

AUTOSTRADA (A1): MILANO-NAPOLI

AMPLIAMENTO ALLA TERZA CORSIA
NEL TRATTO INCISA - VALDARNO

LOTTO 1

PROGETTO ESECUTIVO

DG - DOCUMENTAZIONE GENERALE

IDROLOGIA E IDRAULICA Parte generale

Relazione idrologica Allegato B

IL PROGETTISTA SPECIALISTICO

Ing. Paolo De Paoli
Ord. Ingg. Pavia N. 1739

Responsabile Idrologia e Idraulica

IL RESPONSABILE INTEGRAZIONE
PRESTAZIONI SPECIALISTICHE

Ing. Paola Castiglioni
Ord. Ingg. Varese N. 2725



IL DIRETTORE TECNICO

Ing. Orlando Mazza
Ord. Ingg. Pavia N. 1496

Progettazione Infrastrutture

CODICE IDENTIFICATIVO

RIFERIMENTO PROGETTO											RIFERIMENTO DIRETTORIO				RIFERIMENTO ELABORATO				ORDINATORE
Codice Commessa	Lotto, Sub-Prog. Cod. Appalto	Fase	Capitolo	Paragrafo	W B S	Parte d'opera	Tip.	Disciplina	Progressivo	Rev.					-				
119941	LL01	PE	DG	IDR	GE000	00000	R	IDR	0332	-1					SCALA -				

 	PROJECT MANAGER:				SUPPORTO SPECIALISTICO:				REVISIONE		
	Ing. Paola Castiglioni Ord. Ingg. Varese N. 2725								n.	data	
									0	LUGLIO 2020	
									1	OTTOBRE 2020	
REDATTO:						VERIFICATO:					

VISTO DEL COMMITTENTE



IL RESPONSABILE UNICO DEL PROCEDIMENTO
Ing. Furio Cruciani

VISTO DEL CONCEDENTE



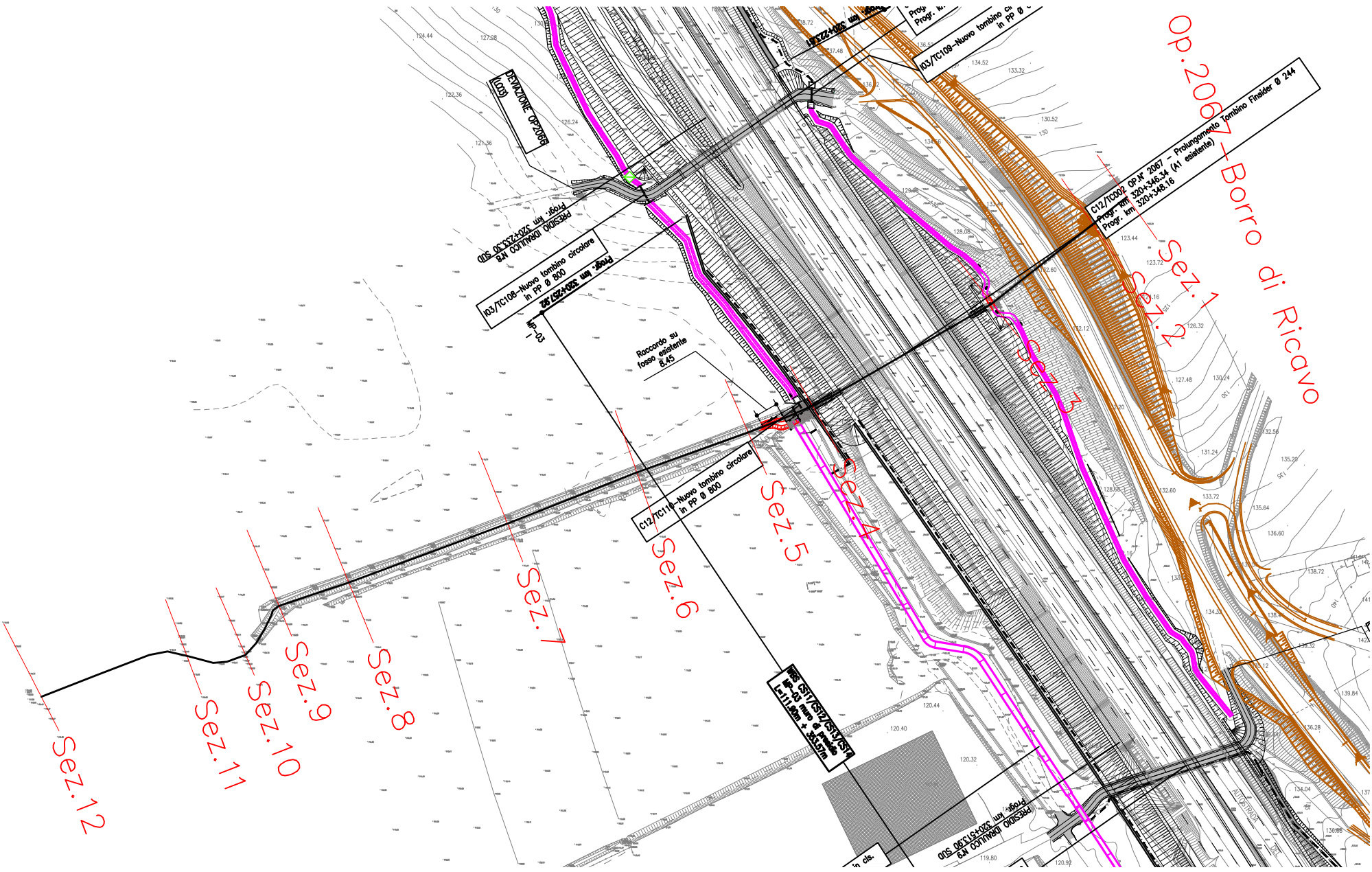
Ministero delle Infrastrutture e dei Trasporti
DIPARTIMENTO PER LE INFRASTRUTTURE, GLI AFFARI GENERALI ED IL PERSONALE
STRUTTURA DI VIGILANZA SULLE CONCESSIONARIE AUTOSTRADALI

OPERE MINORI

OPERA N. 2067

BORRO DI RICA VO

POST OPERAM



HEC-RAS Plan: PO River: Borro Ricavo Reach: Borro Ricavo Profile: Tr 200

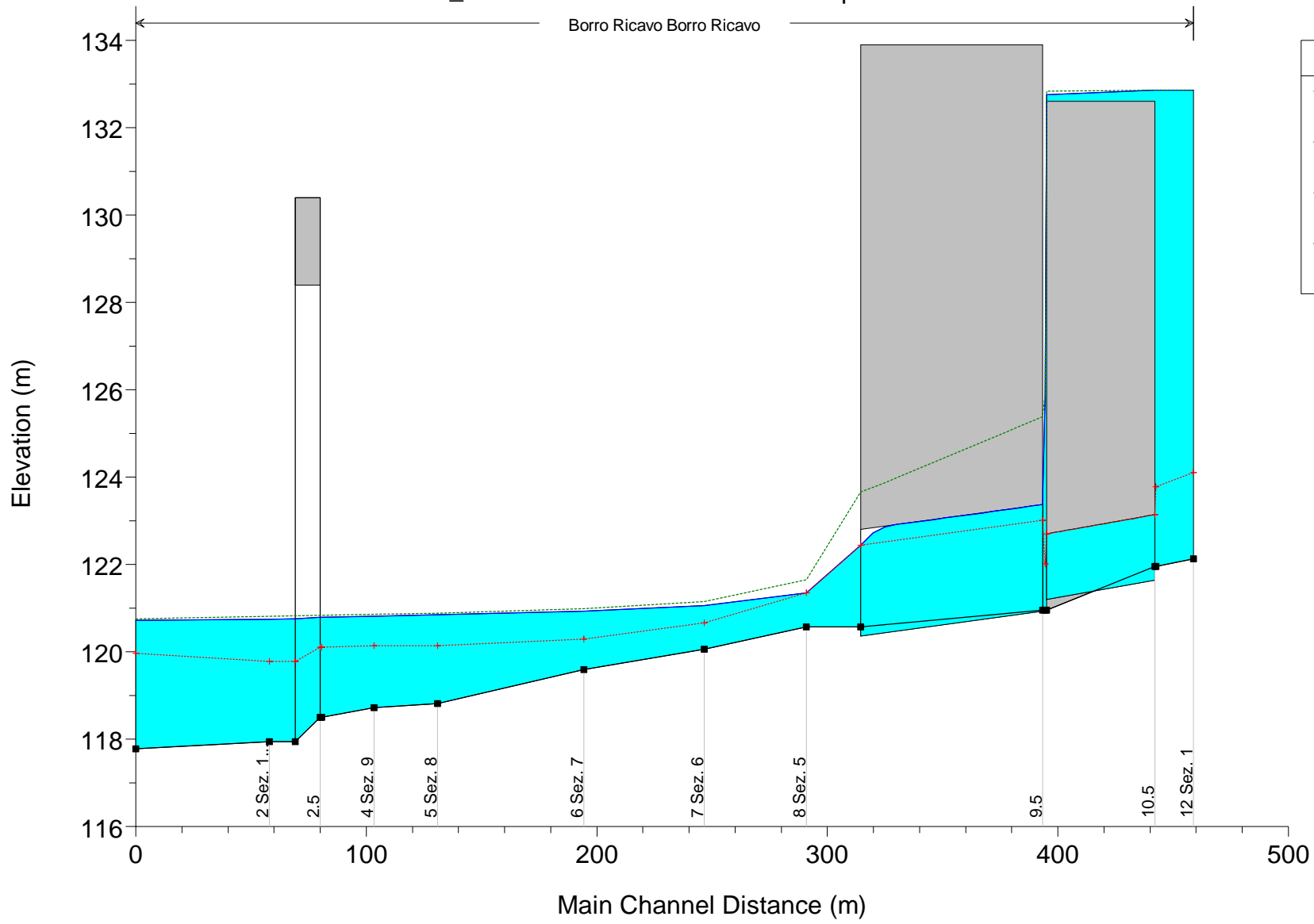
Reach	River Sta		Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Borro Ricavo	12	Sez. 1	Tr 200	20.80	122.13	132.86	124.10	132.86	0.000001	0.09	301.51	38.74	0.01
Borro Ricavo	11	Sez. 2	Tr 200	20.80	121.95	132.86	123.78	132.86	0.000001	0.08	334.22	40.92	0.01
Borro Ricavo	10.5			Culvert									
Borro Ricavo	10	Sez. 3	Tr 200	20.80	120.95	125.89	122.01	125.89	0.000016	0.27	110.21	37.39	0.04
Borro Ricavo	9.5			Culvert									
Borro Ricavo	8	Sez. 5	Tr 200	20.80	120.57	121.35	121.35	121.65	0.021234	2.54	8.61	38.86	1.12
Borro Ricavo	7	Sez. 6	Tr 200	20.80	120.06	121.06	120.67	121.15	0.004775	1.29	15.77	47.50	0.52
Borro Ricavo	6	Sez. 7	Tr 200	20.80	119.59	120.93	120.29	120.99	0.002018	1.17	19.91	44.56	0.38
Borro Ricavo	5	Sez. 8	Tr 200	20.80	118.81	120.85	120.14	120.89	0.001127	1.04	24.32	54.74	0.28
Borro Ricavo	4	Sez. 9	Tr 200	20.80	118.72	120.81	120.14	120.86	0.001109	1.17	23.33	43.05	0.30
Borro Ricavo	3	Sez. 10	Tr 200	20.80	118.50	120.79	120.10	120.83	0.000833	1.14	25.36	35.83	0.27
Borro Ricavo	2.5			Bridge									
Borro Ricavo	2	Sez. 11	Tr 200	20.80	117.94	120.75	119.78	120.81	0.000950	1.23	20.99	37.91	0.28
Borro Ricavo	1	Sez. 12	Tr 200	20.80	117.78	120.72	119.97	120.76	0.000728	1.02	27.64	45.11	0.22

2067_Borro RicavoPO Plan: Post Operam 15/06/2020

Borro Ricavo Borro Ricavo

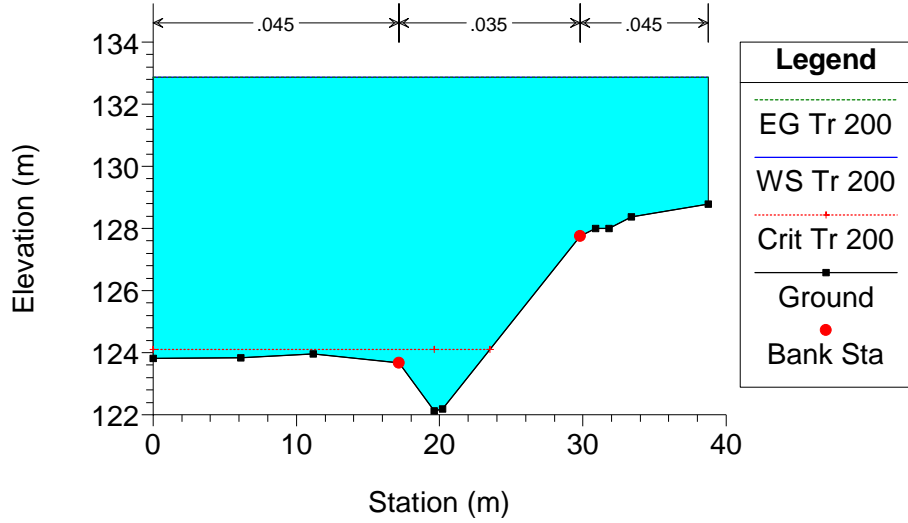
Legend

- EG Tr 200
- WS Tr 200
- Crit Tr 200
- Ground



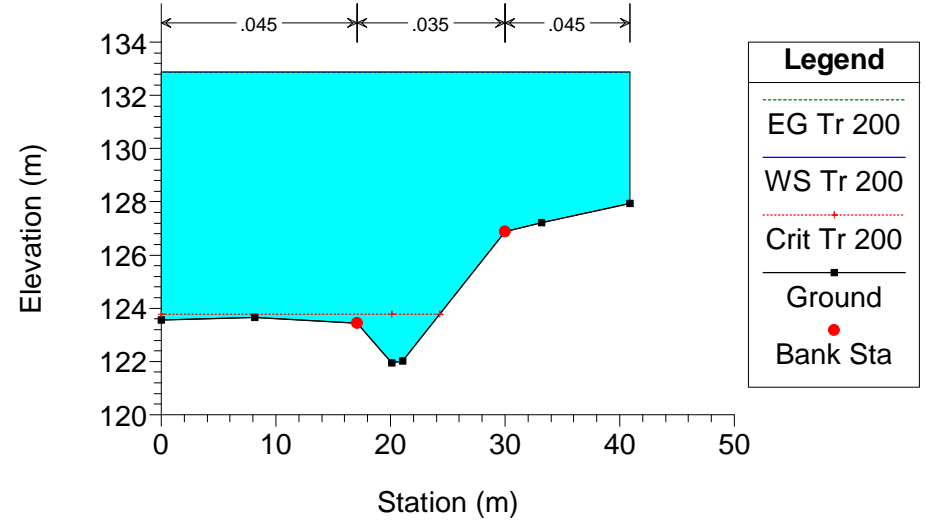
2067_Borro RicavoPO Plan: Post Operam 15/06/2020

River = Borro Ricavo Reach = Borro Ricavo RS = 12 Sez. 1



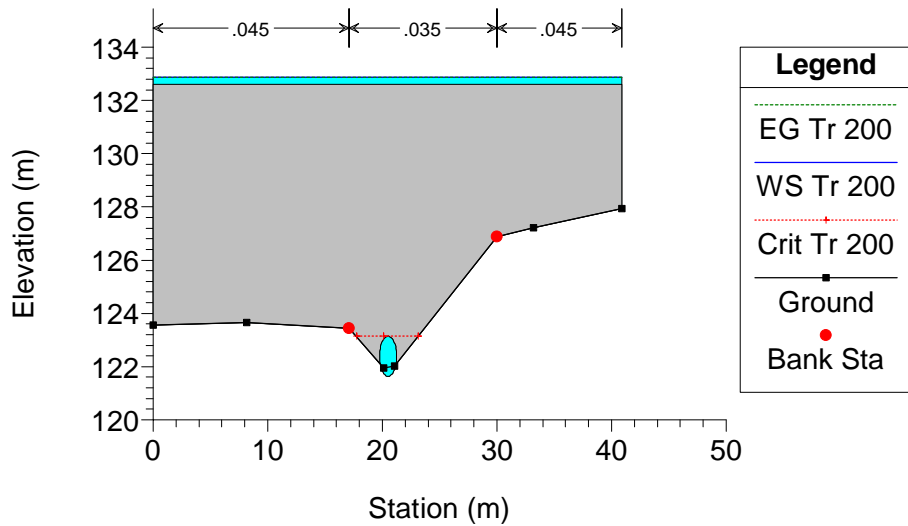
2067_Borro RicavoPO Plan: Post Operam 15/06/2020

River = Borro Ricavo Reach = Borro Ricavo RS = 11 Sez. 2



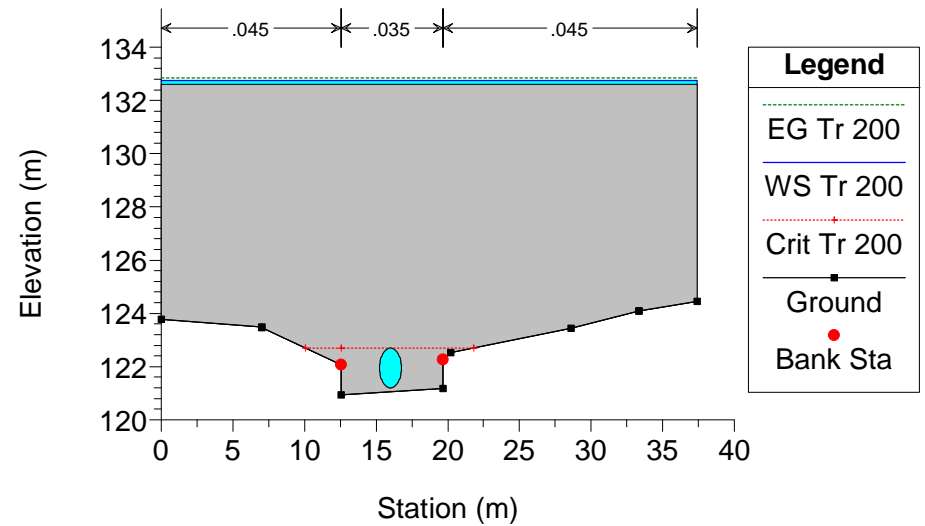
2067_Borro RicavoPO Plan: Post Operam 15/06/2020

River = Borro Ricavo Reach = Borro Ricavo RS = 10.5 Culv Tombino Strada Statale



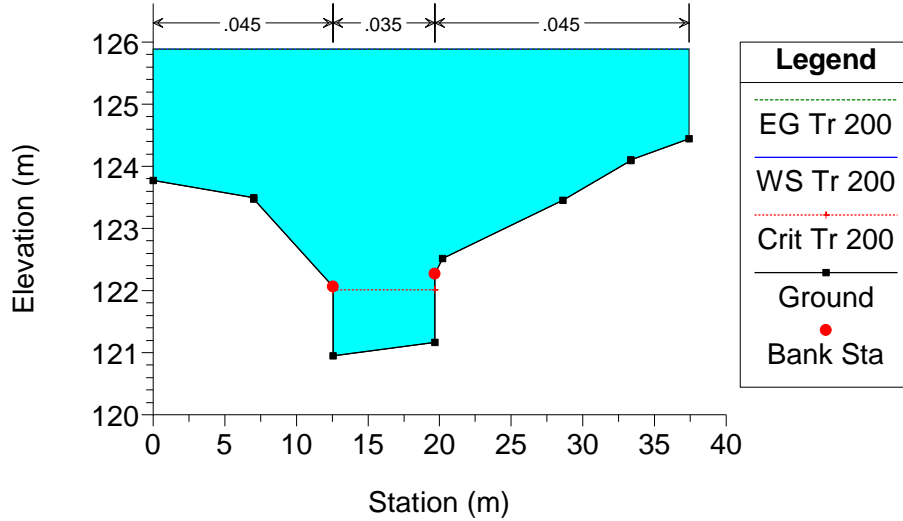
2067_Borro RicavoPO Plan: Post Operam 15/06/2020

River = Borro Ricavo Reach = Borro Ricavo RS = 10.5 Culv Tombino Strada Statale



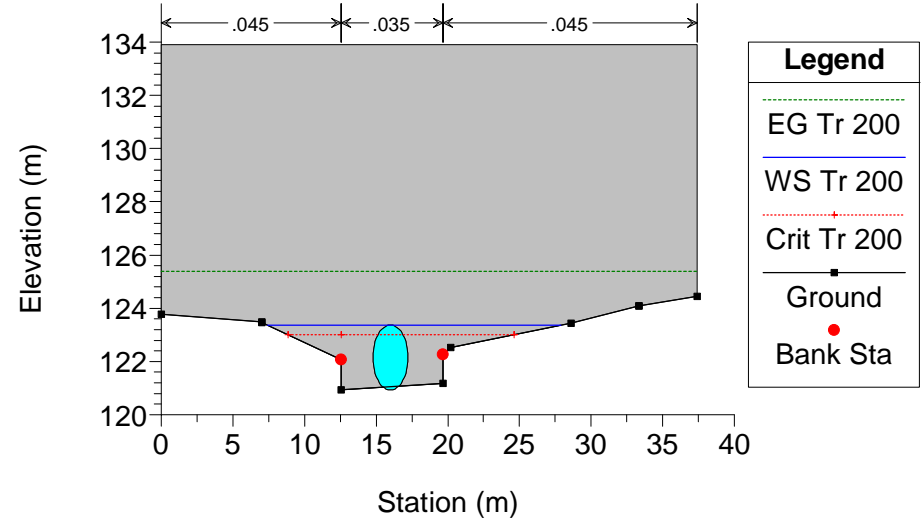
2067_Borro RicavoPO Plan: Post Operam 15/06/2020

River = Borro Ricavo Reach = Borro Ricavo RS = 10 Sez. 3



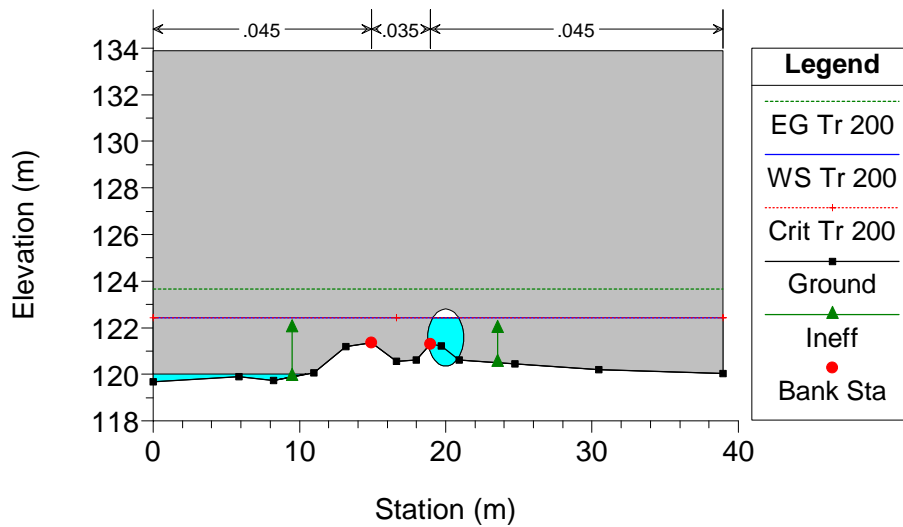
2067_Borro RicavoPO Plan: Post Operam 15/06/2020

River = Borro Ricavo Reach = Borro Ricavo RS = 9.5 Culv Tombino autostradale



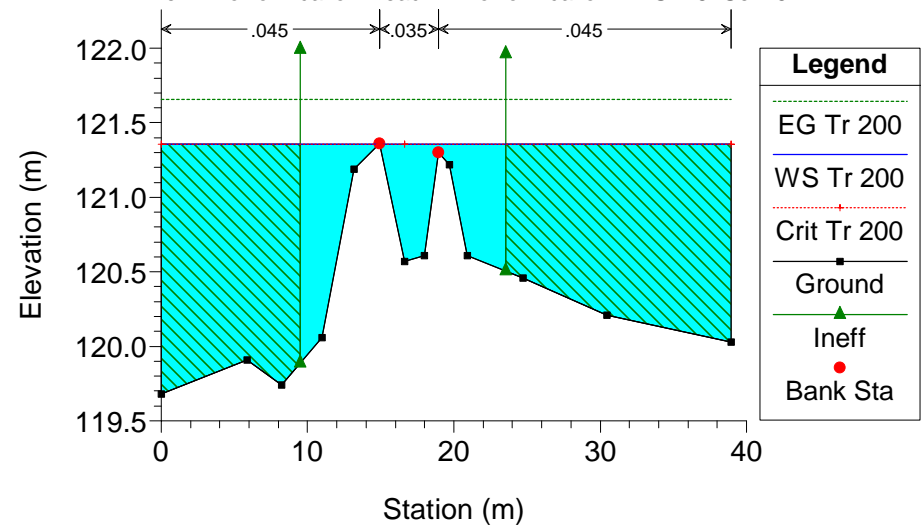
2067_Borro RicavoPO Plan: Post Operam 15/06/2020

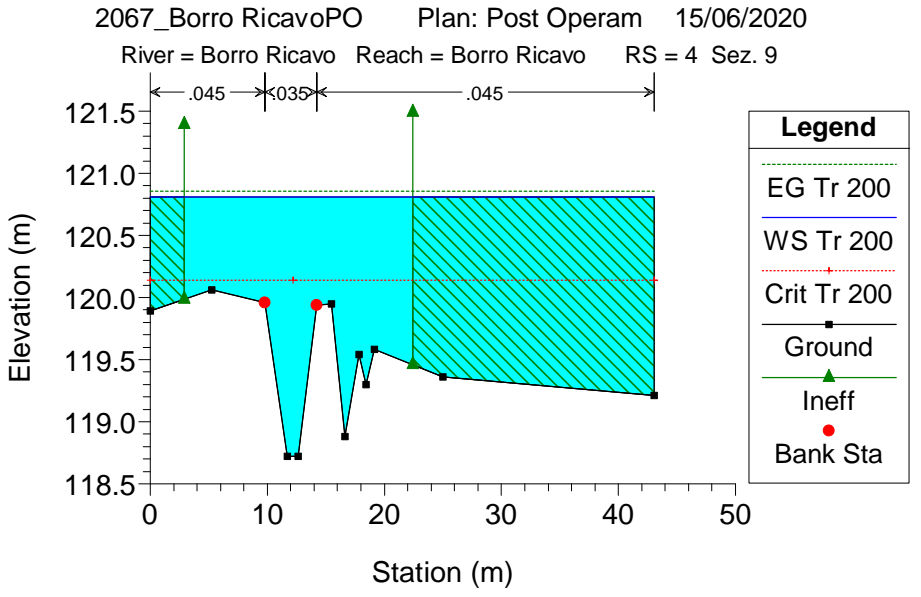
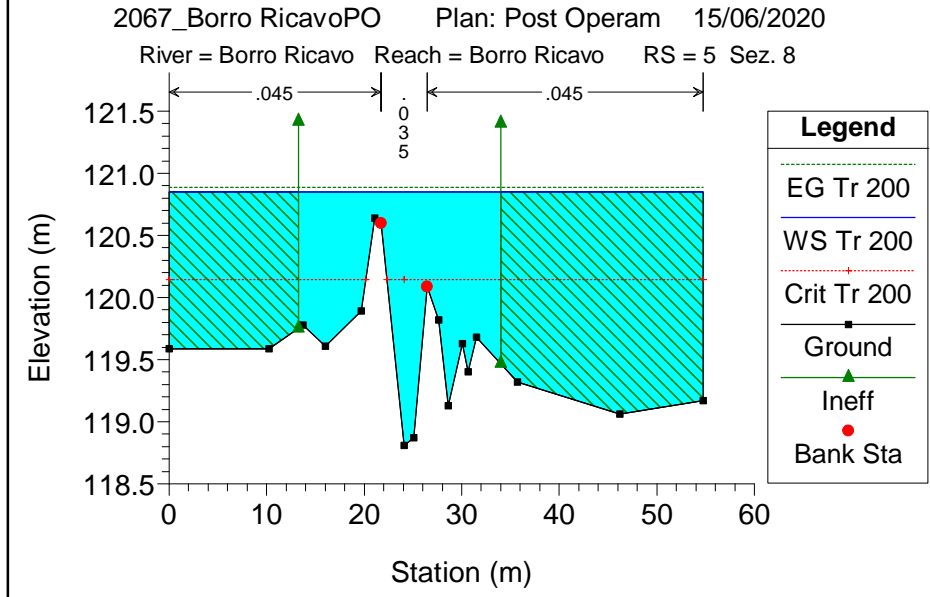
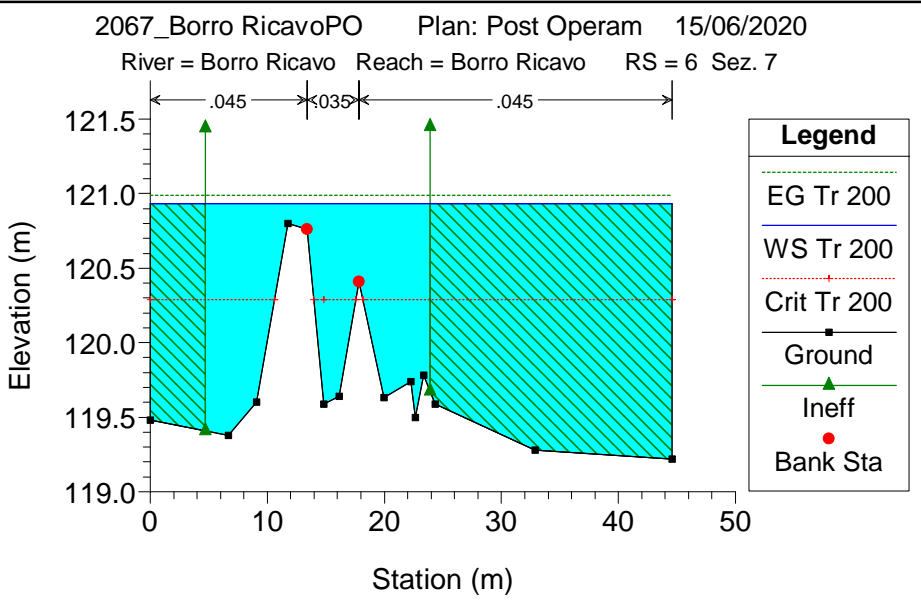
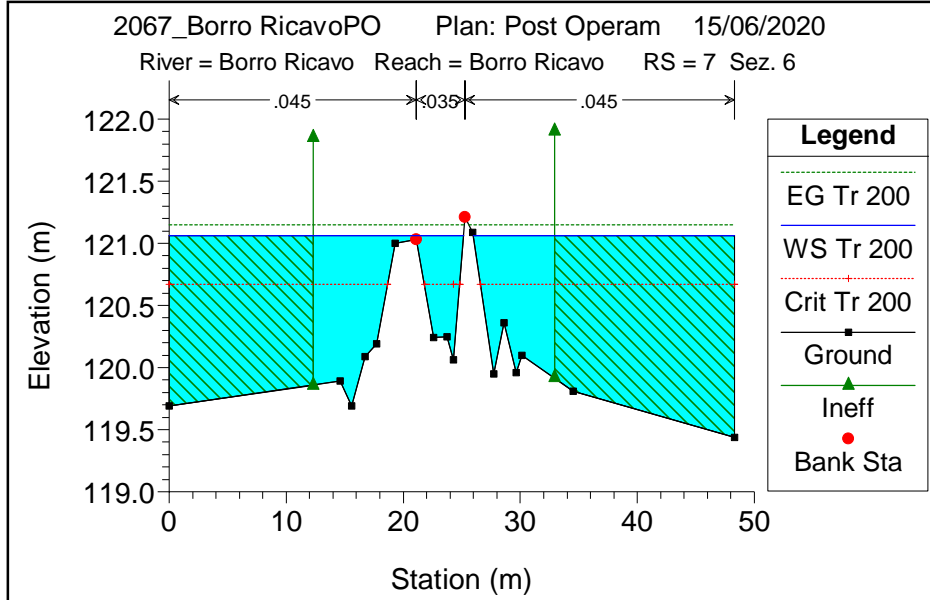
River = Borro Ricavo Reach = Borro Ricavo RS = 9.5 Culv Tombino autostradale

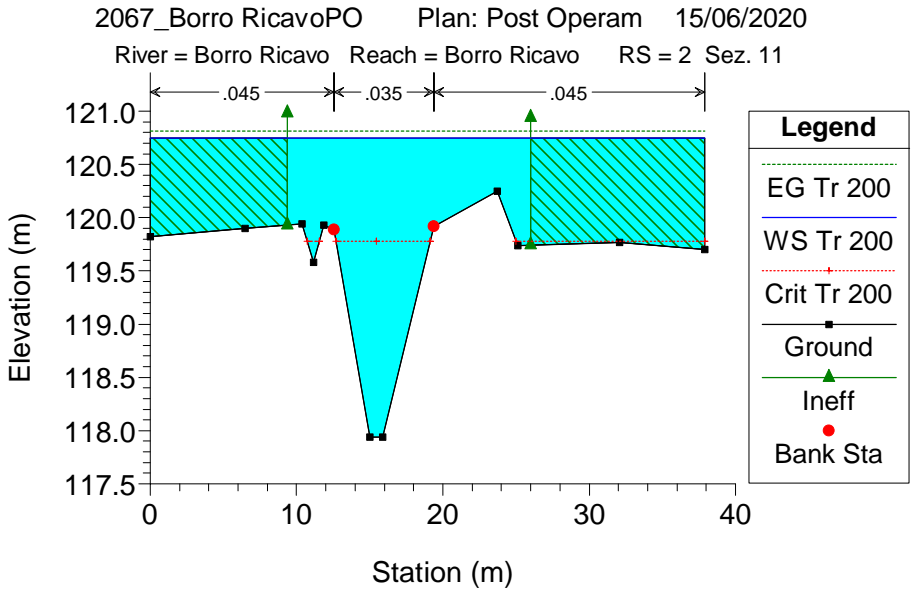
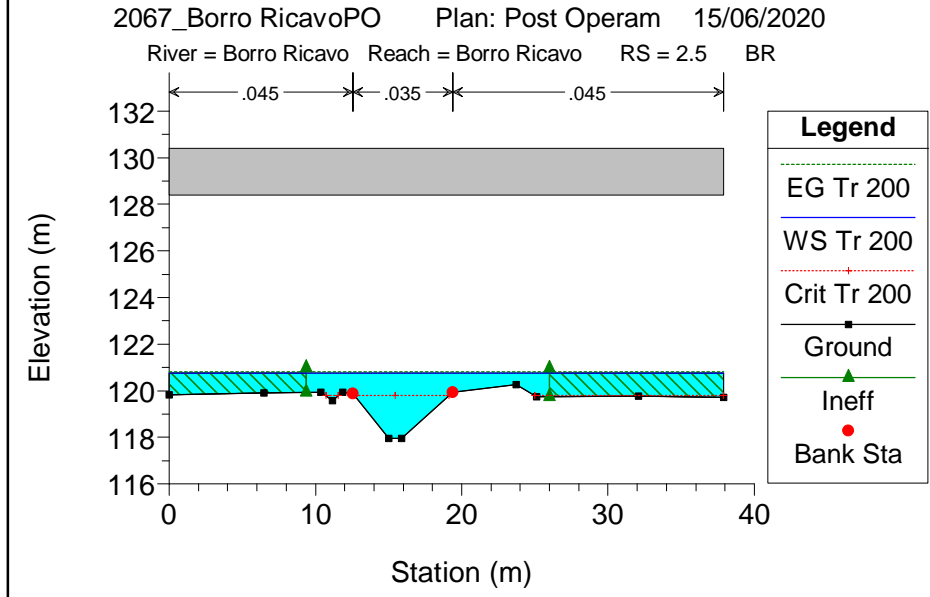
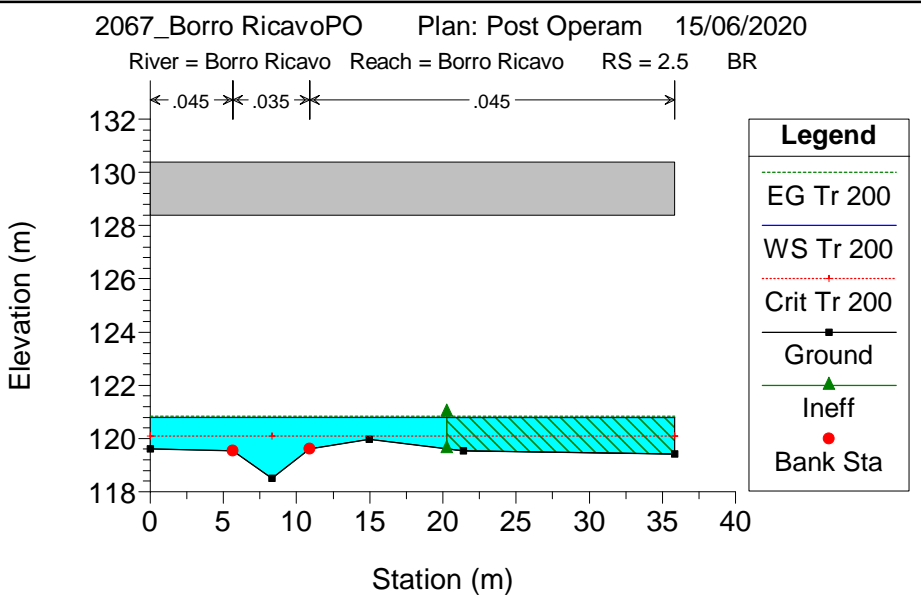
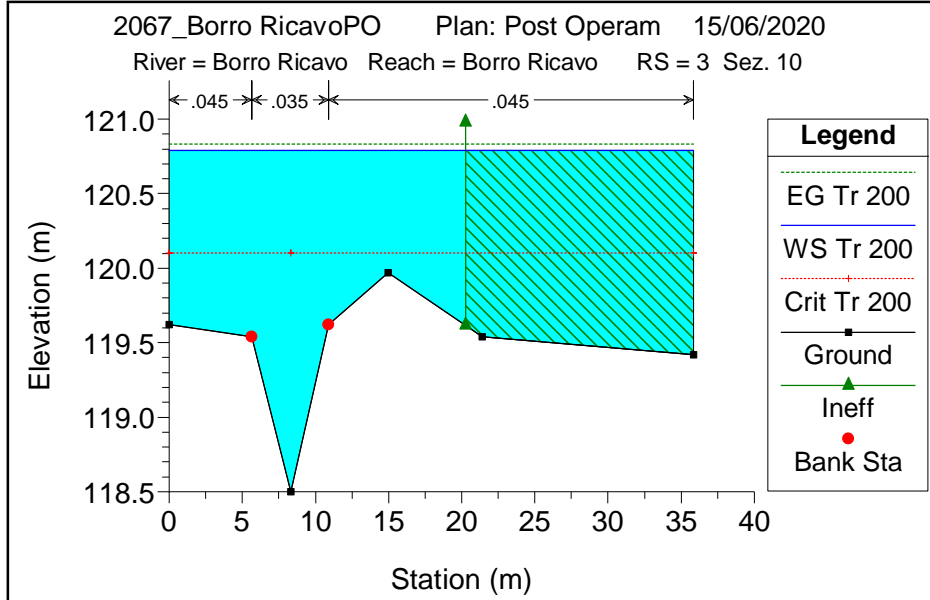


