



COMUNE DI ZOGNO
Provincia di Bergamo

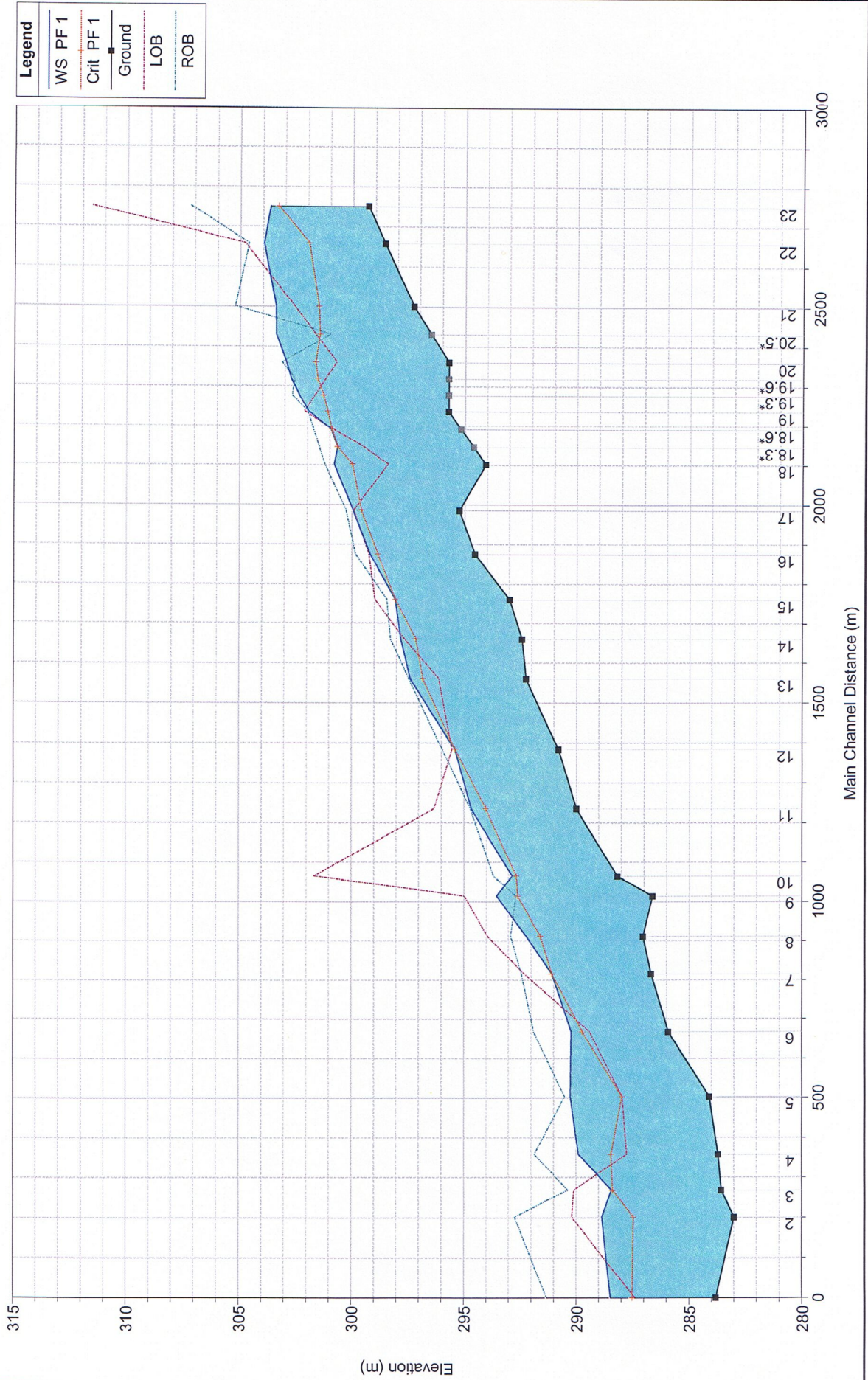


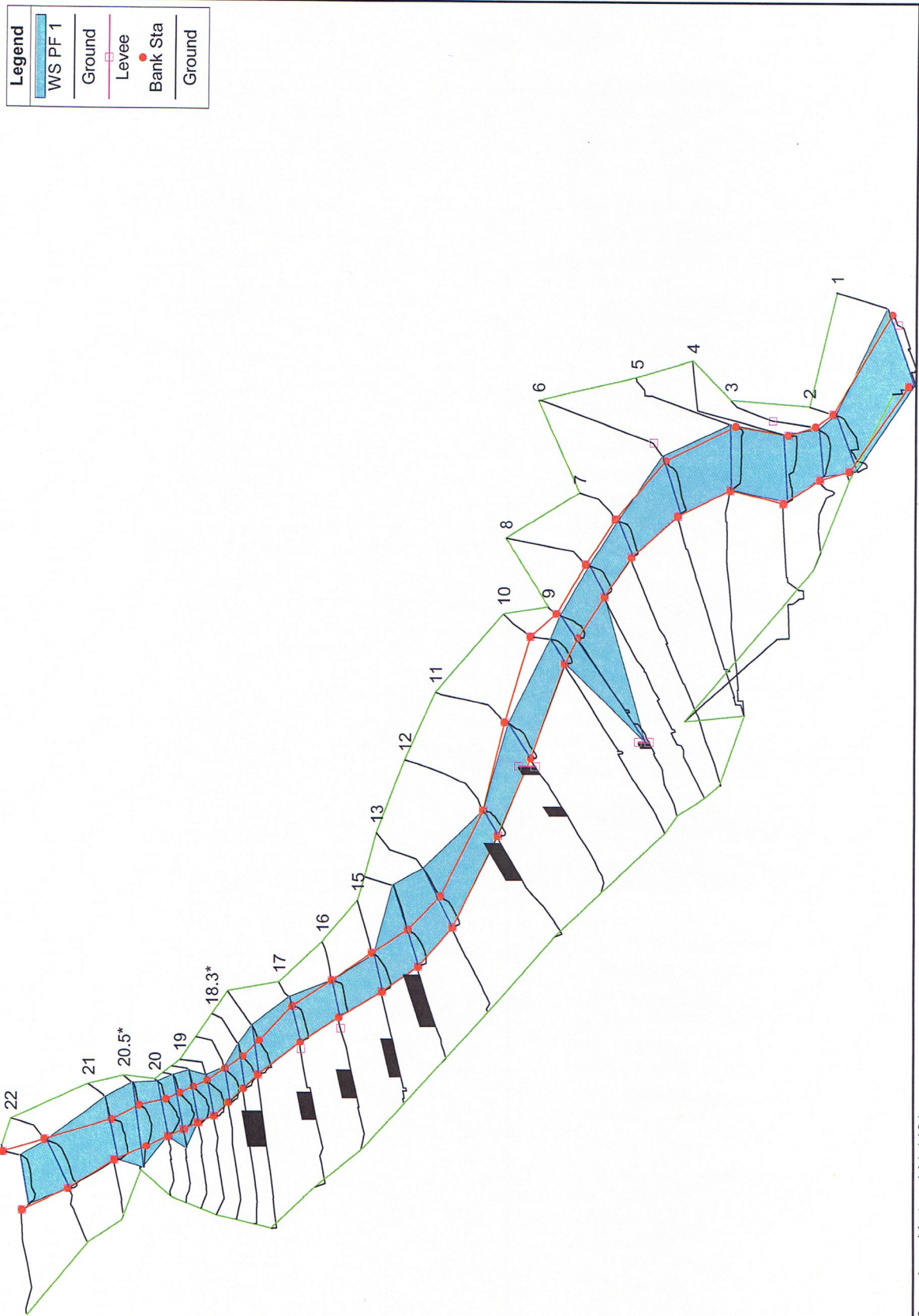
**VALUTAZIONE E ZONAZIONE DELLA PERICOLOSITÀ E DEL RISCHIO
DA ESONDAZIONE NELLE AREE DI FASCIA “B DI PROGETTO” DEL
PAI IN SPONDA DESTRA DEL FIUME BREMBO, ALL’INTERNO DEL
CENTRO EDIFICATO**

