Max Depth (m)		Specif Force (m3)	333.10	351.16
Min El Weir Flow (m)	273.00	Hydr Depth (m)	3.16	3.18
Min El Prs (m)	271.20	W.P. Total (m)	65.04	64.61
Delta EG (m)	0.07	Conv. Total (m3/s)	4965.2	5122.2
Delta WS (m)	0.08	Top Width (m)	53.80	53.80
BR Open Area (m2)	234.87	Frctn Loss (m)	0.02	0.02
BR Open Vel (m/s)	1.47	C & E Loss (m)	0.00	0.00
BR Sluice Coef		Shear Total (N/m2)	65.15	62.10
BR Sel Method	Energy only	Power Total (N/m s)	95.89	90.71

Plan: PlanActuel River278km Pont278 RS: 325 Profile: 50 ans

E.G. US. (m)	270.17	Element	Inside BR US	Inside BR DS
W.S. US. (m)	270.07	E.G. Elev (m)	270.15	270.12
Q Total (m3/s)	270.64	W.S. Elev (m)	270.03	270.00
Q Bridge (m3/s)	270.64	Crit W.S. (m)	268.09	267.83
Q Weir (m3/s)		Max Chl Dpth (m)	4.52	4.51
Weir Sta Lft (m)		Vel Total (m/s)	1.57	1.56
Weir Sta Rgt (m)		Flow Area (m2)	172.16	173.28
Weir Submerg		Froude # Chl	0.24	0.24
Weir Max Depth (m)		Specif Force (m3)	345.61	363.19
Min El Weir Flow (m)	273.00	Hydr Depth (m)	3.20	3.22
Min El Prs (m)	271.20	W.P. Total (m)	65.20	64.75

Plan: PlanActuel River278km Pont278 RS: 325 Profile: 50 ans (Continued)

Delta EG (m)	0.07	Conv. Total (m3/s)	5060.0	5211.1
Delta WS (m)	0.09	Top Width (m)	53.80	53.80
BR Open Area (m2)	234.87	Frctn Loss (m)	0.03	0.02
BR Open Vel (m/s)	1.57	C & E Loss (m)	0.00	0.00
BR Sluice Coef		Shear Total (N/m2)	74.08	70.79
BR Sel Method	Energy only	Power Total (N/m s)	116.45	110.56

Plan: PlanActuel River278km Pont278 RS: 325 Profile: 100 ans

E.G. US. (m)	270.23	Element	Inside BR US	Inside BR DS
W.S. US. (m)	270.11	E.G. Elev (m)	270.21	270.18
Q Total (m3/s)	290.79	W.S. Elev (m)	270.07	270.04
Q Bridge (m3/s)	290.79	Crit W.S. (m)	268.18	267.92
Q Weir (m3/s)		Max Chl Dpth (m)	4.56	4.55
Weir Sta Lft (m)		Vel Total (m/s)	1.67	1.66
Weir Sta Rgt (m)		Flow Area (m2)	174.32	175.27
Weir Submerg		Froude # Chl	0.25	0.25
Weir Max Depth (m)		Specif Force (m3)	358.64	375.73
Min El Weir Flow (m)	273.00	Hydr Depth (m)	3.24	3.26
Min El Prs (m)	271.20	W.P. Total (m)	65.36	64.90
Delta EG (m)	0.08	Conv. Total (m3/s)	5157.7	5302.9
Delta WS (m)	0.10	Top Width (m)	53.80	53.80
BR Open Area (m2)	234.87	Frctn Loss (m)	0.03	0.03
BR Open Vel (m/s)	1.67	C & E Loss (m)	0.00	0.00
BR Sluice Coef		Shear Total (N/m2)	83.14	79.64
BR Sel Method	Energy only	Power Total (N/m s)	138.69	132.13

HEC-RAS River: River278km Reach: Pont278

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
Pont278	550	2 ans	PlanNat	156.90	266.18	269.90	267.86	269.93	0.000213	0.77	204.92	83.70	0.15
Pont278	550	2 ans	PlanActuel	156.90	266.18	269.92	267.85	269.95	0.000208	0.76	206.85	84.22	0.15
Pont278	550	5 ans	PlanNat	197.37	266.18	269.98	268.00	270.03	0.000304	0.93	212.00	84.64	0.19
Pont278	550	5 ans	PlanActuel	197.37	266.18	270.02	268.00	270.06	0.000292	0.92	214.85	84.82	0.18
Pont278	550	10 ans	PlanNat	221.69	266.18	270.04	268.09	270.09	0.000357	1.03	216.90	84.95	0.20
Pont278	550	10 ans	PlanActuel	221.69	266.18	270.08	268.08	270.13	0.000340	1.01	220.37	85.17	0.20
Pont278	550	20 ans	PlanNat	244.07	266.18	270.10	268.16	270.16	0.000404	1.11	221.75	85.27	0.21
Pont278	550	20 ans	PlanActuel	244.07	266.18	270.14	268.15	270.20	0.000383	1.09	225.65	85.45	0.21
Pont278	550	25 ans	PlanNat	250.29	266.18	270.11	268.18	270.18	0.000417	1.13	223.16	85.34	0.22
Pont278	550	25 ans	PlanActuel	250.29	266.18	270.16	268.17	270.22	0.000394	1.11	227.21	85.52	0.21
Pont278	550	50 ans	PlanNat	270.64	266.18	270.17	268.24	270.24	0.000457	1.19	227.82	85.54	0.23
Pont278	550	50 ans	PlanActuel	270.64	266.18	270.22	268.23	270.29	0.000430	1.17	232.36	85.74	0.22
Pont278	550	100 ans	PlanNat	290.79	266.18	270.22	268.30	270.31	0.000494	1.26	232.64	85.75	0.24
Pont278	550	100 ans	PlanActuel	290.79	266.18	270.28	268.29	270.36	0.000463	1.23	237.61	85.97	0.23
Pont278	540	2 ans	PlanNat	156.90	265.81	269.90		269.93	0.000168	0.72	218.38	82.96	0.14
Pont278	540	2 ans	PlanActuel	156.90	265.81	269.92		269.95	0.000163	0.71	220.28	83.26	0.14
Pont278	540	5 ans	PlanNat	197.37	265.81	269.98		270.02	0.000241	0.88	225.42	84.07	0.17
Pont278	540	5 ans	PlanActuel	197.37	265.81	270.02		270.06	0.000231	0.87	228.25	84.50	0.16
Pont278	540	10 ans	PlanNat	221.69	265.81	270.04		270.09	0.000284	0.97	230.31	84.82	0.18
Pont278	540	10 ans	PlanActuel	221.69	265.81	270.08		270.13	0.000271	0.95	233.78	85.38	0.18
Pont278	540	20 ans	PlanNat	244.07	265.81	270.10		270.15	0.000323	1.04	235.17	85.60	0.19
Pont278	540	20 ans	PlanActuel	244.07	265.81	270.14		270.20	0.000307	1.03	239.09	86.18	0.19
Pont278	540	25 ans	PlanNat	250.29	265.81	270.11		270.17	0.000333	1.06	236.59	85.81	0.20
Pont278	540	25 ans	PlanActuel	250.29	265.81	270.16		270.22	0.000316	1.05	240.66	86.42	0.19
Pont278	540	50 ans	PlanNat	270.64	265.81	270.17		270.23	0.000367	1.13	241.31	86.53	0.21
Pont278	540	50 ans	PlanActuel	270.64	265.81	270.22		270.29	0.000347	1.11	245.90	87.24	0.20
Pont278	540	100 ans	PlanNat	290.79	265.81	270.23		270.30	0.000399	1.19	246.20	87.29	0.22
Pont278	540	100 ans	PlanActuel	290.79	265.81	270.28		270.35	0.000375	1.17	251.26	87.93	0.21
Pont278	530	2 ans	PlanNat	156.90	265.61	269.90		269.92	0.000154	0.71	220.93	78.36	0.13
Pont278	530	2 ans	PlanActuel	156.90	265.61	269.92		269.95	0.000150	0.71	222.73	78.60	0.13
Pont278	530	5 ans	PlanNat	197.37	265.61	269.98		270.02	0.000222	0.87	227.52	79.24	0.16
Pont278	530	5 ans	PlanActuel	197.37	265.61	270.02		270.05	0.000214	0.86	230.20	79.71	0.16
Pont278	530	10 ans	PlanNat	221.69	265.61	270.04		270.09	0.000263	0.96	232.10	80.04	0.18
Pont278	530	10 ans	PlanActuel	221.69	265.61	270.08		270.13	0.000252	0.94	235.39	80.67	0.17
Pont278	530	20 ans	PlanNat	244.07	265.61	270.10		270.15	0.000300	1.03	236.67	80.86	0.19
Pont278	530	20 ans	PlanActuel	244.07	265.61	270.14		270.19	0.000286	1.02	240.39	81.46	0.18
Pont278	530	25 ans	PlanNat	250.29	265.61	270.11		270.17	0.000310	1.06	238.00	81.07	0.19
Pont278	530	25 ans	PlanActuel	250.29	265.61	270.16		270.21	0.000295	1.04	241.86	81.72	0.19
Pont278	530	50 ans	PlanNat	270.64	265.61	270.17		270.23	0.000343	1.12	242.43	81.93	0.20
Pont278	530	50 ans	PlanActuel	270.64	265.61	270.22		270.28	0.000325	1.10	246.80	82.98	0.20
Pont278	530	100 ans	PlanNat	290.79	265.61	270.22		270.29	0.000374	1.18	247.05	83.01	0.21
Pont278	530	100 ans	PlanActuel	290.79	265.61	270.28		270.35	0.000353	1.16	251.89	84.18	0.21
Pont278	520	2 ans	PlanNat	156.90	266.05	269.89		269.92	0.000178	0.74	211.31	78.37	0.14
Pont278	520	2 ans	PlanActuel	156.90	266.05	269.92		269.94	0.000173	0.74	213.11	78.50	0.14
Pont278	520	5 ans	PlanNat	197.37	266.05	269.98		270.02	0.000256	0.91	217.73	78.82	0.17
Pont278	520	5 ans	PlanActuel	197.37	266.05	270.01		270.05	0.000246	0.90	220.40	79.00	0.17
Pont278	520	10 ans	PlanNat	221.69	266.05	270.03		270.08	0.000303	1.00	222.18	79.15	0.19
Pont278	520	10 ans	PlanActuel	221.69	266.05	270.07		270.12	0.000290	0.99	225.44	79.54	0.18
Pont278	520	20 ans	PlanNat	244.07	266.05	270.09		270.15	0.000345	1.08	226.60	79.71	0.20
Pont278	520	20 ans	PlanActuel	244.07	266.05	270.13		270.19	0.000328	1.06	230.29	80.23	0.20
Pont278	520	25 ans	PlanNat	250.29	266.05	270.10		270.17	0.000357	1.10	227.88	79.89	0.20
Pont278	520	25 ans	PlanActuel	250.29	266.05	270.15		270.21	0.000339	1.08	231.72	80.44	0.20
Pont278	520	50 ans	PlanNat	270.64	266.05	270.16		270.23	0.000394	1.17	232.16	80.50	0.22
Pont278	520	50 ans	PlanActuel	270.64	266.05	270.21		270.28	0.000372	1.15	236.49	81.12	0.21
Pont278	520	100 ans	PlanNat	290.79	266.05	270.21		270.29	0.000429	1.23	236.61	81.14	0.23
Pont278	520	100 ans	PlanActuel	290.79	266.05	270.27		270.35	0.000403	1.21	241.38	81.80	0.22
Pont278	510	2 ans	PlanNat	156.90	265.91	269.89		269.92	0.000187	0.75	208.99	79.17	0.15
Pont278	510	2 ans	PlanActuel	156.90	265.91	269.91		269.94	0.000182	0.75	210.82	79.34	0.14
Pont278	510	5 ans	PlanNat	197.37	265.91	269.97		270.01	0.000269	0.92	215.39	79.74	0.18
Pont278	510	5 ans	PlanActuel	197.37	265.91	270.01		270.05	0.000259	0.91	218.10	79.95	0.17
Pont278	510	10 ans	PlanNat	221.69	265.91	270.03		270.08	0.000319	1.01	219.83	80.06	0.19
Pont278	510	10 ans	PlanActuel	221.69	265.91	270.07		270.12	0.000304	1.00	223.15	80.29	0.19
Pont278	510	20 ans	PlanNat	244.07	265.91	270.08		270.14	0.000363	1.09	224.25	80.36	0.21
Pont278	510	20 ans	PlanActuel	244.07	265.91	270.13		270.19	0.000345	1.07	227.99	80.65	0.20
Pont278	510	25 ans	PlanNat	250.29	265.91	270.10		270.16	0.000375	1.11	225.53	80.46	0.21
Pont278	510	25 ans	PlanActuel	250.29	265.91	270.15		270.21	0.000356	1.09	229.41	80.76	0.20
Pont278	510	50 ans	PlanNat	270.64	265.91	270.15		270.22	0.000414	1.18	229.79	80.79	0.22
Pont278	510	50 ans	PlanActuel	270.64	265.91	270.21		270.27	0.000390	1.16	234.15	81.06	0.21
Pont278	510	100 ans	PlanNat	290.79	265.91	270.21		270.28	0.000450	1.25	234.21	81.07	0.23
Pont278	510	100 ans	PlanActuel	290.79	265.91	270.26		270.34	0.000423	1.22	238.99	81.35	0.22
Pont278	500	2 ans	PlanNat	156.90	266.03	269.89		269.92	0.000194	0.78	202.19	73.33	0.15
Pont278	500	2 ans	PlanActuel	156.90	266.03	269.91		269.94	0.000189	0.77	203.88	73.50	0.15
Pont278	500	5 ans	PlanNat	197.37	266.03	269.97		270.01	0.000283	0.95	207.97	73.95	0.18
Pont278	500	5 ans	PlanActuel	197.37	266.03	270.00		270.04	0.000273	0.94	210.50	74.26	0.18
Pont278	500	10 ans	PlanNat	221.69	266.03	270.02		270.08	0.000338	1.05	212.00	74.44	0.20
Pont278	500	10 ans	PlanActuel	221.69	266.03	270.06		270.12	0.000324	1.03	215.11	74.81	0.19