2067_Borro RicavoPO Plan: Post Operam 15/06/2020

River = Borro Ricavo Reach = Borro Ricavo RS = 8 Sez. 5

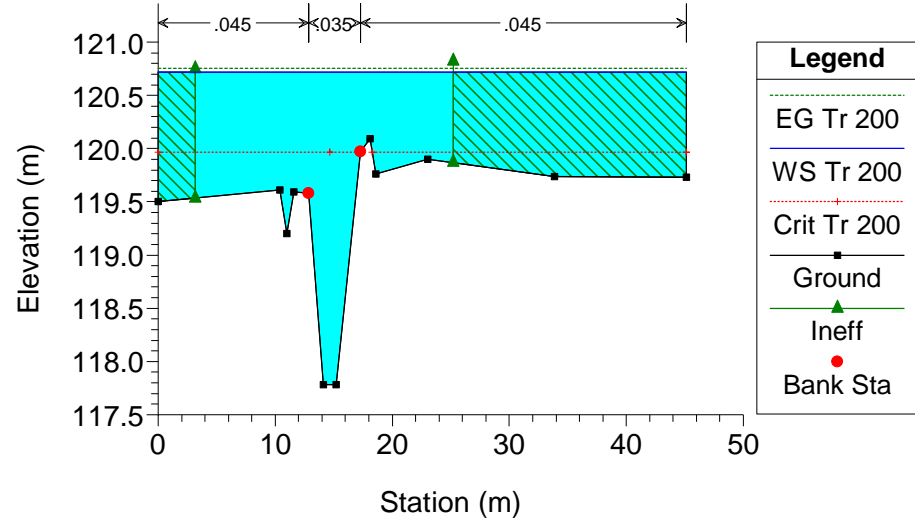






2067_Borro RicavoPO Plan: Post Operam 15/06/2020

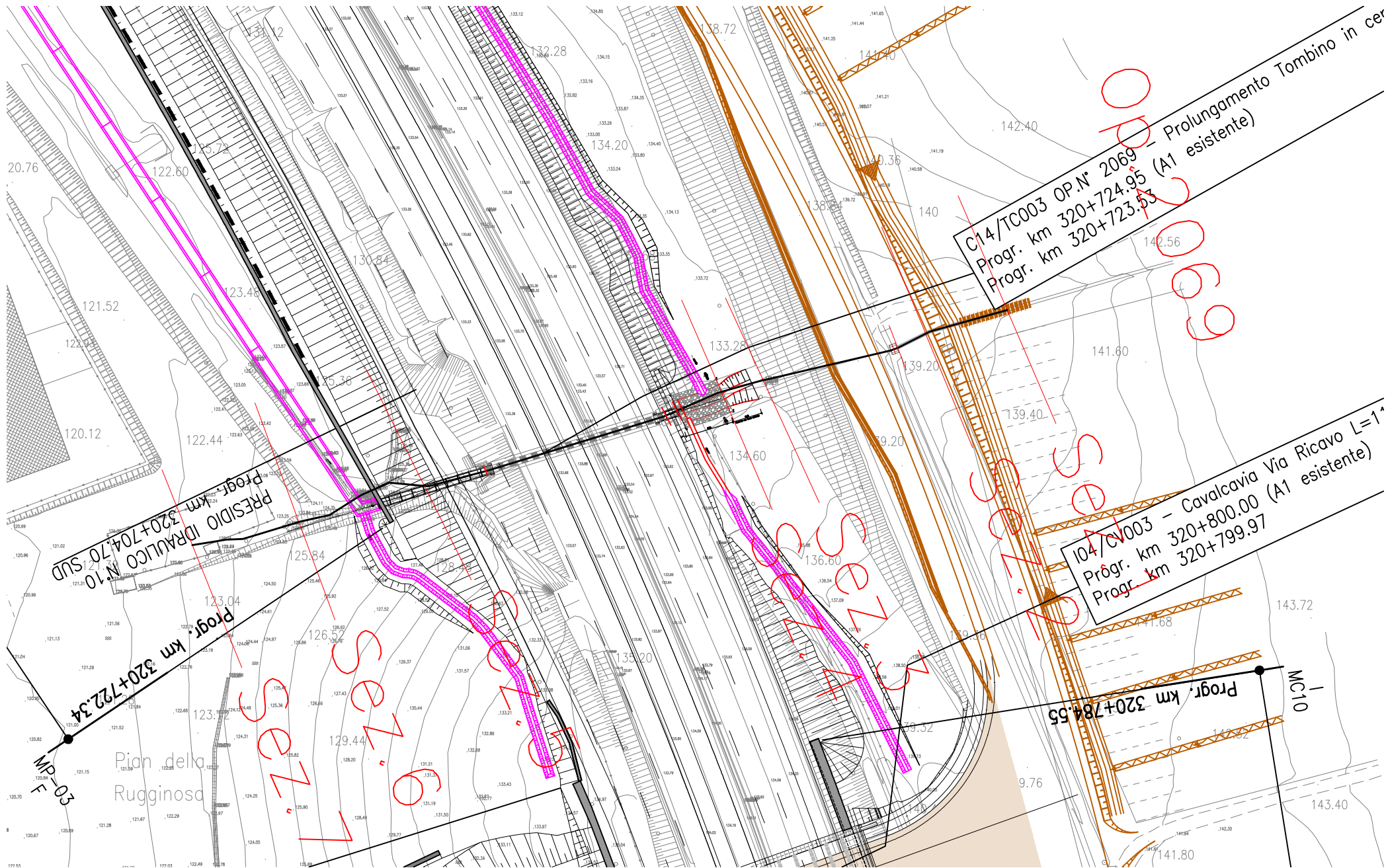
River = Borro Ricavo Reach = Borro Ricavo RS = 1 Sez. 12



OPERA N. 2069

COMPLUVIO

POST OPERAM



C14/TC003 OP.N° 2069 - Prolungamento Tombino in cer
Progr. km 320+724.95 (A1 esistente)
Progr. km 320+723.53

I04/CV003 - Cavalcavia Via Ricavo L=1'
Progr. km 320+800.00 (A1 esistente)
Progr. km 320+799.97

PRESIDIO IDRALICO N° 10 SUD
Progr. km 320+704.70

Progr. km 320+722.34

Pian della Rugginosa

Progr. km 320+784.55

MC10

SENZA

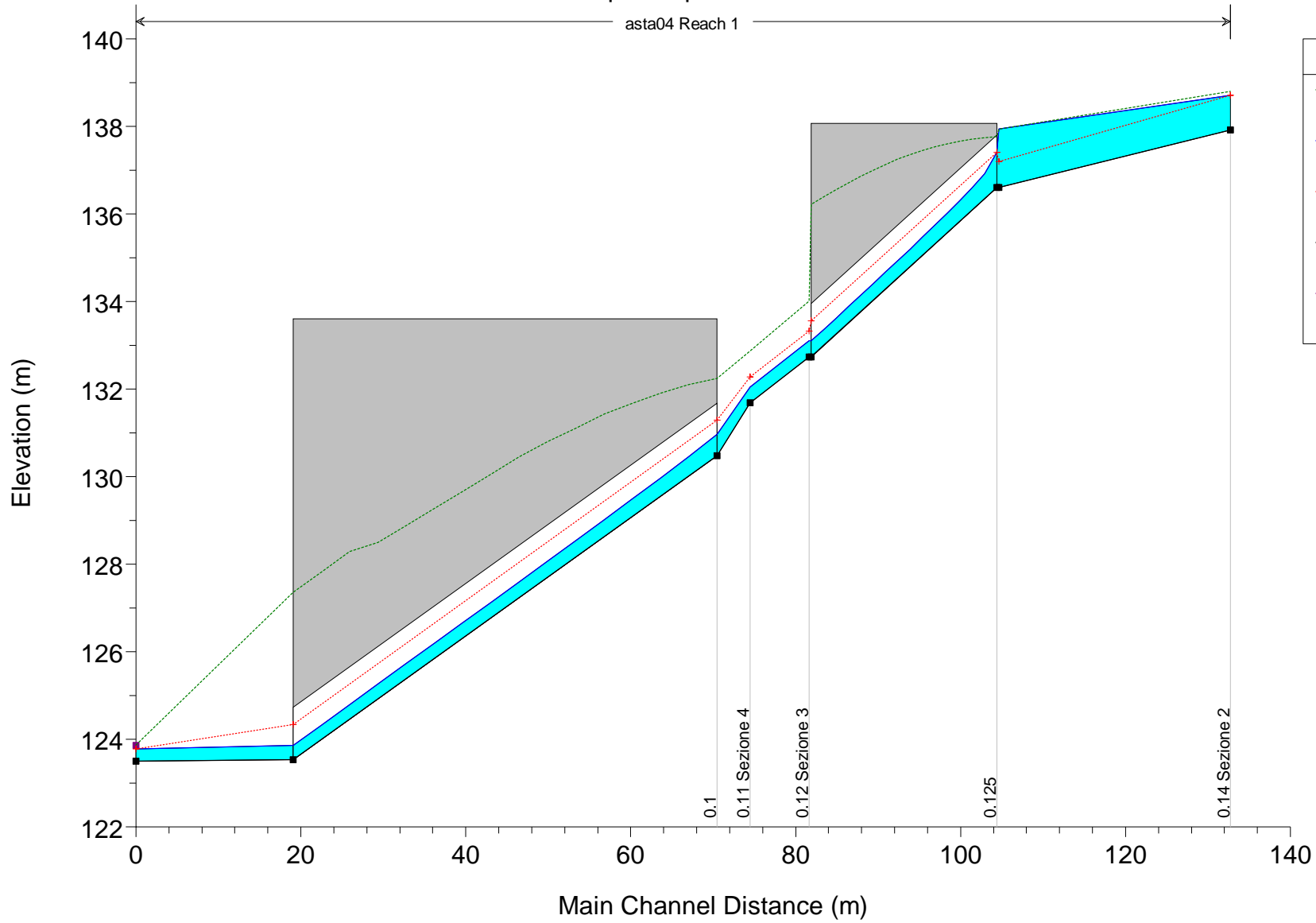
HEC-RAS Plan: POV River: asta04 Reach: Reach 1 Profile: Tr 200

Reach	River Sta		Profile	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
Reach 1	0.14	Sezione 2	Tr 200	2.14	137.92	138.70	138.70	138.81	0.008298	1.56	2.13	13.60	0.64
Reach 1	0.13		Tr 200	2.14	136.60	137.94	137.20	137.94	0.000185	0.31	9.16	18.27	0.11
Reach 1	0.125		Culvert										
Reach 1	0.12	Sezione 3	Tr 200	2.14	132.73	133.10	133.33	134.01	0.171330	4.22	0.51	2.22	2.82
Reach 1	0.11	Sezione 4	Tr 200	2.14	131.69	132.05	132.27	132.87	0.140111	4.03	0.53	2.10	2.56
Reach 1	0.1		Culvert										
Reach 1	0.03	Sezione 6	Tr 200	2.14	123.50	123.78	123.78	123.87	0.020932	1.28	1.67	9.55	0.98

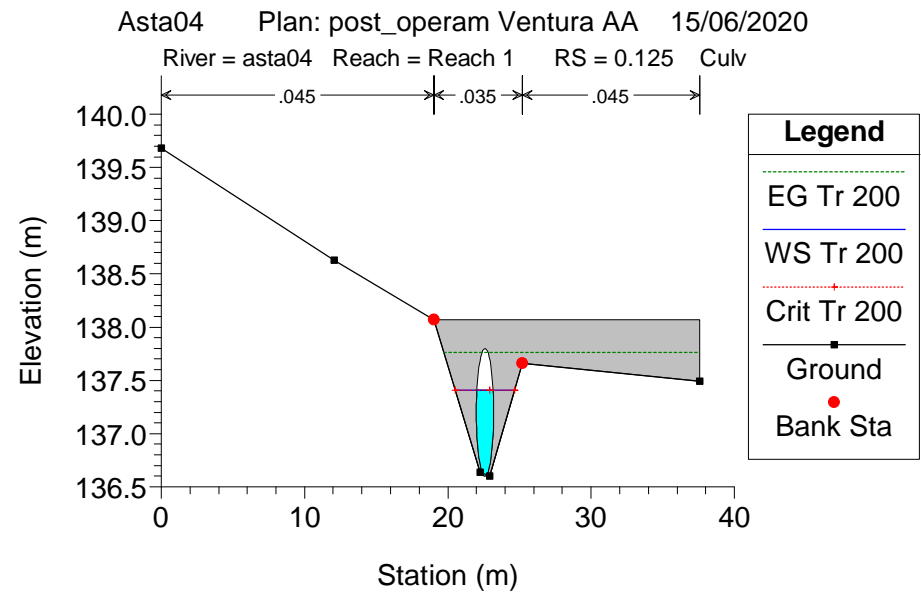
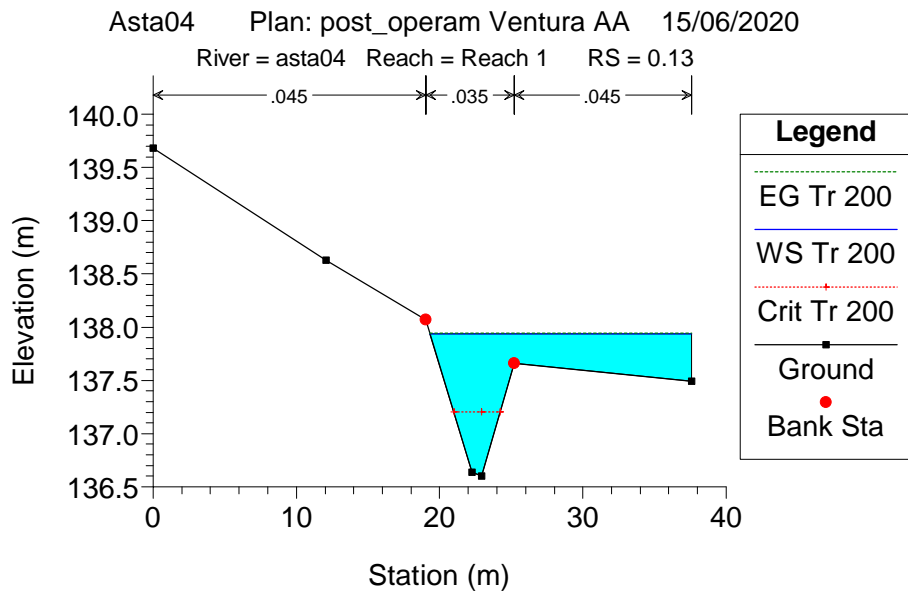
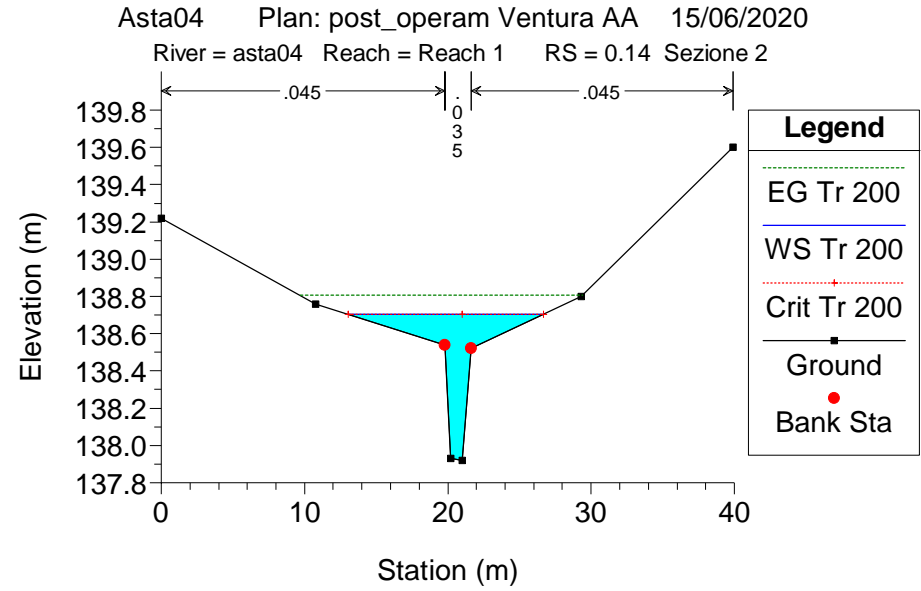
Asta04 Plan: post_operam Ventura AA 15/06/2020

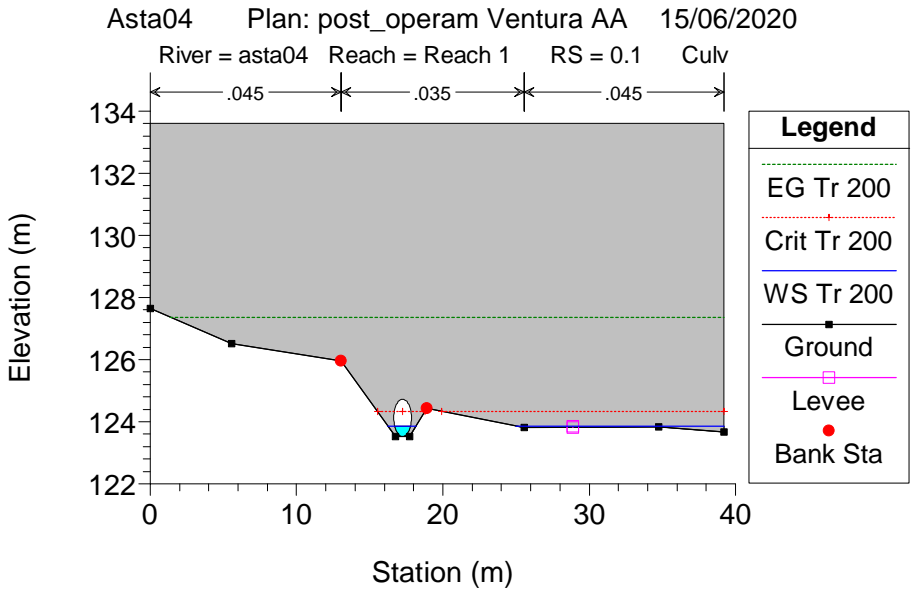
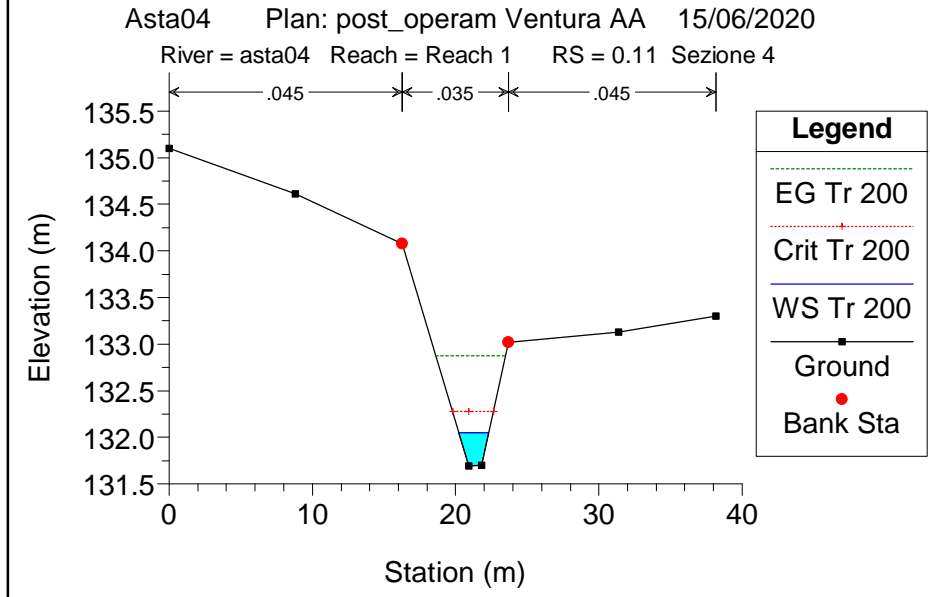
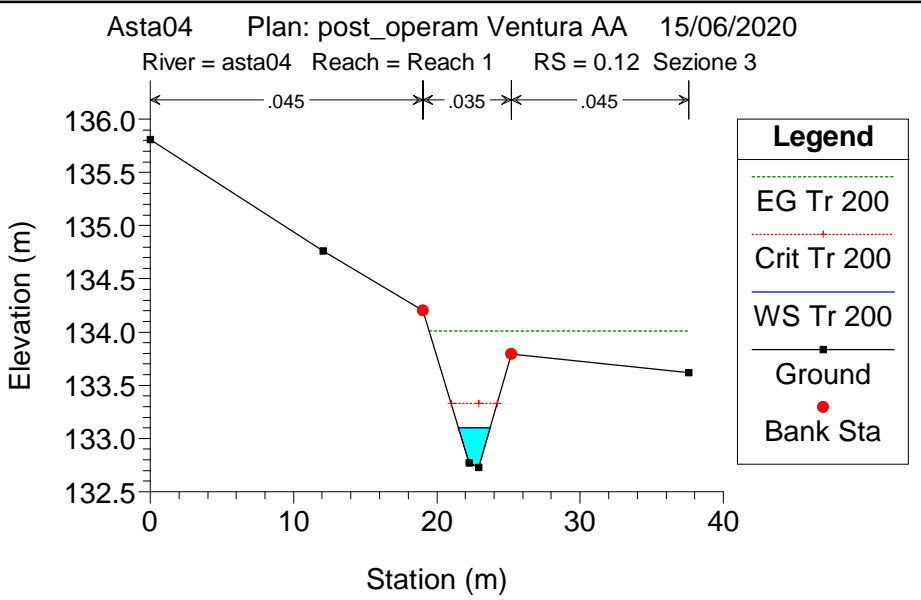
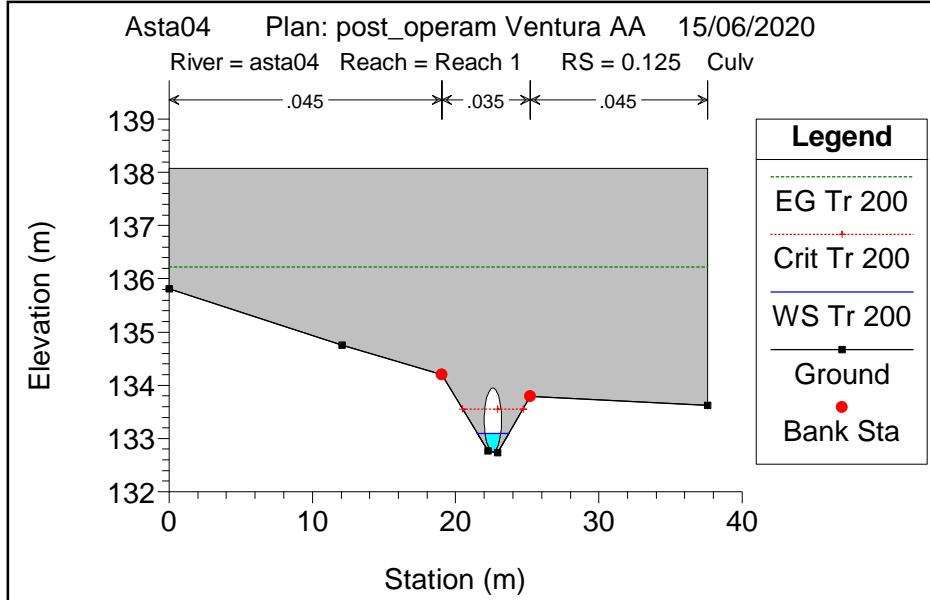
asta04 Reach 1

Legend	
	EG Tr 200
	WS Tr 200
	Crit Tr 200
	Ground
	Right Levee



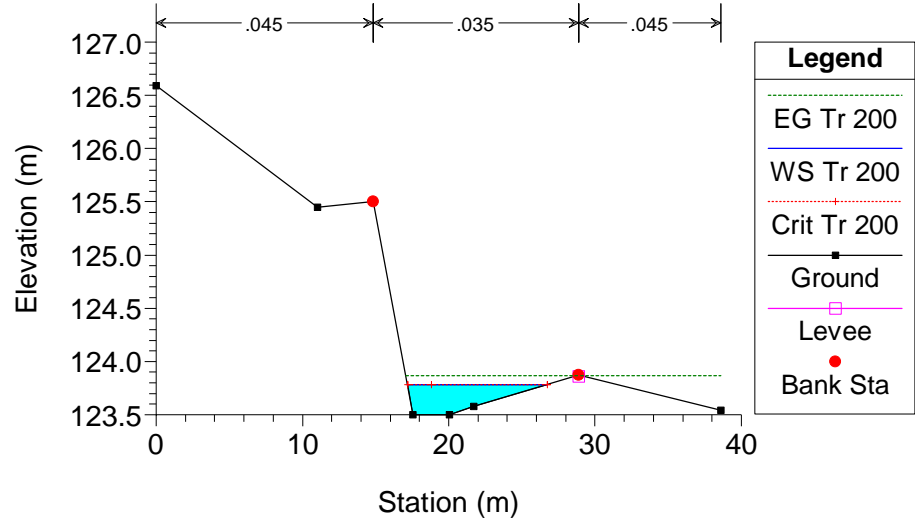
No Data for Plot





Asta04 Plan: post_operam Ventura AA 15/06/2020

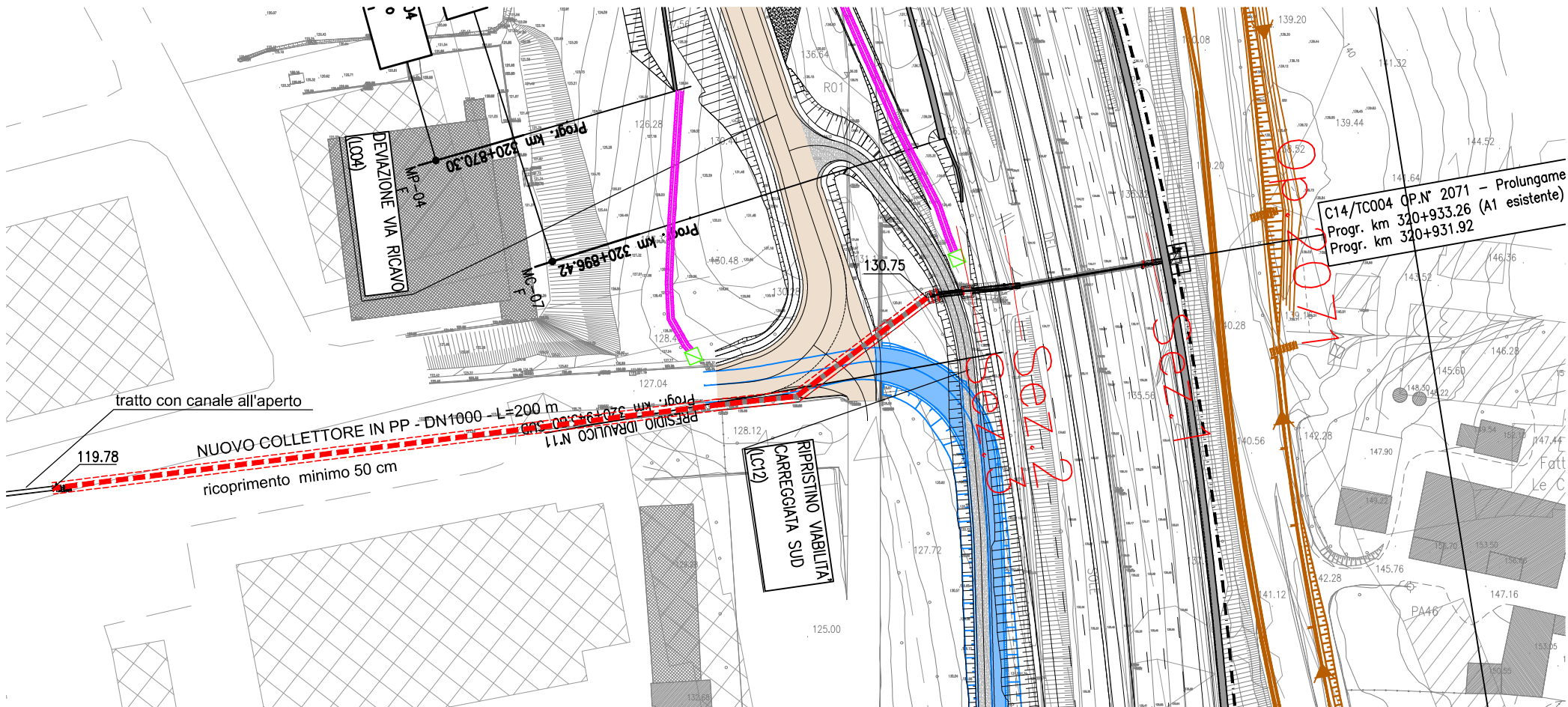
River = asta04 Reach = Reach 1 RS = 0.03 Sezione 6



OPERA N. 2071

COMPLUVIO

POST OPERAM



tratto con canale all'aperto

NUOVO COLLETTORE IN PP - DN1000 - L=200 m
ricoprimento minimo 50 cm
PRESIDIO IDRAULICO N.11
Prog. km 320+933.26

DEVIAZIONE VIA RICAVO
(C004)
MP-04

Prog. km 320+870.30

Prog. km 320+896.42

RIPRISTINO VIABILITA'
CARREGGIATA SUD
(C12)

C14/TC004 OP.N° 2071 - Prolungame
Prog. km 320+933.26 (A1 esistente)
Prog. km 320+931.92

SEZ. 2

SEZ. 1

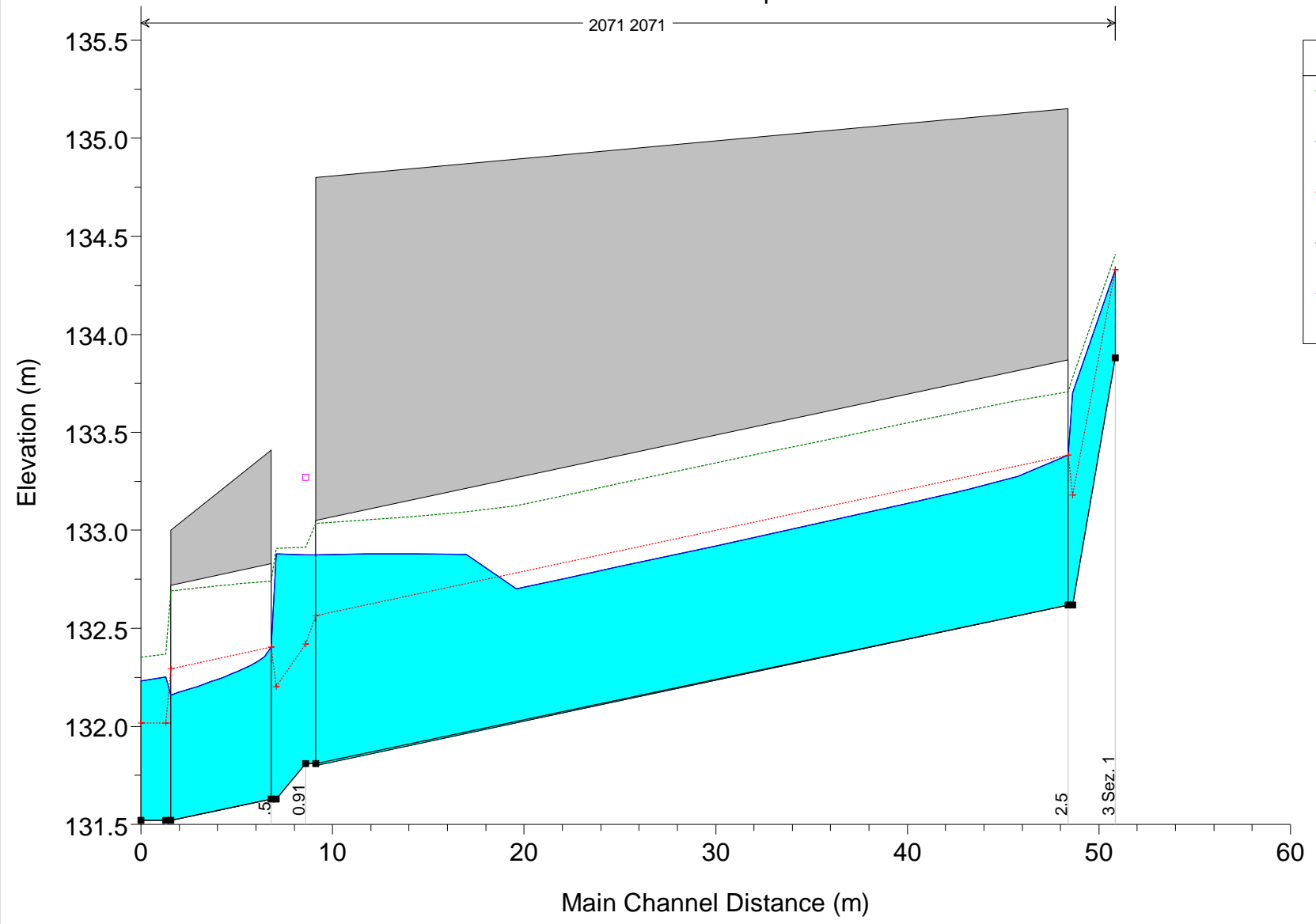
HEC-RAS Plan: Post River: 2071 Reach: 2071 Profile: Tr 200

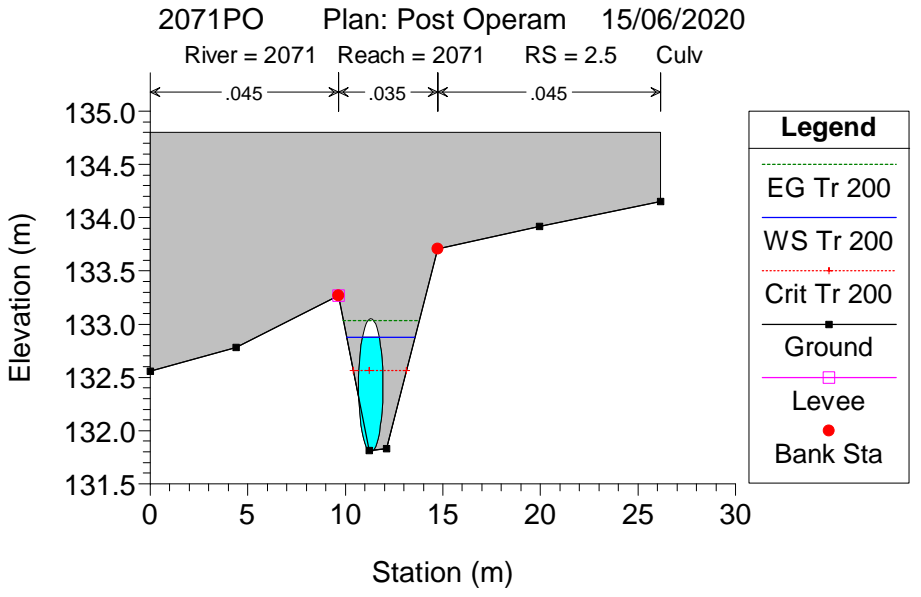
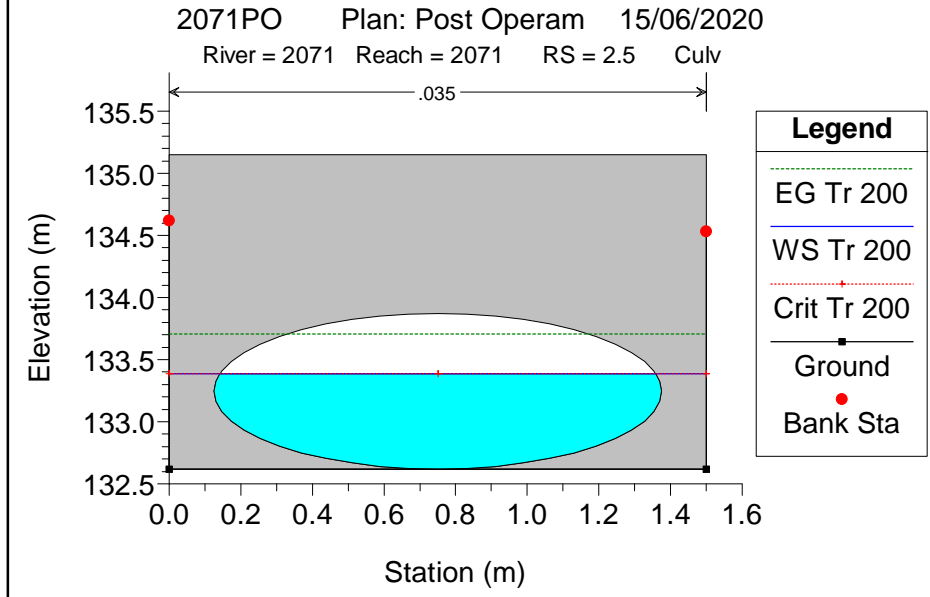
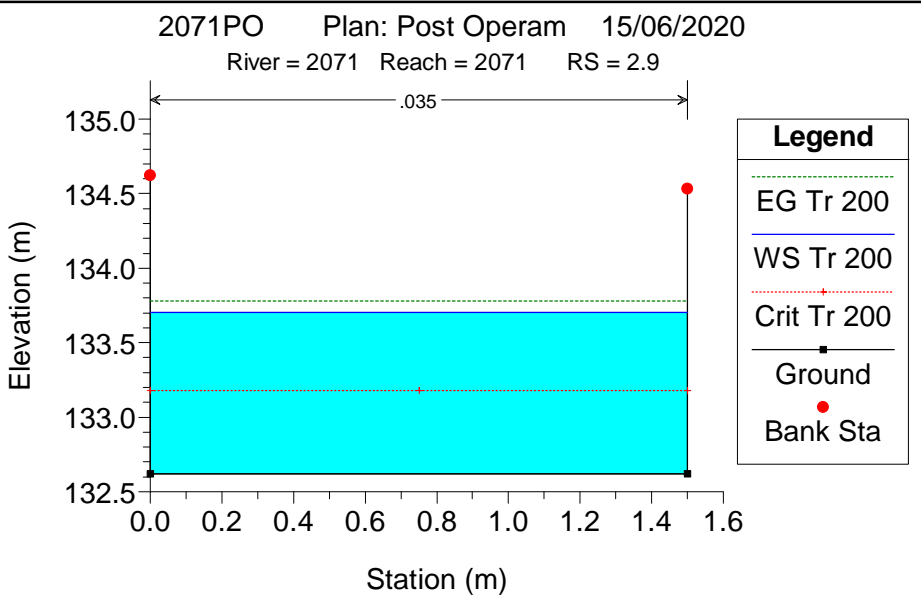
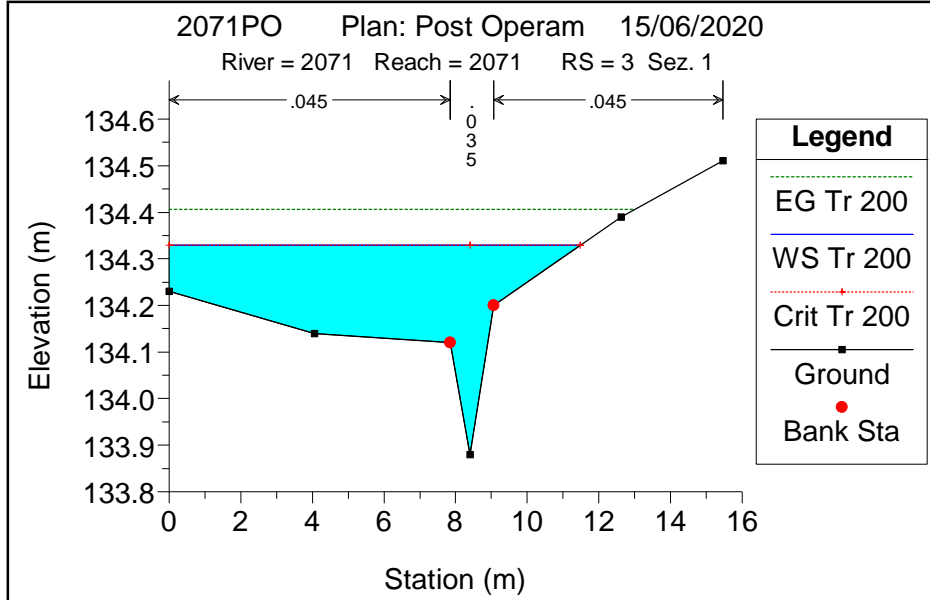
Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
2071	3 Sez. 1	Tr 200	1.98	133.88	134.33	134.33	134.41	0.019406	1.70	1.87	11.48	0.98
2071	2.9	Tr 200	1.98	132.62	133.70	133.18	133.78	0.005395	1.22	1.62	1.50	0.37
2071	2.5		Culvert									
2071	0.91	Tr 200	1.98	131.81	132.88	132.42	132.91	0.001999	0.85	2.32	3.50	0.33
2071	.9	Tr 200	1.98	131.63	132.88	132.20	132.91	0.001268	0.74	2.68	3.09	0.25
2071	.5		Culvert									
2071	.2	Tr 200	1.98	131.52	132.25	132.02	132.37	0.009273	1.50	1.32	1.80	0.56
2071	.1	Tr 200	1.98	131.52	132.23	132.02	132.35	0.010000	1.54	1.28	1.80	0.58