ALLEGATO 4: ELABORATI DI CALCOLO HEC-RAS

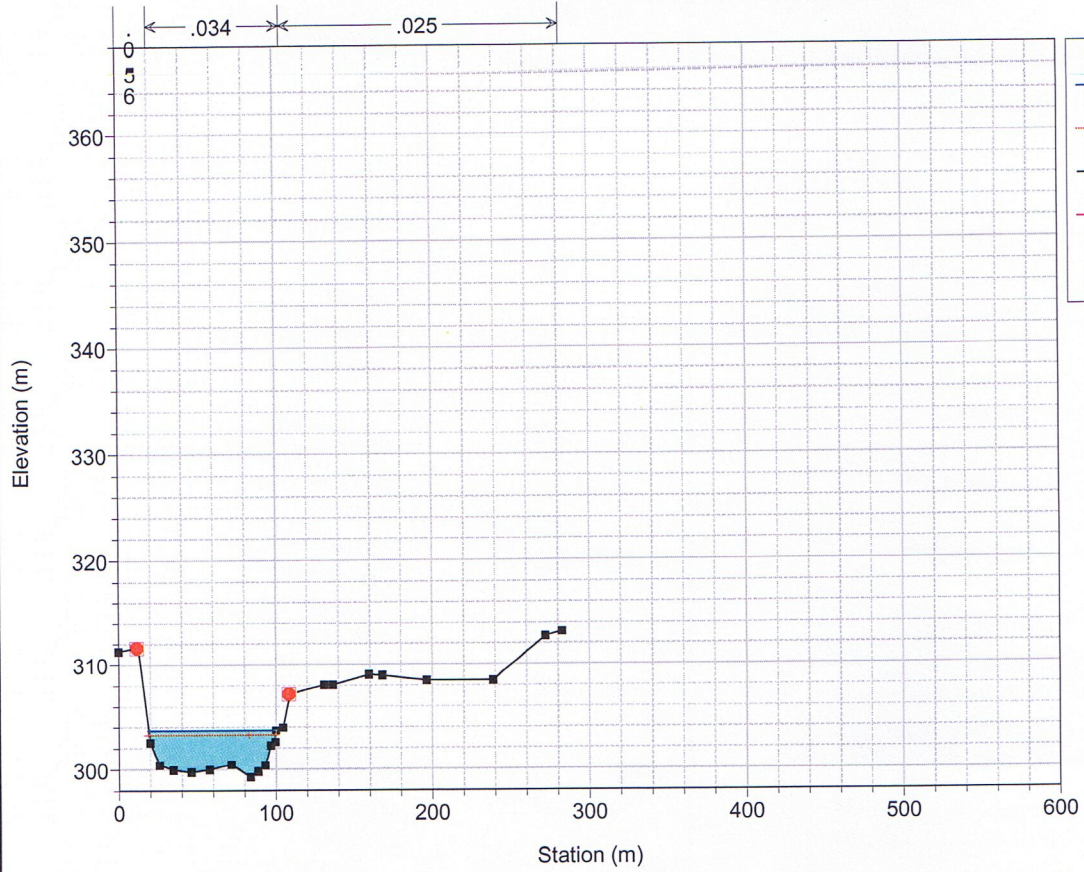
HEC-RAS Plan: PlanDef River: Fiume Brembo Reach: 1 Profile: PF 1