HEC-RAS River: River278km Reach: Pont278 (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
Pont278	500	20 ans	PlanNat	244.07	266.03	270.07		270.14	0.000388	1.13	216.02	74.92	0.21
Pont278	500	20 ans	PlanActuel	244.07	266.03	270.12		270.18	0.000370	1.11	219.54	75.34	0.21
Pont278	500	25 ans	PlanNat	250.29	266.03	270.09		270.16	0.000401	1.15	217.19	75.06	0.22
Pont278	500	25 ans	PlanActuel	250.29	266.03	270.14		270.20	0.000383	1.13	220.84	75.49	0.21
Pont278	500	50 ans	PlanNat	270.64	266.03	270.14		270.22	0.000446	1.22	221.09	75.52	0.23
Pont278	500	50 ans	PlanActuel	270.64	266.03	270.20		270.27	0.000423	1.20	225.20	75.96	0.22
Pont278	500	100 ans	PlanNat	290.79	266.03	270.19		270.28	0.000488	1.29	225.14	75.95	0.24
Pont278	500	100 ans	PlanActuel	290.79	266.03	270.25		270.34	0.000461	1.27	229.67	76.39	0.23
Pont278	490	2 ans	PlanNat	156.90	266.46	269.88		269.92	0.000232	0.82	192.49	74.05	0.16
Pont278	490	2 ans	PlanActuel	156.90	266.46	269.90		269.94	0.000225	0.81	194.22	74.12	0.16
Pont278	490	5 ans	PlanNat	197.37	266.46	269.96		270.01	0.000335	1.00	198.12	74.29	0.19
Pont278	490	5 ans	PlanActuel	197.37	266.46	269.99		270.04	0.000321	0.98	200.69	74.40	0.19
Pont278	490	10 ans	PlanNat	221.69	266.46	270.01		270.07	0.000397	1.10	202.04	74.45	0.21
Pont278	490	10 ans	PlanActuel	221.69	266.46	270.05		270.11	0.000378	1.08	205.18	74.58	0.21
Pont278	490	20 ans	PlanNat	244.07	266.46	270.06		270.13	0.000453	1.19	205.95	74.62	0.23
Pont278	490	20 ans	PlanActuel	244.07	266.46	270.11		270.18	0.000429	1.17	209.49	74.77	0.22
Pont278	490	25 ans	PlanNat	250.29	266.46	270.08		270.15	0.000468	1.21	207.08	74.66	0.23
Pont278	490	25 ans	PlanActuel	250.29	266.46	270.13		270.20	0.000443	1.19	210.75	74.82	0.23
Pont278	490	50 ans	PlanNat	270.64	266.46	270.13		270.21	0.000517	1.28	210.85	74.82	0.24
Pont278	490	50 ans	PlanActuel	270.64	266.46	270.18		270.26	0.000487	1.26	214.97	75.00	0.24
Pont278	490	100 ans	PlanNat	290.79	266.46	270.18		270.27	0.000563	1.35	214.75	74.99	0.26
Pont278	490	100 ans	PlanActuel	290.79	266.46	270.24		270.33	0.000528	1.33	219.28	75.18	0.25
Pont278	480	2 ans	PlanNat	156.90	266.40	269.87		269.91	0.000289	0.86	182.02	76.93	0.18
Pont278	480	2 ans	PlanActuel	156.90	266.40	269.90		269.94	0.000280	0.85	183.84	77.01	0.18
Pont278	480	5 ans	PlanNat	197.37	266.40	269.95		270.00	0.000415	1.05	187.63	77.15	0.21
Pont278	480	5 ans	PlanActuel	197.37	266.40	269.98		270.04	0.000396	1.04	190.33	77.25	0.21
Pont278	480	10 ans	PlanNat	221.69	266.40	270.00		270.07	0.000490	1.16	191.55	77.30	0.23
Pont278	480	10 ans	PlanActuel	221.69	266.40	270.04		270.11	0.000463	1.14	194.86	77.43	0.23
Pont278	480	20 ans	PlanNat	244.07	266.40	270.05		270.13	0.000556	1.25	195.47	77.45	0.25
Pont278	480	20 ans	PlanActuel	244.07	266.40	270.10		270.17	0.000523	1.23	199.21	77.60	0.24
Pont278	480	25 ans	PlanNat	250.29	266.40	270.06		270.15	0.000574	1.27	196.60	77.50	0.25
Pont278	480	25 ans	PlanActuel	250.29	266.40	270.11		270.19	0.000539	1.25	200.48	77.65	0.25
Pont278	480	50 ans	PlanNat	270.64	266.40	270.11		270.21	0.000631	1.35	200.40	77.64	0.27
Pont278	480	50 ans	PlanActuel	270.64	266.40	270.17		270.26	0.000589	1.32	204.76	77.81	0.26
Pont278	480	100 ans	PlanNat	290.79	266.40	270.16		270.27	0.000685	1.43	204.34	77.80	0.28
Pont278	480	100 ans	PlanActuel	290.79	266.40	270.22		270.32	0.000636	1.39	209.14	77.98	0.27
Pont278	470	2 ans	PlanNat	156.90	266.16	269.87		269.91	0.000276	0.85	184.47	77.24	0.17
Pont278	470	2 ans	PlanActuel	156.90	266.16	269.90		269.93	0.000267	0.84	186.29	77.29	0.17
Pont278	470	5 ans	PlanNat	197.37	266.16	269.94		270.00	0.000397	1.04	190.02	77.39	0.21
Pont278	470	5 ans	PlanActuel	197.37	266.16	269.98		270.03	0.000379	1.03	192.74	77.47	0.21
Pont278	470	10 ans	PlanNat	221.69	266.16	269.99		270.06	0.000469	1.15	193.90	77.50	0.23
Pont278	470	10 ans	PlanActuel	221.69	266.16	270.04		270.10	0.000444	1.13	197.24	77.59	0.22
Pont278	470	20 ans	PlanNat	244.07	266.16	270.04		270.12	0.000533	1.24	197.79	77.61	0.25
Pont278	470	20 ans	PlanActuel	244.07	266.16	270.09		270.17	0.000502	1.21	201.56	77.71	0.24
Pont278	470	25 ans	PlanNat	250.29	266.16	270.06		270.14	0.000551	1.26	198.92	77.64	0.25
Pont278	470	25 ans	PlanActuel	250.29	266.16	270.11		270.19	0.000518	1.24	202.83	77.74	0.24
Pont278	470	50 ans	PlanNat	270.64	266.16	270.11		270.20	0.000607	1.34	202.68	77.74	0.26
Pont278	470	50 ans	PlanActuel	270.64	266.16	270.16		270.25	0.000566	1.31	207.08	77.86	0.25
Pont278	470	100 ans	PlanNat	290.79	266.16	270.16		270.26	0.000659	1.41	206.58	77.84	0.27
Pont278	470	100 ans	PlanActuel	290.79	266.16	270.22		270.32	0.000612	1.38	211.42	77.97	0.27
Pont278	460	2 ans	PlanNat	156.90	265.68	269.87		269.91	0.000239	0.82	191.89	75.39	0.16
Pont278	460	2 ans	PlanActuel	156.90	265.68	269.90		269.93	0.000233	0.81	193.67	75.60	0.16
Pont278	460	5 ans	PlanNat	197.37	265.68	269.94		269.99	0.000349	1.00	197.31	76.01	0.20
Pont278	460	5 ans	PlanActuel	197.37	265.68	269.98		270.03	0.000335	0.99	199.98	76.32	0.19
Pont278	460	10 ans	PlanNat	221.69	265.68	269.99		270.06	0.000415	1.10	201.12	76.45	0.22
Pont278	460	10 ans	PlanActuel	221.69	265.68	270.04		270.10	0.000393	1.08	204.42	76.82	0.21
Pont278	460	20 ans	PlanNat	244.07	265.68	270.04		270.12	0.000473	1.19	204.95	76.88	0.23
Pont278	460	20 ans	PlanActuel	244.07	265.68	270.09		270.16	0.000446	1.17	208.70	77.30	0.23
Pont278	460	25 ans	PlanNat	250.29	265.68	270.06		270.13	0.000489	1.21	206.06	77.00	0.24
Pont278	460	25 ans	PlanActuel	250.29	265.68	270.11		270.18	0.000460	1.19	209.96	77.44	0.23
Pont278	460	50 ans	PlanNat	270.64	265.68	270.11		270.19	0.000539	1.29	209.80	77.43	0.25
Pont278	460	50 ans	PlanActuel	270.64	265.68	270.16		270.24	0.000504	1.26	214.19	77.78	0.24
Pont278	460	100 ans	PlanNat	290.79	265.68	270.16		270.25	0.000587	1.36	213.69	77.76	0.26
Pont278	460	100 ans	PlanActuel	290.79	265.68	270.22		270.31	0.000546	1.33	218.53	77.94	0.25
Pont278	450	2 ans	PlanNat	156.90	265.61	269.87		269.90	0.000224	0.80	197.30	76.93	0.16
Pont278	450	2 ans	PlanActuel	156.90	265.61	269.89		269.93	0.000217	0.79	199.12	77.03	0.16
Pont278	450	5 ans	PlanNat	197.37	265.61	269.94		269.99	0.000324	0.97	202.78	77.28	0.19
Pont278	450	5 ans	PlanActuel	197.37	265.61	269.98		270.02	0.000310	0.96	205.51	77.47	0.19
Pont278	450	10 ans	PlanNat	221.69	265.61	269.99		270.05	0.000385	1.07	206.63	77.55	0.21
Pont278	450	10 ans	PlanActuel	221.69	265.61	270.03		270.09	0.000365	1.06	209.99	77.71	0.20
Pont278	450	20 ans	PlanNat	244.07	265.61	270.04		270.11	0.000439	1.16	210.50	77.73	0.22
Pont278	450	20 ans	PlanActuel	244.07	265.61	270.09		270.16	0.000415	1.14	214.29	77.84	0.22
Pont278	450	25 ans	PlanNat	250.29	265.61	270.06		270.13	0.000454	1.18	211.62	77.76	0.23
Pont278	450	25 ans	PlanActuel	250.29	265.61	270.11		270.18	0.000428	1.16	215.55	77.88	0.22
Pont278	450	50 ans	PlanNat	270.64	265.61	270.10		270.18	0.000502	1.26	215.36	77.87	0.24
Pont278	450	50 ans	PlanActuel	270.64	265.61	270.16		270.24	0.000470	1.23	219.79	78.00	0.23