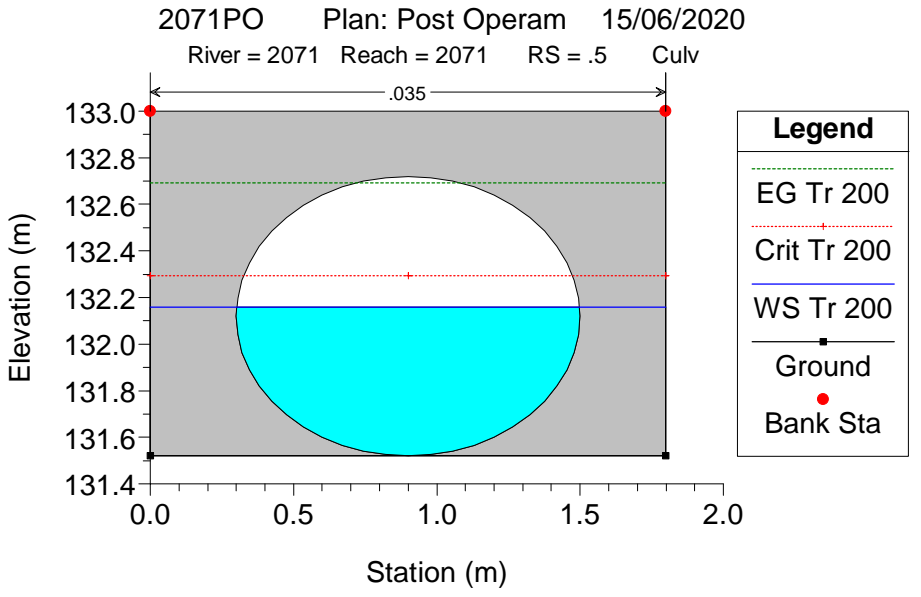
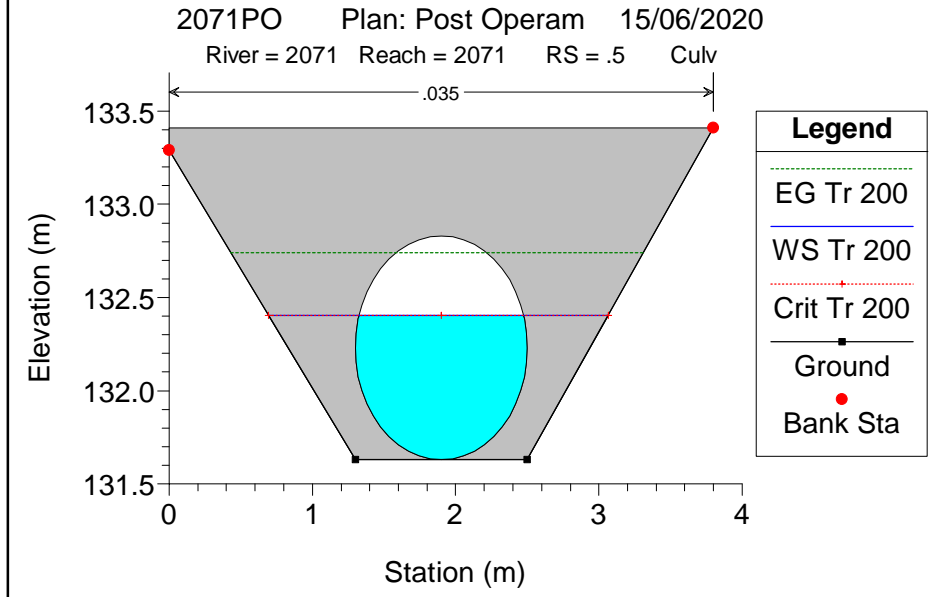
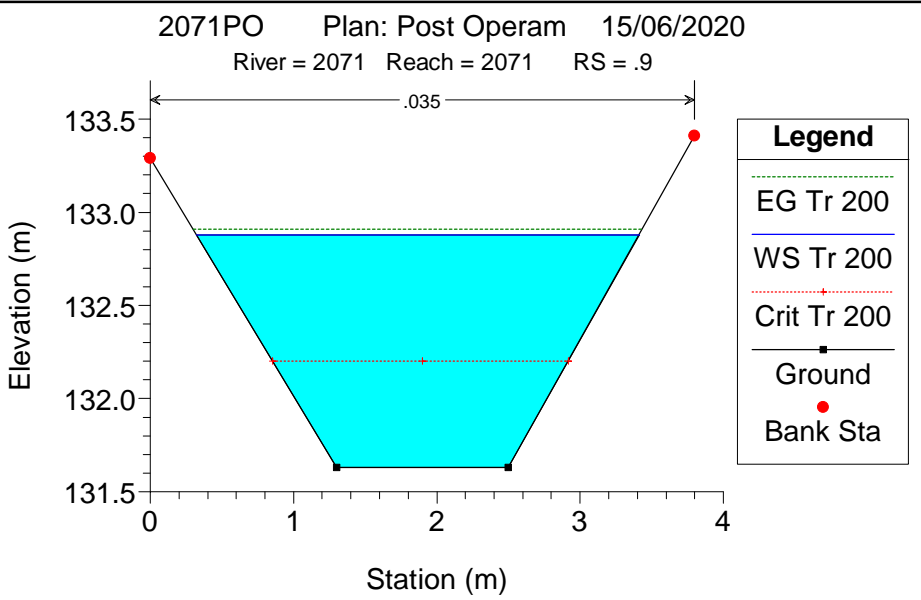
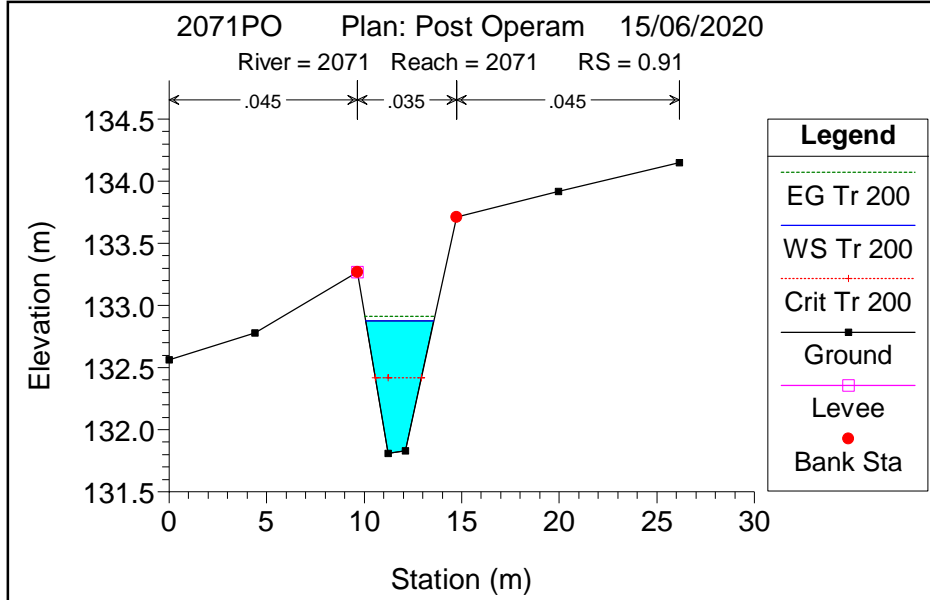
2071PO Plan: Post Operam 15/06/2020

2071 2071

Legend	
	EG Tr 200
	WS Tr 200
	Crit Tr 200
	Ground
	Left Levee

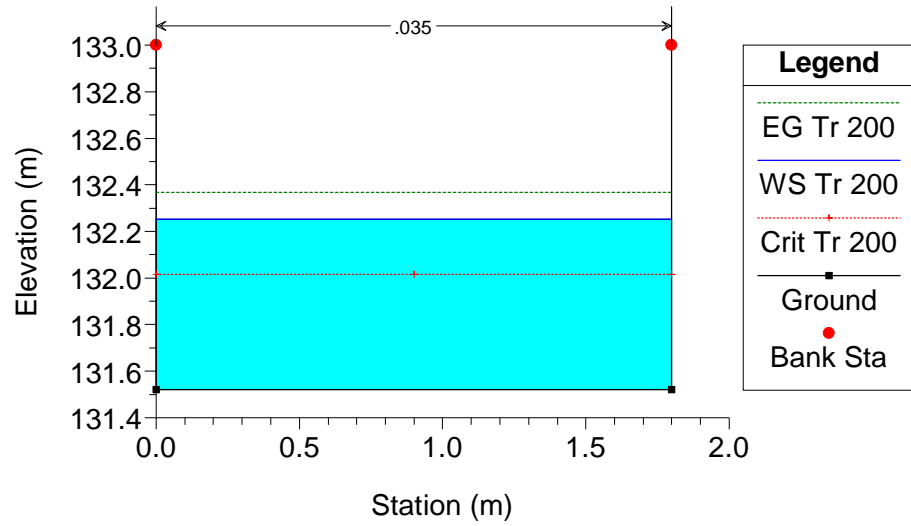






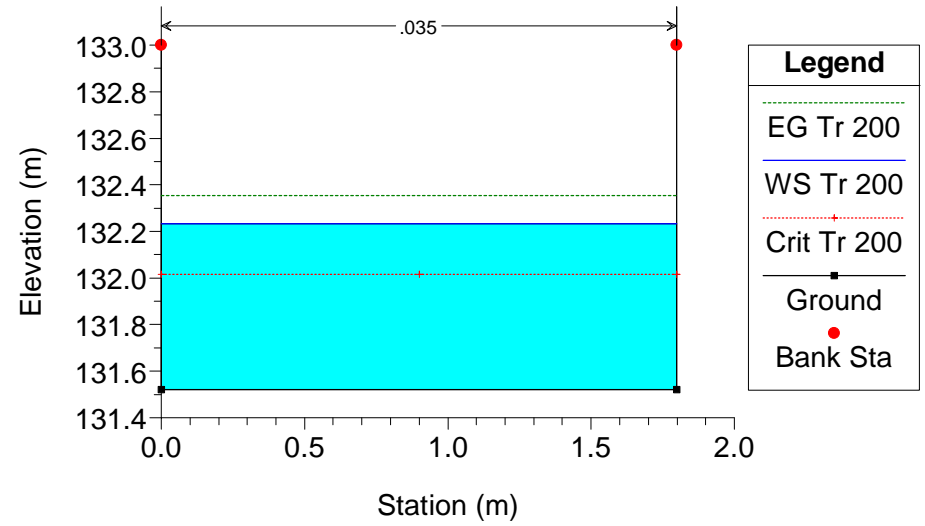
2071PO Plan: Post Operam 15/06/2020

River = 2071 Reach = 2071 RS = .2



2071PO Plan: Post Operam 15/06/2020

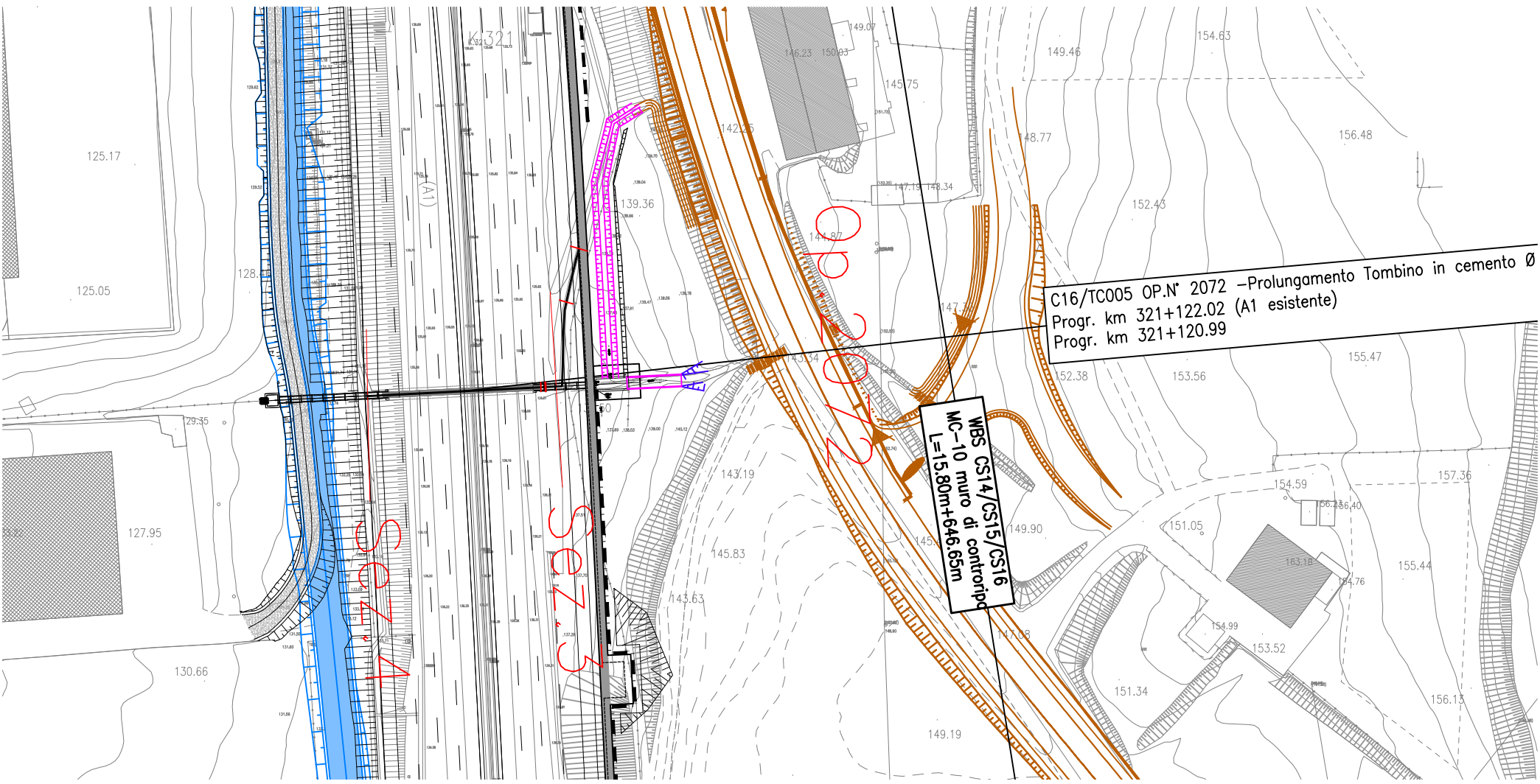
River = 2071 Reach = 2071 RS = .1



OPERA N. 2072

COMPLUVIO

POST OPERAM



C16/TC005 OP.N° 2072 -Prolungamento Tombino in cemento Ø
Progr. km 321+122.02 (A1 esistente)
Progr. km 321+120.99

WBS CS14/CS15/CS16
MC-10 muro di controripo
L=15,80m+6+6,65m

125.17

125.05

128.00

127.95

130.66

K+321

(A1)

139.36

142.25

143.19

145.83

143.63

145.23

149.03

145.75

144.87

145.34

145.90

149.19

149.46

148.77

147.19

148.34

147.70

145.10

145.18

147.08

154.63

152.43

156.48

155.47

153.56

157.36

151.05

155.44

151.34

156.13

154.99

153.52

163.10

154.76

154.59

156.40

HEC-RAS Plan: PO River: 2072 Reach: 2072 Profile: Tr 200

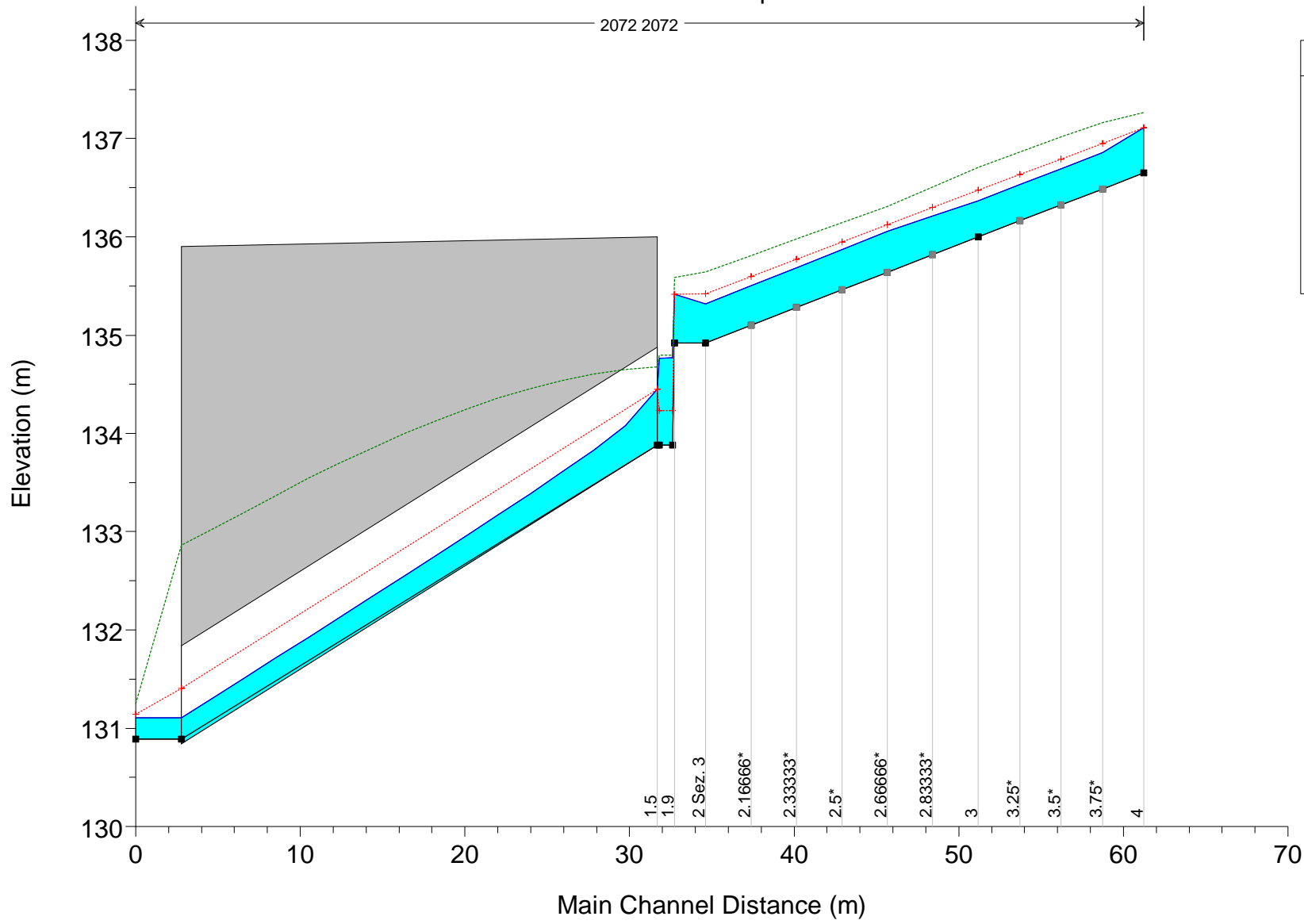
Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
2072	4	Tr 200	0.98	136.65	137.11	137.11	137.27	0.022538	1.75	0.56	1.84	1.01
2072	3	Tr 200	0.98	136.00	136.37	136.47	136.71	0.061931	2.58	0.38	1.46	1.62
2072	2 Sez. 3	Tr 200	0.98	134.92	135.32	135.42	135.64	0.057342	2.53	0.39	1.41	1.54
2072	1.9	Tr 200	0.98	134.92	135.42	135.42	135.59	0.023577	1.82	0.54	1.64	1.01
2072	1.85	Tr 200	0.98	133.88	134.77	134.23	134.80	0.002198	0.74	1.33	1.50	0.25
2072	1.8	Tr 200	0.98	133.88	134.77	134.23	134.79	0.002210	0.74	1.33	1.50	0.25
2072	1.5		Culvert									
2072	1 Sez. 4	Tr 200	0.98	130.89	131.11	131.14	131.25	0.042794	1.68	0.58	3.76	1.37

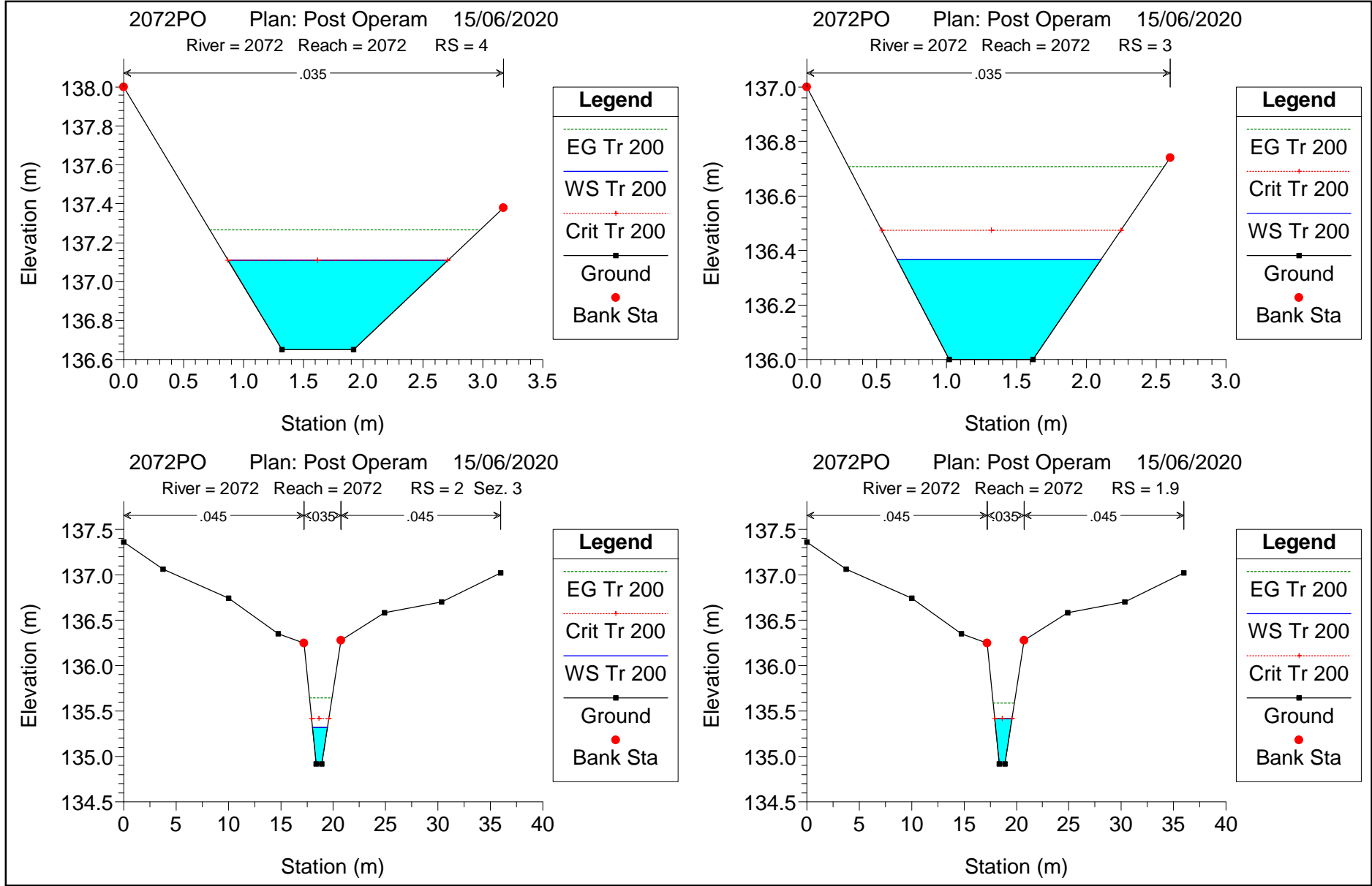
2072PO Plan: Post Operam 15/06/2020

2072 2072

Legend

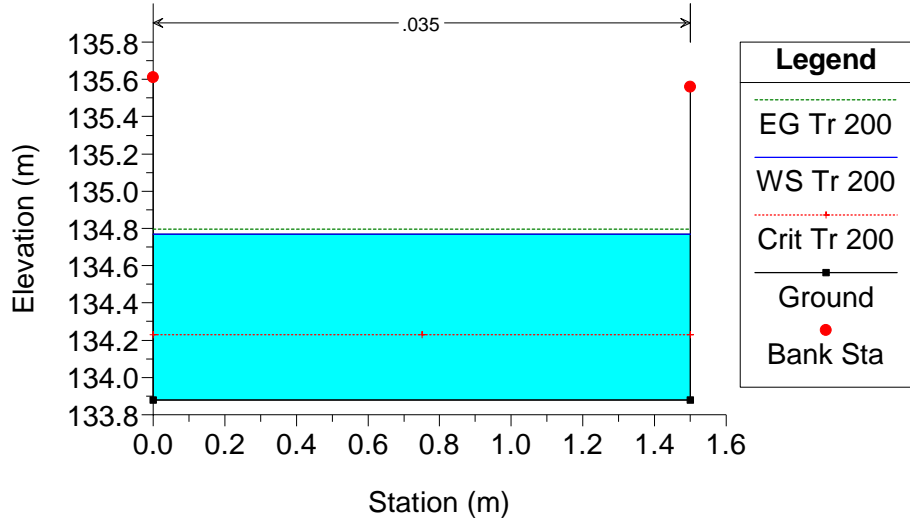
- EG Tr 200
- Crit Tr 200
- WS Tr 200
- Ground





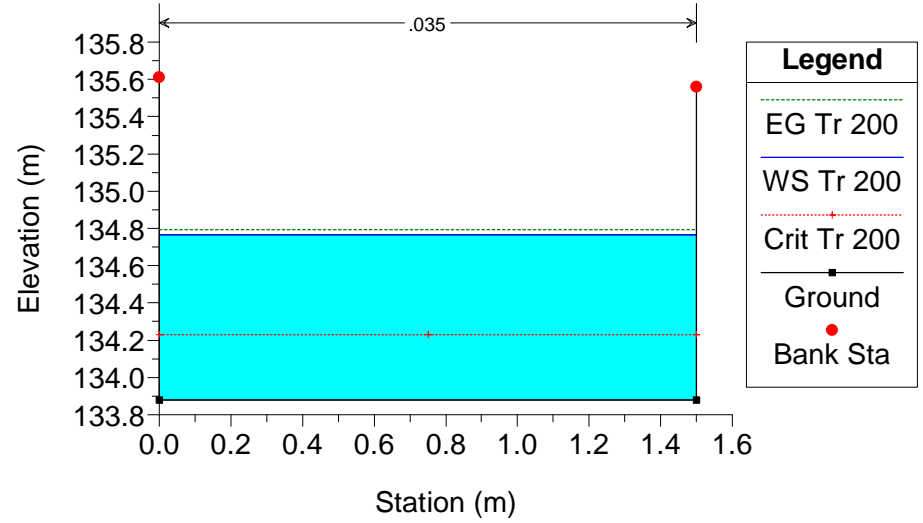
2072PO Plan: Post Operam 15/06/2020

River = 2072 Reach = 2072 RS = 1.85



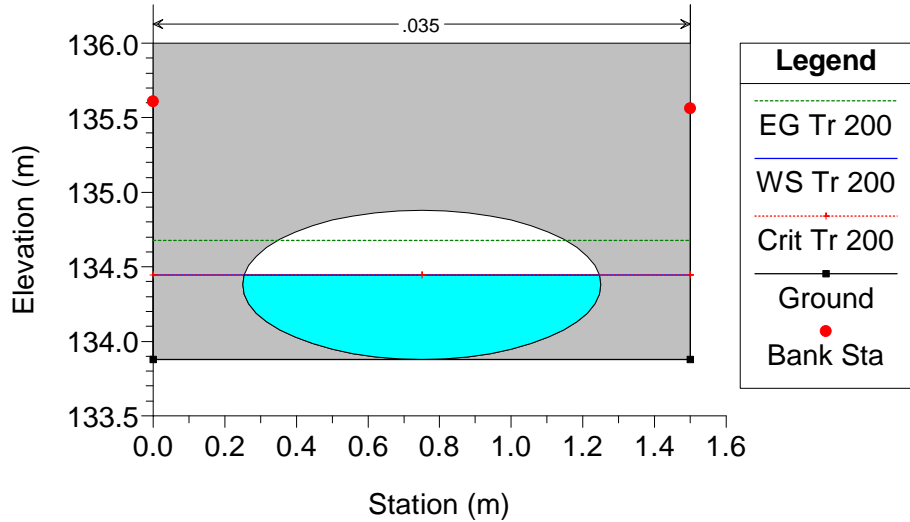
2072PO Plan: Post Operam 15/06/2020

River = 2072 Reach = 2072 RS = 1.8



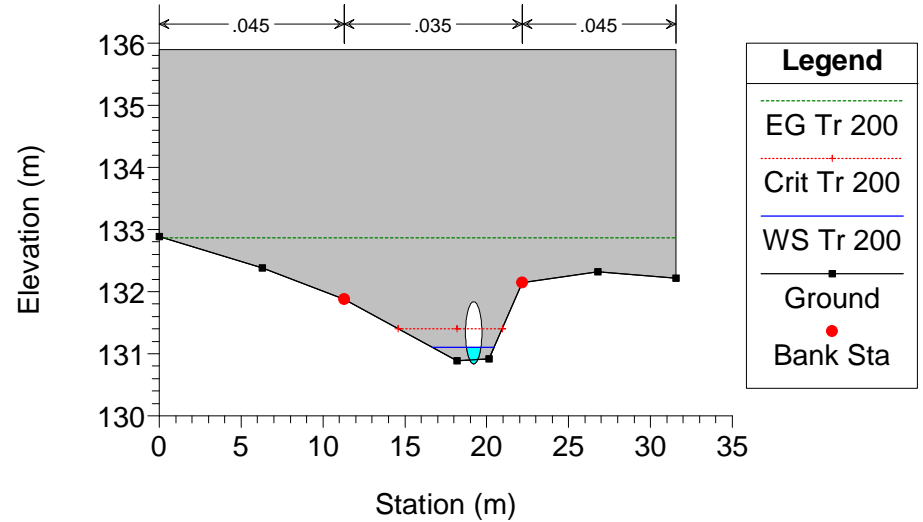
2072PO Plan: Post Operam 15/06/2020

River = 2072 Reach = 2072 RS = 1.5 Culv



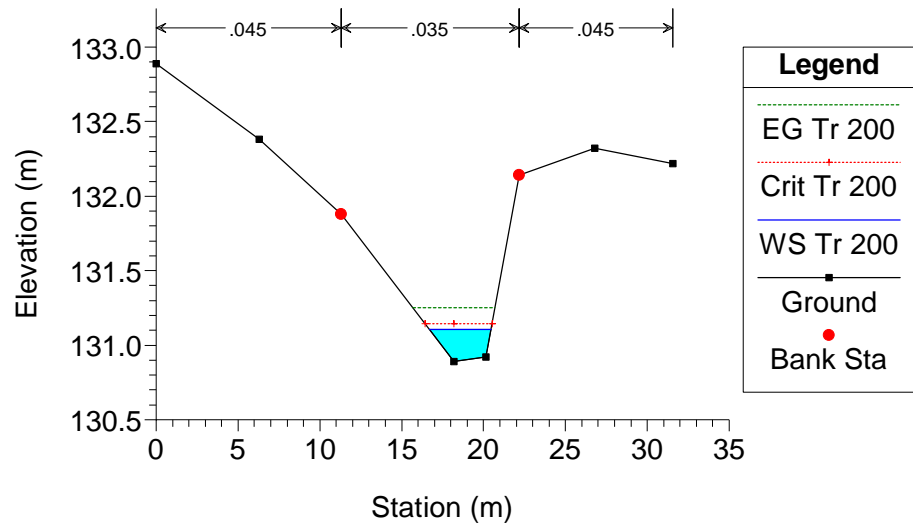
2072PO Plan: Post Operam 15/06/2020

River = 2072 Reach = 2072 RS = 1.5 Culv



2072PO Plan: Post Operam 15/06/2020

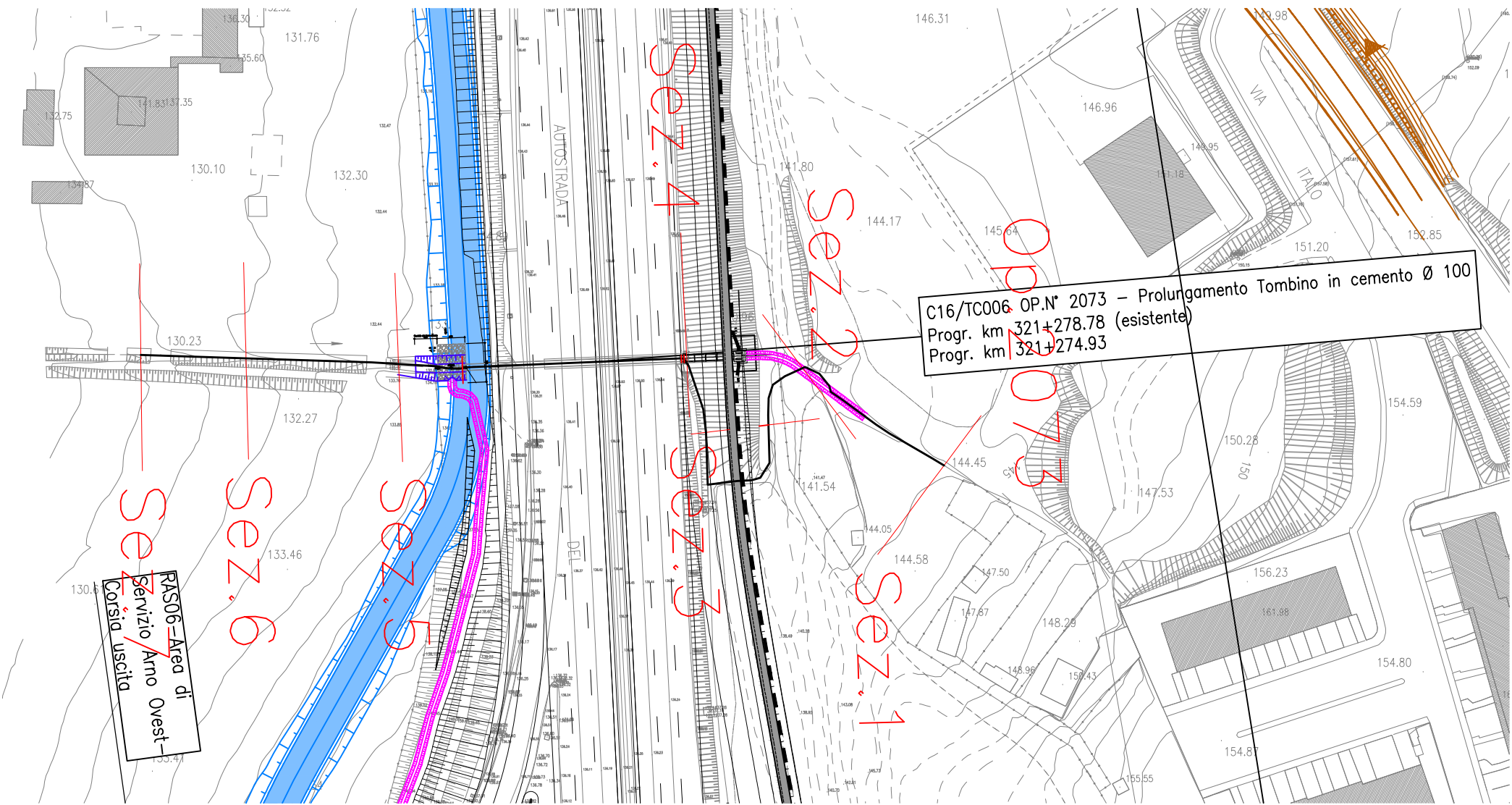
River = 2072 Reach = 2072 RS = 1 Sez. 4



OPERA N. 2073

COMPLUVIO

POST OPERAM



C16/TC006 OP.N° 2073 - Prolungamento Tombino in cemento Ø 100
Progr. km 321+278.78 (esistente)
Progr. km 321+274.93

Area di
Servizio Arno Ovest -
Corsia uscita

Sez. 6

Sez. 5

Sez. 3

Sez. 1

Sez. 2

Sez. 4

0173

AUTOSTRADA DEL

VIA ITALO

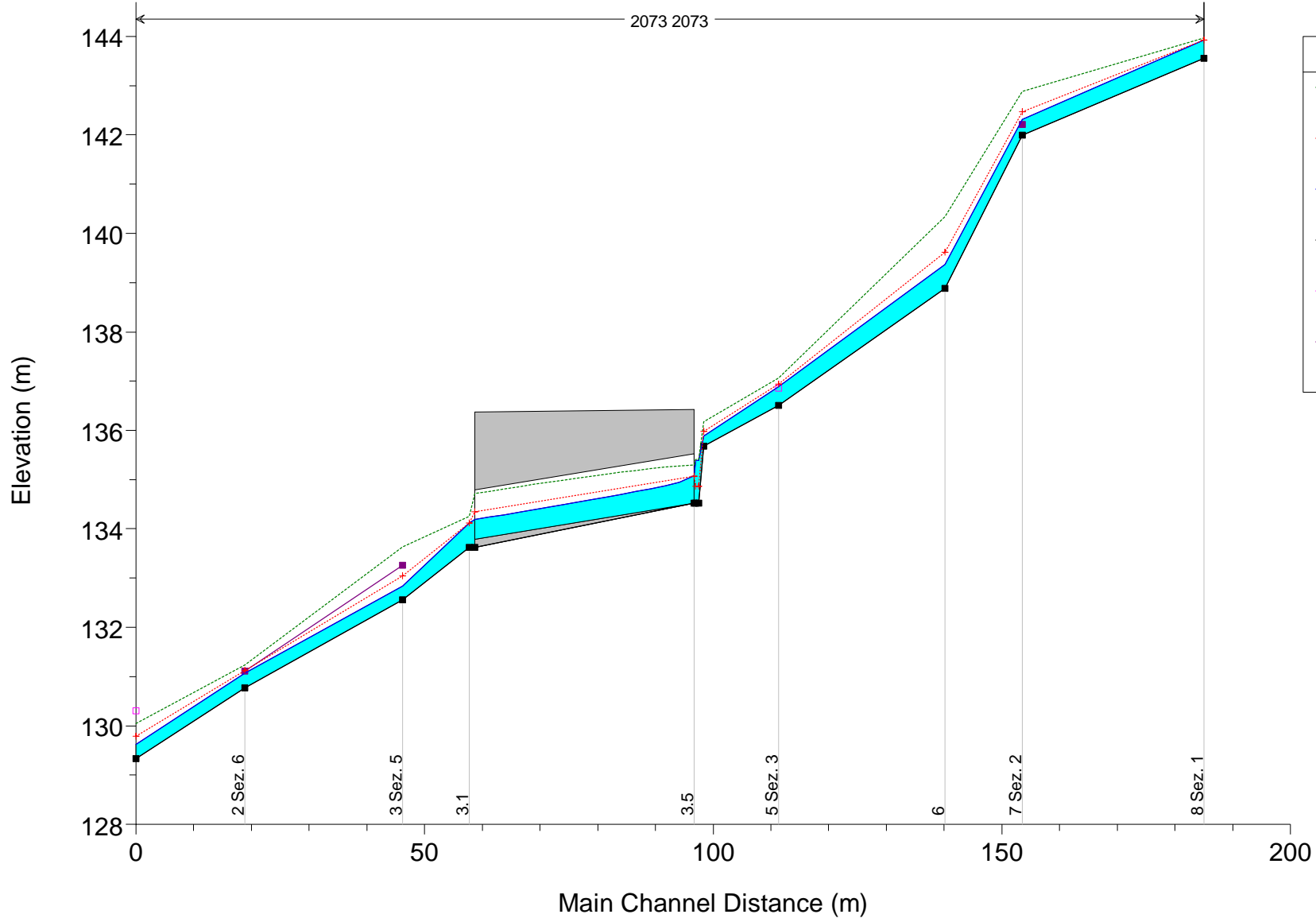
HEC-RAS Plan: Post River: 2073 Reach: 2073 Profile: Tr 200