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)	Froude # Chl	Vel Left (m/s)	Vel Right (m/s)	Vel Chnl (m/s)
1	23	PF 1	1354.26	299.32	303.70	303.34	304.93	0.005802	4.91	275.99	0.85			4.91
1	22	PF 1	1357.56	298.57	303.99	301.97	304.44	0.001561	2.99	453.55	0.44			2.99
1	21	PF 1	1357.56	297.27	303.43	301.53	304.13	0.002283	3.71	383.99	0.52	0.59		3.71
1	20.5*	PF 1	1357.56	296.50	303.42	301.49	303.95	0.001433	3.37	465.41	0.46	0.85	1.80	3.37
1	20	PF 1	1362.23	295.72	302.97	301.67	303.79	0.002719	4.12	367.67	0.59	1.39		4.12
1	19.6*	PF 1	1362.23	295.72	302.75	301.57	303.66	0.002835	4.31	351.28	0.62	1.12	0.96	4.31
1	19.3*	PF 1	1362.23	295.72	302.40	301.31	303.51	0.003617	4.70	303.87	0.69	0.77		4.70
1	19	PF 1	1362.23	295.72	301.97	301.12	303.30	0.005582	5.12	265.90	0.76	0.05		5.12
1	18.6*	PF 1	1362.23	295.17	300.98	300.94	302.94	0.008034	6.21	219.39	0.99	0.15		6.21
1	18.3*	PF 1	1362.23	294.61	300.69	300.69	302.58	0.007196	6.13	233.01	0.95	1.14		6.13
1	18	PF 1	1366.76	294.06	300.84	300.02	302.03	0.003253	4.93	303.26	0.72	1.28		4.93
1	17	PF 1	1370.30	295.23	299.99	299.61	301.50	0.006055	5.46	256.04	0.86	0.68		5.46
1	16	PF 1	1370.30	294.54	299.23	298.88	300.81	0.006283	5.57	246.16	0.88			5.57
1	15	PF 1	1374.50	292.98	298.09	298.09	299.93	0.008892	6.01	228.81	1.00			6.01
1	14	PF 1	1374.50	292.43	297.84	297.18	299.02	0.005279	4.89	321.52	0.76	0.94		4.89
1	13	PF 1	1374.50	292.25	297.42	296.86	298.50	0.004572	4.71	332.56	0.72	1.15		4.71
1	12	PF 1	1380.20	290.80	295.43	295.43	297.38	0.007676	6.19	222.91	1.00			6.19
1	11	PF 1	1380.20	290.00	294.70	294.05	295.77	0.005318	4.59	300.64	0.76			4.59
1	10	PF 1	1385.60	288.18	292.88	292.70	294.66	0.007053	5.91	234.29	0.94			5.91
1	9	PF 1	1389.30	286.62	293.57	292.64	294.08	0.002525	3.53	484.65	0.50		1.96	3.53
1	8	PF 1	1389.30	287.04	292.26	291.63	293.61	0.006248	5.14	270.12	0.80			5.14
1	7	PF 1	1392.60	286.69	291.13	291.13	292.85	0.009139	5.81	239.56	1.00			5.81
1	6	PF 1	1392.60	285.92	290.26	289.77	291.27	0.005453	4.45	315.39	0.78	0.72		4.45
1	5	PF 1	1397.80	284.10	290.31	288.01	290.73	0.001183	2.88	487.58	0.41	0.56		2.88
1	4	PF 1	1397.80	283.70	289.94	288.49	290.49	0.002137	3.29	426.62	0.52	0.67		3.29
1	3	PF 1	1397.80	283.57	288.48	288.43	290.06	0.007640	5.57	251.07	0.98			5.57
1	2	PF 1	1404.40	283.00	288.90	287.50	289.48	0.002703	3.39	413.81	0.55			3.39
1	1	PF 1	1408.60	283.81	288.52	287.56	289.08	0.001490	3.33	428.01	0.59	0.59		3.33





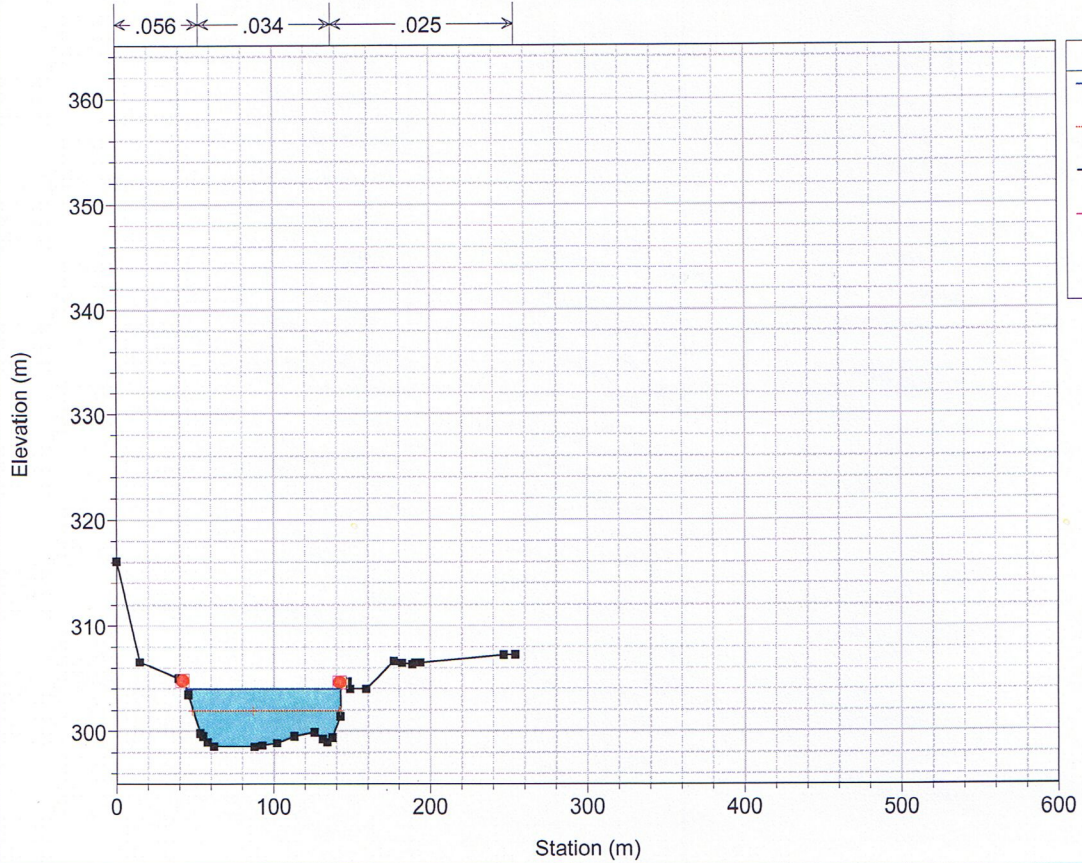
ZognoHecRasDef Plan: PlanDEF 01 05/12/2013
RS = 23