HEC-RAS River: River278km Reach: Pont278 (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
Pont278	450	100 ans	PlanNat	290.79	265.61	270.15		270.24	0.000547	1.33	219.26	77.99	0.25
Pont278	450	100 ans	PlanActuel	290.79	265.61	270.22		270.30	0.000509	1.30	224.13	78.13	0.24
Pont278	440	2 ans	PlanNat	156.90	265.85	269.87		269.90	0.000231	0.81	194.54	77.07	0.16
Pont278	440	2 ans	PlanActuel	156.90	265.85	269.89		269.92	0.000224	0.80	196.37	77.14	0.16
Pont278	440	5 ans	PlanNat	197.37	265.85	269.94		269.99	0.000335	0.99	199.90	77.28	0.19
Pont278	440	5 ans	PlanActuel	197.37	265.85	269.97		270.02	0.000321	0.98	202.64	77.39	0.19
Pont278	440	10 ans	PlanNat	221.69	265.85	269.99		270.05	0.000398	1.09	203.67	77.44	0.21
Pont278	440	10 ans	PlanActuel	221.69	265.85	270.03		270.09	0.000378	1.07	207.04	77.57	0.21
Pont278	440	20 ans	PlanNat	244.07	265.85	270.03		270.11	0.000455	1.18	207.46	77.58	0.23
Pont278	440	20 ans	PlanActuel	244.07	265.85	270.08		270.15	0.000429	1.16	211.28	77.72	0.22
Pont278	440	25 ans	PlanNat	250.29	265.85	270.05		270.12	0.000471	1.20	208.56	77.62	0.23
Pont278	440	25 ans	PlanActuel	250.29	265.85	270.10		270.17	0.000443	1.18	212.52	77.76	0.23
Pont278	440	50 ans	PlanNat	270.64	265.85	270.10		270.18	0.000520	1.28	212.24	77.75	0.24
Pont278	440	50 ans	PlanActuel	270.64	265.85	270.15		270.23	0.000487	1.25	216.70	77.92	0.24
Pont278	440	100 ans	PlanNat	290.79	265.85	270.15		270.24	0.000567	1.35	216.07	77.89	0.26
Pont278	440	100 ans	PlanActuel	290.79	265.85	270.21		270.30	0.000528	1.32	220.98	78.07	0.25
Pont278	430	2 ans	PlanNat	156.90	266.23	269.86		269.90	0.000257	0.84	187.36	75.81	0.17
Pont278	430	2 ans	PlanActuel	156.90	266.23	269.89		269.92	0.000249	0.83	189.17	75.89	0.17
Pont278	430	5 ans	PlanNat	197.37	266.23	269.93		269.98	0.000373	1.03	192.44	76.03	0.20
Pont278	430	5 ans	PlanActuel	197.37	266.23	269.96		270.02	0.000356	1.01	195.16	76.14	0.20
Pont278	430	10 ans	PlanNat	221.69	266.23	269.98		270.04	0.000443	1.13	196.03	76.18	0.22
Pont278	430	10 ans	PlanActuel	221.69	266.23	270.02		270.08	0.000420	1.11	199.38	76.32	0.22
Pont278	430	20 ans	PlanNat	244.07	266.23	270.02		270.10	0.000507	1.22	199.64	76.33	0.24
Pont278	430	20 ans	PlanActuel	244.07	266.23	270.07		270.15	0.000477	1.20	203.44	76.49	0.23
Pont278	430	25 ans	PlanNat	250.29	266.23	270.04		270.12	0.000524	1.25	200.68	76.37	0.24
Pont278	430	25 ans	PlanActuel	250.29	266.23	270.09		270.17	0.000492	1.23	204.63	76.55	0.24
Pont278	430	50 ans	PlanNat	270.64	266.23	270.08		270.17	0.000580	1.33	204.20	76.53	0.26
Pont278	430	50 ans	PlanActuel	270.64	266.23	270.14		270.23	0.000541	1.30	208.66	76.73	0.25
Pont278	430	100 ans	PlanNat	290.79	266.23	270.13		270.23	0.000632	1.40	207.87	76.69	0.27
Pont278	430	100 ans	PlanActuel	290.79	266.23	270.19		270.29	0.000587	1.37	212.78	76.92	0.26
Pont278	420	2 ans	PlanNat	156.90	266.25	269.86		269.90	0.000265	0.85	184.52	74.90	0.17
Pont278	420	2 ans	PlanActuel	156.90	266.25	269.88		269.92	0.000257	0.84	186.32	74.98	0.17
Pont278	420	5 ans	PlanNat	197.37	266.25	269.92		269.98	0.000386	1.04	189.41	75.11	0.21
Pont278	420	5 ans	PlanActuel	197.37	266.25	269.96		270.01	0.000369	1.03	192.11	75.23	0.20
Pont278	420	10 ans	PlanNat	221.69	266.25	269.97		270.04	0.000459	1.15	192.86	75.26	0.23
Pont278	420	10 ans	PlanActuel	221.69	266.25	270.01		270.08	0.000435	1.13	196.20	75.41	0.22
Pont278	420	20 ans	PlanNat	244.07	266.25	270.02		270.09	0.000526	1.25	196.35	75.42	0.24
Pont278	420	20 ans	PlanActuel	244.07	266.25	270.07		270.14	0.000495	1.22	200.13	75.58	0.24
Pont278	420	25 ans	PlanNat	250.29	266.25	270.03		270.11	0.000544	1.27	197.36	75.46	0.25
Pont278	420	25 ans	PlanActuel	250.29	266.25	270.08		270.16	0.000511	1.25	201.30	75.64	0.24
Pont278	420	50 ans	PlanNat	270.64	266.25	270.07		270.17	0.000603	1.35	200.76	75.61	0.26
Pont278	420	50 ans	PlanActuel	270.64	266.25	270.13		270.22	0.000562	1.32	205.21	75.81	0.25
Pont278	420	100 ans	PlanNat	290.79	266.25	270.12		270.22	0.000658	1.43	204.31	75.77	0.27
Pont278	420	100 ans	PlanActuel	290.79	266.25	270.19		270.28	0.000611	1.39	209.21	75.99	0.27
Pont278	410	2 ans	PlanNat	156.90	266.27	269.86		269.89	0.000257	0.85	184.13	71.53	0.17
Pont278	410	2 ans	PlanActuel	156.90	266.27	269.88		269.92	0.000249	0.84	185.86	71.60	0.17
Pont278	410	5 ans	PlanNat	197.37	266.27	269.92		269.97	0.000375	1.05	188.70	71.71	0.21
Pont278	410	5 ans	PlanActuel	197.37	266.27	269.96		270.01	0.000359	1.03	191.29	71.82	0.20
Pont278	410	10 ans	PlanNat	221.69	266.27	269.96		270.03	0.000448	1.16	191.93	71.85	0.23
Pont278	410	10 ans	PlanActuel	221.69	266.27	270.01		270.07	0.000425	1.14	195.12	71.98	0.22
Pont278	410	20 ans	PlanNat	244.07	266.27	270.01		270.09	0.000515	1.25	195.19	71.98	0.24
Pont278	410	20 ans	PlanActuel	244.07	266.27	270.06		270.14	0.000485	1.23	198.82	72.13	0.24
Pont278	410	25 ans	PlanNat	250.29	266.27	270.02		270.11	0.000533	1.28	196.14	72.02	0.25
Pont278	410	25 ans	PlanActuel	250.29	266.27	270.08		270.15	0.000501	1.25	199.92	72.17	0.24
Pont278	410	50 ans	PlanNat	270.64	266.27	270.07		270.16	0.000592	1.36	199.32	72.15	0.26
Pont278	410	50 ans	PlanActuel	270.64	266.27	270.13		270.22	0.000553	1.33	203.59	72.32	0.25
Pont278	410	100 ans	PlanNat	290.79	266.27	270.11		270.22	0.000648	1.44	202.65	72.28	0.27
Pont278	410	100 ans	PlanActuel	290.79	266.27	270.18		270.28	0.000602	1.40	207.36	72.47	0.26
Pont278	400	2 ans	PlanNat	156.90	266.06	269.85		269.89	0.000223	0.82	190.98	70.38	0.16
Pont278	400	2 ans	PlanActuel	156.90	266.06	269.88		269.91	0.000217	0.81	192.68	70.56	0.16
Pont278	400	5 ans	PlanNat	197.37	266.06	269.92		269.97	0.000330	1.01	195.46	70.87	0.19
Pont278	400	5 ans	PlanActuel	197.37	266.06	269.95		270.00	0.000317	1.00	198.02	71.15	0.19
Pont278	400	10 ans	PlanNat	221.69	266.06	269.96		270.03	0.000397	1.12	198.64	71.22	0.21
Pont278	400	10 ans	PlanActuel	221.69	266.06	270.01		270.07	0.000379	1.10	201.82	71.56	0.21
Pont278	400	20 ans	PlanNat	244.07	266.06	270.01		270.08	0.000459	1.21	201.86	71.57	0.23
Pont278	400	20 ans	PlanActuel	244.07	266.06	270.06		270.13	0.000435	1.19	205.49	71.96	0.22
Pont278	400	25 ans	PlanNat	250.29	266.06	270.02		270.10	0.000476	1.23	202.81	71.67	0.23
Pont278	400	25 ans	PlanActuel	250.29	266.06	270.07		270.15	0.000451	1.21	206.58	72.08	0.23
Pont278	400	50 ans	PlanNat	270.64	266.06	270.07		270.15	0.000532	1.31	205.97	72.02	0.25
Pont278	400	50 ans	PlanActuel	270.64	266.06	270.12		270.21	0.000499	1.29	210.25	72.47	0.24
Pont278	400	100 ans	PlanNat	290.79	266.06	270.11		270.21	0.000585	1.39	209.29	72.37	0.26
Pont278	400	100 ans	PlanActuel	290.79	266.06	270.18		270.27	0.000544	1.36	214.02	72.87	0.25
Pont278	390	2 ans	PlanNat	156.90	265.54	269.85		269.89	0.000201	0.79	198.86	73.47	0.15
Pont278	390	2 ans	PlanActuel	156.90	265.54	269.88		269.91	0.000196	0.78	200.63	73.65	0.15
Pont278	390	5 ans	PlanNat	197.37	265.54	269.92		269.97	0.000296	0.97	203.53	73.86	0.18