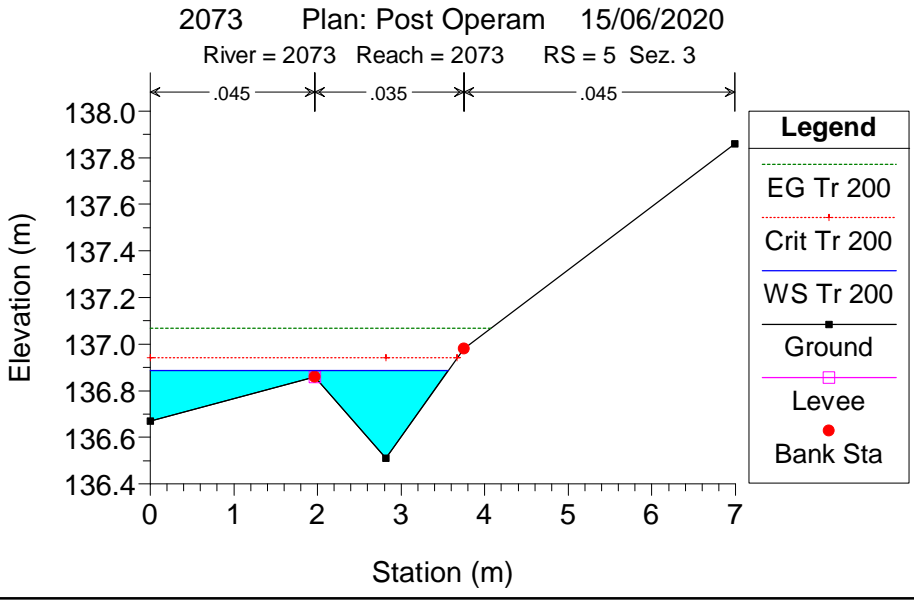
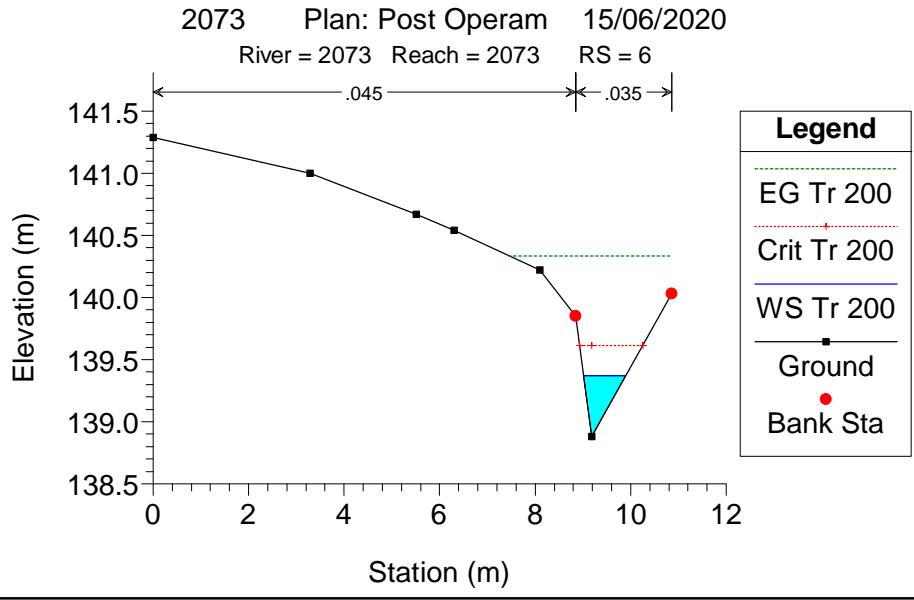
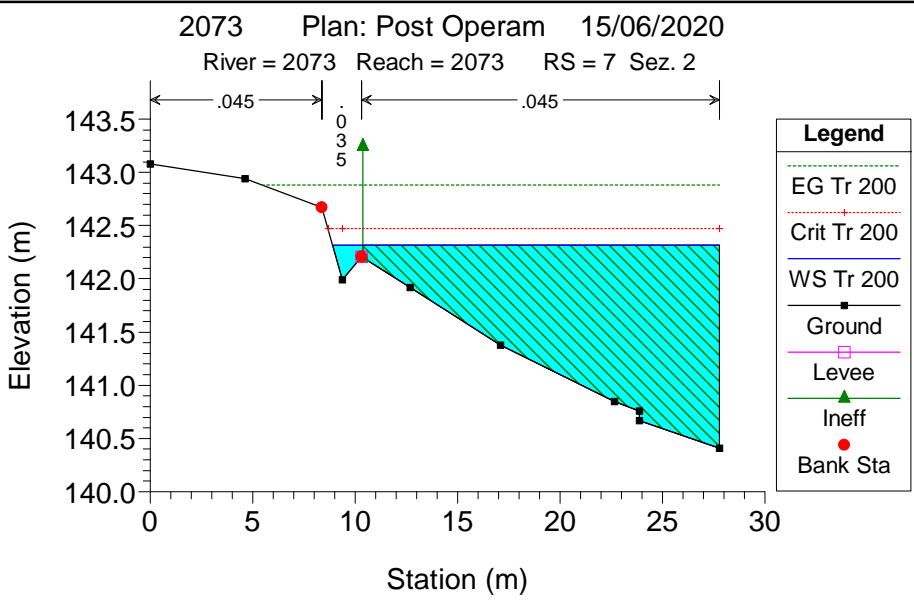
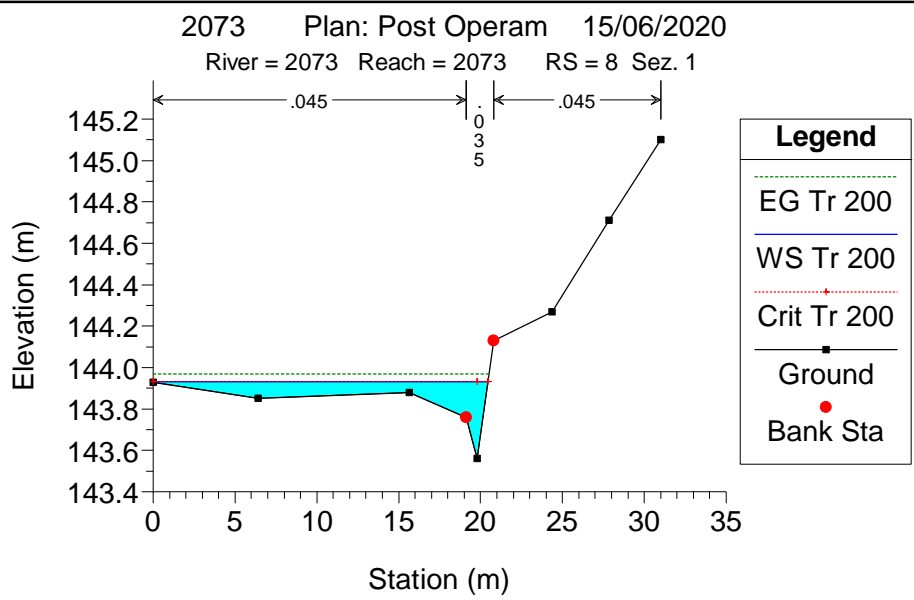
Reach	River Sta		Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
2073	8	Sez. 1	Tr 200	0.94	143.56	143.93	143.93	143.97	0.014518	1.22	1.59	20.45	0.81
2073	7	Sez. 2	Tr 200	0.94	141.99	142.31	142.47	142.88	0.134109	3.35	0.28	18.88	2.41
2073	6		Tr 200	0.94	138.88	139.37	139.62	140.34	0.276509	4.35	0.22	0.88	2.81
2073	5	Sez. 3	Tr 200	0.94	136.51	136.89	136.94	137.07	0.055084	2.12	0.55	3.56	1.53
2073	4	Sez. 4	Tr 200	0.94	135.68	135.89	135.98	136.17	0.087080	2.35	0.40	2.64	1.92
2073	3.9		Tr 200	0.94	134.52	135.39	134.86	135.41	0.002160	0.72	1.30	1.50	0.25
2073	3.8		Tr 200	0.94	134.52	135.39	134.86	135.41	0.002168	0.72	1.30	1.50	0.25
2073	3.5			Culvert									
2073	3.1		Tr 200	0.94	133.62	134.11	134.11	134.26	0.021001	1.67	0.57	2.13	1.00
2073	3	Sez. 5	Tr 200	0.94	132.56	132.84	133.04	133.63	0.210622	3.95	0.24	1.26	2.91
2073	2	Sez. 6	Tr 200	0.94	130.77	131.07	131.13	131.24	0.042373	2.08	0.68	7.16	1.38
2073	1	Sez. 7	Tr 200	0.94	129.33	129.62	129.78	130.05	0.098102	2.88	0.33	1.61	2.04

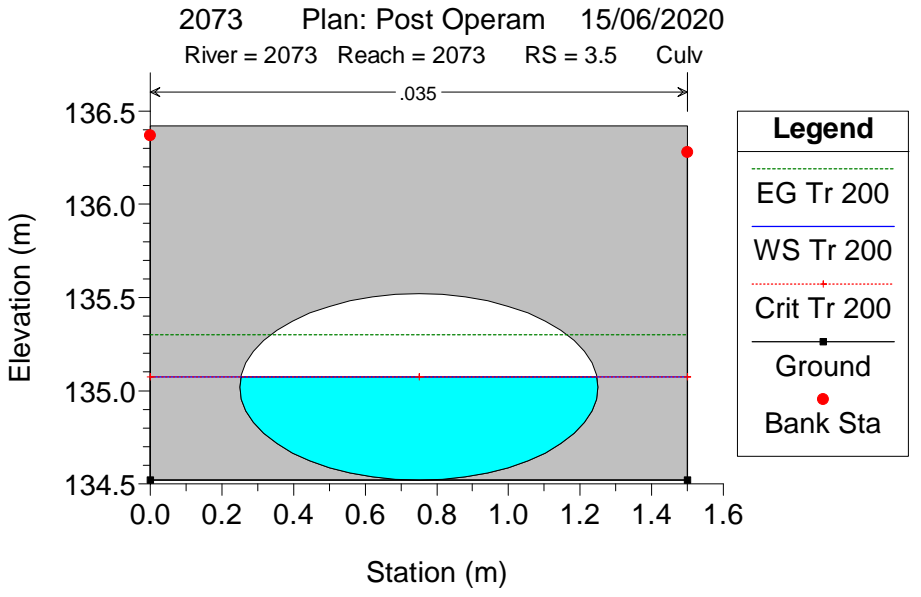
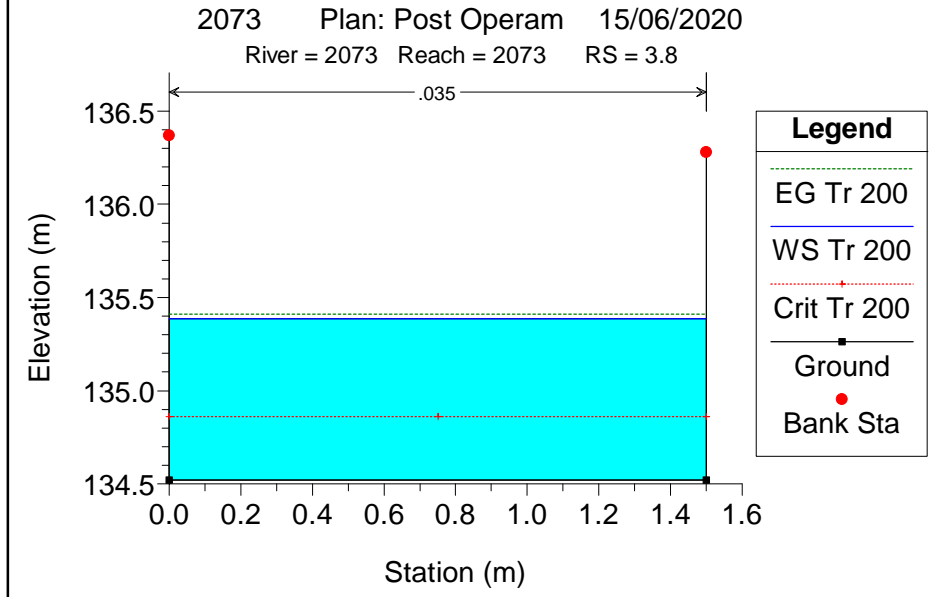
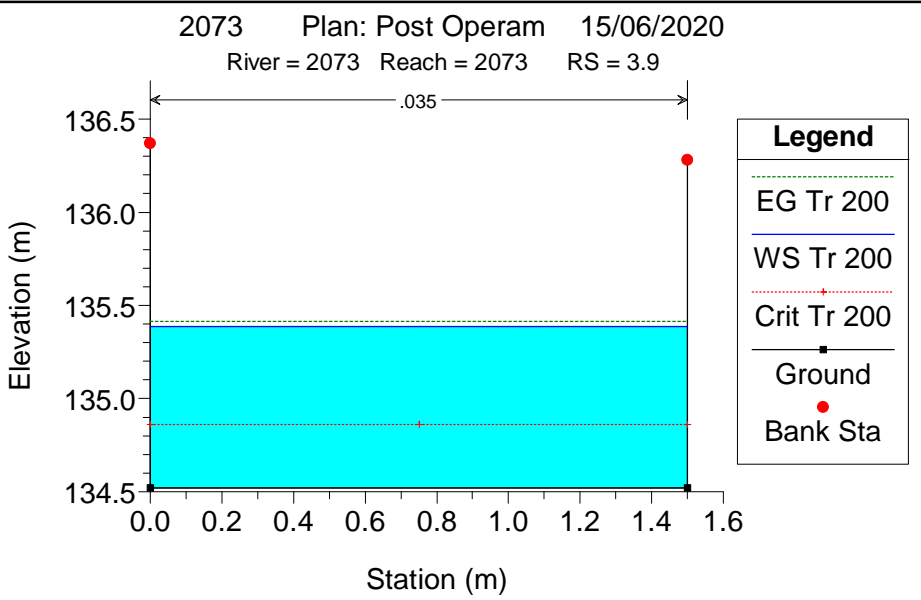
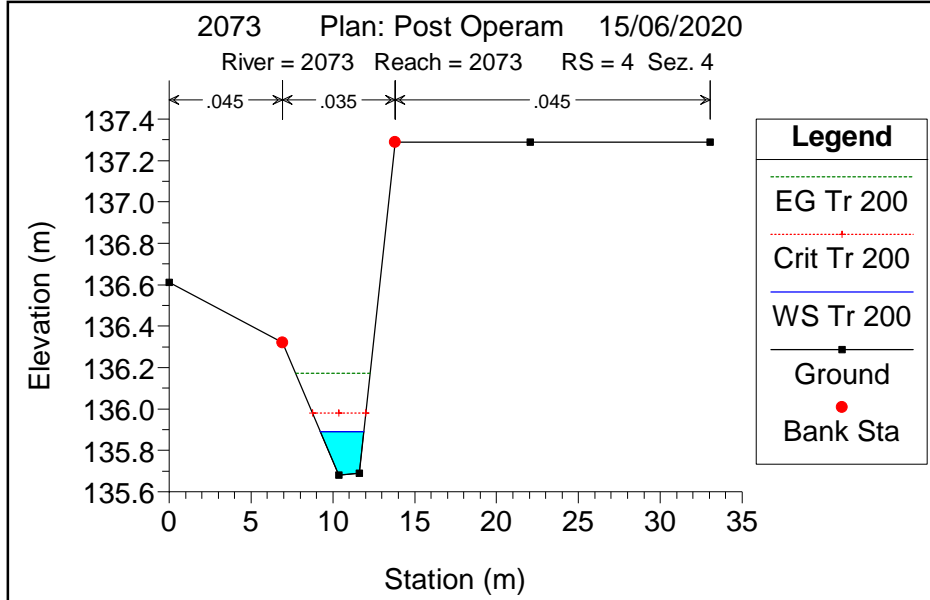
2073 Plan: Post Operam 15/06/2020

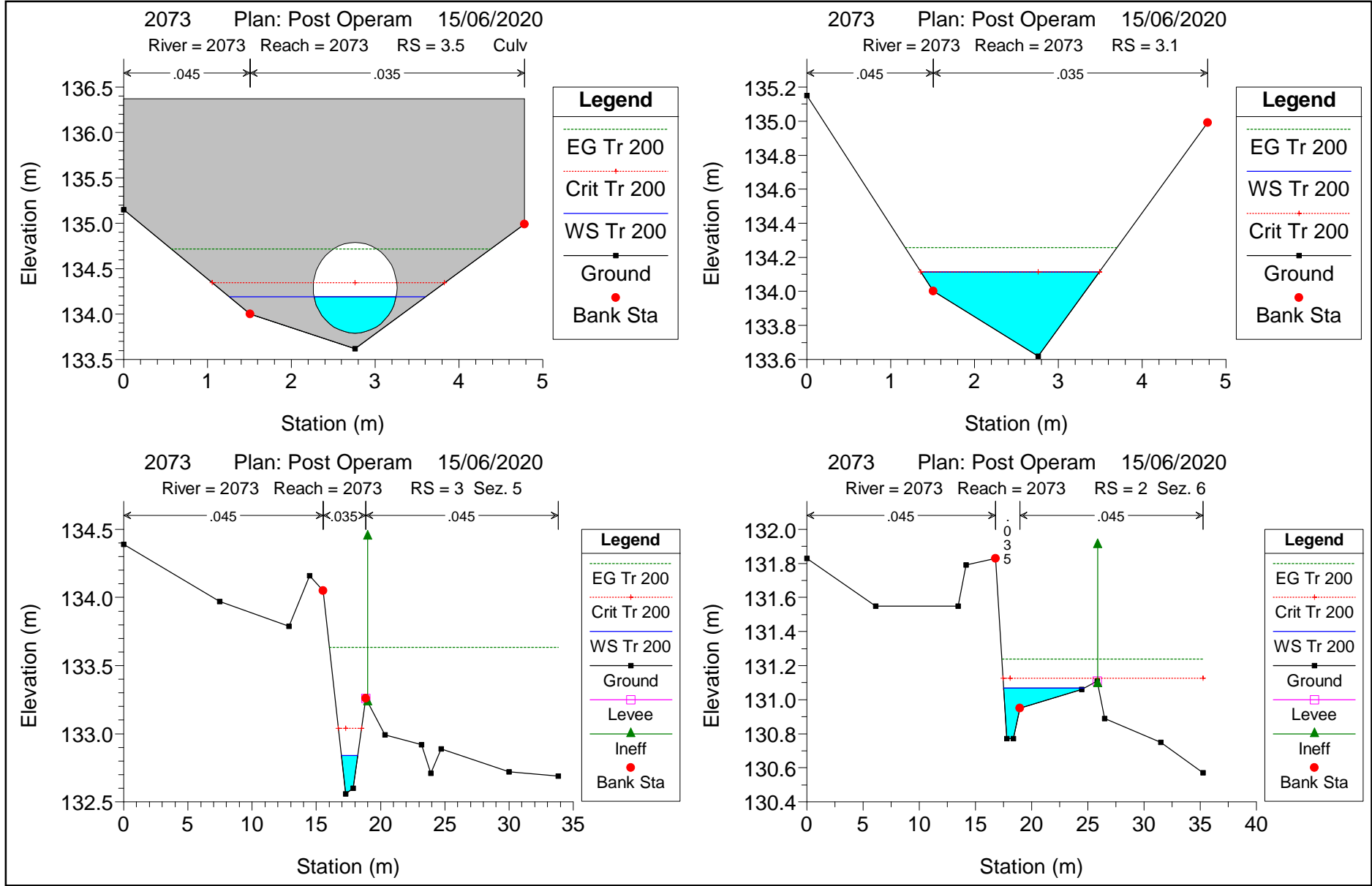
Legend

- EG Tr 200
- Crit Tr 200
- WS Tr 200
- Ground
- Left Levee
- Right Levee



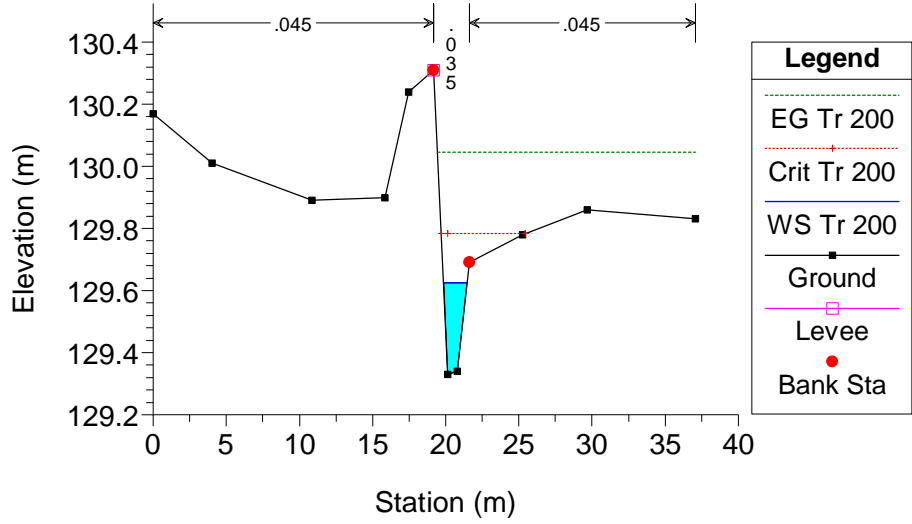






2073 Plan: Post Operam 15/06/2020

River = 2073 Reach = 2073 RS = 1 Sez. 7



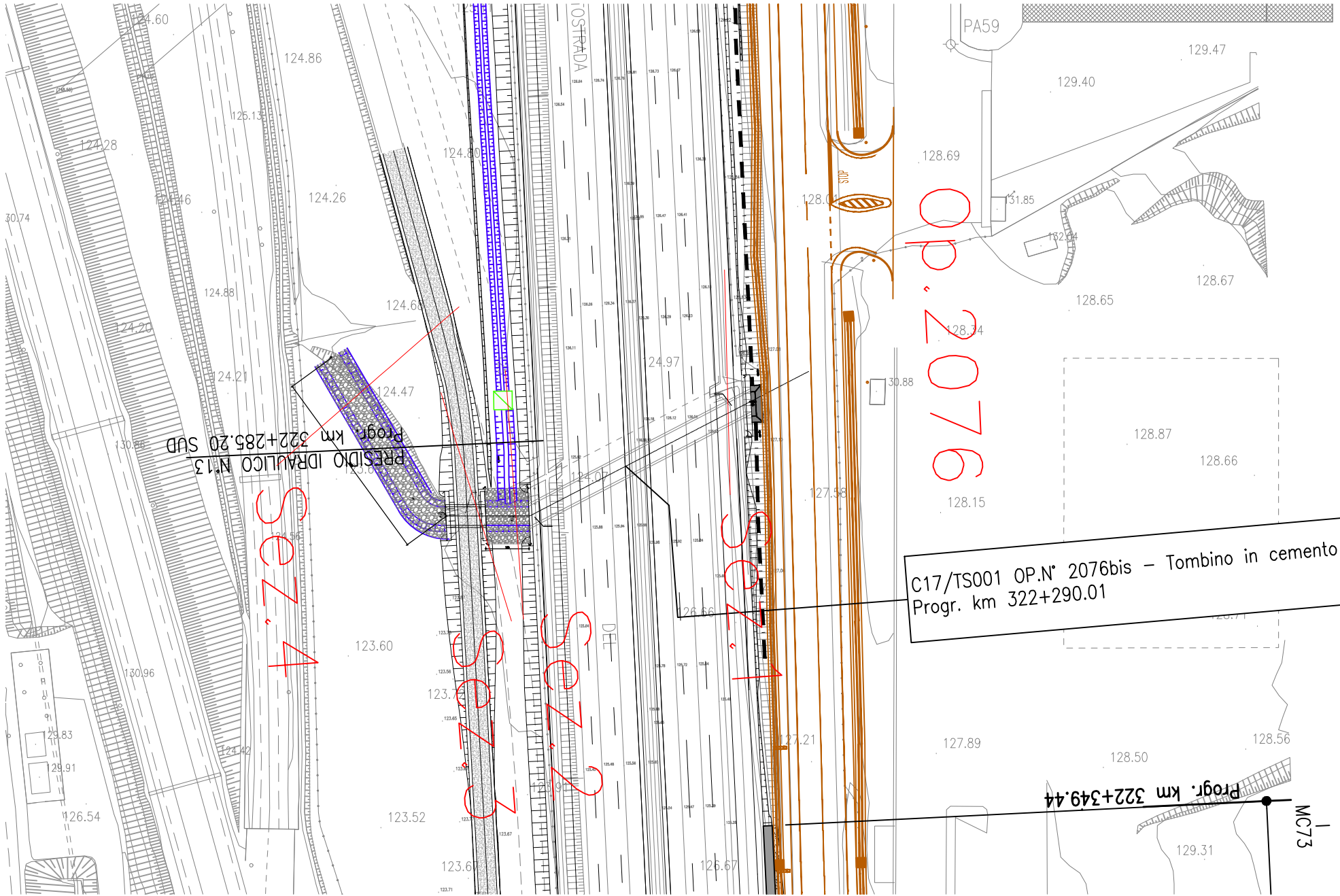
OPERA N.

2076bis

NUOVO

TOMBINO

SCATOLARE



PRESDIO IDRAULICO N.13
Progr. km 322+285.20 SUD

SOZ. 4

SOZ. 2

SOZ. 1

C17/TS001 OP. N° 2076bis - Tombino in cemento 20x10
Progr. km 322+290.01

OP. 2076

Progr. km 322+349.44

MC73

PA59

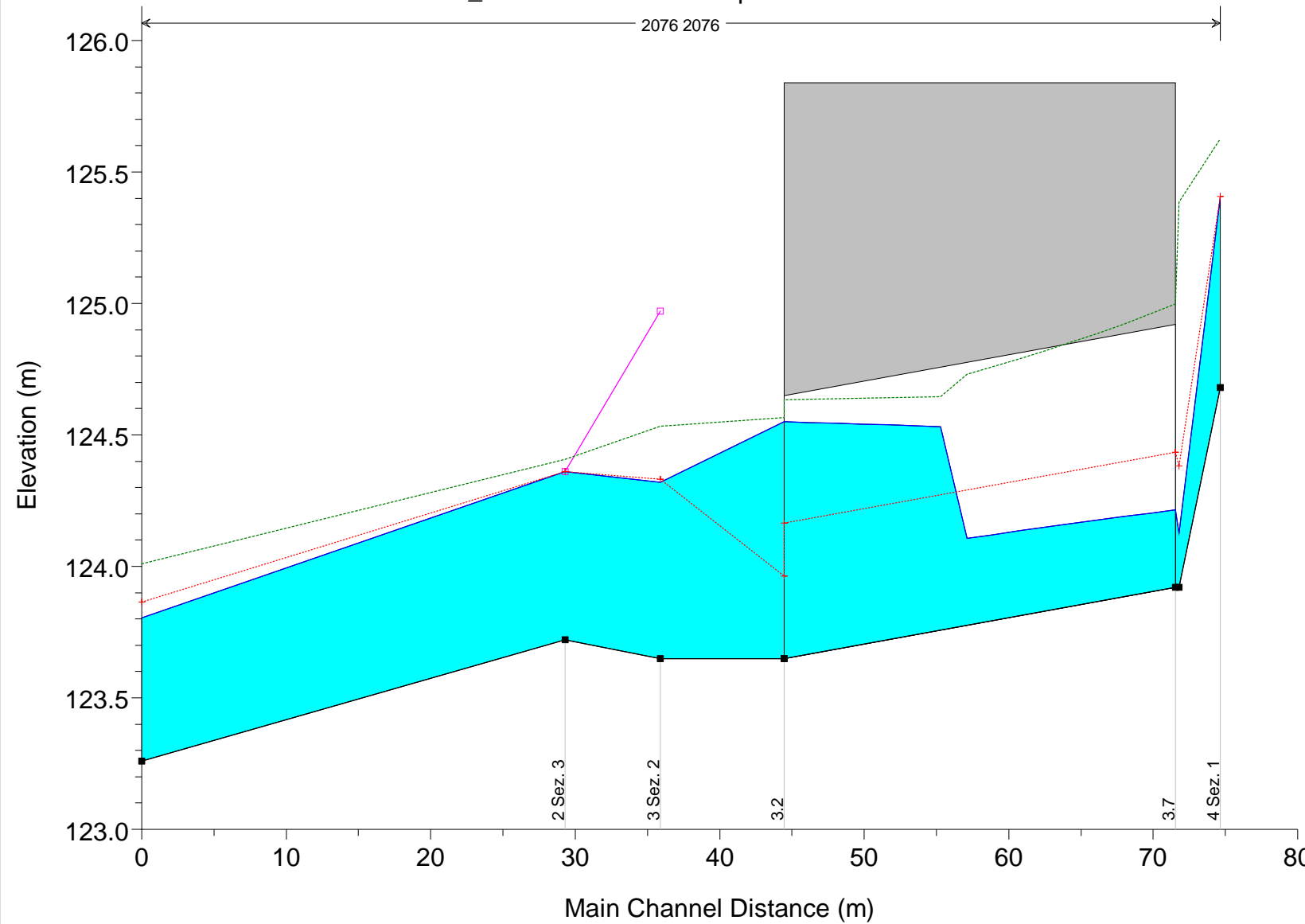
MC73

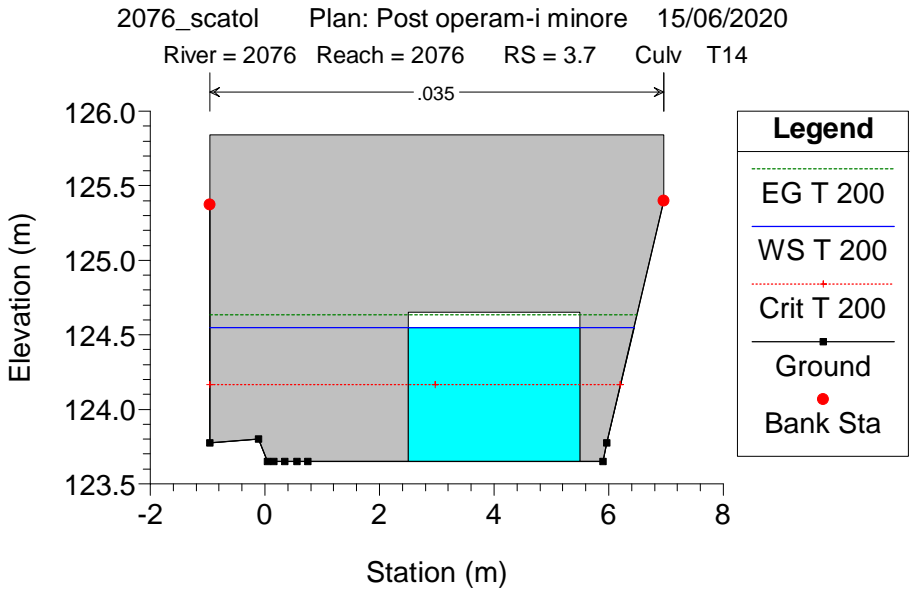
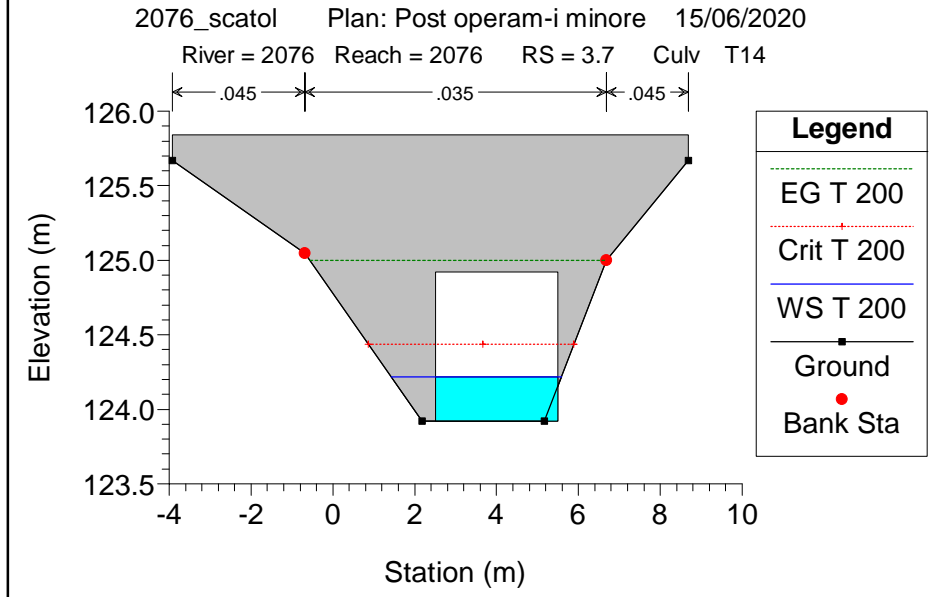
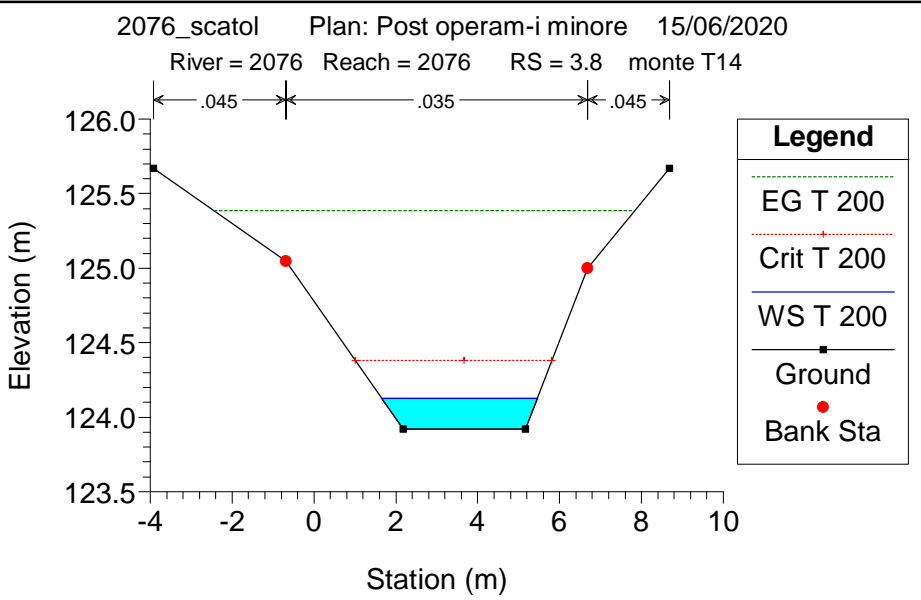
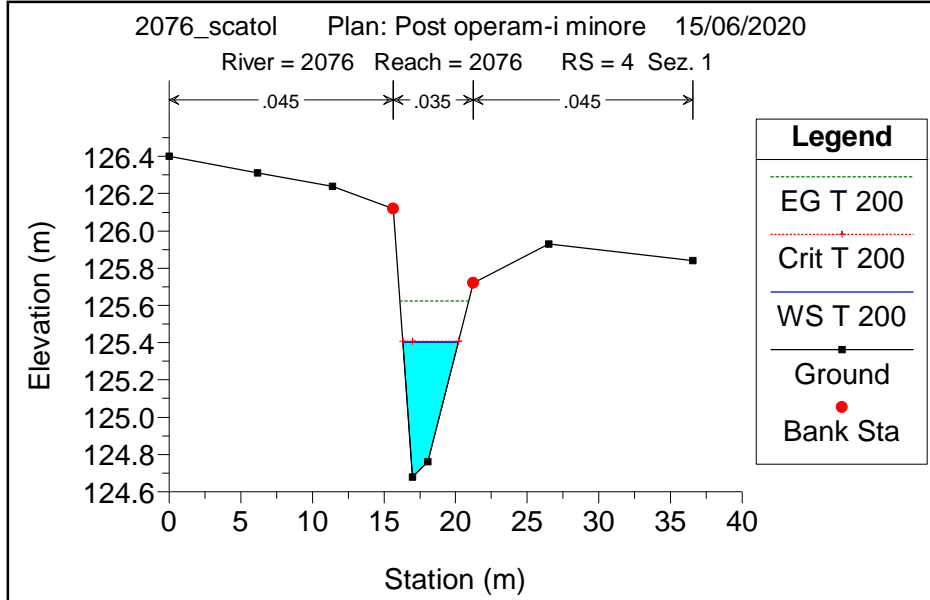
HEC-RAS Plan: PO-i min River: 2076 Reach: 2076 Profile: T 200

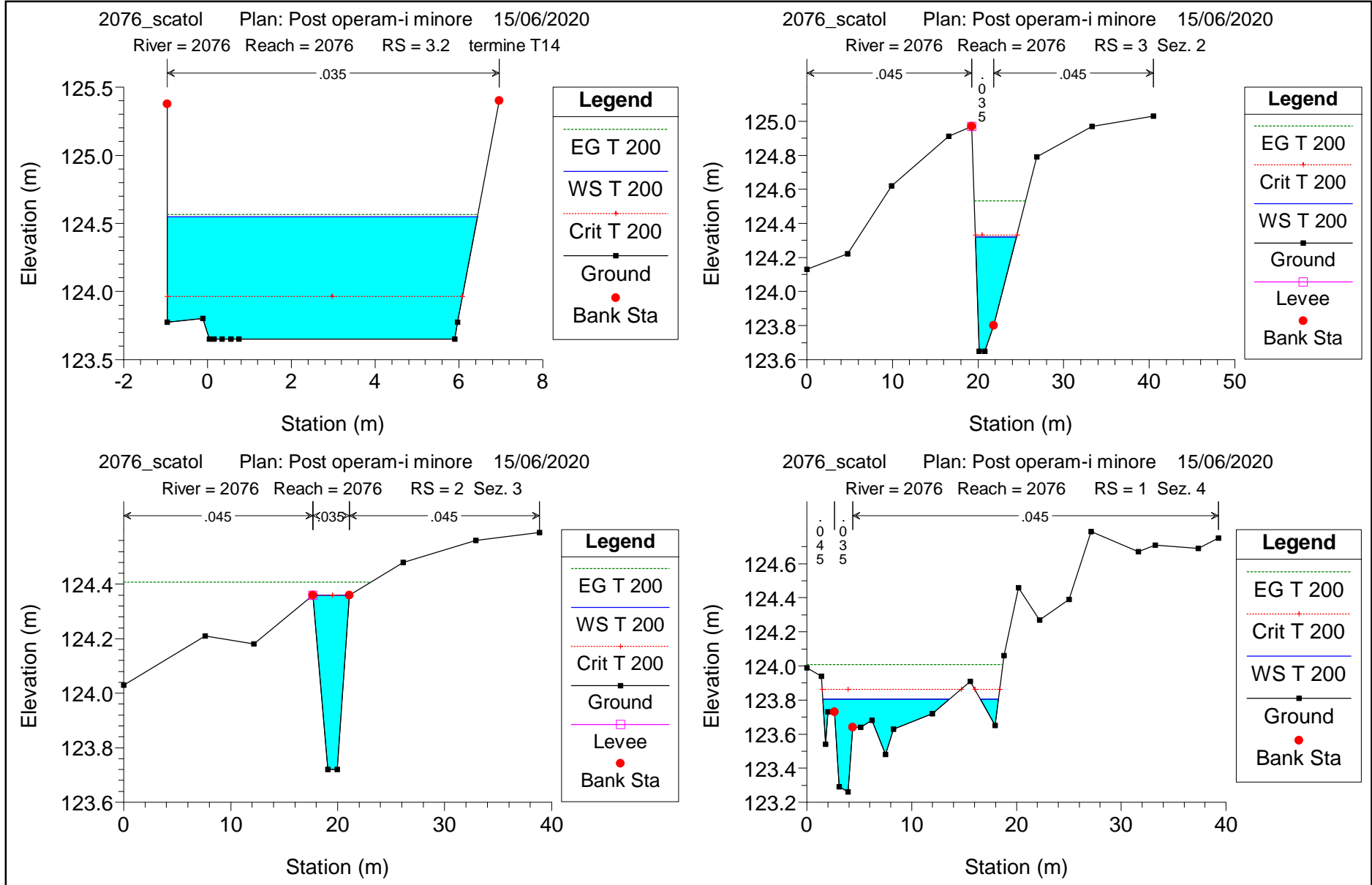
Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
2076	4 Sez. 1	T 200	3.47	124.68	125.41	125.41	125.63	0.018581	2.08	1.67	3.88	1.01
2076	3.8	T 200	3.47	123.92	124.13	124.38	125.39	0.301446	4.97	0.70	3.81	3.71
2076	3.7		Culvert									
2076	3.2	T 200	3.47	123.65	124.55	123.96	124.57	0.000580	0.55	6.29	7.41	0.19
2076	3 Sez. 2	T 200	3.47	123.65	124.32	124.33	124.53	0.016311	2.24	1.89	4.78	0.95
2076	2 Sez. 3	T 200	3.47	123.72	124.36	124.36	124.41	0.007093	1.24	4.45	21.10	0.62
2076	1 Sez. 4	T 200	3.47	123.26	123.80	123.86	124.01	0.031414	2.55	2.29	13.75	1.25