Legend

- WS PF 1
- Crit PF 1
- Ground
- Levee
- Bank Sta

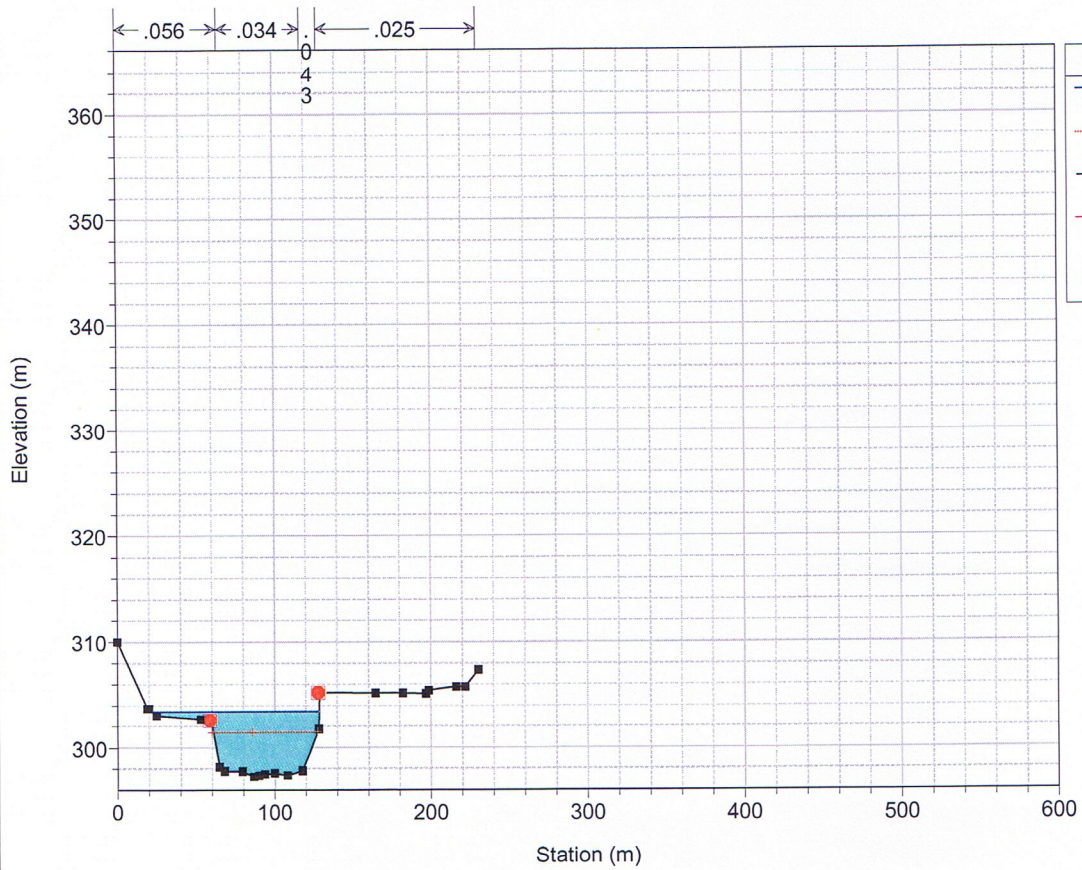
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RS = 22