HEC-RAS River: River278km Reach: Pont278 (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
Pont278	390	5 ans	PlanActuel	197.37	265.54	269.95		270.00	0.000284	0.96	206.21	73.98	0.18
Pont278	390	10 ans	PlanNat	221.69	265.54	269.96		270.02	0.000355	1.07	206.84	74.01	0.20
Pont278	390	10 ans	PlanActuel	221.69	265.54	270.01		270.06	0.000337	1.06	210.14	74.15	0.20
Pont278	390	20 ans	PlanNat	244.07	265.54	270.01		270.08	0.000409	1.16	210.19	74.16	0.22
Pont278	390	20 ans	PlanActuel	244.07	265.54	270.06		270.13	0.000386	1.14	213.95	74.31	0.21
Pont278	390	25 ans	PlanNat	250.29	265.54	270.02		270.09	0.000424	1.19	211.17	74.20	0.22
Pont278	390	25 ans	PlanActuel	250.29	265.54	270.07		270.14	0.000400	1.17	215.07	74.36	0.22
Pont278	390	50 ans	PlanNat	270.64	265.54	270.07		270.15	0.000472	1.26	214.44	74.33	0.24
Pont278	390	50 ans	PlanActuel	270.64	265.54	270.12		270.20	0.000442	1.24	218.85	74.50	0.23
Pont278	390	100 ans	PlanNat	290.79	265.54	270.11		270.20	0.000518	1.34	217.86	74.46	0.25
Pont278	390	100 ans	PlanActuel	290.79	265.54	270.18		270.26	0.000483	1.31	222.73	74.64	0.24
Pont278	380	2 ans	PlanNat	156.90	265.32	269.85		269.88	0.000250	0.84	185.89	72.66	0.17
Pont278	380	2 ans	PlanActuel	156.90	265.32	269.87		269.91	0.000243	0.84	187.66	72.88	0.17
Pont278	380	5 ans	PlanNat	197.37	265.32	269.91		269.96	0.000369	1.04	190.24	73.16	0.20
Pont278	380	5 ans	PlanActuel	197.37	265.32	269.94		270.00	0.000354	1.02	192.93	73.39	0.20
Pont278	380	10 ans	PlanNat	221.69	265.32	269.95		270.02	0.000443	1.15	193.35	73.43	0.22
Pont278	380	10 ans	PlanActuel	221.69	265.32	269.99		270.06	0.000421	1.13	196.68	73.77	0.22
Pont278	380	20 ans	PlanNat	244.07	265.32	269.99		270.07	0.000511	1.24	196.51	73.75	0.24
Pont278	380	20 ans	PlanActuel	244.07	265.32	270.04		270.12	0.000483	1.22	200.32	74.17	0.24
Pont278	380	25 ans	PlanNat	250.29	265.32	270.00		270.09	0.000530	1.27	197.44	73.86	0.25
Pont278	380	25 ans	PlanActuel	250.29	265.32	270.06		270.14	0.000499	1.24	201.40	74.24	0.24
Pont278	380	50 ans	PlanNat	270.64	265.32	270.05		270.14	0.000591	1.35	200.55	74.19	0.26
Pont278	380	50 ans	PlanActuel	270.64	265.32	270.11		270.20	0.000552	1.32	205.05	74.49	0.25
Pont278	380	100 ans	PlanNat	290.79	265.32	270.09		270.19	0.000649	1.43	203.82	74.40	0.27
Pont278	380	100 ans	PlanActuel	290.79	265.32	270.16		270.26	0.000603	1.40	208.80	74.87	0.26
Pont278	370	2 ans	PlanNat	156.90	265.49	269.84		269.88	0.000321	0.92	170.15	70.35	0.19
Pont278	370	2 ans	PlanActuel	156.90	265.49	269.86		269.90	0.000311	0.91	171.89	70.54	0.19
Pont278	370	5 ans	PlanNat	197.37	265.49	269.89		269.96	0.000473	1.14	173.99	70.77	0.23
Pont278	370	5 ans	PlanActuel	197.37	265.49	269.93		269.99	0.000451	1.12	176.63	71.05	0.22
Pont278	370	10 ans	PlanNat	221.69	265.49	269.93		270.01	0.000568	1.26	176.75	71.07	0.25
Pont278	370	10 ans	PlanActuel	221.69	265.49	269.98		270.05	0.000536	1.23	180.04	71.26	0.25
Pont278	370	20 ans	PlanNat	244.07	265.49	269.97		270.06	0.000655	1.36	179.57	71.24	0.27
Pont278	370	20 ans	PlanActuel	244.07	265.49	270.02		270.11	0.000613	1.33	183.34	71.43	0.26
Pont278	370	25 ans	PlanNat	250.29	265.49	269.98		270.08	0.000679	1.39	180.40	71.28	0.28
Pont278	370	25 ans	PlanActuel	250.29	265.49	270.04		270.13	0.000634	1.36	184.32	71.48	0.27
Pont278	370	50 ans	PlanNat	270.64	265.49	270.02		270.13	0.000756	1.48	183.18	71.42	0.29
Pont278	370	50 ans	PlanActuel	270.64	265.49	270.08		270.19	0.000701	1.44	187.64	71.64	0.28
Pont278	370	100 ans	PlanNat	290.79	265.49	270.06		270.19	0.000830	1.57	186.11	71.57	0.31
Pont278	370	100 ans	PlanActuel	290.79	265.49	270.13		270.25	0.000764	1.53	191.05	71.81	0.30
Pont278	348	2 ans	PlanActuel	156.90	265.50	269.86	267.44	269.90	0.000879	0.89	176.84	68.56	0.17
Pont278	348	5 ans	PlanActuel	197.37	265.50	269.92	267.67	269.98	0.001287	1.10	181.27	69.01	0.21
Pont278	348	10 ans	PlanActuel	221.69	265.50	269.97	267.80	270.04	0.001538	1.21	184.45	69.54	0.23
Pont278	348	20 ans	PlanActuel	244.07	265.50	270.01	267.92	270.10	0.001769	1.31	187.55	69.90	0.25
Pont278	348	25 ans	PlanActuel	250.29	265.50	270.02	267.94	270.12	0.001832	1.34	188.48	70.00	0.25
Pont278	348	50 ans	PlanActuel	270.64	265.50	270.07	268.03	270.17	0.002035	1.43	191.63	70.36	0.26
Pont278	348	100 ans	PlanActuel	290.79	265.50	270.11	268.12	270.23	0.002230	1.51	194.87	70.65	0.28
Pont278	321	2 ans	PlanActuel	156.90	265.49	269.82		269.87	0.000810	0.93	170.17	59.47	0.17
Pont278	321	5 ans	PlanActuel	197.37	265.49	269.87		269.94	0.001220	1.15	172.95	59.93	0.21
Pont278	321	10 ans	PlanActuel	221.69	265.49	269.90		269.99	0.001484	1.28	175.03	60.27	0.23
Pont278	321	20 ans	PlanActuel	244.07	265.49	269.94		270.04	0.001737	1.39	177.03	60.57	0.25
Pont278	321	25 ans	PlanActuel	250.29	265.49	269.95		270.05	0.001808	1.42	177.64	60.66	0.25
Pont278	321	50 ans	PlanActuel	270.64	265.49	269.98		270.10	0.002040	1.52	179.71	60.96	0.27
Pont278	321	100 ans	PlanActuel	290.79	265.49	270.02		270.15	0.002272	1.62	181.84	61.26	0.28
Pont278	310	2 ans	PlanNat	156.90	265.41	269.82		269.86	0.000236	0.91	172.49	57.35	0.17
Pont278	310	2 ans	PlanActuel	156.90	265.41	269.82		269.86	0.000236	0.91	172.49	57.35	0.17
Pont278	310	5 ans	PlanNat	197.37	265.41	269.87		269.93	0.000357	1.13	175.12	57.65	0.21
Pont278	310	5 ans	PlanActuel	197.37	265.41	269.87		269.93	0.000357	1.13	175.12	57.65	0.21
Pont278	310	10 ans	PlanNat	221.69	265.41	269.90		269.98	0.000437	1.25	177.03	57.88	0.23
Pont278	310	10 ans	PlanActuel	221.69	265.41	269.90		269.98	0.000436	1.25	177.08	57.89	0.23
Pont278	310	20 ans	PlanNat	244.07	265.41	269.93		270.03	0.000513	1.37	178.94	58.14	0.25
Pont278	310	20 ans	PlanActuel	244.07	265.41	269.93		270.03	0.000513	1.36	178.97	58.15	0.25
Pont278	310	25 ans	PlanNat	250.29	265.41	269.94		270.04	0.000534	1.40	179.52	58.22	0.25
Pont278	310	25 ans	PlanActuel	250.29	265.41	269.94		270.04	0.000534	1.40	179.55	58.22	0.25
Pont278	310	50 ans	PlanNat	270.64	265.41	269.98		270.09	0.000606	1.49	181.45	58.48	0.27
Pont278	310	50 ans	PlanActuel	270.64	265.41	269.98		270.09	0.000605	1.49	181.50	58.49	0.27
Pont278	310	100 ans	PlanNat	290.79	265.41	270.01		270.14	0.000676	1.59	183.51	58.90	0.28
Pont278	310	100 ans	PlanActuel	290.79	265.41	270.01		270.14	0.000675	1.59	183.53	58.91	0.28
Pont278	300	2 ans	PlanNat	156.90	265.30	269.82		269.86	0.000223	0.89	176.09	58.21	0.16
Pont278	300	2 ans	PlanActuel	156.90	265.30	269.82		269.86	0.000223	0.89	176.09	58.21	0.16
Pont278	300	5 ans	PlanNat	197.37	265.30	269.86		269.93	0.000338	1.11	178.73	58.60	0.20
Pont278	300	5 ans	PlanActuel	197.37	265.30	269.86		269.93	0.000338	1.11	178.73	58.60	0.20
Pont278	300	10 ans	PlanNat	221.69	265.30	269.90		269.97	0.000413	1.23	180.64	58.81	0.22
Pont278	300	10 ans	PlanActuel	221.69	265.30	269.90		269.98	0.000413	1.23	180.70	58.81	0.22
Pont278	300	20 ans	PlanNat	244.07	265.30	269.93		270.02	0.000485	1.34	182.56	59.01	0.24
Pont278	300	20 ans	PlanActuel	244.07	265.30	269.93		270.02	0.000485	1.34	182.60	59.02	0.24