Legend

- EG T 200
- Crit T 200
- WS T 200
- Ground
- Left Levee







OPERA N. 2079

COMPLUVIO

POST OPERAM

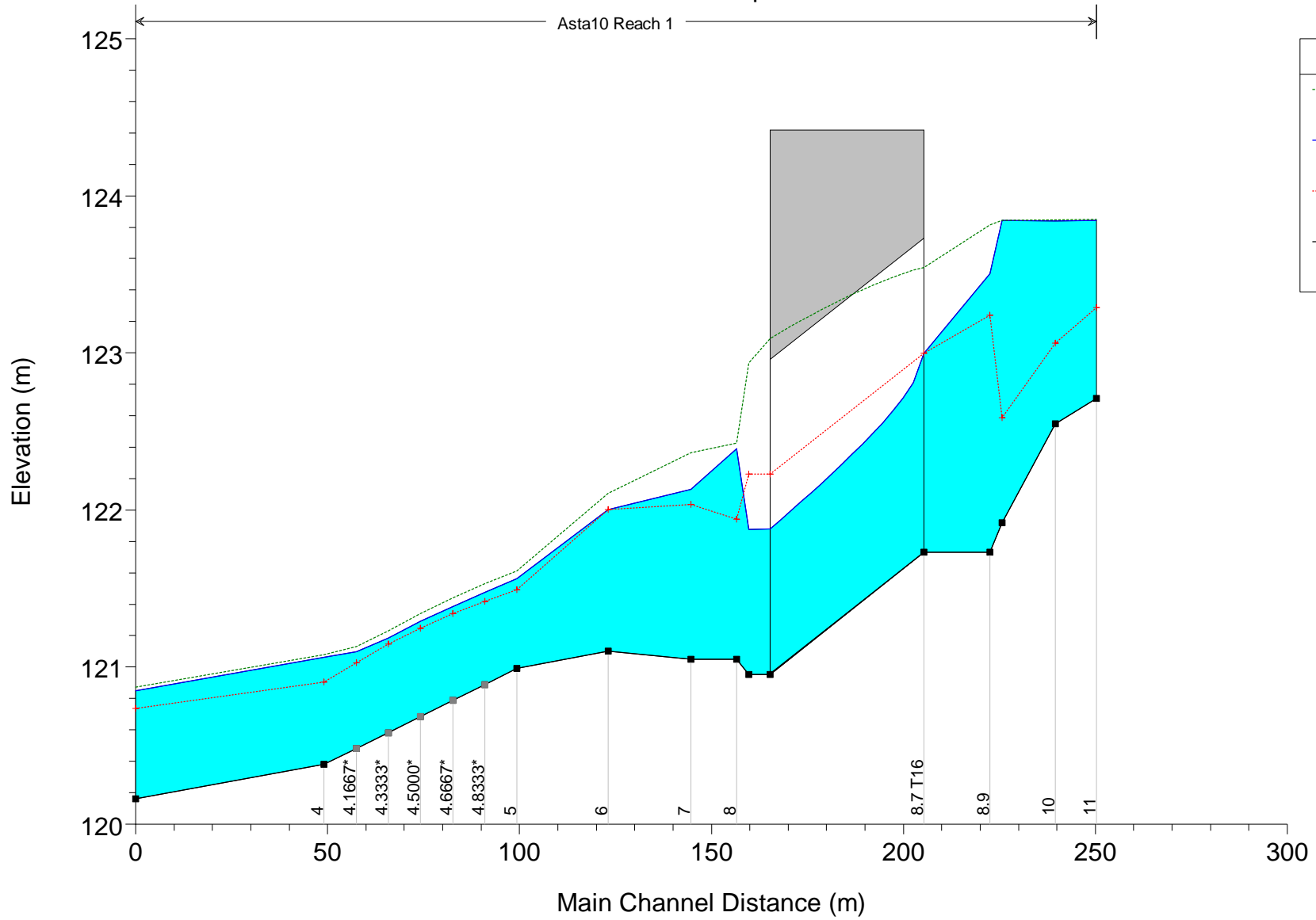
HEC-RAS Plan: post River: Asta10 Reach: Reach 1 Profile: T 200

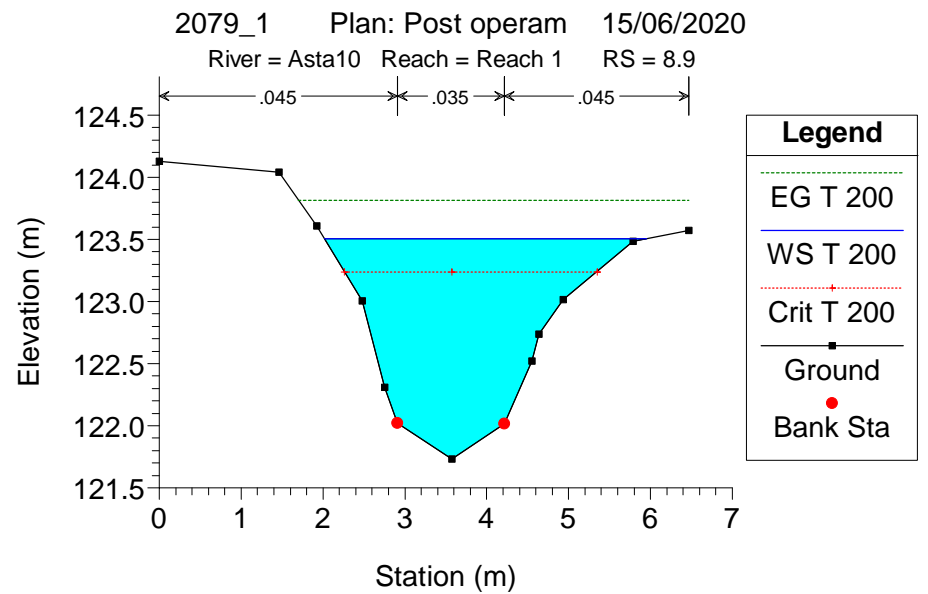
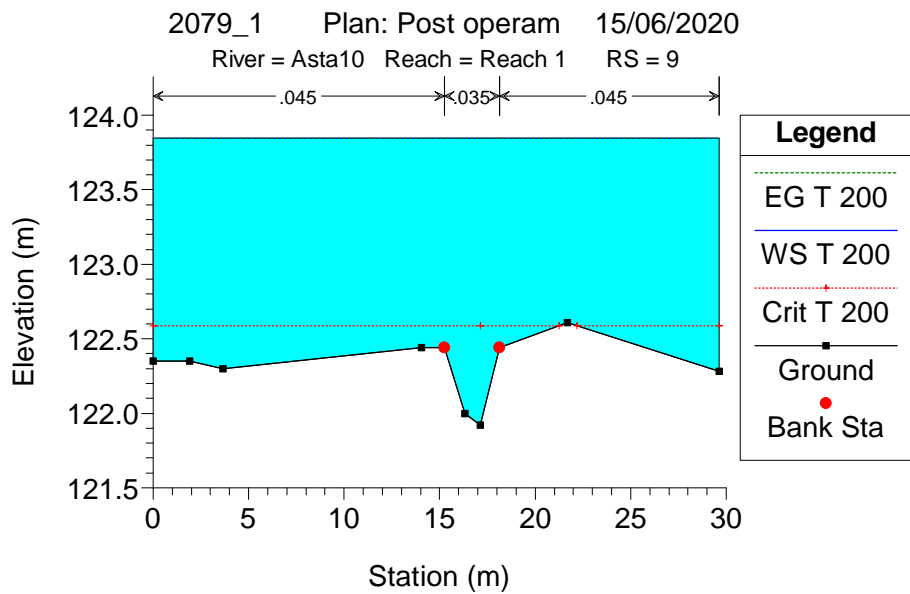
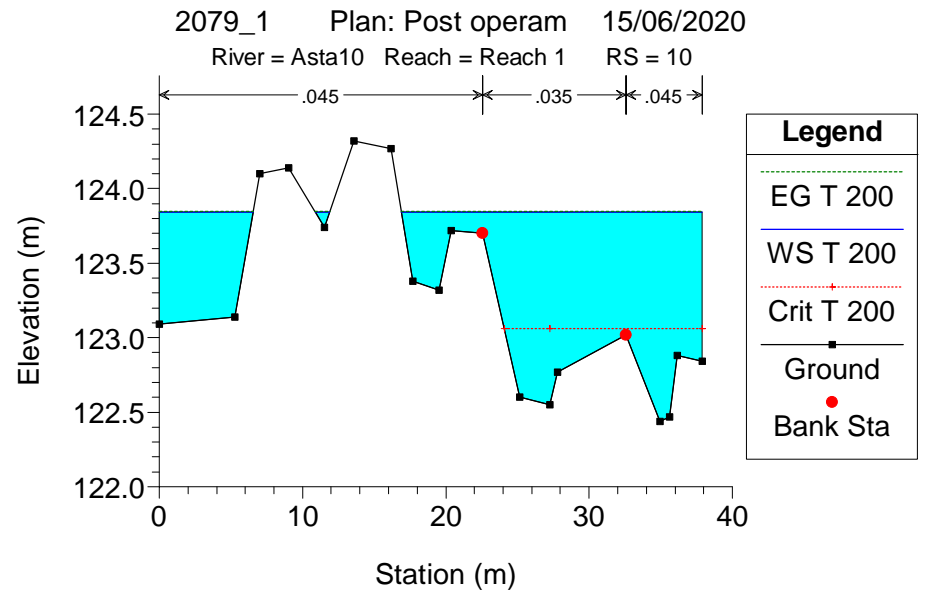
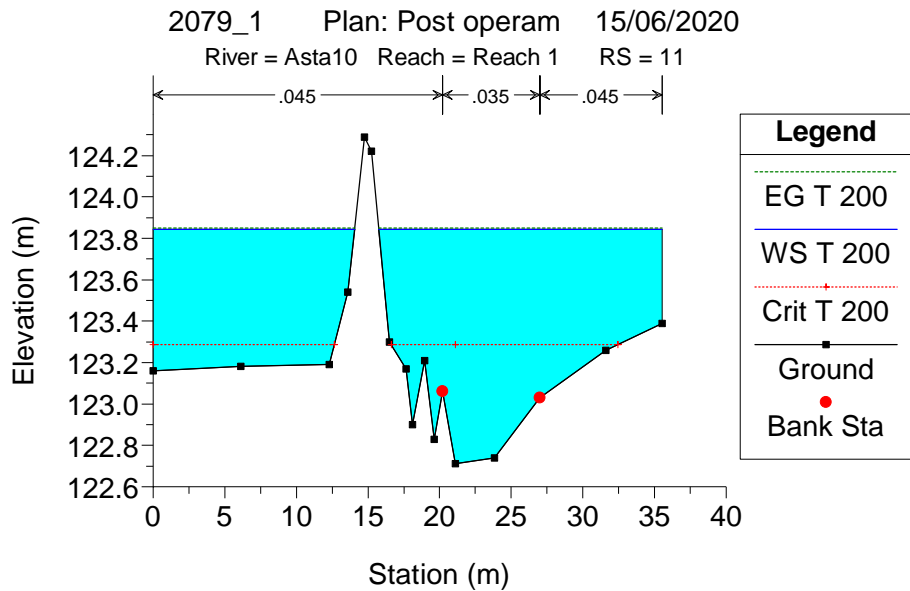
Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach 1	11	T 200	6.87	122.71	123.84	123.29	123.85	0.000213	0.42	24.13	33.87	0.13
Reach 1	10	T 200	6.87	122.55	123.84	123.06	123.85	0.000217	0.40	21.47	28.52	0.13
Reach 1	9	T 200	6.87	121.92	123.84	122.59	123.84	0.000033	0.22	43.23	29.63	0.05
Reach 1	8.9	T 200	6.87	121.73	123.50	123.24	123.81	0.005196	2.68	3.58	3.94	0.67
Reach 1	8.7		Culvert									
Reach 1	8.2	T 200	6.87	120.95	121.88	122.23	122.94	0.058425	4.57	1.53	2.23	1.66
Reach 1	8	T 200	6.87	121.05	122.39	121.94	122.43	0.001667	0.98	9.30	21.72	0.33
Reach 1	7	T 200	6.87	121.05	122.13	122.03	122.37	0.011197	2.14	3.21	4.79	0.83
Reach 1	6	T 200	6.87	121.10	122.00	122.00	122.11	0.009428	2.10	6.64	32.04	0.76
Reach 1	5	T 200	6.87	120.99	121.56	121.49	121.61	0.009423	1.35	7.17	25.44	0.68
Reach 1	4	T 200	6.87	120.38	121.06	120.91	121.08	0.003680	0.73	12.46	47.46	0.38
Reach 1	3	T 200	6.87	120.16	120.85	120.74	120.87	0.005001	0.95	11.03	46.88	0.51

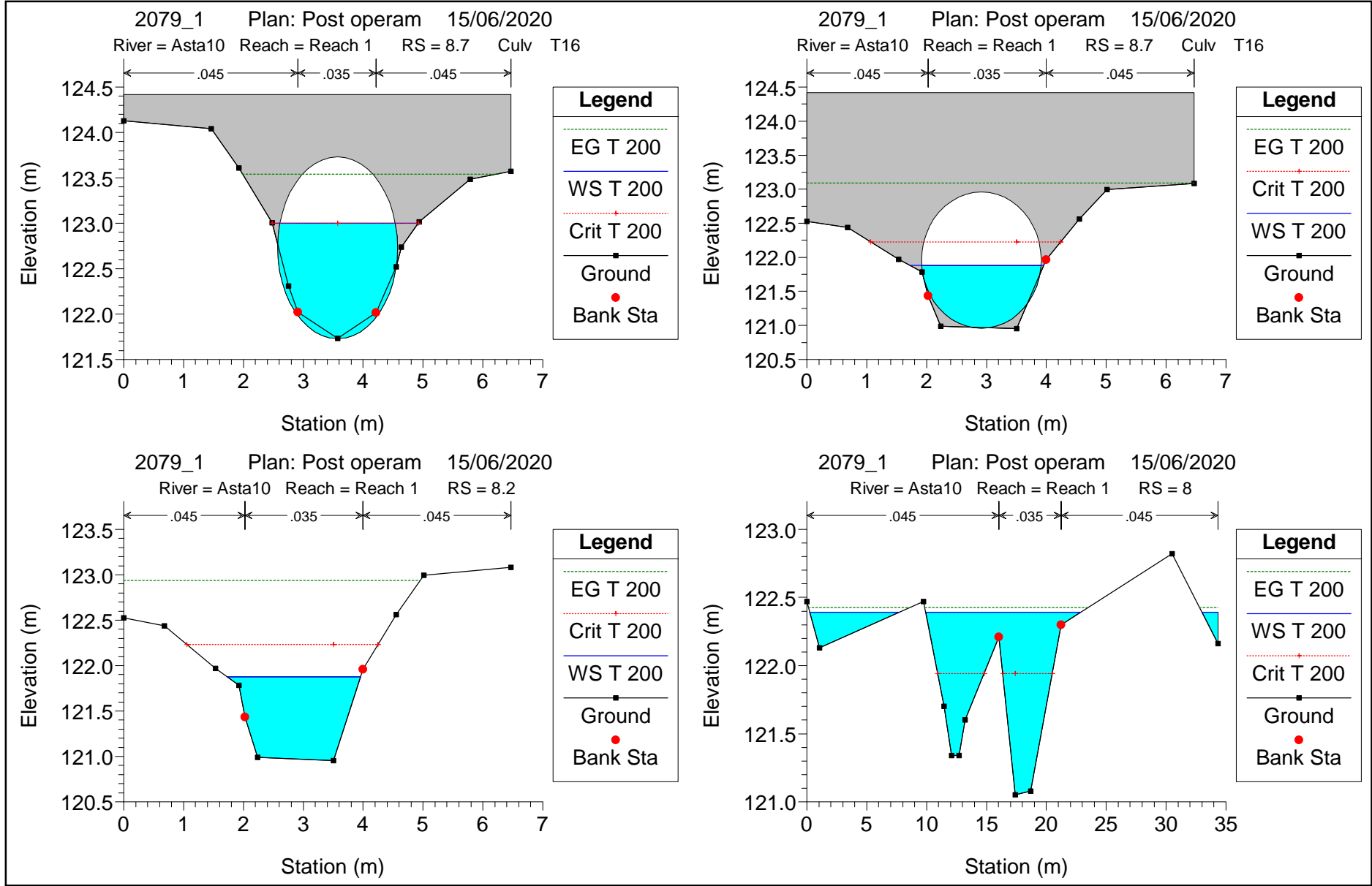
2079_1 Plan: Post operam 15/06/2020

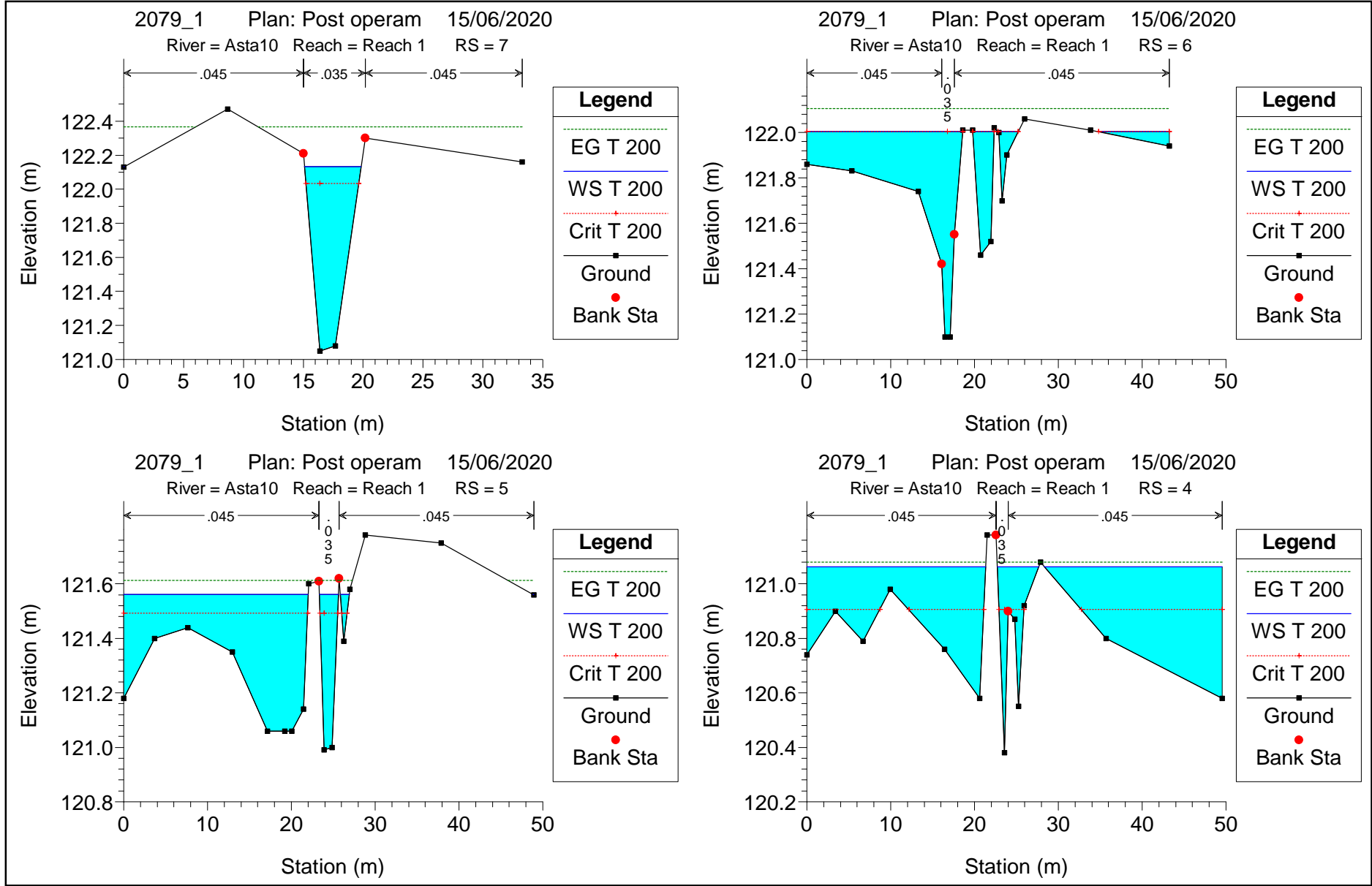
Asta10 Reach 1

Legend	
	EG T 200
	WS T 200
	Crit T 200
	Ground



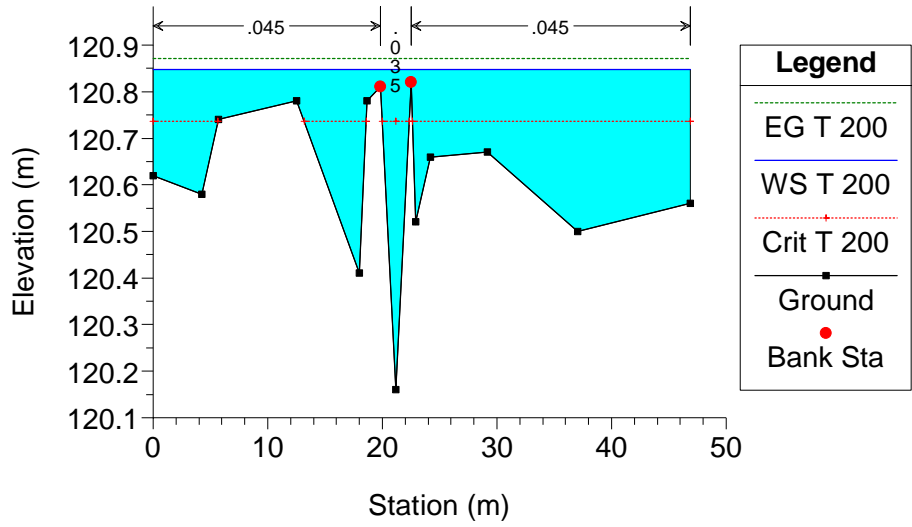






2079_1 Plan: Post operam 15/06/2020

River = Asta10 Reach = Reach 1 RS = 3



OPERA N. 2080

COMPLUVIO

POST OPERAM

(con raddoppio

OP2080bis)

DEVIAZIONE OP2080
(LC36)

RESIDUO IDRAULICO N°16
C20/TC009 OP.N° 2080 - Prolungamento tombino (esistente)
Prog. km 323+049.00
Prog. km 323+078.28

C20/TC010 OP.N° 2080bis
Prog. km 323+059.28
Prog. km 323+083.67

C20/SP005
Prog. km
Prog. km

DEVIAZIONE OP2081
(LC21)

SEZ. 7

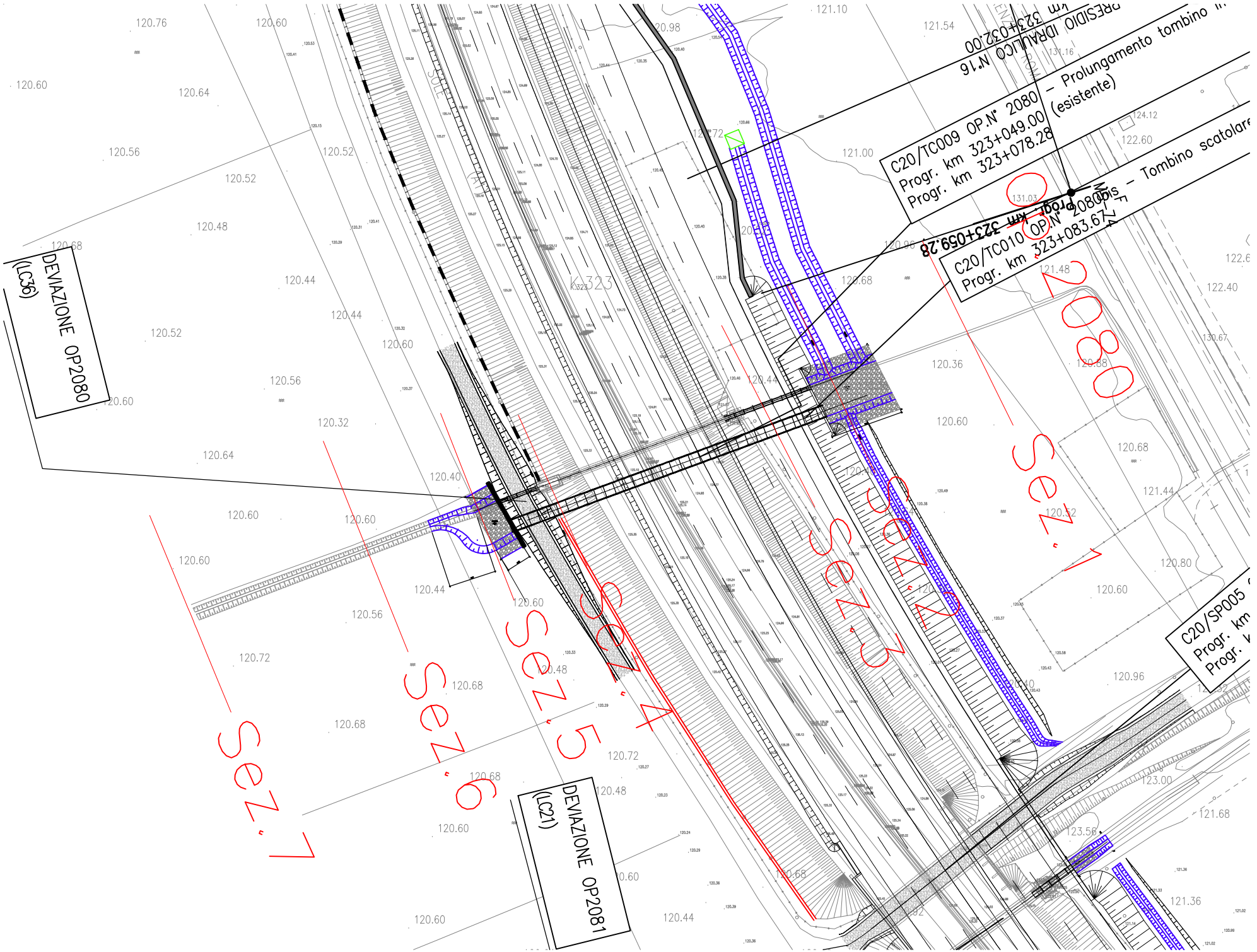
SEZ. 6

SEZ. 5

SEZ. 4

SEZ. 3

SEZ. 2



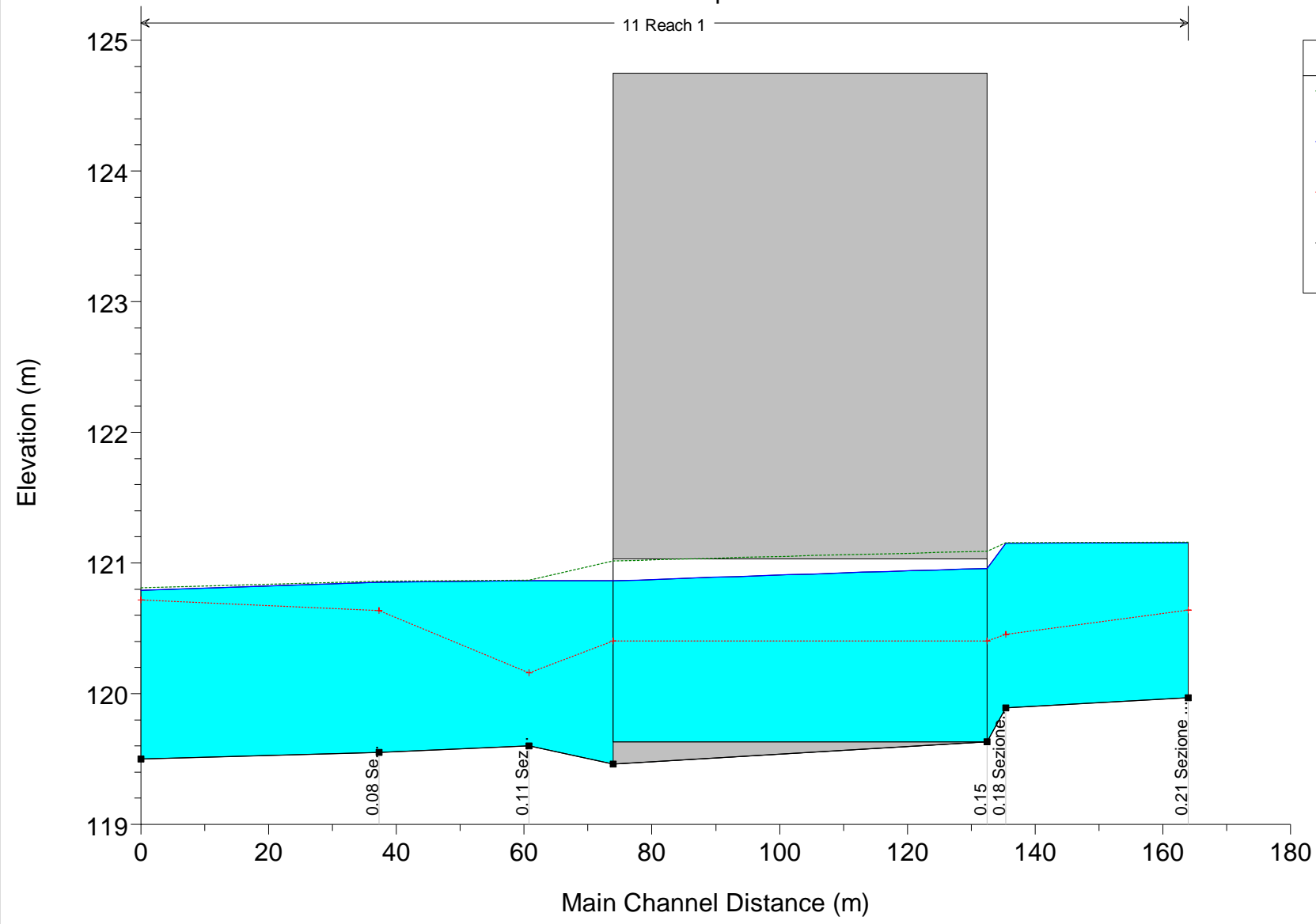
HEC-RAS Plan: PO scat River: 11 Reach: Reach 1 Profile: Tr 200

Reach	River Sta		Profile	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
Reach 1	0.21	Sezione 1	Tr 200	5.00	119.97	121.16	120.64	121.16	0.000161	0.34	23.99	40.83	0.11
Reach 1	0.18	Sezione 2	Tr 200	5.00	119.89	121.15	120.45	121.15	0.000066	0.22	31.28	40.55	0.07
Reach 1	0.15			Culvert									
Reach 1	0.11	Sezione 5	Tr 200	5.00	119.60	120.86	120.16	120.87	0.000231	0.43	19.51	39.94	0.13
Reach 1	0.08	Sezione 6	Tr 200	5.00	119.55	120.85	120.64	120.86	0.000717	0.48	16.24	45.10	0.18
Reach 1	0.05	Sezione 7	Tr 200	5.00	119.50	120.79	120.72	120.81	0.003000	0.93	9.88	42.28	0.36

11 Reach 1

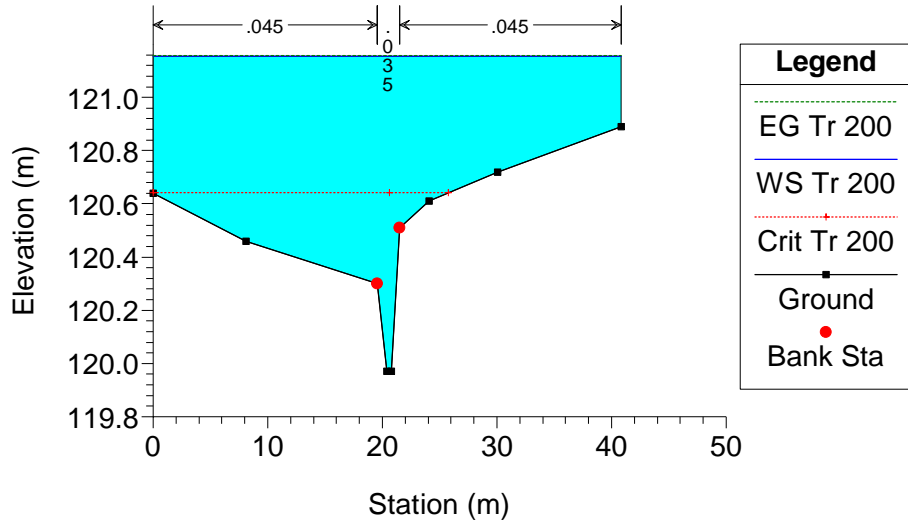
Legend

- EG Tr 200
- WS Tr 200
- Crit Tr 200
- Ground



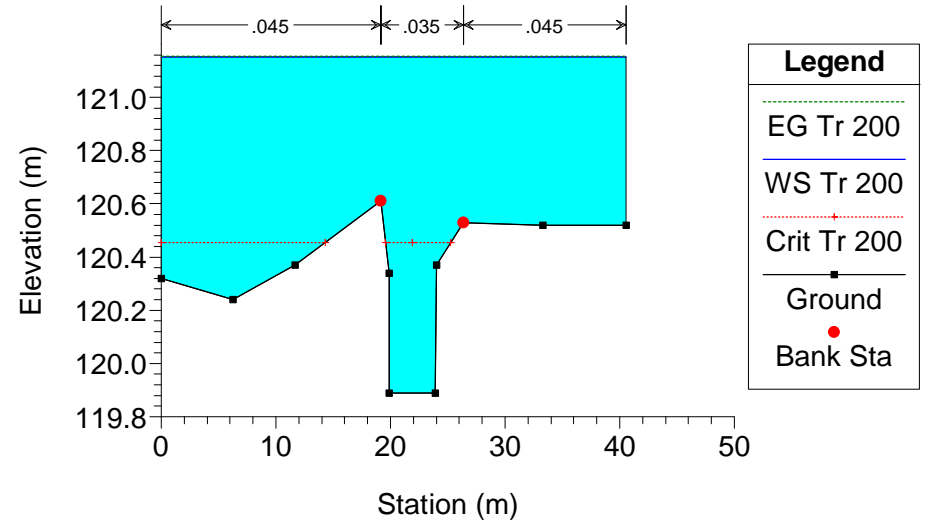
2080e2080bis Plan: Post operam con scolare 15/06/2020

River = 11 Reach = Reach 1 RS = 0.21 Sezione 1



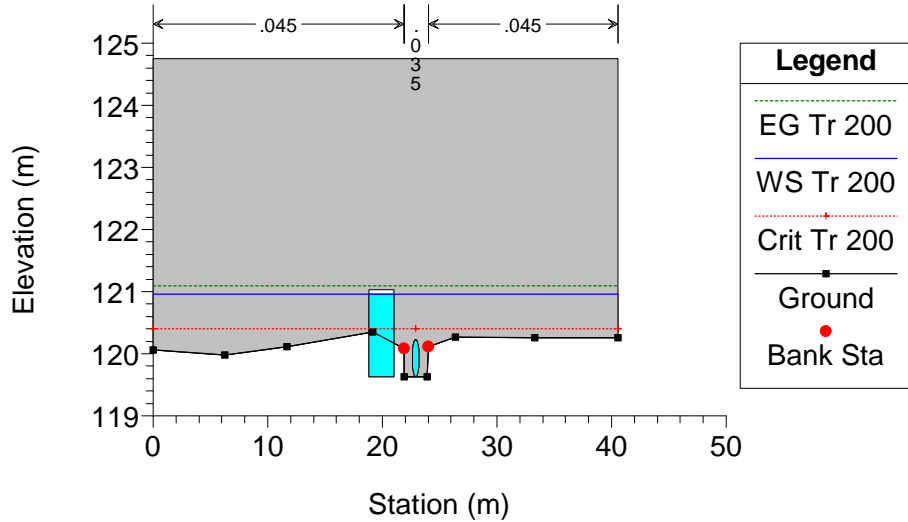
2080e2080bis Plan: Post operam con scolare 15/06/2020

River = 11 Reach = Reach 1 RS = 0.18 Sezione 2



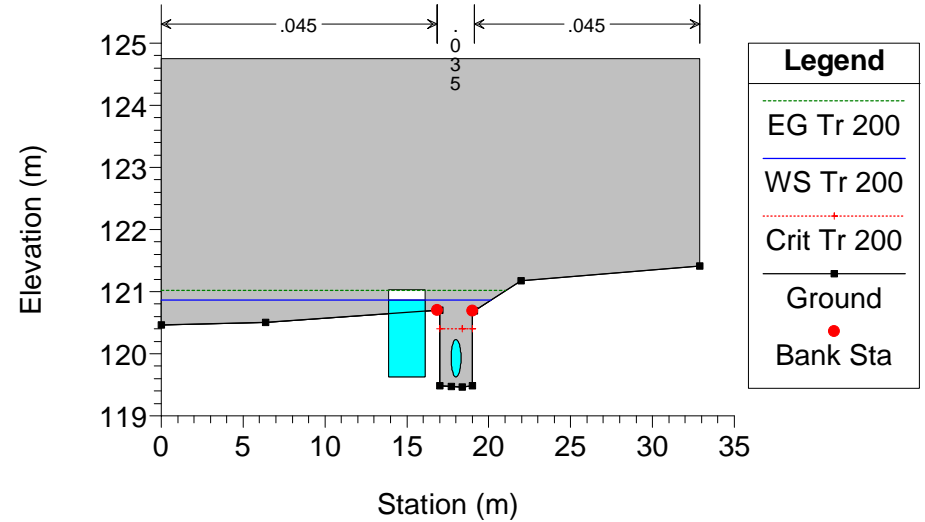
2080e2080bis Plan: Post operam con scolare 15/06/2020