Legend

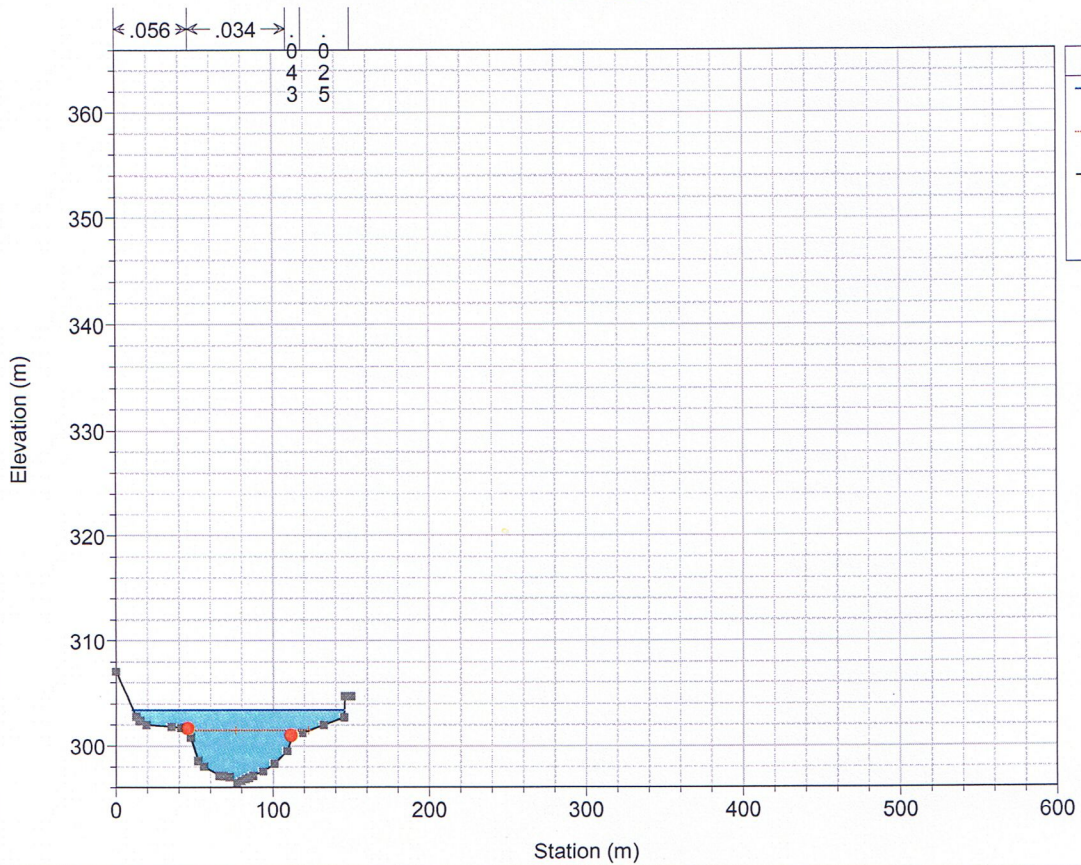
- WS PF 1
- Crit PF 1
- Ground
- Levee
- Bank Sta