HEC-RAS River: River278km Reach: Pont278 (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
Pont278	300	25 ans	PlanNat	250.29	265.30	269.94		270.04	0.000506	1.37	183.14	59.08	0.25
Pont278	300	25 ans	PlanActuel	250.29	265.30	269.94		270.04	0.000505	1.37	183.17	59.08	0.25
Pont278	300	50 ans	PlanNat	270.64	265.30	269.97		270.08	0.000573	1.47	185.08	59.32	0.26
Pont278	300	50 ans	PlanActuel	270.64	265.30	269.97		270.08	0.000573	1.47	185.13	59.33	0.26
Pont278	300	100 ans	PlanNat	290.79	265.30	270.01		270.13	0.000641	1.56	187.14	59.58	0.28
Pont278	300	100 ans	PlanActuel	290.79	265.30	270.01		270.13	0.000640	1.56	187.16	59.58	0.28
Pont278	290	2 ans	PlanNat	156.90	264.92	269.82		269.86	0.000189	0.81	192.56	63.19	0.15
Pont278	290	2 ans	PlanActuel	156.90	264.92	269.82		269.86	0.000189	0.81	192.56	63.19	0.15
Pont278	290	5 ans	PlanNat	197.37	264.92	269.87		269.92	0.000287	1.01	195.52	63.61	0.18
Pont278	290	5 ans	PlanActuel	197.37	264.92	269.87		269.92	0.000287	1.01	195.52	63.61	0.18
Pont278	290	10 ans	PlanNat	221.69	264.92	269.90		269.97	0.000351	1.12	197.66	63.90	0.20
Pont278	290	10 ans	PlanActuel	221.69	264.92	269.90		269.97	0.000351	1.12	197.73	63.90	0.20
Pont278	290	20 ans	PlanNat	244.07	264.92	269.94		270.01	0.000413	1.22	199.82	64.18	0.22
Pont278	290	20 ans	PlanActuel	244.07	264.92	269.94		270.01	0.000413	1.22	199.86	64.19	0.22
Pont278	290	25 ans	PlanNat	250.29	264.92	269.95		270.03	0.000431	1.25	200.47	64.28	0.23
Pont278	290	25 ans	PlanActuel	250.29	264.92	269.95		270.03	0.000430	1.25	200.51	64.29	0.23
Pont278	290	50 ans	PlanNat	270.64	264.92	269.98		270.07	0.000487	1.34	202.65	64.56	0.24
Pont278	290	50 ans	PlanActuel	270.64	264.92	269.98		270.07	0.000487	1.34	202.71	64.57	0.24
Pont278	290	100 ans	PlanNat	290.79	264.92	270.02		270.12	0.000543	1.42	204.97	64.86	0.25
Pont278	290	100 ans	PlanActuel	290.79	264.92	270.02		270.12	0.000542	1.42	204.99	64.86	0.25
Pont278	280	2 ans	PlanNat	156.90	265.35	269.81		269.85	0.000251	0.88	179.17	65.95	0.17
Pont278	280	2 ans	PlanActuel	156.90	265.35	269.81		269.85	0.000251	0.88	179.17	65.95	0.17
Pont278	280	5 ans	PlanNat	197.37	265.35	269.86		269.92	0.000378	1.08	181.99	66.28	0.21
Pont278	280	5 ans	PlanActuel	197.37	265.35	269.86		269.92	0.000378	1.08	181.99	66.28	0.21
Pont278	280	10 ans	PlanNat	221.69	265.35	269.89		269.96	0.000460	1.21	184.04	66.53	0.23
Pont278	280	10 ans	PlanActuel	221.69	265.35	269.89		269.96	0.000460	1.20	184.11	66.54	0.23
Pont278	280	20 ans	PlanNat	244.07	265.35	269.92		270.01	0.000539	1.31	186.11	66.78	0.25
Pont278	280	20 ans	PlanActuel	244.07	265.35	269.92		270.01	0.000538	1.31	186.15	66.78	0.25
Pont278	280	25 ans	PlanNat	250.29	265.35	269.93		270.02	0.000561	1.34	186.74	66.85	0.25
Pont278	280	25 ans	PlanActuel	250.29	265.35	269.93		270.02	0.000560	1.34	186.78	66.86	0.25
Pont278	280	50 ans	PlanNat	270.64	265.35	269.96		270.06	0.000633	1.43	188.84	67.10	0.27
Pont278	280	50 ans	PlanActuel	270.64	265.35	269.96		270.07	0.000632	1.43	188.90	67.11	0.27
Pont278	280	100 ans	PlanNat	290.79	265.35	269.99		270.11	0.000705	1.52	191.08	67.36	0.29
Pont278	280	100 ans	PlanActuel	290.79	265.35	269.99		270.11	0.000704	1.52	191.11	67.37	0.29
Pont278	270	2 ans	PlanNat	156.90	265.78	269.79		269.85	0.000452	1.06	148.33	64.77	0.22
Pont278	270	2 ans	PlanActuel	156.90	265.78	269.79		269.85	0.000451	1.06	148.33	64.77	0.22
Pont278	270	5 ans	PlanNat	197.37	265.78	269.82		269.91	0.000688	1.32	150.26	64.93	0.27
Pont278	270	5 ans	PlanActuel	197.37	265.78	269.82		269.91	0.000685	1.32	150.25	64.93	0.27
Pont278	270	10 ans	PlanNat	221.69	265.78	269.84		269.95	0.000842	1.46	151.70	65.06	0.30
Pont278	270	10 ans	PlanActuel	221.69	265.78	269.84		269.95	0.000838	1.46	151.76	65.06	0.30
Pont278	270	20 ans	PlanNat	244.07	265.78	269.87		270.00	0.000990	1.60	153.15	65.18	0.33
Pont278	270	20 ans	PlanActuel	244.07	265.78	269.87		270.00	0.000987	1.60	153.19	65.18	0.33
Pont278	270	25 ans	PlanNat	250.29	265.78	269.87		270.01	0.001032	1.63	153.60	65.22	0.34
Pont278	270	25 ans	PlanActuel	250.29	265.78	269.87		270.01	0.001028	1.63	153.63	65.22	0.34
Pont278	270	50 ans	PlanNat	270.64	265.78	269.89		270.05	0.001171	1.75	155.09	65.34	0.36
Pont278	270	50 ans	PlanActuel	270.64	265.78	269.90		270.05	0.001166	1.75	155.15	65.35	0.36
Pont278	270	100 ans	PlanNat	290.79	265.78	269.92		270.10	0.001309	1.86	156.71	65.49	0.38
Pont278	270	100 ans	PlanActuel	290.79	265.78	269.92		270.10	0.001305	1.86	156.72	65.49	0.38
Pont278	260	2 ans	PlanNat	156.90	265.57	269.79		269.84	0.000366	1.02	154.80	62.42	0.20
Pont278	260	2 ans	PlanActuel	156.90	265.57	269.79		269.84	0.000366	1.02	154.80	62.42	0.20
Pont278	260	5 ans	PlanNat	197.37	265.57	269.82		269.90	0.000559	1.26	156.64	63.54	0.25
Pont278	260	5 ans	PlanActuel	197.37	265.57	269.82		269.90	0.000559	1.26	156.64	63.54	0.25
Pont278	260	10 ans	PlanNat	221.69	265.57	269.84		269.94	0.000686	1.41	158.03	64.28	0.28
Pont278	260	10 ans	PlanActuel	221.69	265.57	269.84		269.94	0.000686	1.41	158.09	64.31	0.28
Pont278	260	20 ans	PlanNat	244.07	265.57	269.86		269.98	0.000810	1.54	159.44	64.98	0.30
Pont278	260	20 ans	PlanActuel	244.07	265.57	269.86		269.98	0.000810	1.54	159.48	65.00	0.30
Pont278	260	25 ans	PlanNat	250.29	265.57	269.87		270.00	0.000845	1.57	159.88	65.19	0.31
Pont278	260	25 ans	PlanActuel	250.29	265.57	269.87		270.00	0.000845	1.57	159.92	65.21	0.31
Pont278	260	50 ans	PlanNat	270.64	265.57	269.89		270.04	0.000962	1.68	161.35	65.92	0.33
Pont278	260	50 ans	PlanActuel	270.64	265.57	269.89		270.04	0.000961	1.68	161.42	65.95	0.33
Pont278	260	100 ans	PlanNat	290.79	265.57	269.92		270.08	0.001078	1.79	162.96	66.69	0.35
Pont278	260	100 ans	PlanActuel	290.79	265.57	269.92		270.08	0.001078	1.79	162.98	66.70	0.35
Pont278	250	2 ans	PlanNat	156.90	265.09	269.79		269.84	0.000299	0.97	167.09	77.28	0.19
Pont278	250	2 ans	PlanActuel	156.90	265.09	269.79		269.84	0.000299	0.97	167.09	77.28	0.19
Pont278	250	5 ans	PlanNat	197.37	265.09	269.82		269.89	0.000457	1.21	169.37	78.21	0.23
Pont278	250	5 ans	PlanActuel	197.37	265.09	269.82		269.89	0.000457	1.21	169.37	78.21	0.23
Pont278	250	10 ans	PlanNat	221.69	265.09	269.84		269.93	0.000562	1.34	171.10	78.96	0.25
Pont278	250	10 ans	PlanActuel	221.69	265.09	269.84		269.93	0.000561	1.34	171.17	78.98	0.25
Pont278	250	20 ans	PlanNat	244.07	265.09	269.86		269.97	0.000664	1.47	172.84	79.80	0.28
Pont278	250	20 ans	PlanActuel	244.07	265.09	269.86		269.97	0.000664	1.47	172.89	79.83	0.28
Pont278	250	25 ans	PlanNat	250.29	265.09	269.87		269.98	0.000693	1.50	173.39	80.06	0.28
Pont278	250	25 ans	PlanActuel	250.29	265.09	269.87		269.98	0.000692	1.50	173.43	80.07	0.28
Pont278	250	50 ans	PlanNat	270.64	265.09	269.89		270.02	0.000789	1.61	175.21	80.81	0.30
Pont278	250	50 ans	PlanActuel	270.64	265.09	269.89		270.03	0.000788	1.61	175.29	80.84	0.30
Pont278	250	100 ans	PlanNat	290.79	265.09	269.92		270.07	0.000885	1.71	177.20	81.21	0.32
Pont278	250	100 ans	PlanActuel	290.79	265.09	269.92		270.07	0.000885	1.71	177.23	81.22	0.32