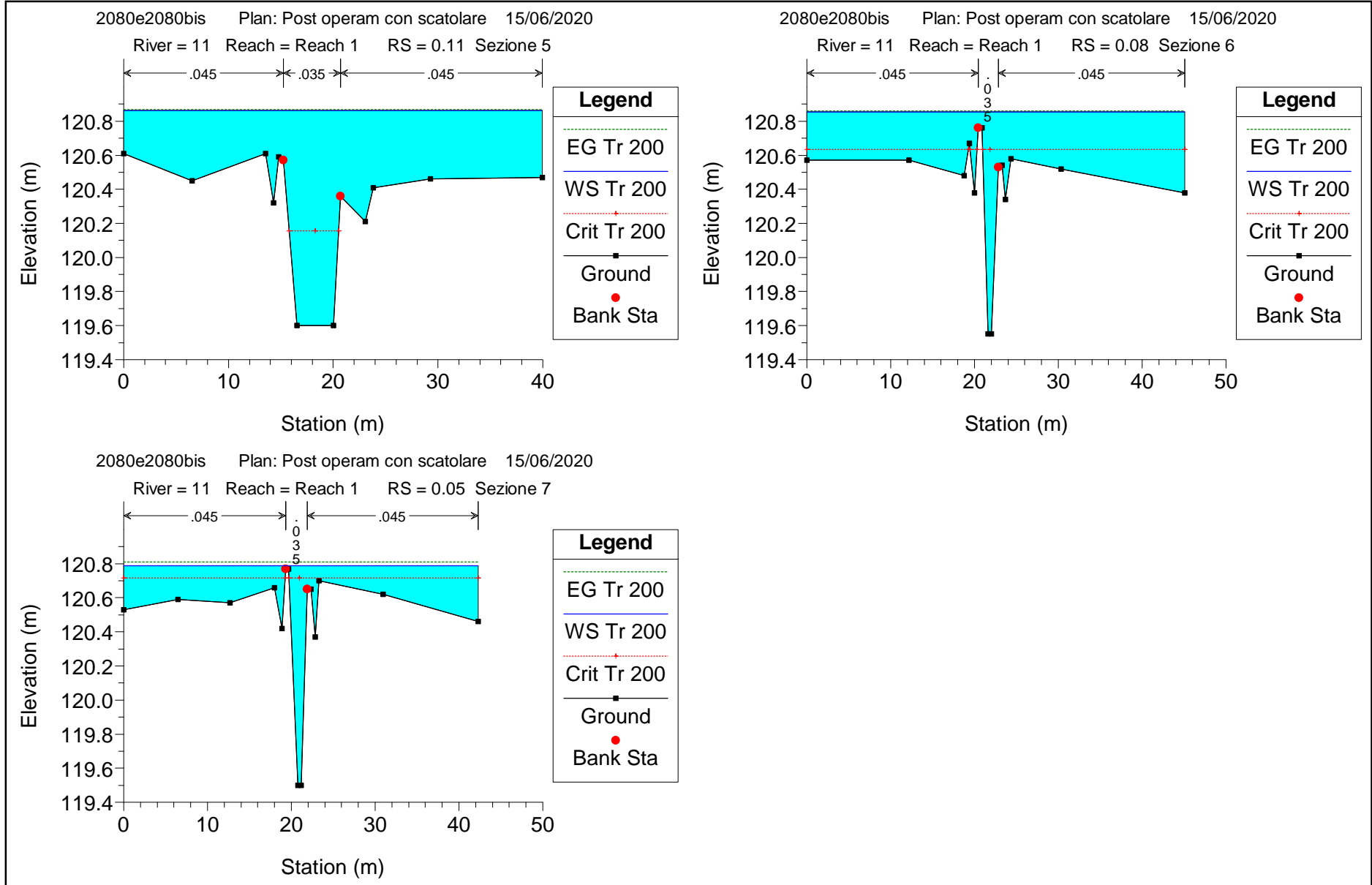
River = 11 Reach = Reach 1 RS = 0.15 Culv



2080e2080bis Plan: Post operam con scolare 15/06/2020

River = 11 Reach = Reach 1 RS = 0.15 Culv

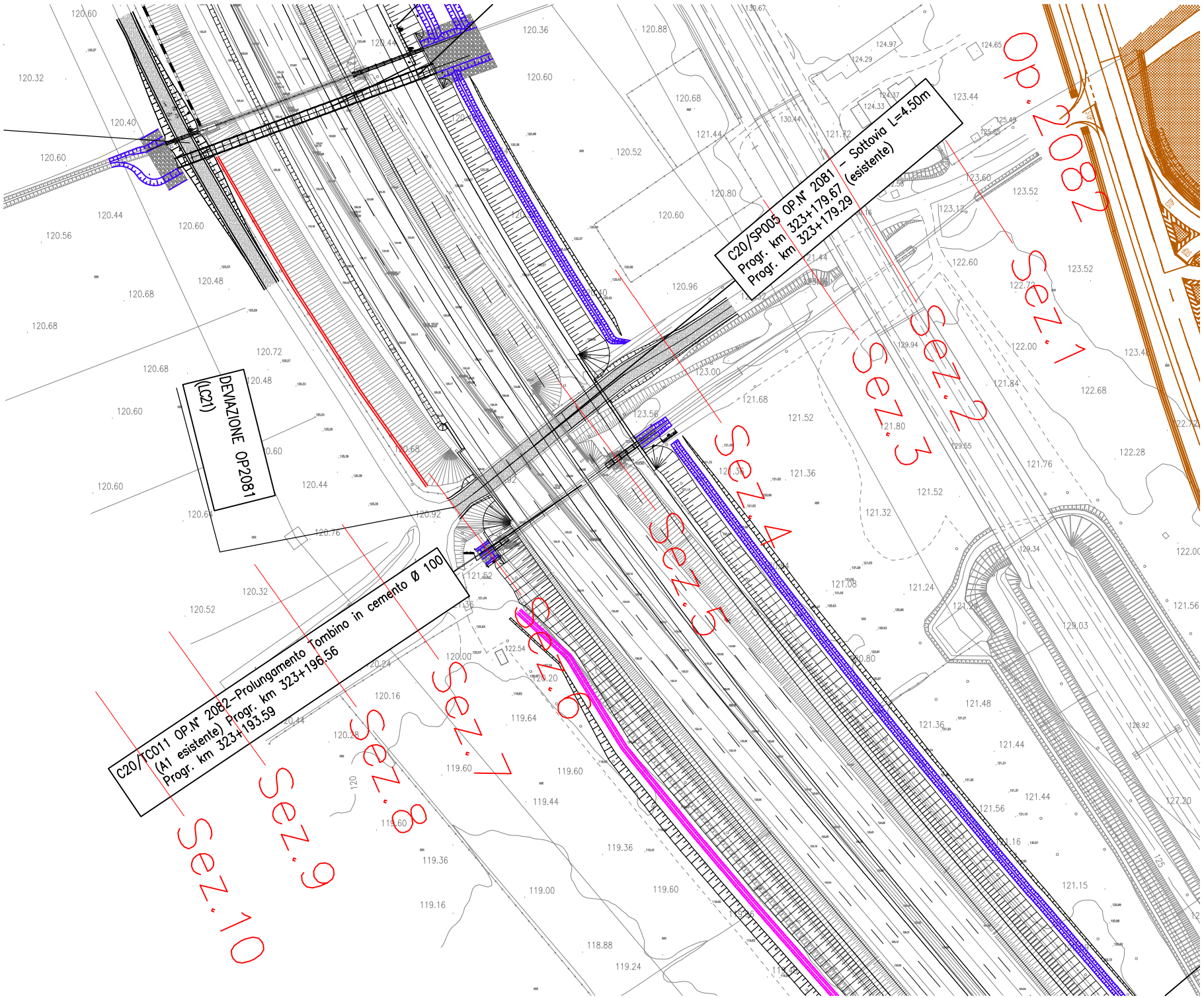




OPERA N. 2082

COMPLUVIO

POST OPERAM



C20/SP003 OP. N° 2081 - Sottovia L=4.50m
Prog. km 323+179.67
Prog. km 323+179.29 (esistente)

DEVIAZIONE OP2081
(LC21)

C20/TC011 OP. N° 2082 - Prolungamento tombino in cemento Ø 100
(A1 esistente) Prog. km 323+193.59
Prog. km 323+198.56

Op. 2082

Sez. 1

Sez. 2

Sez. 3

Sez. 4

Sez. 5

Sez. 6

Sez. 7

Sez. 8

Sez. 9

Sez. 10

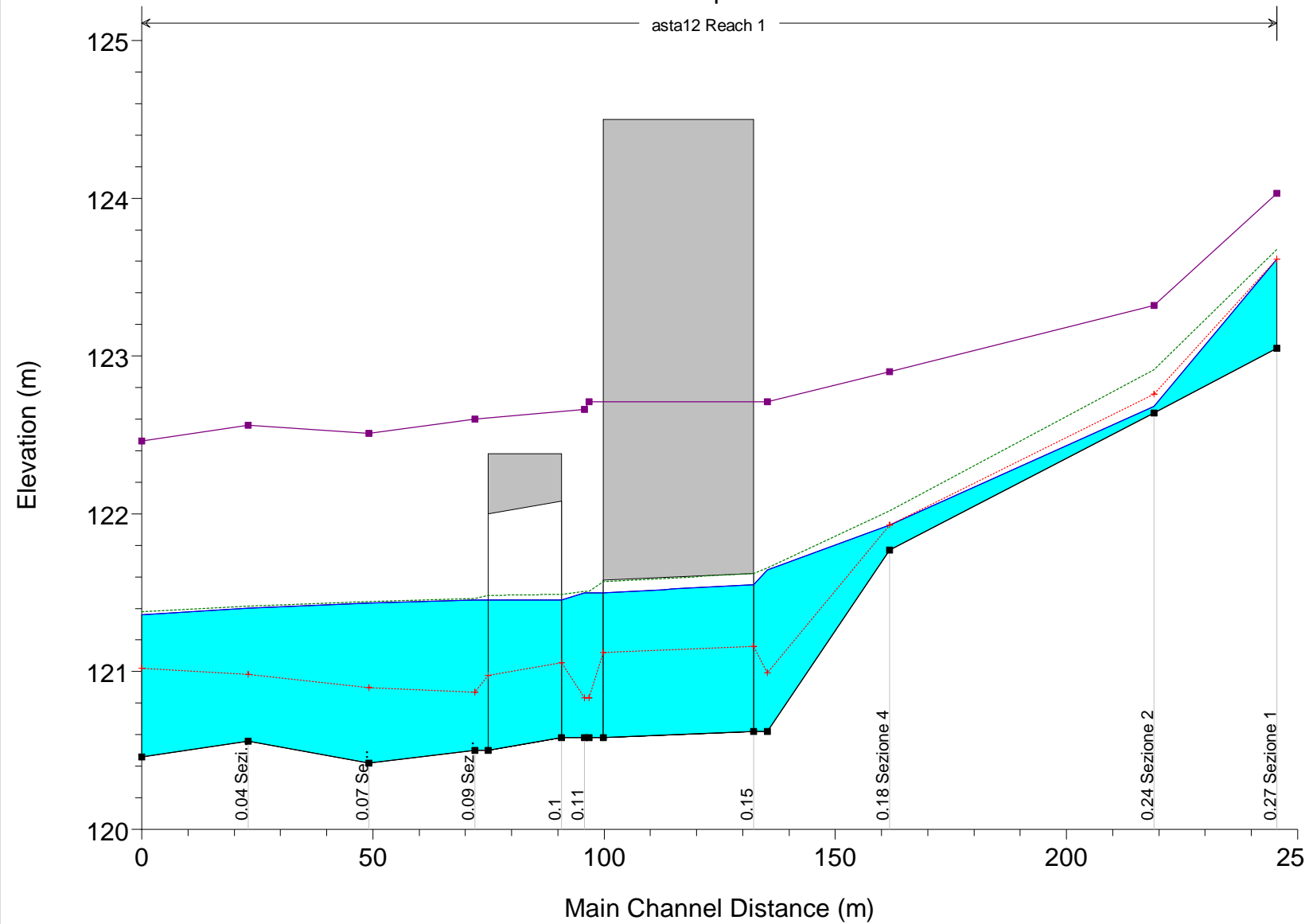
HEC-RAS Plan: PO fin River: asta12 Reach: Reach 1 Profile: Tr 200

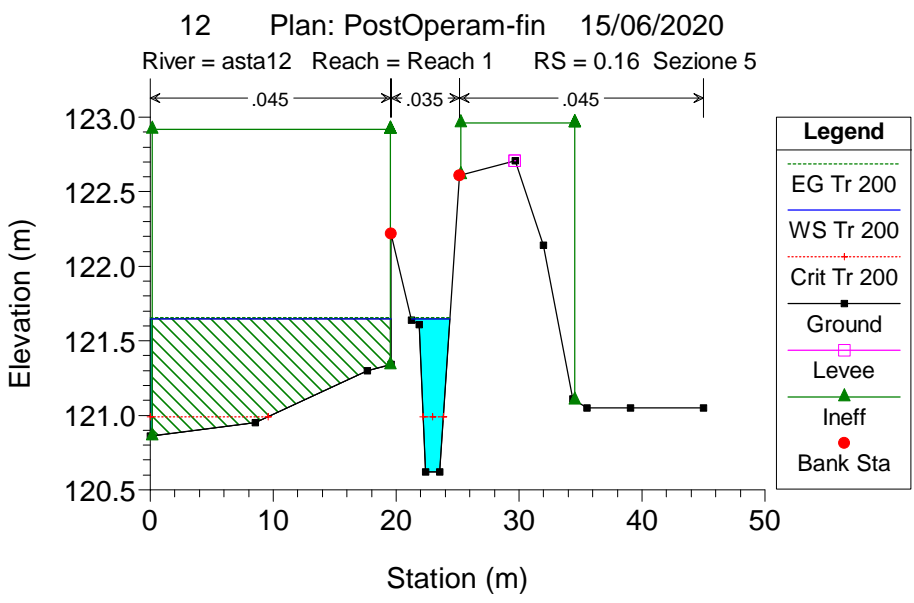
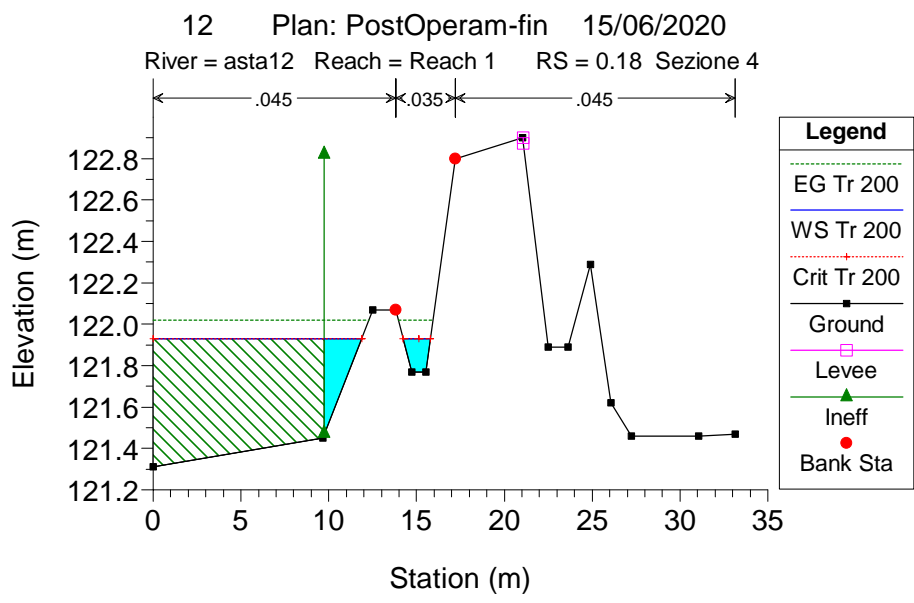
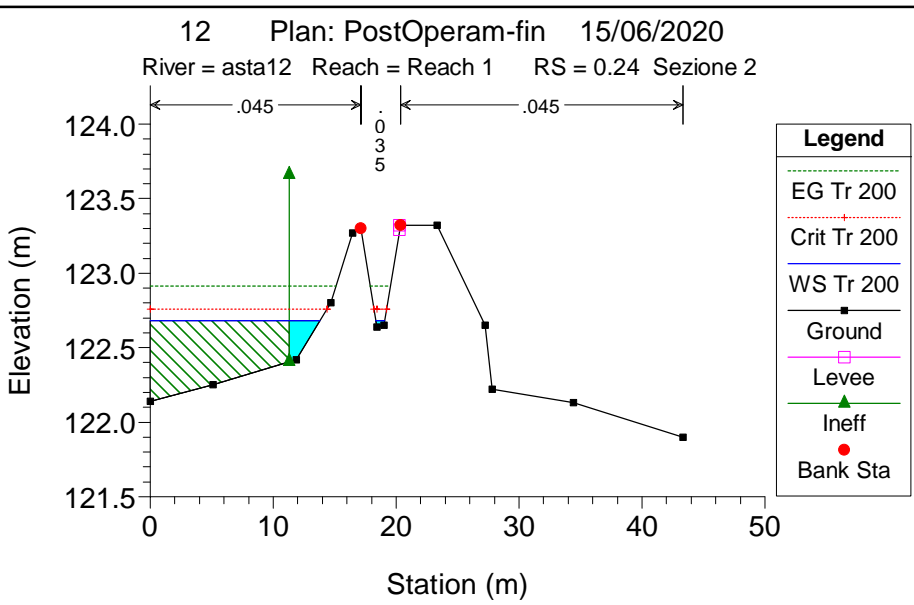
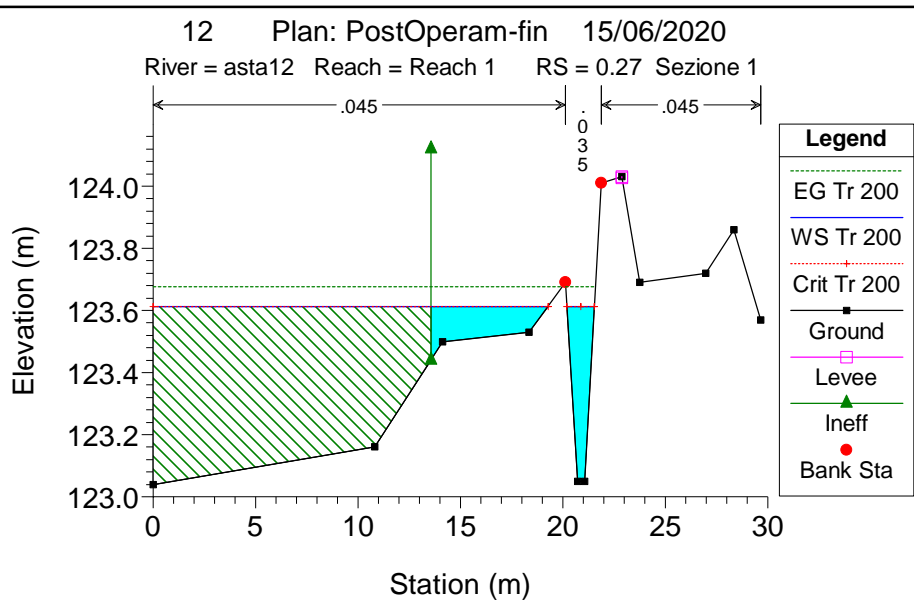
Reach	River Sta		Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Reach 1	0.27	Sezione 1	Tr 200	0.89	123.05	123.61	123.61	123.68	0.012579	1.30	1.01	20.61	0.70
Reach 1	0.24	Sezione 2	Tr 200	0.89	122.64	122.68	122.76	122.91	0.108055	0.94	0.42	14.50	1.67
Reach 1	0.18	Sezione 4	Tr 200	0.89	121.77	121.93	121.93	122.02	0.028347	1.15	0.68	13.43	1.05
Reach 1	0.16	Sezione 5	Tr 200	0.89	120.62	121.64	120.99	121.66	0.000776	0.46	2.01	22.72	0.19
Reach 1	0.15			Culvert									
Reach 1	0.12	Sezione 6	Tr 200	0.89	120.58	121.50	120.83	121.51	0.000575	0.43	2.08	15.84	0.14
Reach 1	0.11		Tr 200	0.89	120.58	121.50	120.83	121.51	0.000581	0.44	2.04	15.81	0.15
Reach 1	0.1			Culvert									
Reach 1	0.09	Sezione 7	Tr 200	0.89	120.50	121.45	120.87	121.46	0.000626	0.41	2.32	21.04	0.16
Reach 1	0.07	Sezione 8	Tr 200	0.89	120.42	121.43	120.90	121.44	0.000920	0.47	2.04	19.82	0.19
Reach 1	0.04	Sezione 9	Tr 200	0.89	120.56	121.40	120.98	121.42	0.001259	0.57	1.71	19.55	0.25
Reach 1	0.02	Sezione 10	Tr 200	0.89	120.46	121.36	121.02	121.38	0.002002	0.67	1.47	18.32	0.30

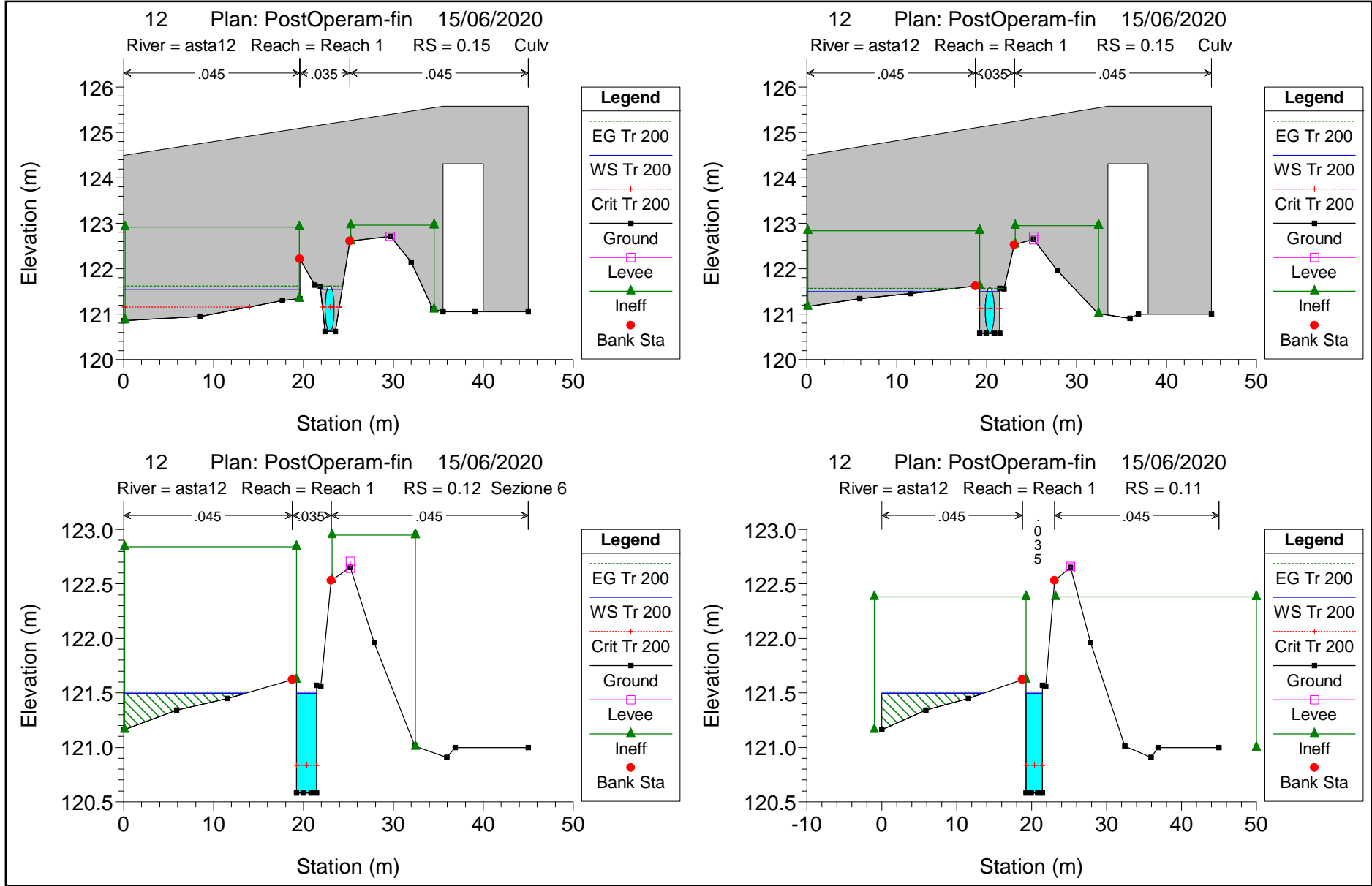
asta12 Reach 1

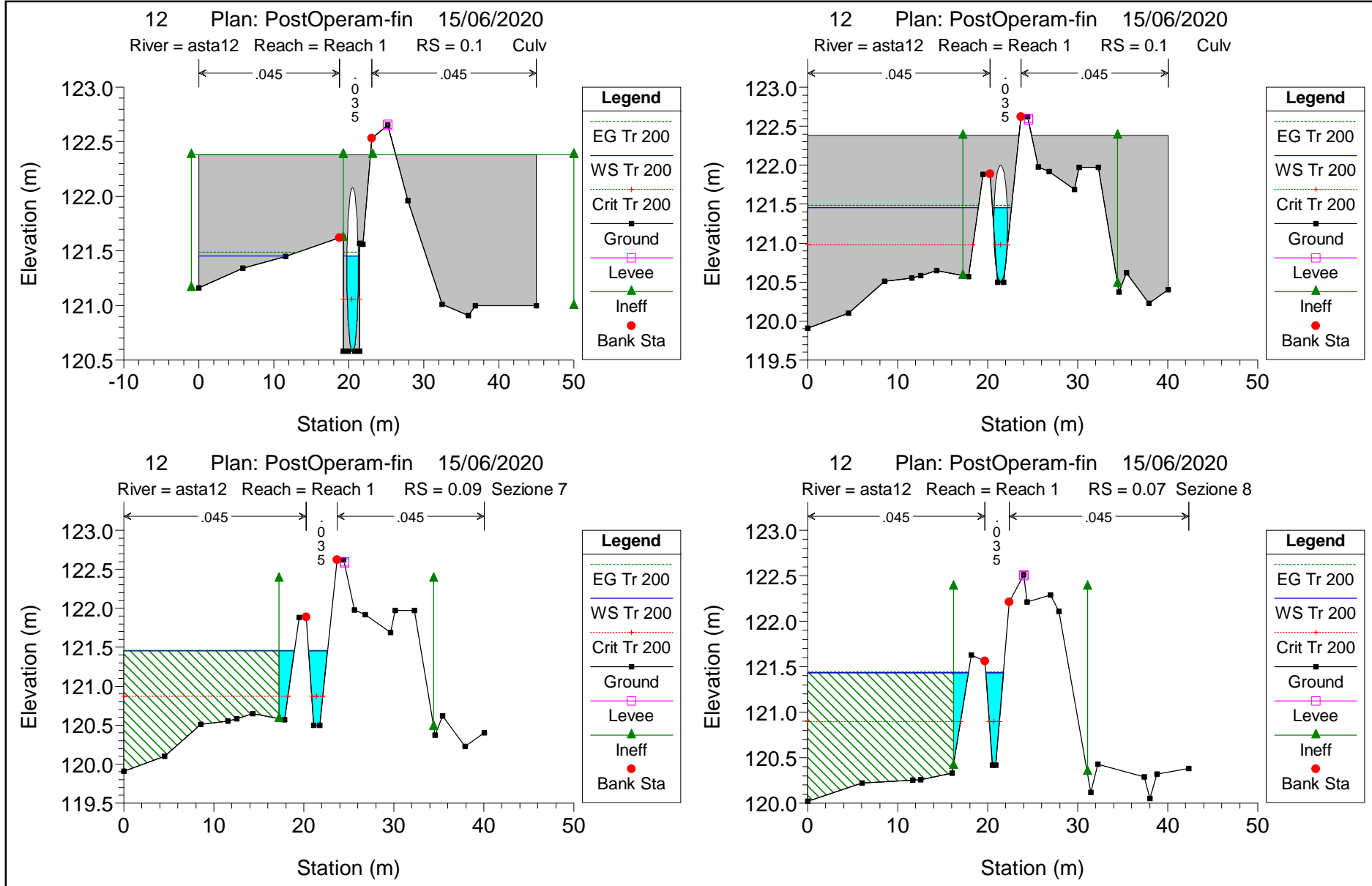
Legend

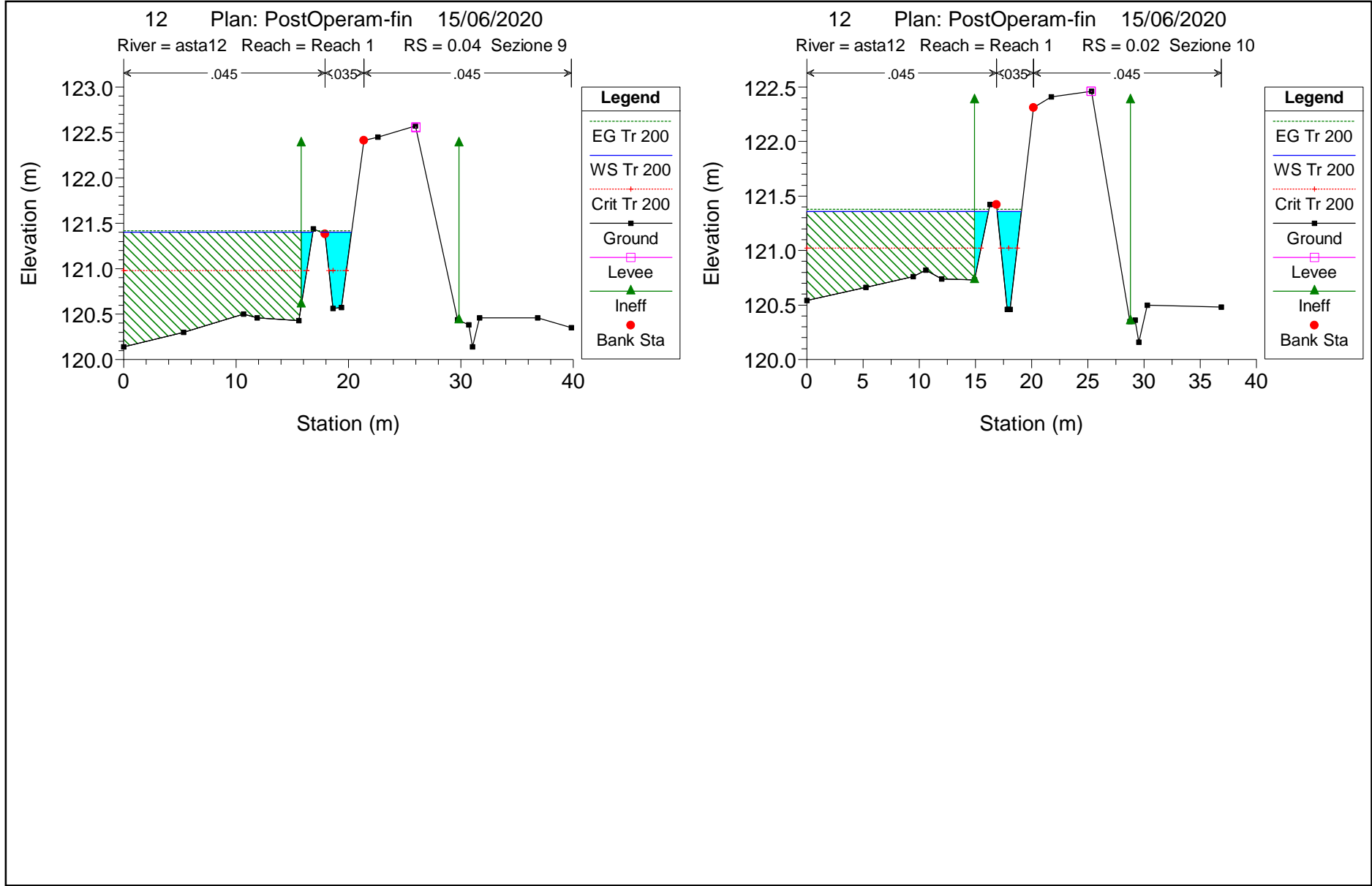
- EG Tr 200
- WS Tr 200
- Crit Tr 200
- Ground
- Right Levee