ZognoHecRasDef Plan: PlanDEF 01 05/12/2013
RS = 21



Legend	
WS PF 1	—
Crit PF 1	- - -
Ground	■
Levee	□
Bank Sta	●

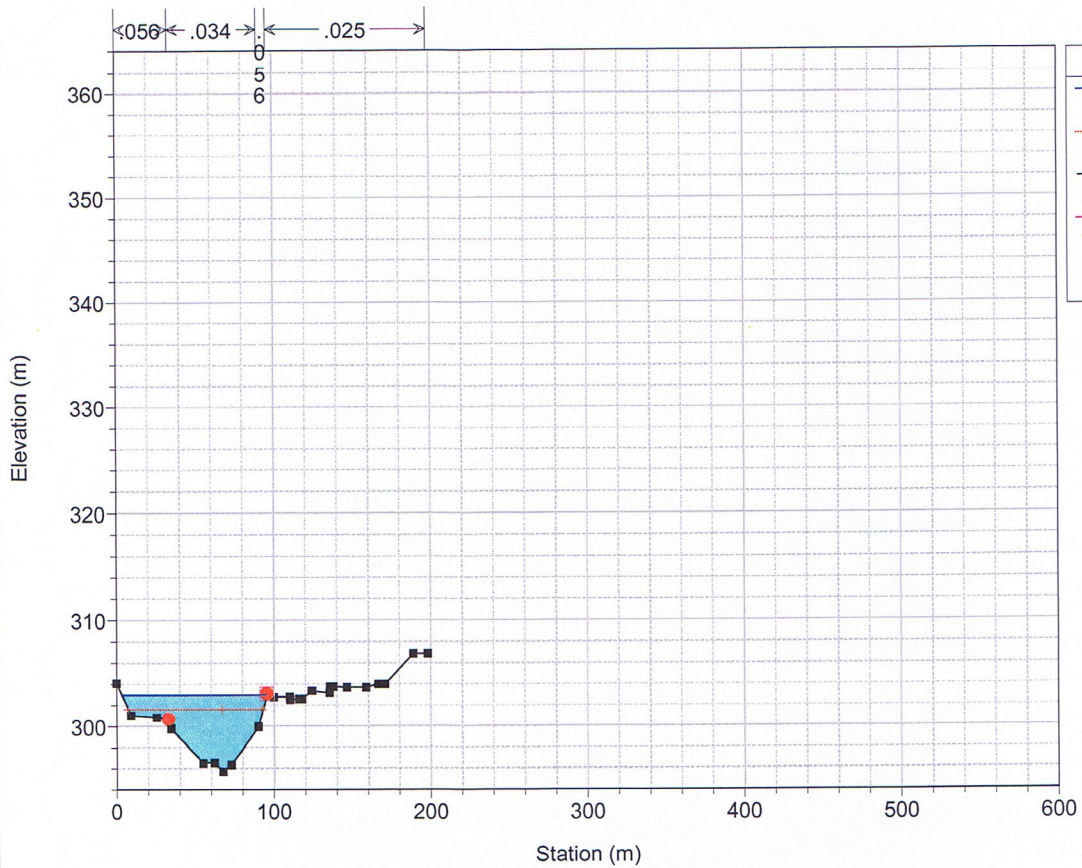
ZognoHecRasDef Plan: PlanDEF 01 05/12/2013
RS = 20.5*



Legend	
WS PF 1	—
Crit PF 1	- - -
Ground	■
Bank Sta	●

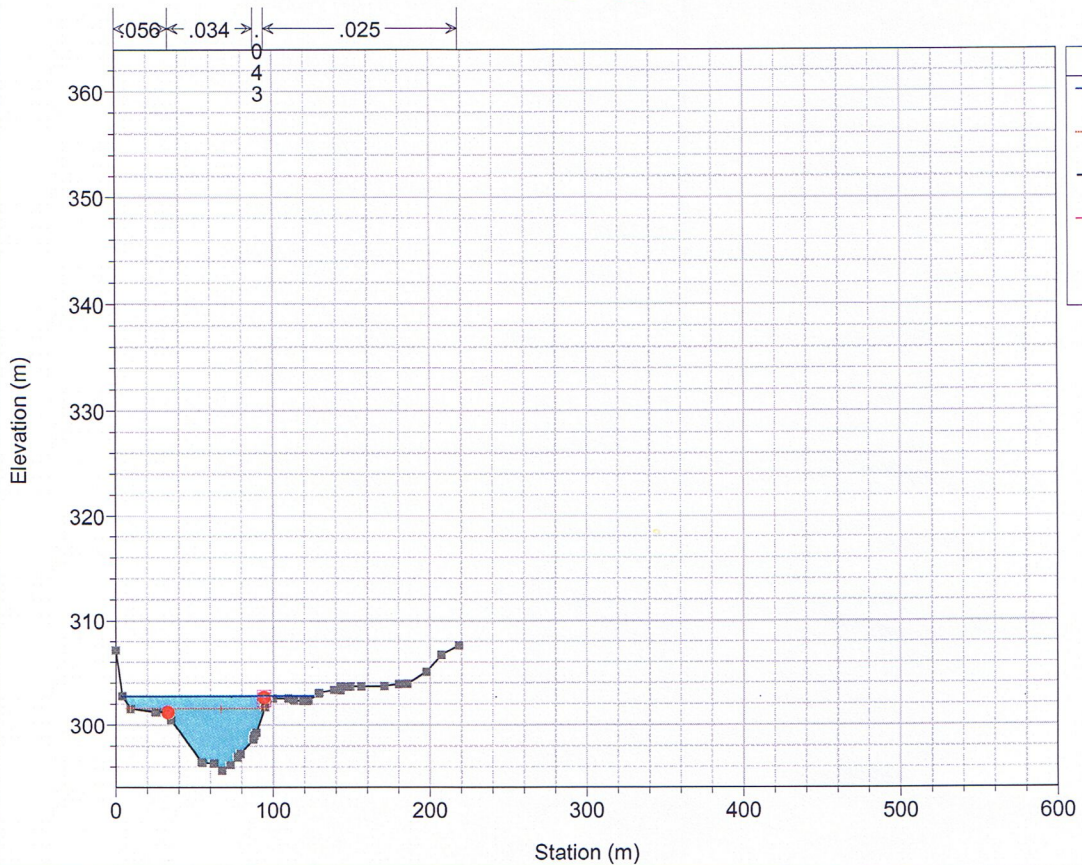
1 cm Horiz. = 48.20826 m 1 cm Vert. = 7.208123 m