HEC-RAS River: River278km Reach: Pont278 (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
Pont278	240	2 ans	PlanNat	156.90	265.58	269.79	267.55	269.83	0.000291	0.97	183.63	98.29	0.18
Pont278	240	2 ans	PlanActuel	156.90	265.58	269.79	267.55	269.83	0.000291	0.97	183.63	98.29	0.18
Pont278	240	5 ans	PlanNat	197.37	265.58	269.82	267.76	269.89	0.000444	1.21	186.42	98.63	0.23
Pont278	240	5 ans	PlanActuel	197.37	265.58	269.82	267.76	269.89	0.000444	1.21	186.42	98.63	0.23
Pont278	240	10 ans	PlanNat	221.69	265.58	269.84	267.87	269.93	0.000545	1.34	188.53	98.91	0.25
Pont278	240	10 ans	PlanActuel	221.69	265.58	269.84	267.87	269.93	0.000545	1.34	188.62	98.92	0.25
Pont278	240	20 ans	PlanNat	244.07	265.58	269.86	267.97	269.96	0.000644	1.47	190.65	99.22	0.27
Pont278	240	20 ans	PlanActuel	244.07	265.58	269.86	267.97	269.97	0.000643	1.47	190.72	99.25	0.27
Pont278	240	25 ans	PlanNat	250.29	265.58	269.87	268.00	269.98	0.000672	1.50	191.32	99.44	0.28
Pont278	240	25 ans	PlanActuel	250.29	265.58	269.87	268.00	269.98	0.000671	1.50	191.37	99.46	0.28
Pont278	240	50 ans	PlanNat	270.64	265.58	269.89	268.09	270.01	0.000764	1.61	193.53	99.76	0.30
Pont278	240	50 ans	PlanActuel	270.64	265.58	269.89	268.09	270.02	0.000764	1.61	193.63	99.77	0.30
Pont278	240	100 ans	PlanNat	290.79	265.58	269.91	268.17	270.06	0.000857	1.71	195.94	100.01	0.32
Pont278	240	100 ans	PlanActuel	290.79	265.58	269.91	268.17	270.06	0.000857	1.71	195.98	100.01	0.32
Pont278	230	2 ans	PlanNat	156.90	265.09	269.79	267.14	269.83	0.000211	0.88	180.46	104.71	0.16
Pont278	230	2 ans	PlanActuel	156.90	265.09	269.79	267.14	269.83	0.000211	0.88	180.46	104.71	0.16
Pont278	230	5 ans	PlanNat	197.37	265.09	269.82	267.36	269.88	0.000325	1.10	182.22	105.00	0.20
Pont278	230	5 ans	PlanActuel	197.37	265.09	269.82	267.36	269.88	0.000325	1.10	182.22	105.00	0.20
Pont278	230	10 ans	PlanNat	221.69	265.09	269.84	267.47	269.92	0.000401	1.23	183.47	105.28	0.22
Pont278	230	10 ans	PlanActuel	221.69	265.09	269.84	267.47	269.92	0.000401	1.23	183.52	105.28	0.22
Pont278	230	20 ans	PlanNat	244.07	265.09	269.86	267.57	269.95	0.000476	1.34	184.76	105.33	0.24
Pont278	230	20 ans	PlanActuel	244.07	265.09	269.86	267.57	269.95	0.000476	1.34	184.80	105.33	0.24
Pont278	230	25 ans	PlanNat	250.29	265.09	269.87	267.60	269.96	0.000497	1.37	185.16	105.35	0.24
Pont278	230	25 ans	PlanActuel	250.29	265.09	269.87	267.60	269.96	0.000497	1.37	185.19	105.35	0.24
Pont278	230	50 ans	PlanNat	270.64	265.09	269.89	267.69	270.00	0.000569	1.47	186.48	105.40	0.26
Pont278	230	50 ans	PlanActuel	270.64	265.09	269.89	267.68	270.00	0.000568	1.47	186.54	105.40	0.26
Pont278	230	100 ans	PlanNat	290.79	265.09	269.91	267.77	270.04	0.000643	1.57	187.85	105.46	0.28
Pont278	230	100 ans	PlanActuel	290.79	265.09	269.91	267.77	270.04	0.000642	1.57	187.87	105.46	0.28
Pont278	220	2 ans	PlanNat	156.90	265.17	269.79	267.14	269.83	0.000182	0.81	228.98	104.75	0.15
Pont278	220	2 ans	PlanActuel	156.90	265.17	269.79	267.14	269.83	0.000182	0.81	228.98	104.75	0.15
Pont278	220	5 ans	PlanNat	197.37	265.17	269.83	267.34	269.87	0.000278	1.01	232.28	104.83	0.18
Pont278	220	5 ans	PlanActuel	197.37	265.17	269.83	267.34	269.87	0.000278	1.01	232.28	104.83	0.18
Pont278	220	10 ans	PlanNat	221.69	265.17	269.85	267.46	269.91	0.000342	1.12	234.64	104.89	0.20
Pont278	220	10 ans	PlanActuel	221.69	265.17	269.85	267.46	269.91	0.000342	1.12	234.73	104.89	0.20
Pont278	220	20 ans	PlanNat	244.07	265.17	269.87	267.56	269.94	0.000404	1.23	237.09	104.96	0.22
Pont278	220	20 ans	PlanActuel	244.07	265.17	269.87	267.56	269.94	0.000403	1.23	237.14	104.96	0.22
Pont278	220	25 ans	PlanNat	250.29	265.17	269.88	267.59	269.95	0.000421	1.25	237.85	104.98	0.22
Pont278	220	25 ans	PlanActuel	250.29	265.17	269.88	267.58	269.95	0.000421	1.25	237.87	104.98	0.22
Pont278	220	50 ans	PlanNat	270.64	265.17	269.90	267.68	269.99	0.000479	1.34	240.34	105.05	0.24
Pont278	220	50 ans	PlanActuel	270.64	265.17	269.90	267.68	269.99	0.000479	1.34	240.42	105.05	0.24
Pont278	220	100 ans	PlanNat	290.79	265.17	269.93	267.76	270.02	0.000538	1.43	242.94	105.11	0.25
Pont278	220	100 ans	PlanActuel	290.79	265.17	269.93	267.76	270.02	0.000538	1.43	242.95	105.11	0.25
Pont278	210	2 ans	PlanNat	156.90	266.00	269.79	267.52	269.82	0.000233	0.87	211.09	103.27	0.16
Pont278	210	2 ans	PlanActuel	156.90	266.00	269.79	267.52	269.82	0.000233	0.87	211.09	103.27	0.16
Pont278	210	5 ans	PlanNat	197.37	266.00	269.81	267.72	269.87	0.000356	1.08	213.94	103.47	0.20
Pont278	210	5 ans	PlanActuel	197.37	266.00	269.81	267.71	269.87	0.000356	1.08	213.94	103.47	0.20
Pont278	210	10 ans	PlanNat	221.69	266.00	269.83	267.82	269.90	0.000438	1.20	216.01	103.62	0.23
Pont278	210	10 ans	PlanActuel	221.69	266.00	269.84	267.83	269.90	0.000437	1.20	216.09	103.63	0.23
Pont278	210	20 ans	PlanNat	244.07	266.00	269.86	267.93	269.94	0.000517	1.31	218.15	103.78	0.25
Pont278	210	20 ans	PlanActuel	244.07	266.00	269.86	267.93	269.94	0.000517	1.31	218.20	103.78	0.25
Pont278	210	25 ans	PlanNat	250.29	266.00	269.86	267.95	269.95	0.000540	1.34	218.83	103.83	0.25
Pont278	210	25 ans	PlanActuel	250.29	266.00	269.86	267.95	269.95	0.000540	1.34	218.86	103.83	0.25
Pont278	210	50 ans	PlanNat	270.64	266.00	269.88	268.04	269.98	0.000615	1.43	221.04	103.99	0.27
Pont278	210	50 ans	PlanActuel	270.64	266.00	269.88	268.04	269.98	0.000614	1.43	221.12	104.00	0.27
Pont278	210	100 ans	PlanNat	290.79	266.00	269.90	268.12	270.02	0.000691	1.53	223.35	104.15	0.28
Pont278	210	100 ans	PlanActuel	290.79	266.00	269.91	268.12	270.02	0.000691	1.53	223.36	104.15	0.28
Pont278	200	2 ans	PlanNat	156.90	265.78	269.78	267.59	269.82	0.000253	0.88	204.03	102.85	0.17
Pont278	200	2 ans	PlanActuel	156.90	265.78	269.78	267.58	269.82	0.000253	0.88	204.04	102.85	0.17
Pont278	200	5 ans	PlanNat	197.37	265.78	269.81	267.80	269.87	0.000387	1.09	206.65	103.06	0.21
Pont278	200	5 ans	PlanActuel	197.37	265.78	269.81	267.80	269.87	0.000387	1.09	206.65	103.06	0.21
Pont278	200	10 ans	PlanNat	221.69	265.78	269.83	267.91	269.90	0.000477	1.22	208.54	103.20	0.23
Pont278	200	10 ans	PlanActuel	221.69	265.78	269.83	267.92	269.90	0.000476	1.22	208.63	103.20	0.23
Pont278	200	20 ans	PlanNat	244.07	265.78	269.85	268.01	269.93	0.000564	1.33	210.53	103.35	0.25
Pont278	200	20 ans	PlanActuel	244.07	265.78	269.85	268.01	269.93	0.000564	1.33	210.57	103.35	0.25
Pont278	200	25 ans	PlanNat	250.29	265.78	269.85	268.03	269.94	0.000589	1.36	211.15	103.39	0.26
Pont278	200	25 ans	PlanActuel	250.29	265.78	269.85	268.03	269.94	0.000588	1.36	211.18	103.39	0.26
Pont278	200	50 ans	PlanNat	270.64	265.78	269.87	268.12	269.97	0.000671	1.46	213.19	103.55	0.28
Pont278	200	50 ans	PlanActuel	270.64	265.78	269.87	268.12	269.98	0.000670	1.46	213.28	103.55	0.28
Pont278	200	100 ans	PlanNat	290.79	265.78	269.89	268.20	270.01	0.000755	1.55	215.33	103.71	0.30
Pont278	200	100 ans	PlanActuel	290.79	265.78	269.89	268.20	270.01	0.000755	1.55	215.35	103.71	0.30
Pont278	190	2 ans	PlanNat	156.90	266.38	269.77	267.90	269.82	0.000315	0.93	190.09	102.63	0.19
Pont278	190	2 ans	PlanActuel	156.90	266.38	269.77	267.90	269.82	0.000315	0.93	190.09	102.63	0.19
Pont278	190	5 ans	PlanNat	197.37	266.38	269.80	268.07	269.86	0.000485	1.15	192.25	102.89	0.23
Pont278	190	5 ans	PlanActuel	197.37	266.38	269.80	268.07	269.86	0.000485	1.15	192.25	102.89	0.23
Pont278	190	10 ans	PlanNat	221.69	266.38	269.81	268.17	269.89	0.000599	1.29	193.83	103.08	0.26