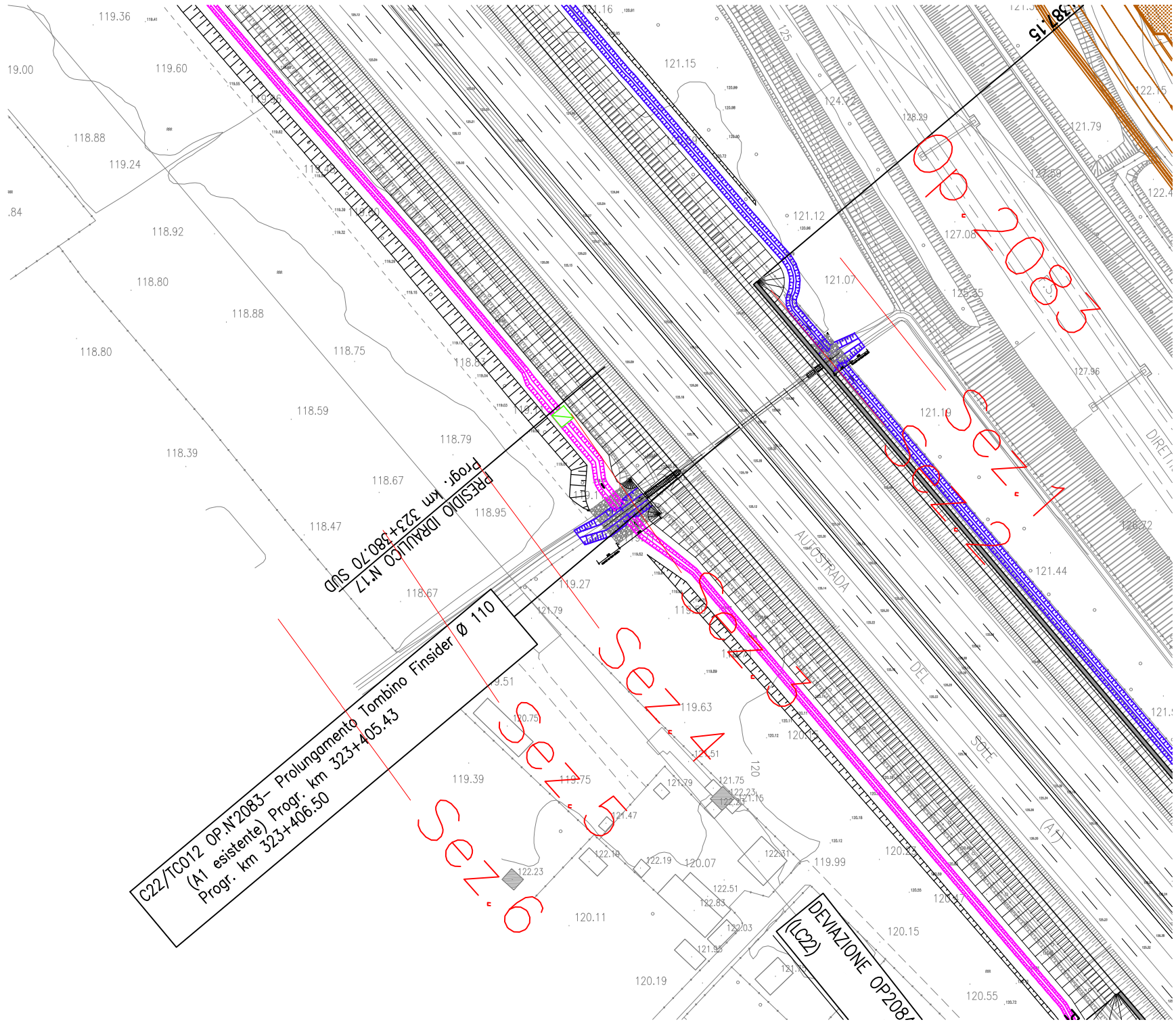




OPERA N. 2083

COMPLUVIO

POST OPERAM

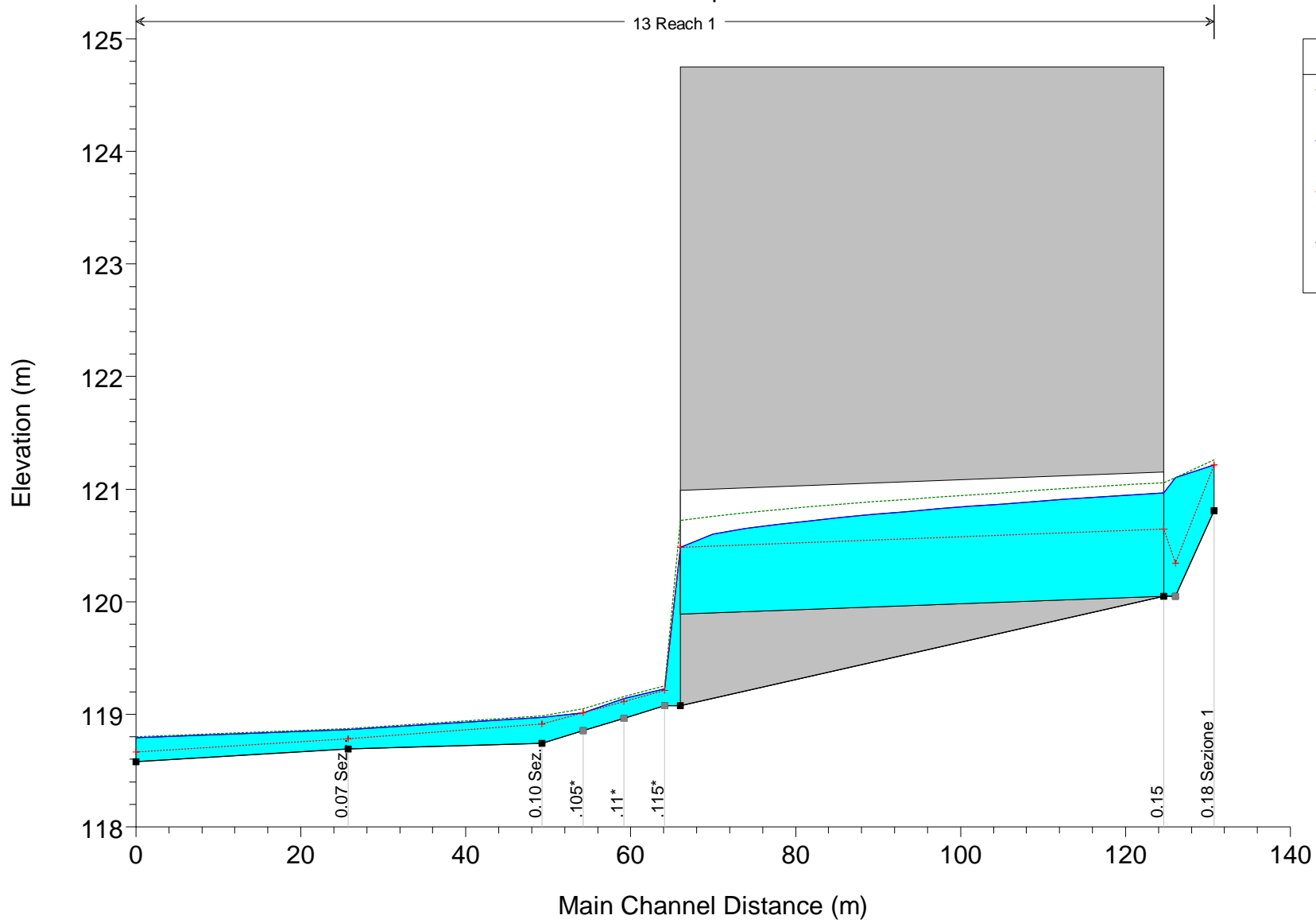


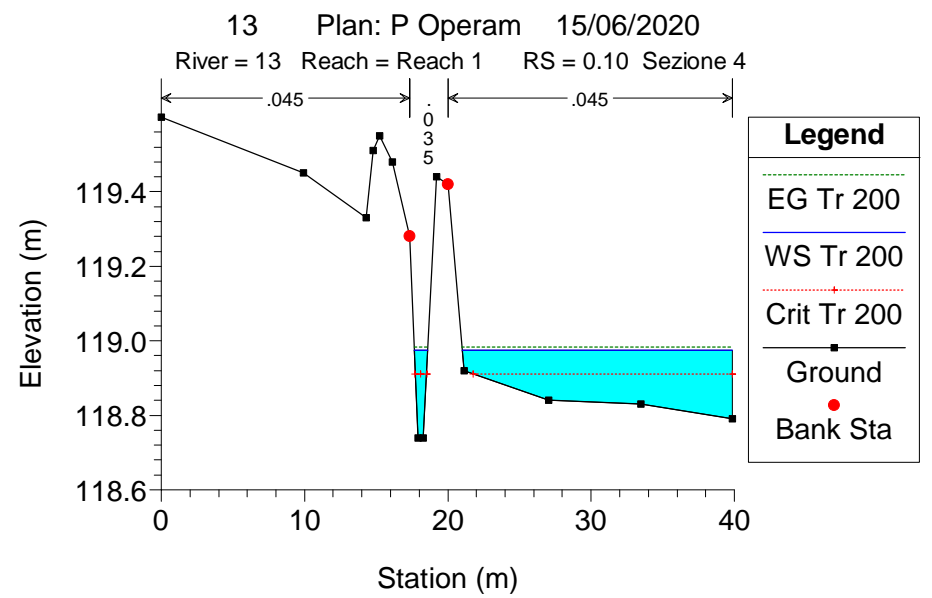
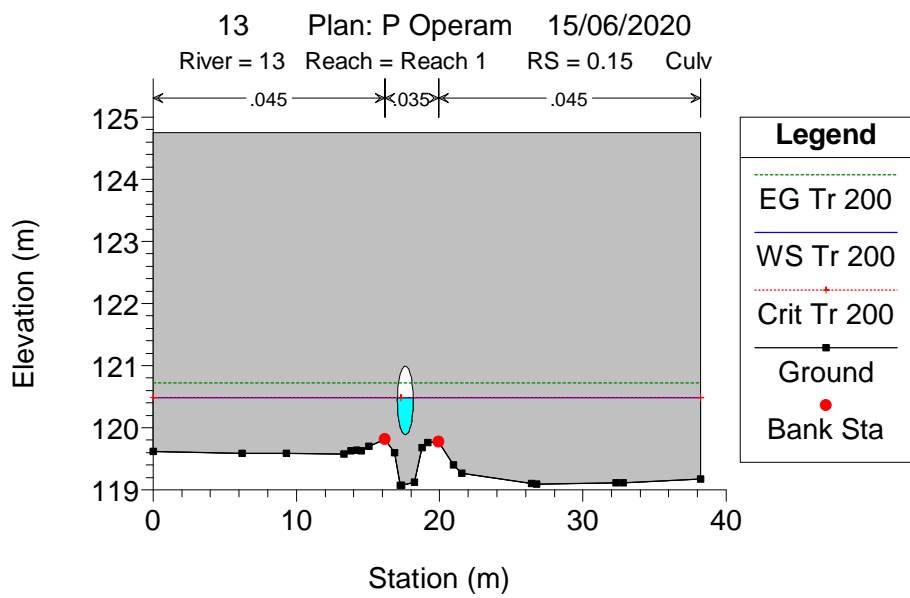
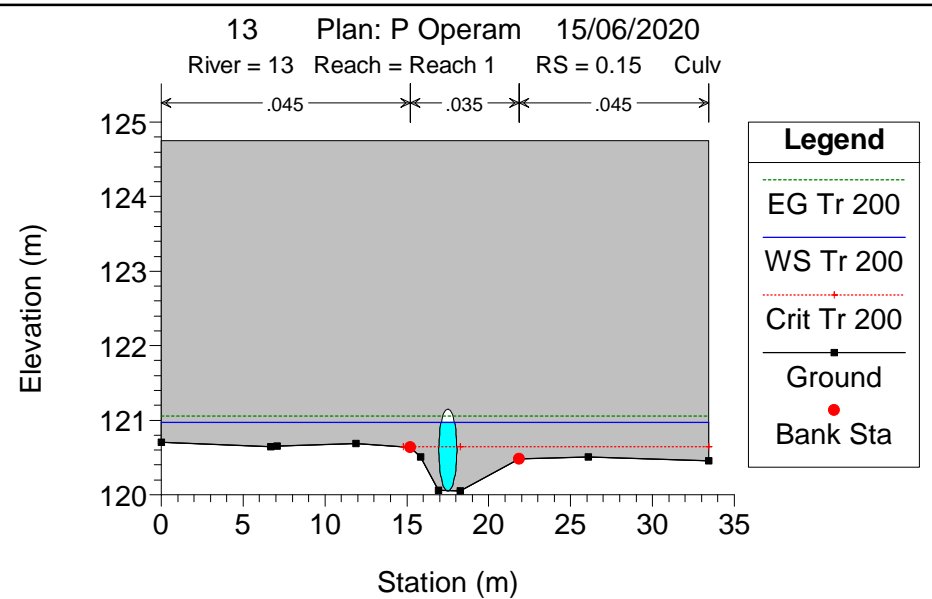
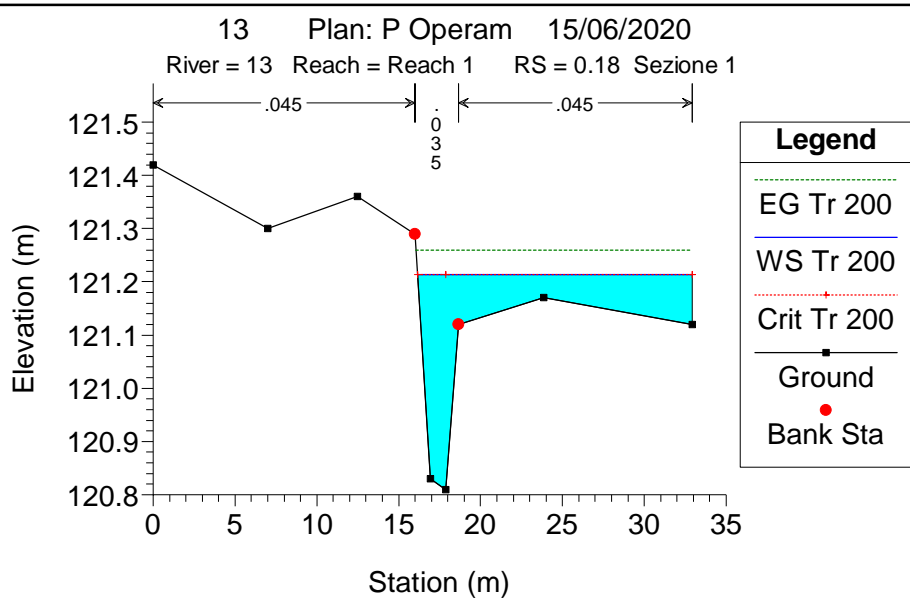
HEC-RAS Plan: post River: 13 Reach: Reach 1 Profile: Tr 200

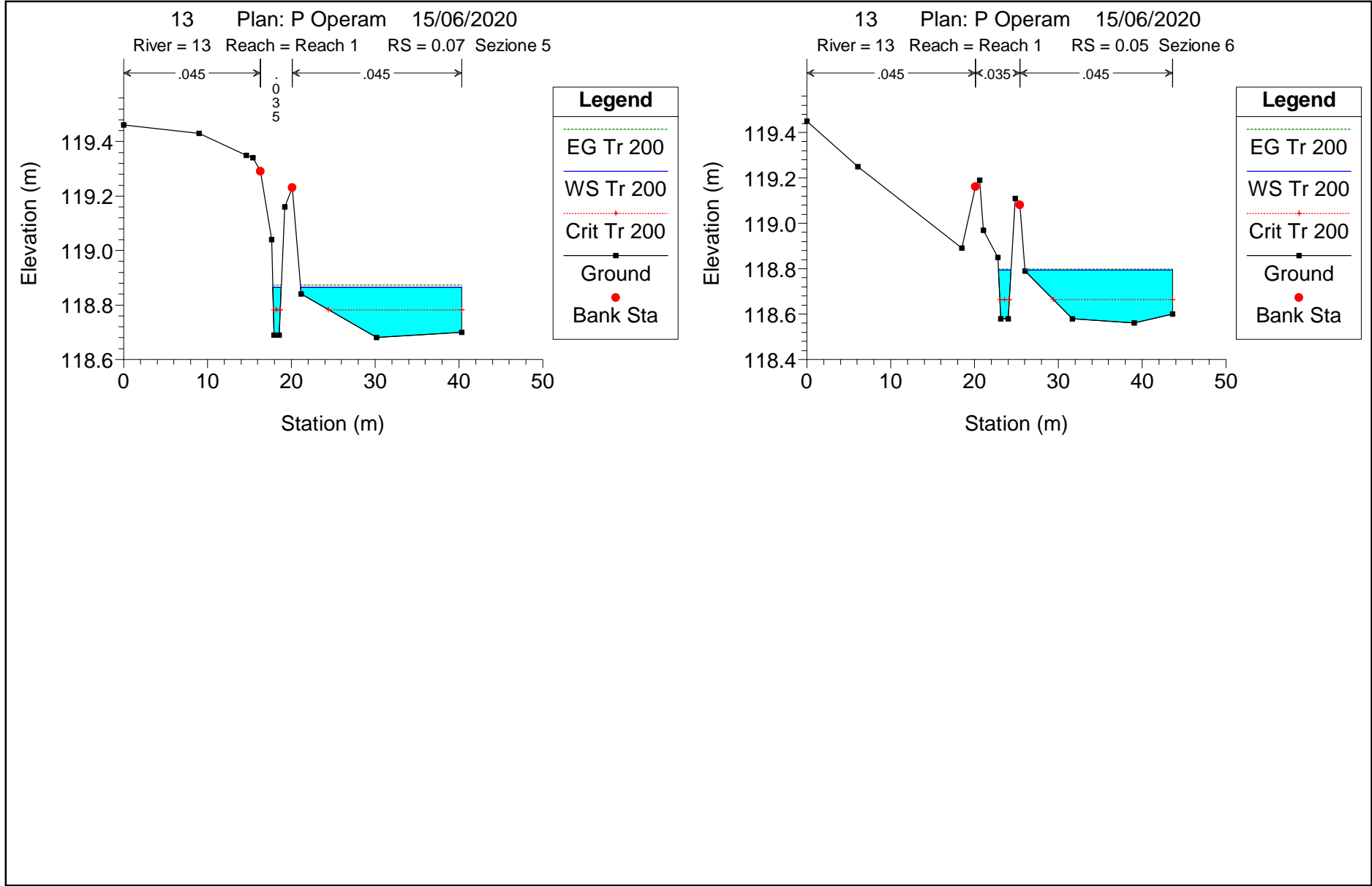
Reach	River Sta		Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Reach 1	0.18	Sezione 1	Tr 200	1.13	120.81	121.21	121.21	121.26	0.008591	1.10	1.70	16.78	0.66
Reach 1	0.15			Culvert									
Reach 1	0.10	Sezione 4	Tr 200	1.13	118.74	118.97	118.91	118.98	0.005200	0.56	2.67	19.82	0.44
Reach 1	0.07	Sezione 5	Tr 200	1.13	118.69	118.87	118.78	118.87	0.004212	0.46	2.87	20.25	0.39
Reach 1	0.05	Sezione 6	Tr 200	1.13	118.58	118.79	118.66	118.80	0.002002	0.37	3.50	19.10	0.29

13 Reach 1

Legend	
	EG Tr 200
	WS Tr 200
	Crit Tr 200
	Ground



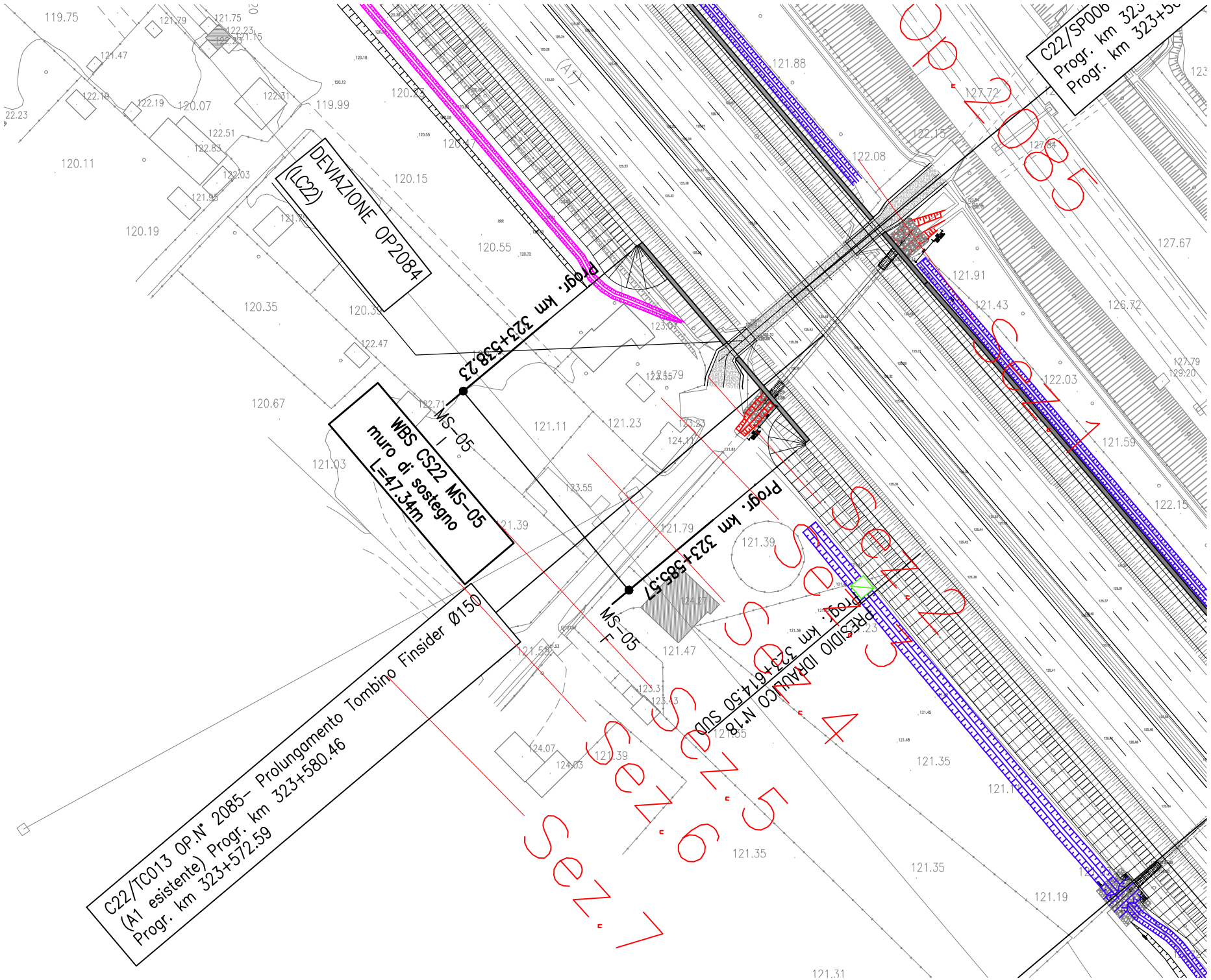




OPERA N. 2085

COMPLUVIO

POST OPERAM



DEVIAZIONE OP2084
(LC22)

WBS CS22 MS-05
muro di sostegno
L=47.34m

C22/TC013 OP.N° 2085- Prolungamento Tombino
(A1 esistente) Progr. km 323+572.59
Progr. km 323+580.46

Progr. km 323+582.23

Progr. km 323+585.57

Progr. km 323+614.50

C22/SP00b
Progr. km 323
Progr. km 323+50

SENZA

SENZA

SENZA

SENZA

119.75

121.79

121.75

122.23

121.15

120.11

120.19

120.35

120.3

120.67

121.03

121.11

121.23

121.39

121.79

121.39

121.47

121.59

124.07

124.05

121.39

121.35

121.35

121.

121.35

121.19

121.31

127.67

126.72

127.79

129.20

122.15

121.59

121.91

121.43

122.15

122.08

121.88

127.72

127.87

123

HEC-RAS Plan: PO River: 14 Reach: Reach 1 Profile: Tr 200

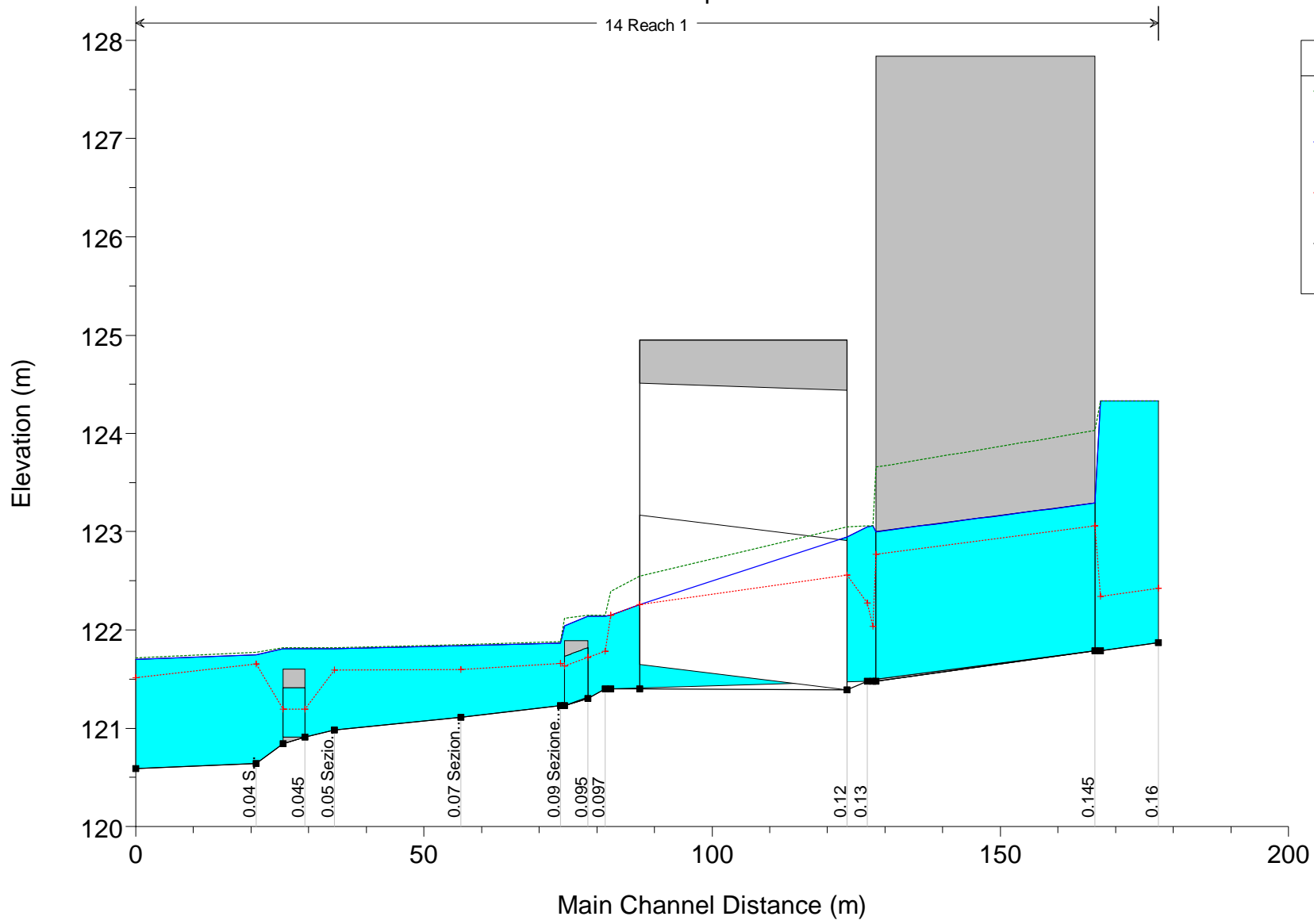
Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach 1	0.16	Tr 200	6.06	121.87	124.33	122.42	124.33	0.000006	0.11	72.53	36.09	0.02
Reach 1	0.15 Aggiunta	Tr 200	6.06	121.79	124.33	122.34	124.33	0.000006	0.10	75.41	36.09	0.02
Reach 1	0.145		Culvert									
Reach 1	0.14 Sezione 1	Tr 200	6.06	121.48	123.06	122.03	123.06	0.000040	0.20	40.72	36.09	0.05
Reach 1	0.13	Tr 200	6.06	121.48	123.05	122.27	123.06	0.000254	0.49	16.75	36.09	0.13
Reach 1	0.12		Mult Open									
Reach 1	0.10 Sezione 2	Tr 200	6.06	121.40	122.15	122.15	122.39	0.022986	2.65	2.93	30.92	1.16
Reach 1	0.097	Tr 200	6.06	121.40	122.14	121.78	122.15	0.000666	0.45	16.12	30.92	0.20
Reach 1	0.095		Culvert									
Reach 1	0.09 Sezione 3	Tr 200	6.06	121.23	121.87	121.66	121.88	0.002467	0.72	10.86	30.96	0.37
Reach 1	0.07 Sezione 4	Tr 200	6.06	121.11	121.84	121.60	121.85	0.001475	0.64	13.53	36.89	0.29
Reach 1	0.05 Sezione 5	Tr 200	6.06	120.98	121.81	121.59	121.82	0.001343	0.60	14.56	41.54	0.28
Reach 1	0.045		Culvert									
Reach 1	0.04 Sezione 6	Tr 200	6.06	120.64	121.75	121.65	121.77	0.003423	1.07	9.98	34.40	0.40
Reach 1	0.01 Sezione 7	Tr 200	6.06	120.59	121.70	121.51	121.72	0.002000	0.84	12.03	35.75	0.33

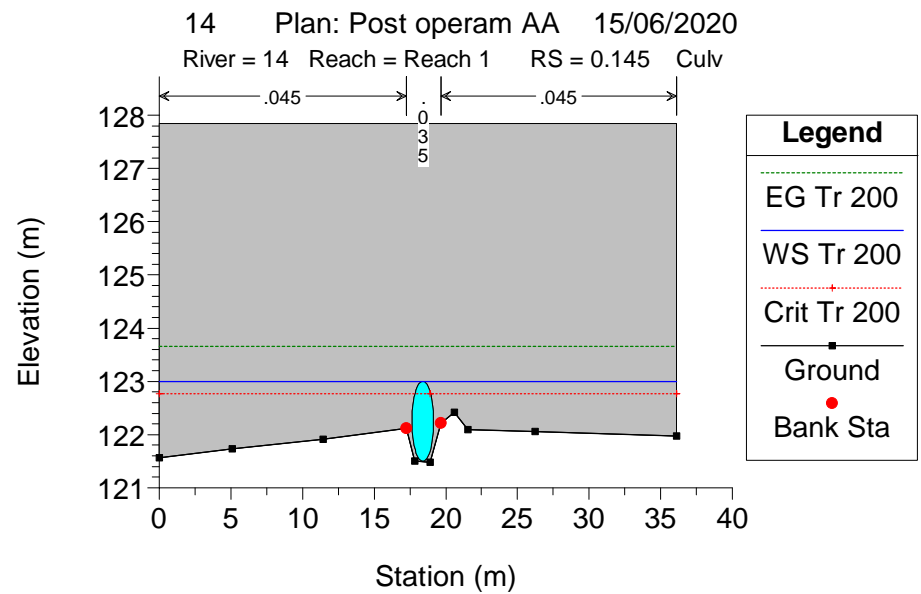
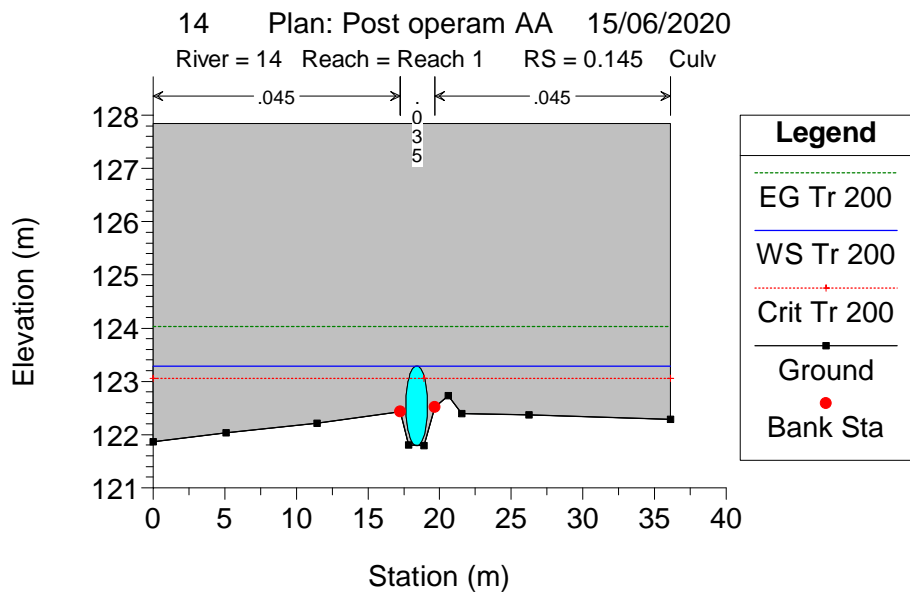
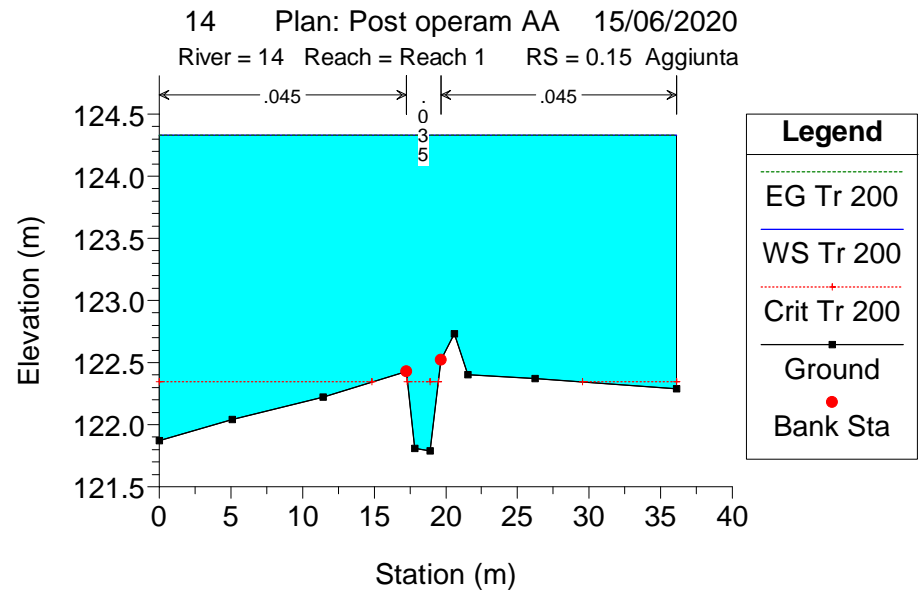
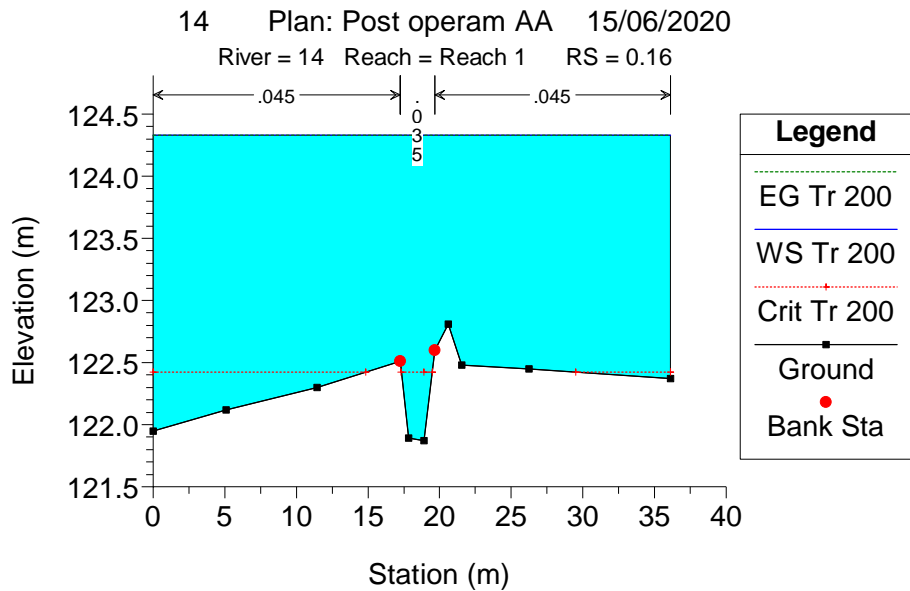
14 Plan: Post operam AA 15/06/2020

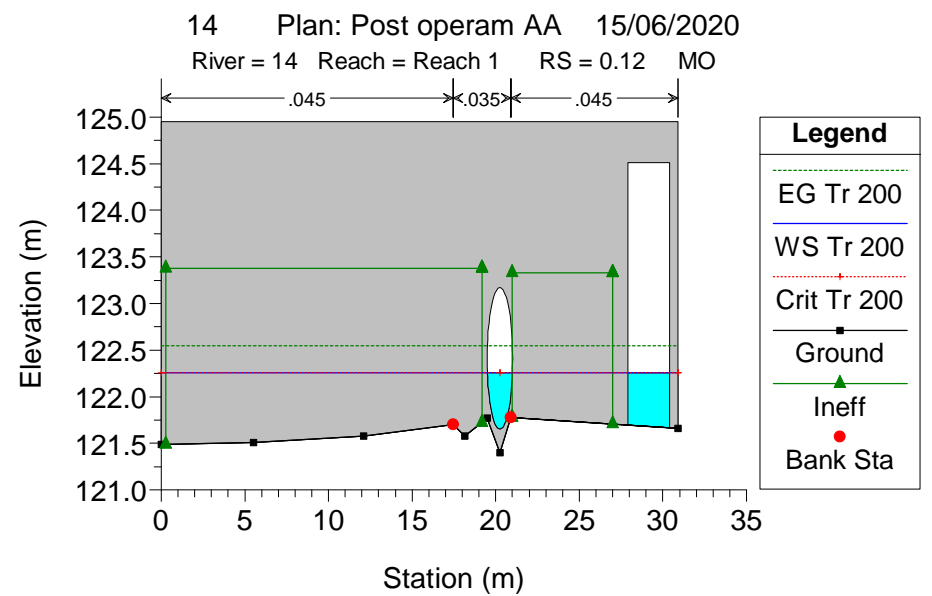
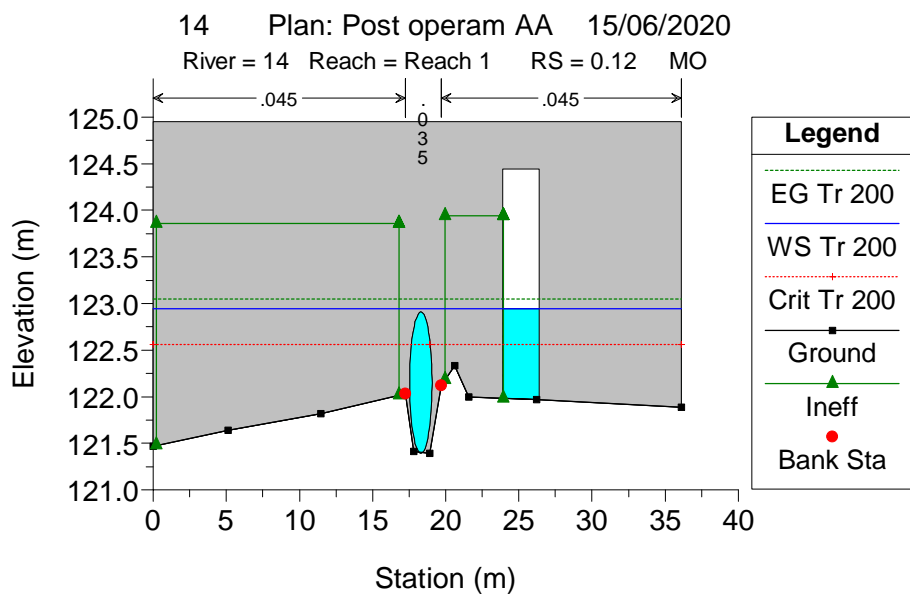
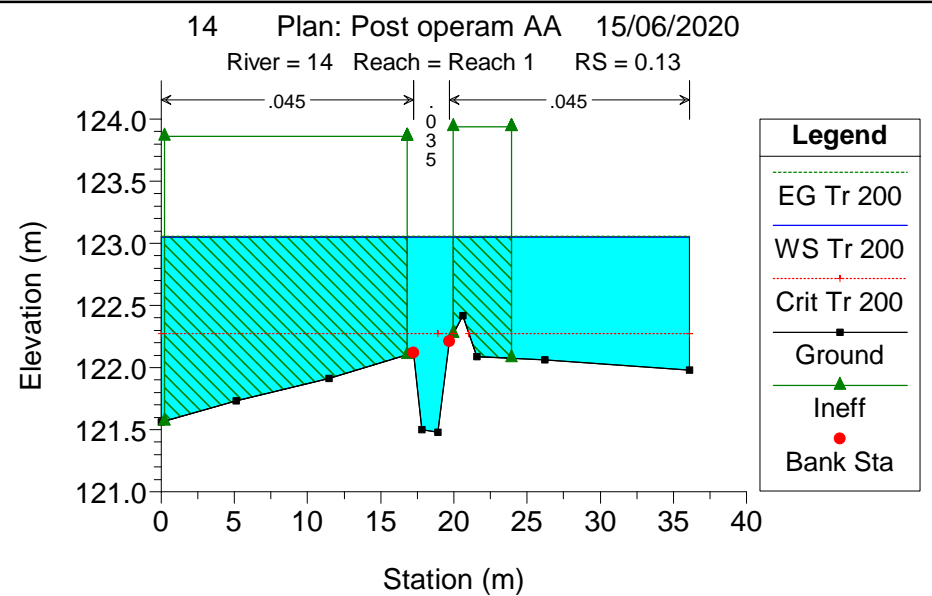
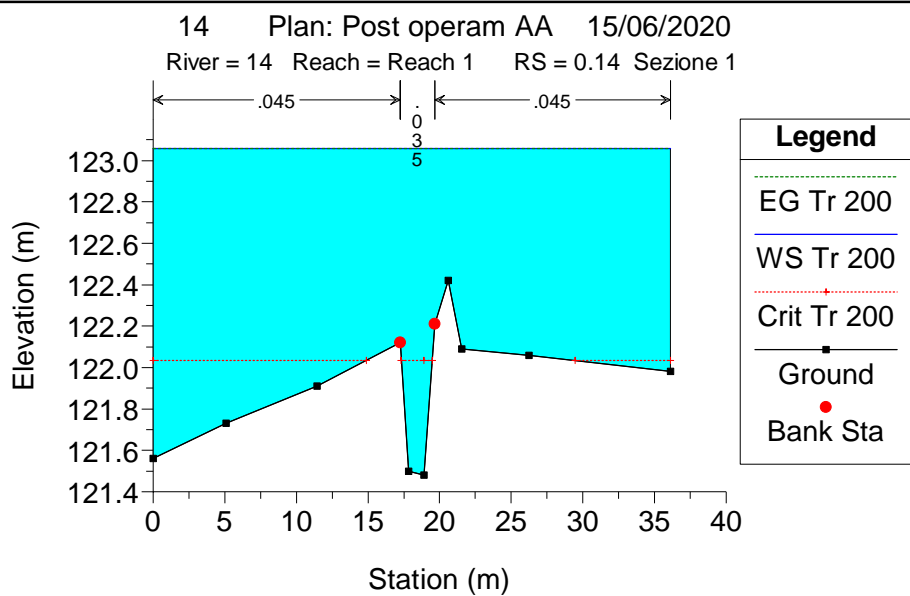
14 Reach 1

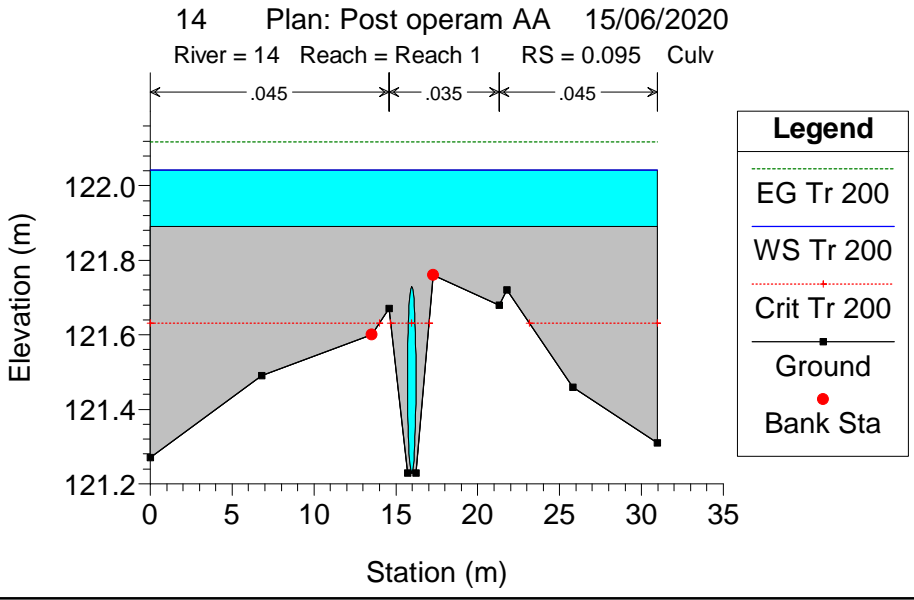
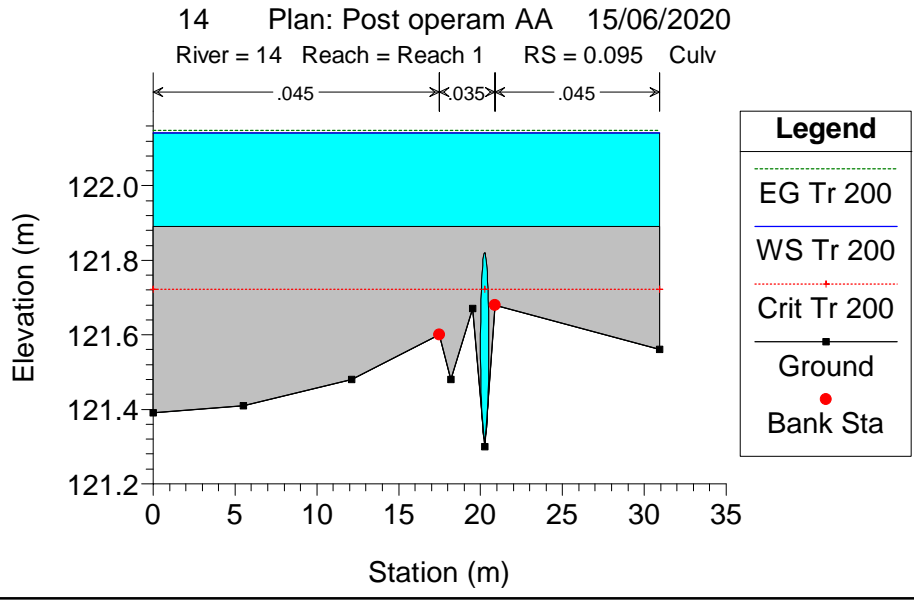
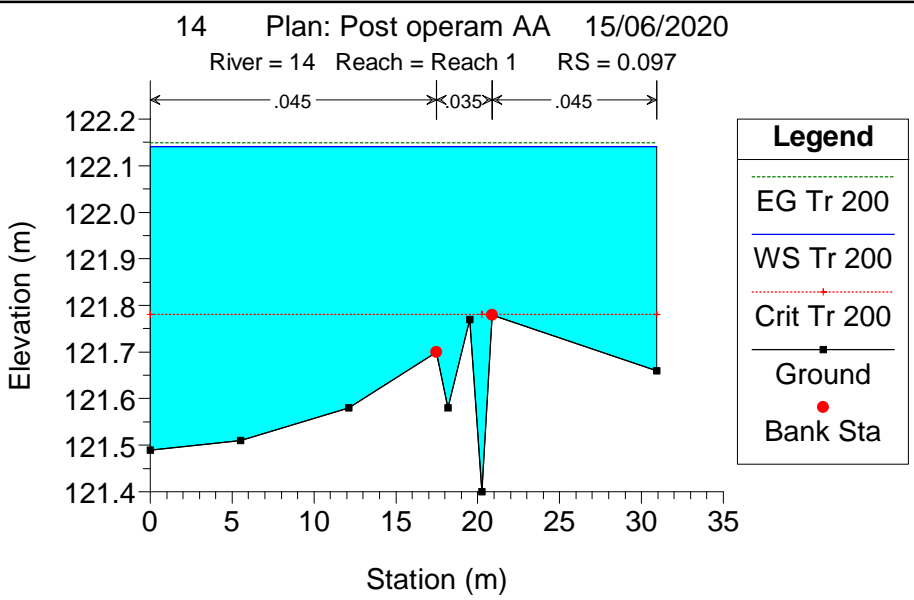
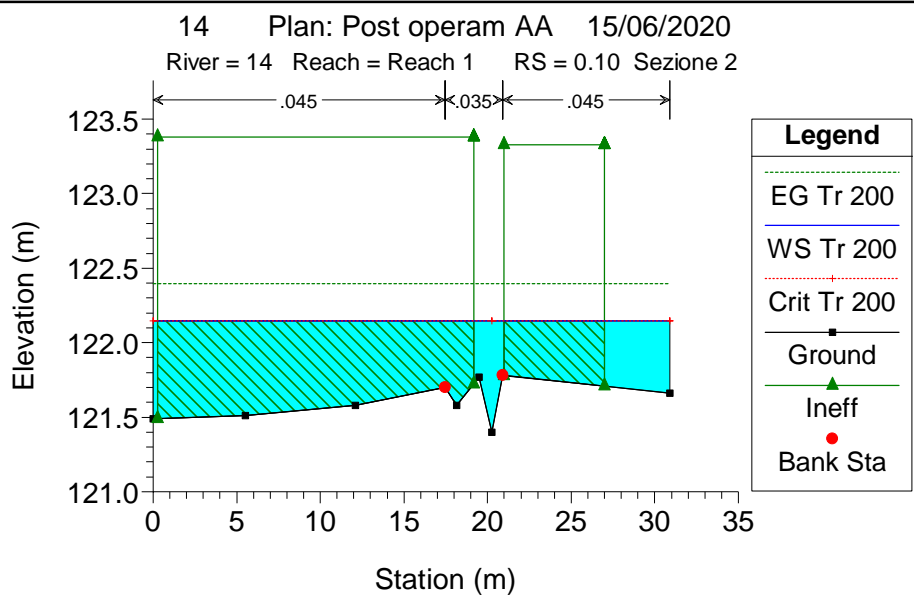
Legend

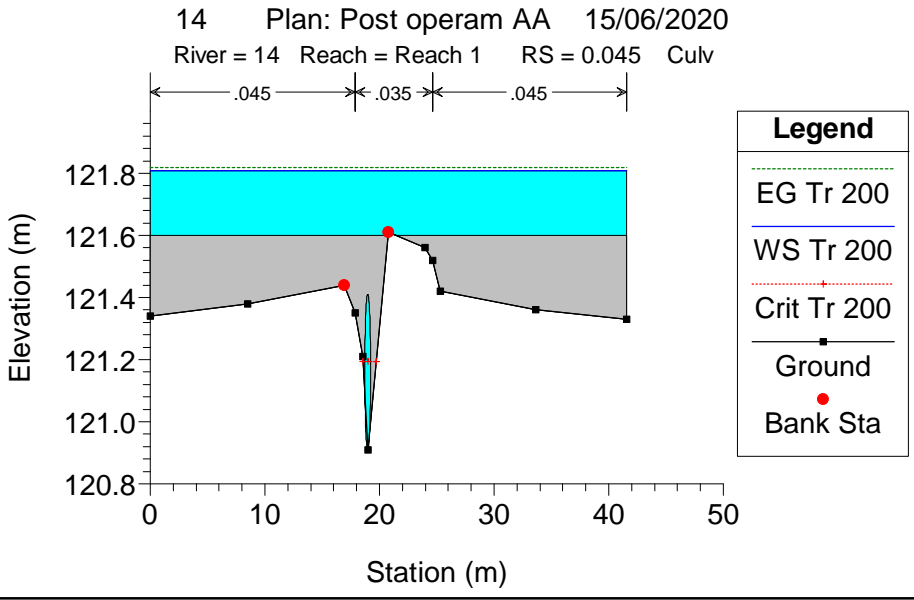
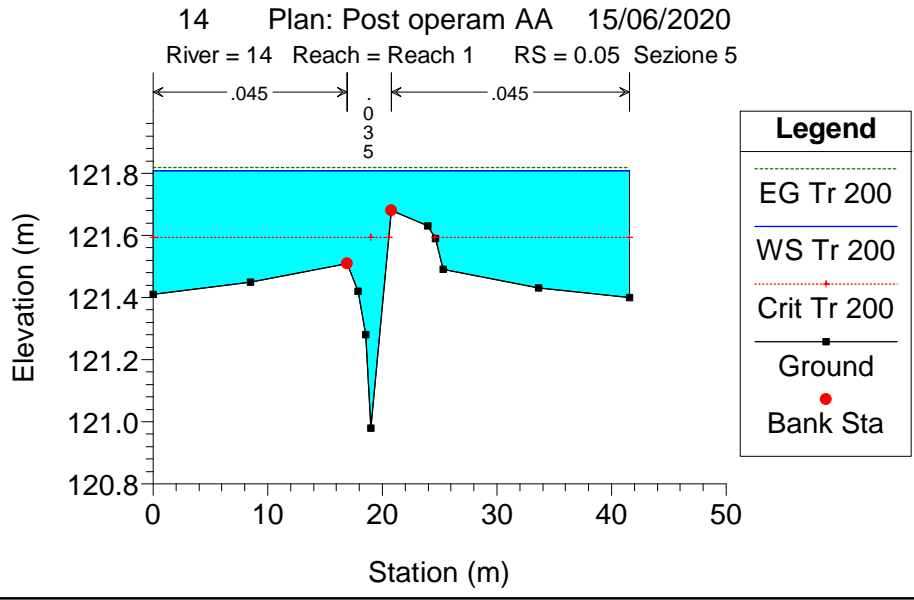
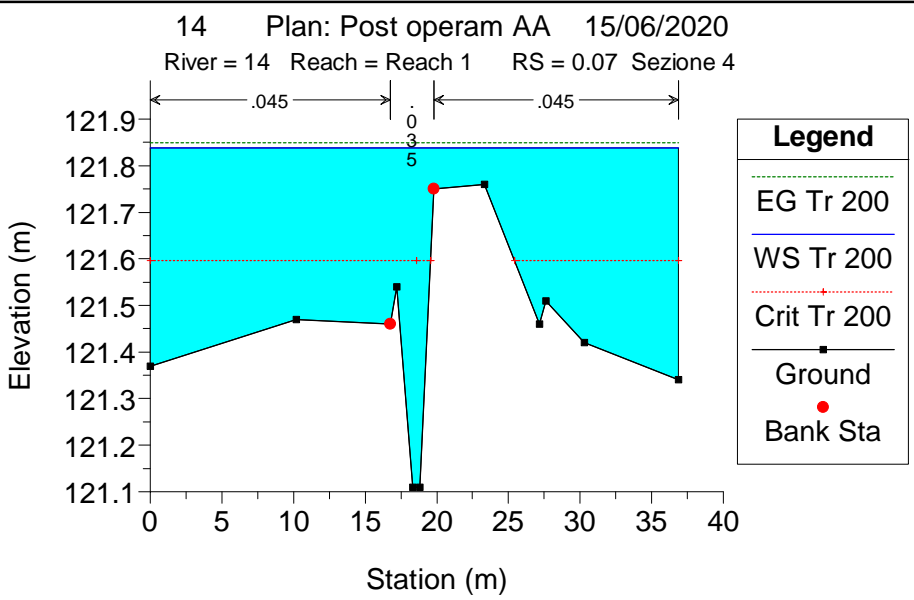
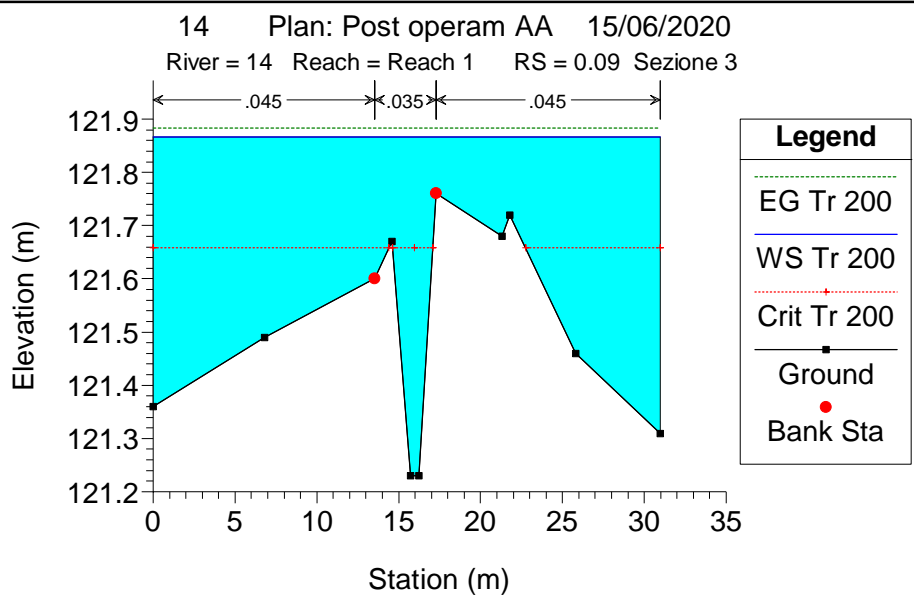
- EG Tr 200
- WS Tr 200
- Crit Tr 200
- Ground

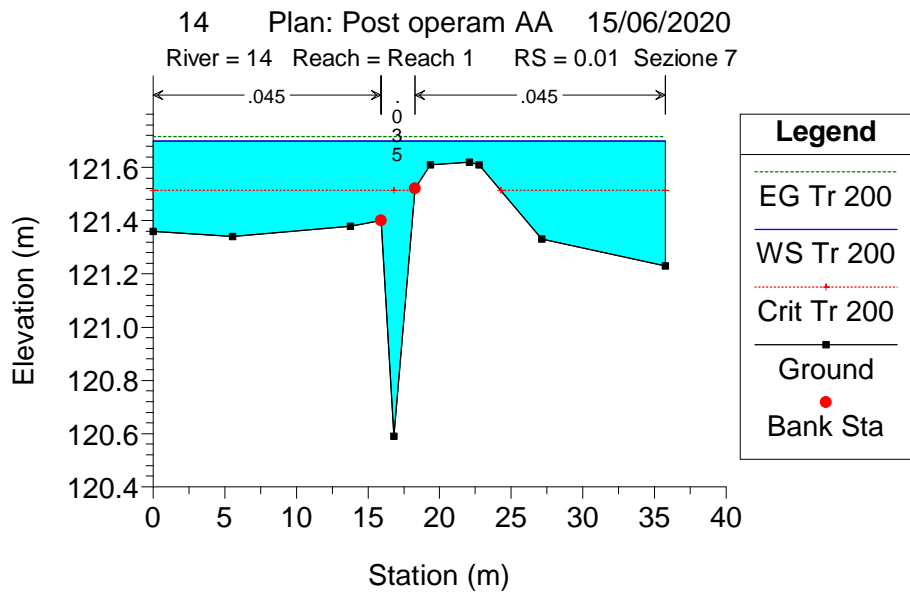
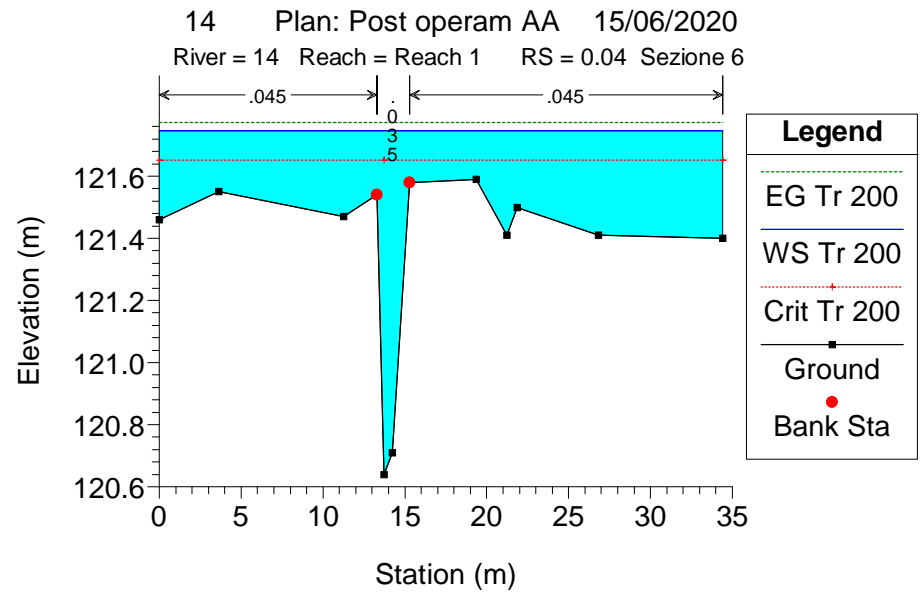
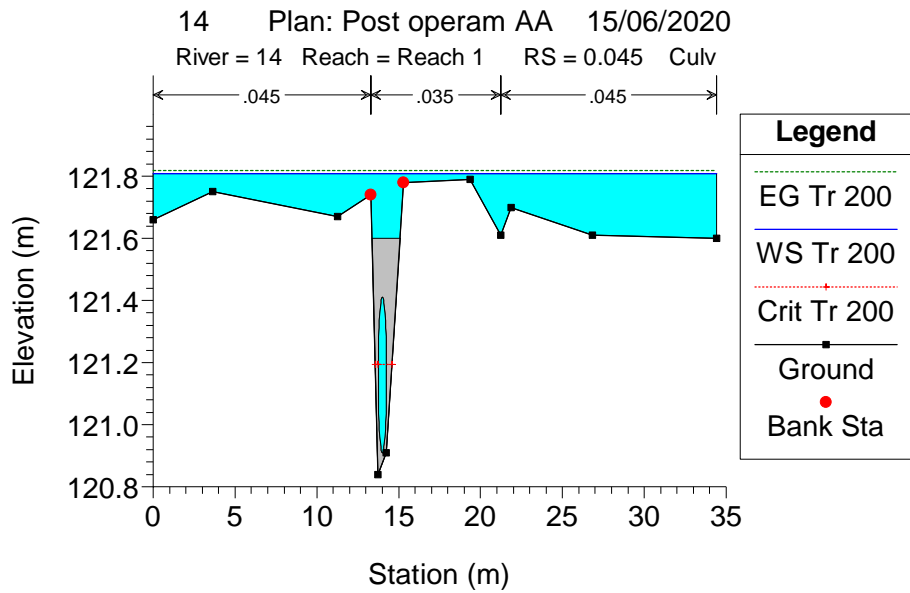








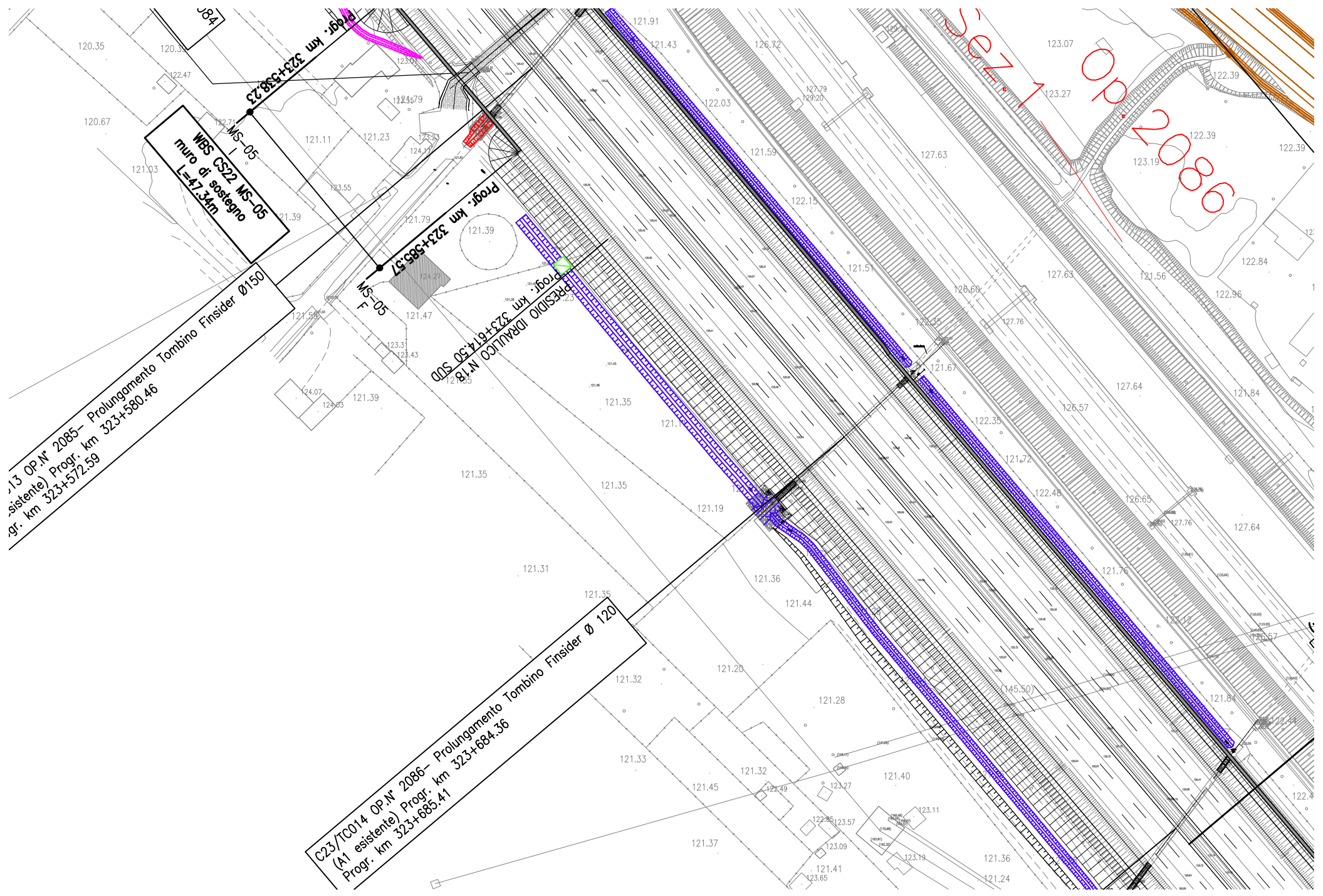




OPERA N. 2086

COMPLUVIO

POST OPERAM



WBS CS22 MS-05
muro di sostegno
L=17.34m

13 OP.N° 2085 - Prolungamento Tombino Finsider Ø150
sistente) Progr. km 323+572.59
gr. km 323+580.46

C23/TC014 OP.N° 2086 - Prolungamento Tombino Finsider Ø 120
(A1 esistente) Progr. km 323+685.41
Progr. km 323+684.36

Progr. km 323+538.23
MS-05
Progr. km 323+585.57
MS-05
PRESIDIO IRRALICO N° 18 SUD
Progr. km 323+674.50 SUD

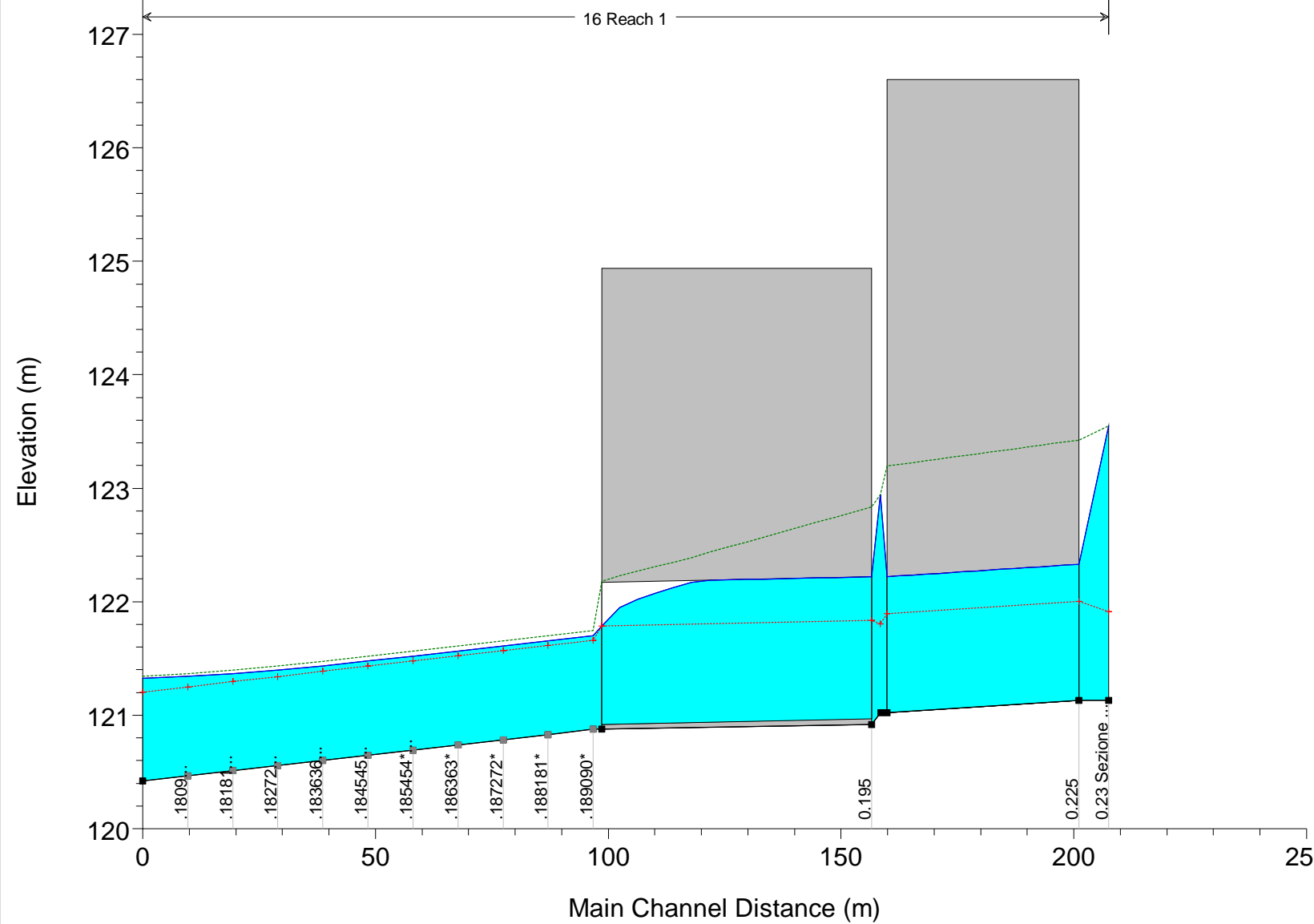
SENSE
Op. 2086

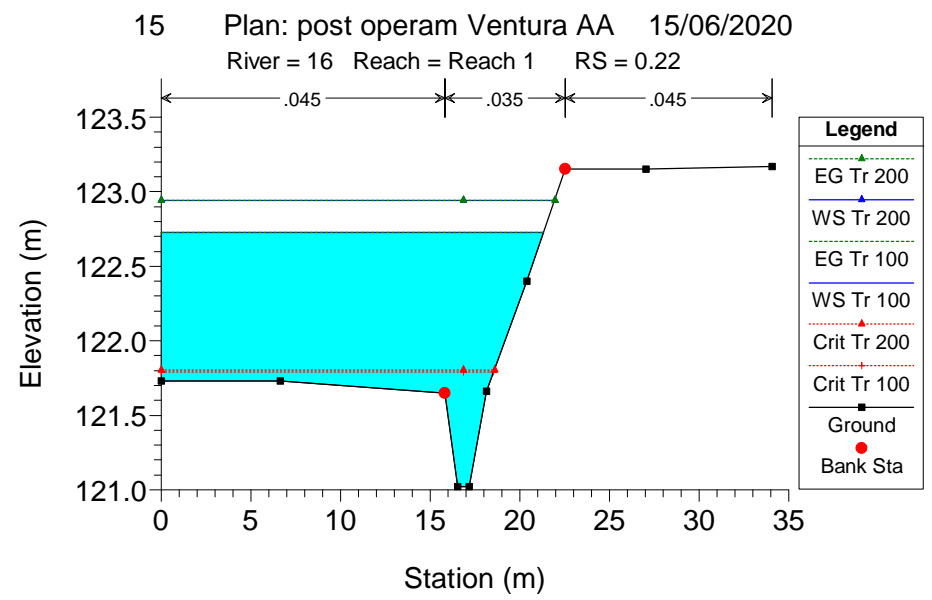
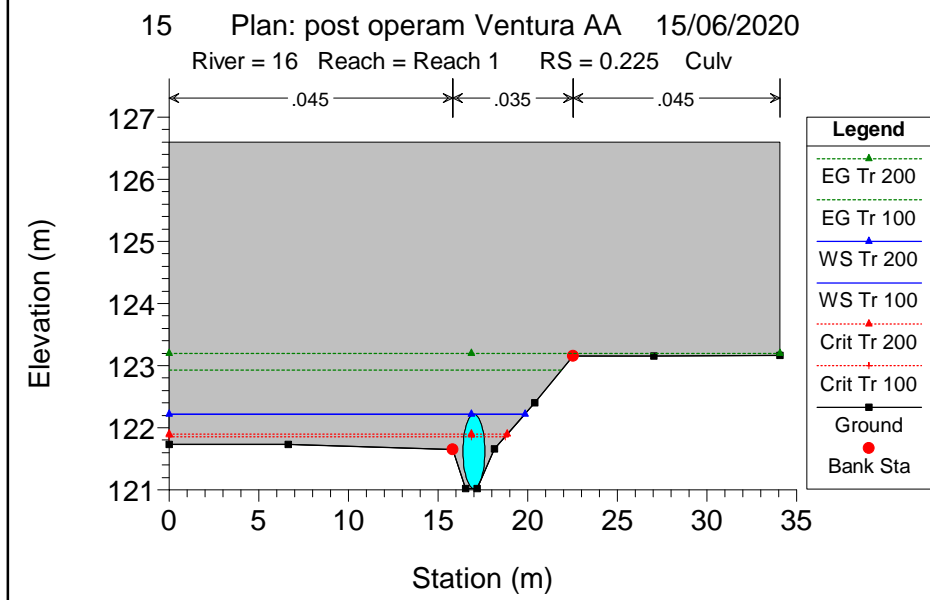
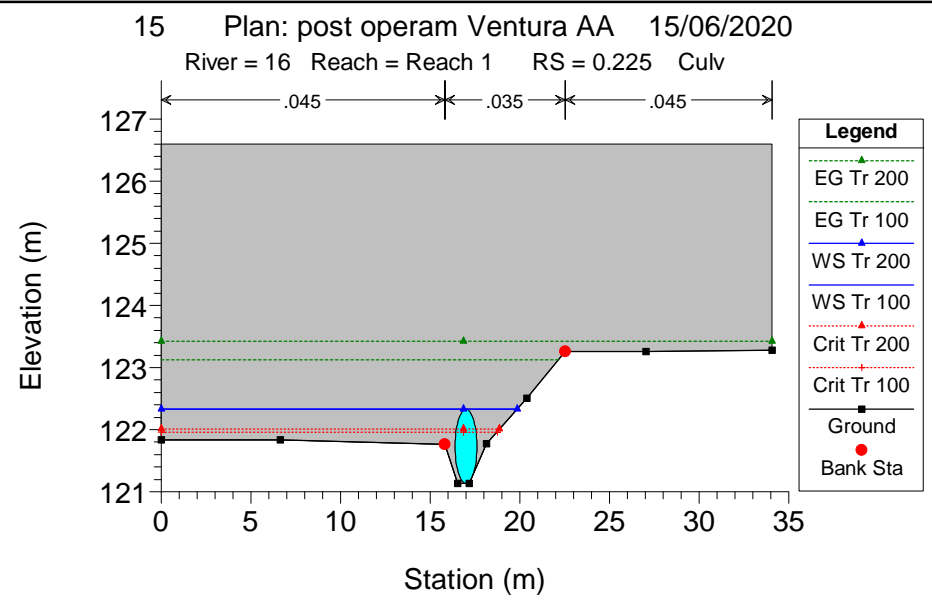
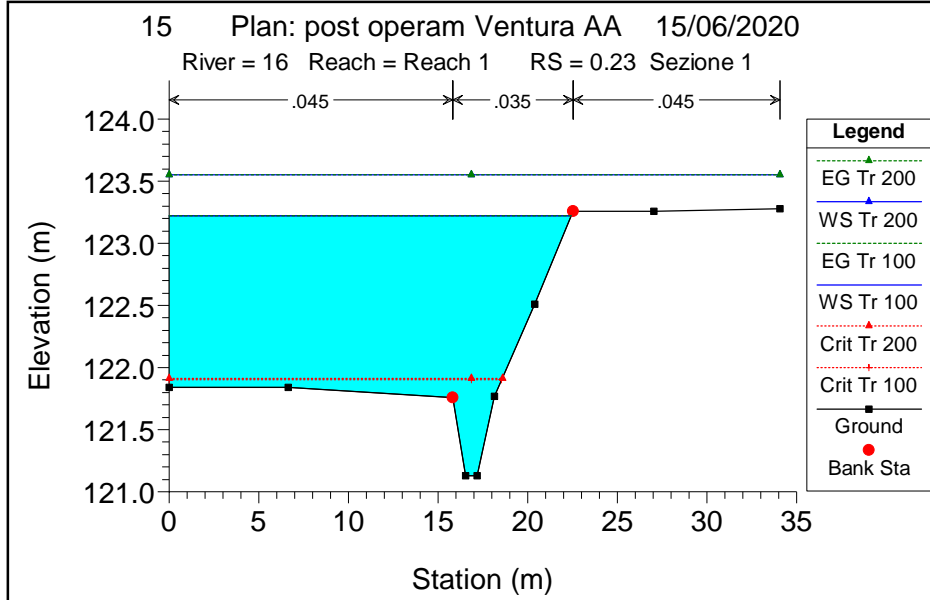
HEC-RAS Plan: POV River: 16 Reach: Reach 1 Profile: Tr 200

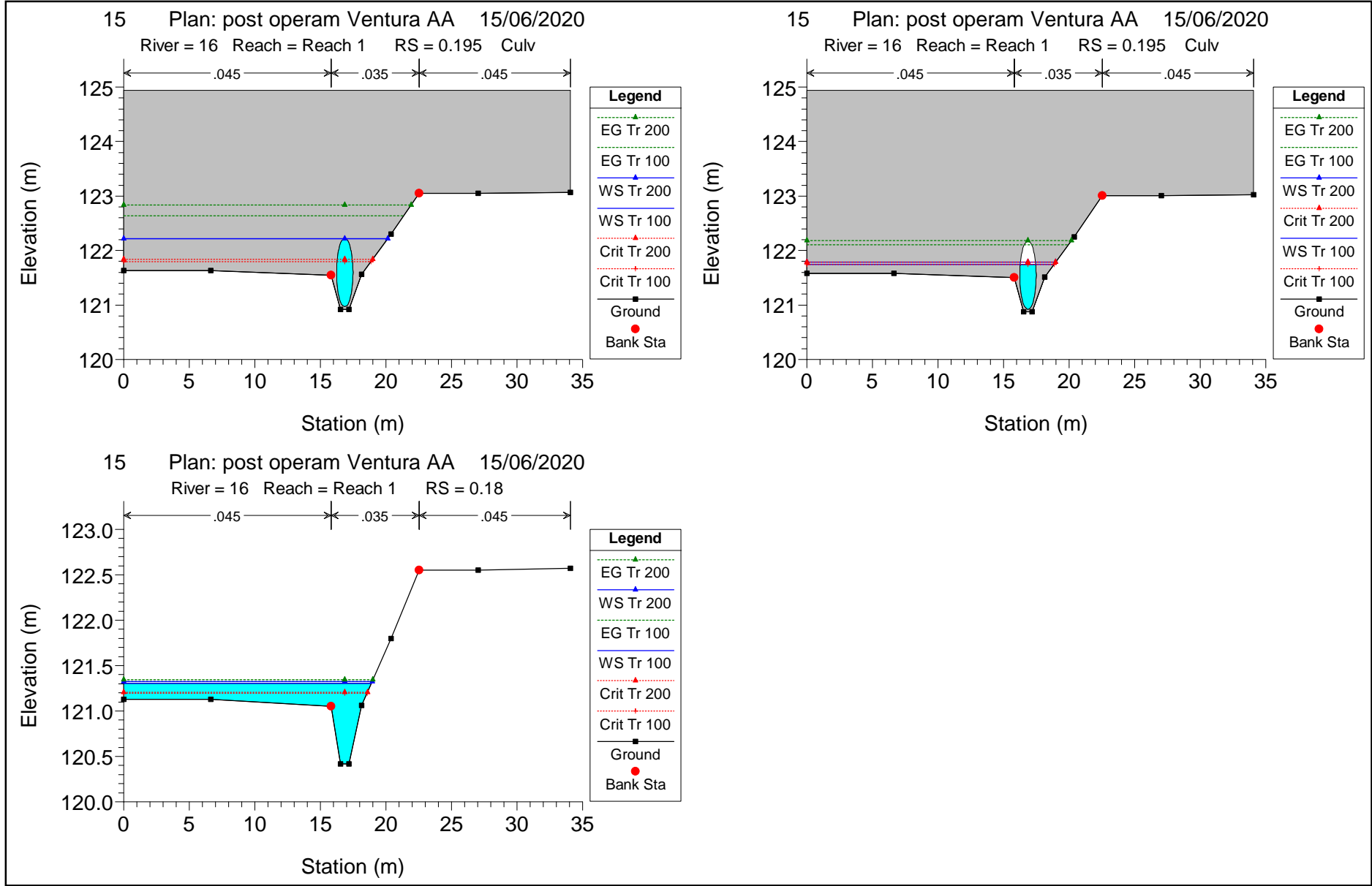
Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach 1	0.23 Sezione 1	Tr 200	2.52	121.13	123.55	121.91	123.55	0.000005	0.07	40.44	34.07	0.02
Reach 1	0.225		Culvert									
Reach 1	0.22	Tr 200	2.52	121.02	122.94	121.80	122.94	0.000015	0.11	25.97	21.95	0.03
Reach 1	0.195		Culvert									
Reach 1	0.18	Tr 200	2.52	120.42	121.32	121.20	121.34	0.002001	0.77	5.12	18.96	0.34

Legend

- EG Tr 200
- WS Tr 200
- Crit Tr 200
- Ground



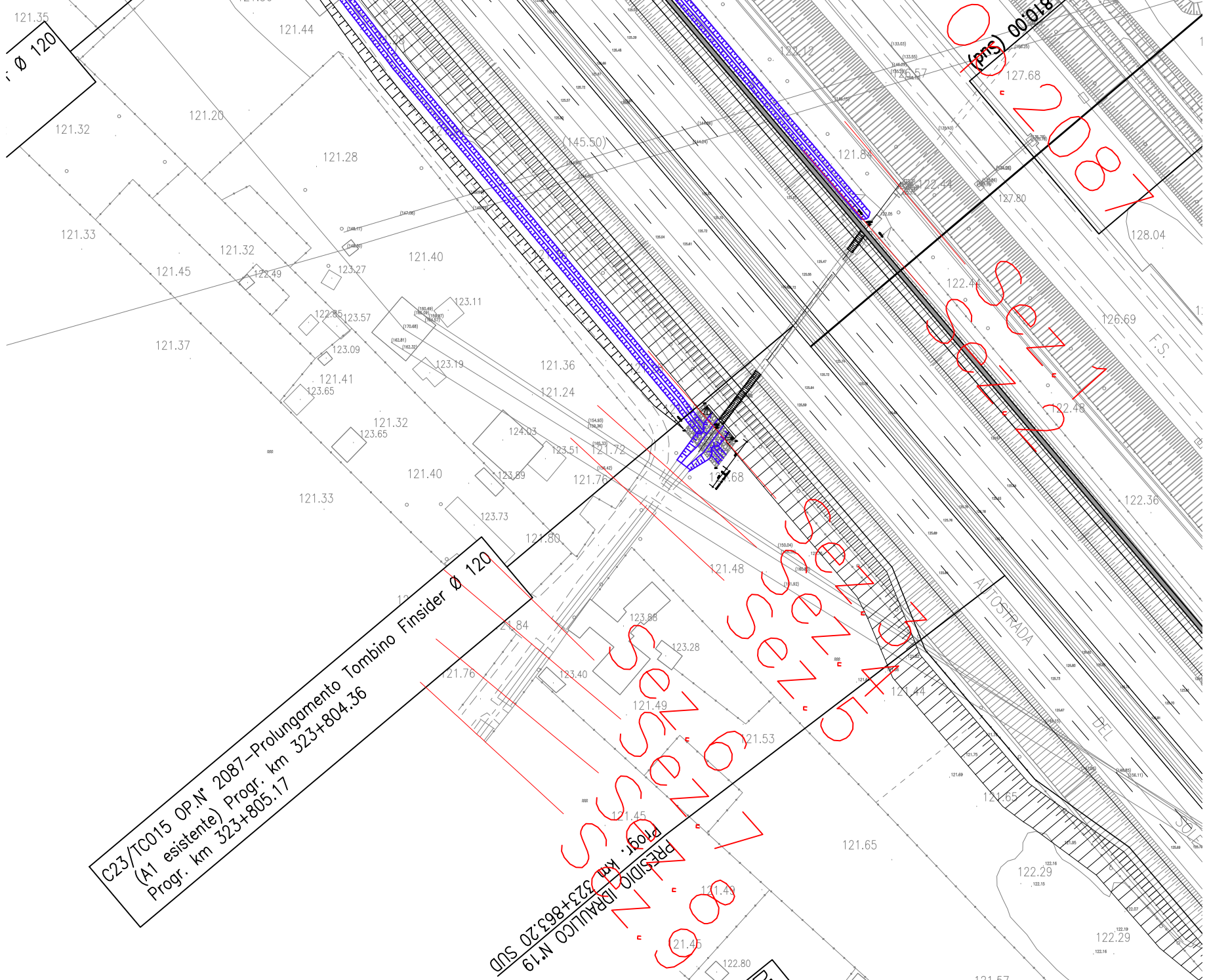




OPERA N. 2087

COMPLUVIO

POST OPERAM



C23/TC015 OP. N° 2087 - Prolongamento Tombino Finsider Ø 120
(A1 existente) Progr. km 323+804.36
Progr. km 323+805.17

PRESIDIO AERIAL N.º 19
Progr. km 323+803.20 SUD

(ms) 00/018

PROYECTO ASESORIA CONSULTOR

PROYECTO ASESORIA CONSULTOR

HEC-RAS Plan: PO River: 16 Reach: Reach 1 Profile: Tr 200

Reach	River Sta		Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Reach 1	0.20	Sezione 1	Tr 200	1.46	121.38	122.49	121.85	122.49	0.000040	0.13	13.79	24.00	0.05
Reach 1	0.15			Culvert									
Reach 1	0.14	Sezione 2	Tr 200	1.46	121.05	122.28	121.57	122.29	0.000471	0.38	7.29	33.12	0.11
Reach 1	0.1			Culvert									
Reach 1	0.09	Sezione 4	Tr 200	1.46	120.63	121.92	121.10	121.92	0.000215	0.31	7.00	24.34	0.11
Reach 1	0.08	Sezione 5	Tr 200	1.46	120.61	121.92	121.10	121.92	0.000200	0.30	8.53	37.35	0.10
Reach 1	0.075			Culvert									
Reach 1	0.07	Sezione 6	Tr 200	1.46	120.61	121.87	121.11	121.88	0.000209	0.29	9.09	37.11	0.10
Reach 1	0.041	Sezione 7	Tr 200	1.46	120.54	121.84	121.17	121.86	0.001889	0.76	2.88	19.91	0.25
Reach 1	0.0405			Culvert									
Reach 1	0.04	Sezione 8	Tr 200	1.46	120.54	121.73	121.15	121.75	0.001809	0.74	3.08	23.88	0.26
Reach 1	0.03	Sezione 9	Tr 200	1.46	120.53	121.70	121.13	121.73	0.002004	0.79	2.48	21.61	0.28

16 Reach 1

Legend

- EG Tr 200
- WS Tr 200
- Crit Tr 200
- Ground