HEC-RAS River: River278km Reach: Pont278 (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
Pont278	190	10 ans	PlanActuel	221.69	266.38	269.81	268.17	269.89	0.000598	1.29	193.91	103.09	0.26
Pont278	190	20 ans	PlanNat	244.07	266.38	269.83	268.25	269.92	0.000710	1.41	195.50	103.23	0.28
Pont278	190	20 ans	PlanActuel	244.07	266.38	269.83	268.26	269.92	0.000709	1.41	195.54	103.24	0.28
Pont278	190	25 ans	PlanNat	250.29	266.38	269.83	268.28	269.93	0.000741	1.44	196.03	103.28	0.29
Pont278	190	25 ans	PlanActuel	250.29	266.38	269.83	268.28	269.93	0.000741	1.44	196.06	103.28	0.29
Pont278	190	50 ans	PlanNat	270.64	266.38	269.85	268.35	269.97	0.000847	1.54	197.77	103.44	0.31
Pont278	190	50 ans	PlanActuel	270.64	266.38	269.85	268.36	269.97	0.000846	1.54	197.86	103.45	0.31
Pont278	190	100 ans	PlanNat	290.79	266.38	269.87	268.43	270.00	0.000955	1.65	199.59	103.61	0.33
Pont278	190	100 ans	PlanActuel	290.79	266.38	269.87	268.43	270.00	0.000955	1.65	199.60	103.61	0.33
Pont278	180	2 ans	PlanNat	156.90	266.72	269.77		269.81	0.000400	0.96	171.24	90.82	0.21
Pont278	180	2 ans	PlanActuel	156.90	266.72	269.77		269.81	0.000400	0.96	171.24	90.82	0.21
Pont278	180	5 ans	PlanNat	197.37	266.72	269.78		269.86	0.000618	1.20	172.71	91.17	0.26
Pont278	180	5 ans	PlanActuel	197.37	266.72	269.78		269.86	0.000618	1.20	172.71	91.17	0.26
Pont278	180	10 ans	PlanNat	221.69	266.72	269.79		269.88	0.000766	1.34	173.79	91.43	0.29
Pont278	180	10 ans	PlanActuel	221.69	266.72	269.80		269.89	0.000765	1.34	173.86	91.45	0.29
Pont278	180	20 ans	PlanNat	244.07	266.72	269.81		269.92	0.000911	1.47	174.95	91.68	0.31
Pont278	180	20 ans	PlanActuel	244.07	266.72	269.81		269.92	0.000910	1.47	174.99	91.69	0.31
Pont278	180	25 ans	PlanNat	250.29	266.72	269.81		269.92	0.000952	1.51	175.33	91.77	0.32
Pont278	180	25 ans	PlanActuel	250.29	266.72	269.81		269.93	0.000951	1.50	175.36	91.77	0.32
Pont278	180	50 ans	PlanNat	270.64	266.72	269.82		269.96	0.001092	1.62	176.52	92.03	0.34
Pont278	180	50 ans	PlanActuel	270.64	266.72	269.83		269.96	0.001090	1.62	176.63	92.05	0.34
Pont278	180	100 ans	PlanNat	290.79	266.72	269.84		269.99	0.001235	1.73	177.79	92.27	0.37
Pont278	180	100 ans	PlanActuel	290.79	266.72	269.84		269.99	0.001234	1.73	177.84	92.27	0.37
Pont278	170	2 ans	PlanNat	156.90	266.47	269.76		269.81	0.000409	0.94	167.72	81.61	0.21
Pont278	170	2 ans	PlanActuel	156.90	266.47	269.76		269.81	0.000409	0.94	167.72	81.61	0.21
Pont278	170	5 ans	PlanNat	197.37	266.47	269.78		269.85	0.000633	1.17	168.90	81.81	0.26
Pont278	170	5 ans	PlanActuel	197.37	266.47	269.78		269.85	0.000633	1.17	168.90	81.81	0.26
Pont278	170	10 ans	PlanNat	221.69	266.47	269.79		269.88	0.000786	1.31	169.78	81.95	0.29
Pont278	170	10 ans	PlanActuel	221.69	266.47	269.79		269.88	0.000785	1.31	169.85	81.97	0.29
Pont278	170	20 ans	PlanNat	244.07	266.47	269.80		269.90	0.000936	1.43	170.73	82.11	0.31
Pont278	170	20 ans	PlanActuel	244.07	266.47	269.80		269.91	0.000935	1.43	170.76	82.12	0.31
Pont278	170	25 ans	PlanNat	250.29	266.47	269.80		269.91	0.000978	1.46	171.04	82.17	0.32
Pont278	170	25 ans	PlanActuel	250.29	266.47	269.80		269.91	0.000978	1.46	171.08	82.17	0.32
Pont278	170	50 ans	PlanNat	270.64	266.47	269.82		269.94	0.001123	1.57	172.02	82.34	0.34
Pont278	170	50 ans	PlanActuel	270.64	266.47	269.82		269.94	0.001121	1.57	172.12	82.36	0.34
Pont278	170	100 ans	PlanNat	290.79	266.47	269.83		269.97	0.001272	1.68	173.06	82.55	0.37
Pont278	170	100 ans	PlanActuel	290.79	266.47	269.83		269.97	0.001271	1.68	173.11	82.56	0.37
Pont278	160	2 ans	PlanNat	156.90	266.49	269.76		269.80	0.000428	0.96	163.77	80.53	0.21
Pont278	160	2 ans	PlanActuel	156.90	266.49	269.76		269.80	0.000428	0.96	163.77	80.53	0.21
Pont278	160	5 ans	PlanNat	197.37	266.49	269.77		269.84	0.000667	1.20	164.63	80.59	0.27
Pont278	160	5 ans	PlanActuel	197.37	266.49	269.77		269.84	0.000667	1.20	164.63	80.59	0.27
Pont278	160	10 ans	PlanNat	221.69	266.49	269.78		269.87	0.000831	1.34	165.28	80.64	0.30
Pont278	160	10 ans	PlanActuel	221.69	266.49	269.78		269.87	0.000829	1.34	165.35	80.65	0.30
Pont278	160	20 ans	PlanNat	244.07	266.49	269.78		269.90	0.000993	1.47	165.99	80.70	0.32
Pont278	160	20 ans	PlanActuel	244.07	266.49	269.78		269.90	0.000992	1.47	166.02	80.70	0.32
Pont278	160	25 ans	PlanNat	250.29	266.49	269.79		269.90	0.001040	1.51	166.23	80.72	0.33
Pont278	160	25 ans	PlanActuel	250.29	266.49	269.79		269.90	0.001039	1.51	166.27	80.72	0.33
Pont278	160	50 ans	PlanNat	270.64	266.49	269.80		269.93	0.001199	1.62	166.94	80.77	0.36
Pont278	160	50 ans	PlanActuel	270.64	266.49	269.80		269.93	0.001196	1.62	167.06	80.78	0.36
Pont278	160	100 ans	PlanNat	290.79	266.49	269.81		269.96	0.001364	1.74	167.71	80.83	0.38
Pont278	160	100 ans	PlanActuel	290.79	266.49	269.81		269.96	0.001362	1.74	167.79	80.84	0.38
Pont278	150	2 ans	PlanNat	156.90	266.42	269.74		269.80	0.000589	1.06	148.97	80.86	0.25
Pont278	150	2 ans	PlanActuel	156.90	266.42	269.74		269.80	0.000589	1.06	148.97	80.86	0.25
Pont278	150	5 ans	PlanNat	197.37	266.42	269.74		269.83	0.000931	1.33	149.03	80.87	0.31
Pont278	150	5 ans	PlanActuel	197.37	266.42	269.74		269.83	0.000931	1.33	149.03	80.87	0.31
Pont278	150	10 ans	PlanNat	221.69	266.42	269.74		269.86	0.001174	1.49	149.07	80.87	0.35
Pont278	150	10 ans	PlanActuel	221.69	266.42	269.74		269.86	0.001174	1.49	149.07	80.87	0.35
Pont278	150	20 ans	PlanNat	244.07	266.42	269.74		269.88	0.001421	1.64	149.12	80.88	0.38
Pont278	150	20 ans	PlanActuel	244.07	266.42	269.74		269.88	0.001421	1.64	149.12	80.88	0.38
Pont278	150	25 ans	PlanNat	250.29	266.42	269.74		269.89	0.001494	1.68	149.14	80.88	0.39
Pont278	150	25 ans	PlanActuel	250.29	266.42	269.74		269.89	0.001494	1.68	149.14	80.88	0.39
Pont278	150	50 ans	PlanNat	270.64	266.42	269.74		269.91	0.001745	1.82	149.18	80.88	0.42
Pont278	150	50 ans	PlanActuel	270.64	266.42	269.74		269.91	0.001744	1.82	149.20	80.88	0.42
Pont278	150	100 ans	PlanNat	290.79	266.42	269.74		269.94	0.002012	1.95	149.24	80.89	0.45
Pont278	150	100 ans	PlanActuel	290.79	266.42	269.74		269.94	0.002011	1.95	149.26	80.89	0.45
Pont278	140	2 ans	PlanNat	156.90	266.49	269.74		269.79	0.000496	1.01	155.25	77.79	0.23
Pont278	140	2 ans	PlanActuel	156.90	266.49	269.74		269.79	0.000496	1.01	155.25	77.79	0.23
Pont278	140	5 ans	PlanNat	197.37	266.49	269.74		269.82	0.000787	1.27	155.18	77.78	0.29
Pont278	140	5 ans	PlanActuel	197.37	266.49	269.74		269.82	0.000787	1.27	155.18	77.78	0.29
Pont278	140	10 ans	PlanNat	221.69	266.49	269.74		269.84	0.000993	1.43	155.14	77.78	0.32
Pont278	140	10 ans	PlanActuel	221.69	266.49	269.74		269.84	0.000993	1.43	155.14	77.78	0.32
Pont278	140	20 ans	PlanNat	244.07	266.49	269.74		269.86	0.001205	1.57	155.09	77.78	0.35
Pont278	140	20 ans	PlanActuel	244.07	266.49	269.74		269.86	0.001205	1.57	155.09	77.78	0.35
Pont278	140	25 ans	PlanNat	250.29	266.49	269.74		269.87	0.001268	1.61	155.07	77.77	0.36
Pont278	140	25 ans	PlanActuel	250.29	266.49	269.74		269.87	0.001268	1.61	155.07	77.77	0.36
Pont278	140	50 ans	PlanNat	270.64	266.49	269.74		269.89	0.001484	1.75	155.02	77.77	0.39

HEC-RAS River: River278km Reach: Pont278 (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
Pont278	140	50 ans	PlanActuel	270.64	266.49	269.74		269.89	0.001484	1.75	155.02	77.77	0.39
Pont278	140	100 ans	PlanNat	290.79	266.49	269.74		269.91	0.001715	1.88	154.96	77.77	0.42
Pont278	140	100 ans	PlanActuel	290.79	266.49	269.74		269.91	0.001715	1.88	154.96	77.77	0.42
Pont278	130	2 ans	PlanNat	156.90	266.33	269.74	267.82	269.78	0.000348	0.93	168.84	72.78	0.19
Pont278	130	2 ans	PlanActuel	156.90	266.33	269.74	267.81	269.78	0.000348	0.93	168.84	72.78	0.19
Pont278	130	5 ans	PlanNat	197.37	266.33	269.74	268.01	269.81	0.000551	1.17	168.84	72.78	0.25
Pont278	130	5 ans	PlanActuel	197.37	266.33	269.74	268.00	269.81	0.000551	1.17	168.84	72.78	0.25
Pont278	130	10 ans	PlanNat	221.69	266.33	269.74	268.10	269.83	0.000695	1.31	168.84	72.78	0.28
Pont278	130	10 ans	PlanActuel	221.69	266.33	269.74	268.11	269.83	0.000695	1.31	168.84	72.78	0.28
Pont278	130	20 ans	PlanNat	244.07	266.33	269.74	268.19	269.85	0.000842	1.45	168.84	72.78	0.30
Pont278	130	20 ans	PlanActuel	244.07	266.33	269.74	268.19	269.85	0.000842	1.45	168.84	72.78	0.30
Pont278	130	25 ans	PlanNat	250.29	266.33	269.74	268.22	269.85	0.000886	1.48	168.84	72.78	0.31
Pont278	130	25 ans	PlanActuel	250.29	266.33	269.74	268.21	269.85	0.000886	1.48	168.84	72.78	0.31
Pont278	130	50 ans	PlanNat	270.64	266.33	269.74	268.29	269.87	0.001035	1.60	168.84	72.78	0.34
Pont278	130	50 ans	PlanActuel	270.64	266.33	269.74	268.30	269.87	0.001035	1.60	168.84	72.78	0.34
Pont278	130	100 ans	PlanNat	290.79	266.33	269.74	268.38	269.89	0.001195	1.72	168.84	72.78	0.36
Pont278	130	100 ans	PlanActuel	290.79	266.33	269.74	268.38	269.89	0.001195	1.72	168.84	72.78	0.36