ZognoHecRasDef Plan: PlanDEF 01 05/12/2013
RS = 20



Legend	
WS PF 1	—
Crit PF 1	- - -
Ground	■
Levee	—
Bank Sta	●

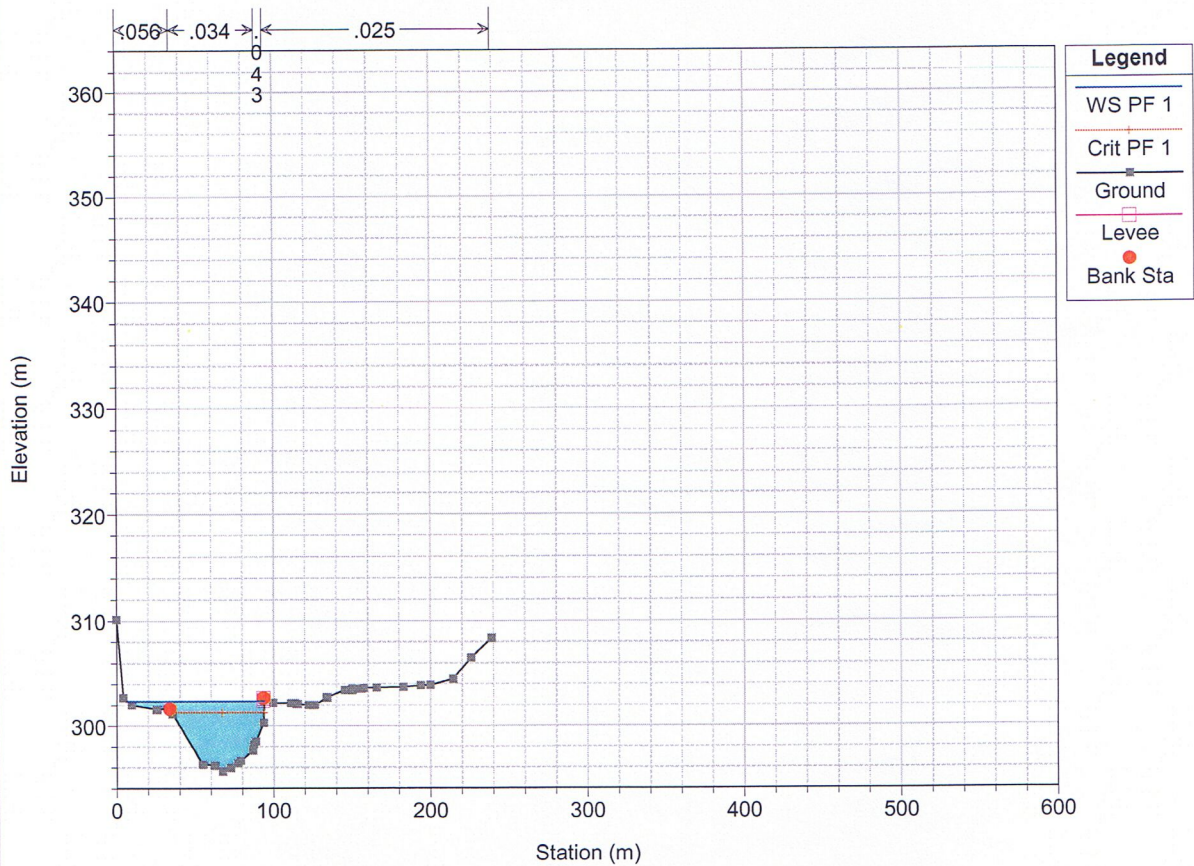
ZognoHecRasDef Plan: PlanDEF 01 05/12/2013
RS = 19.6*



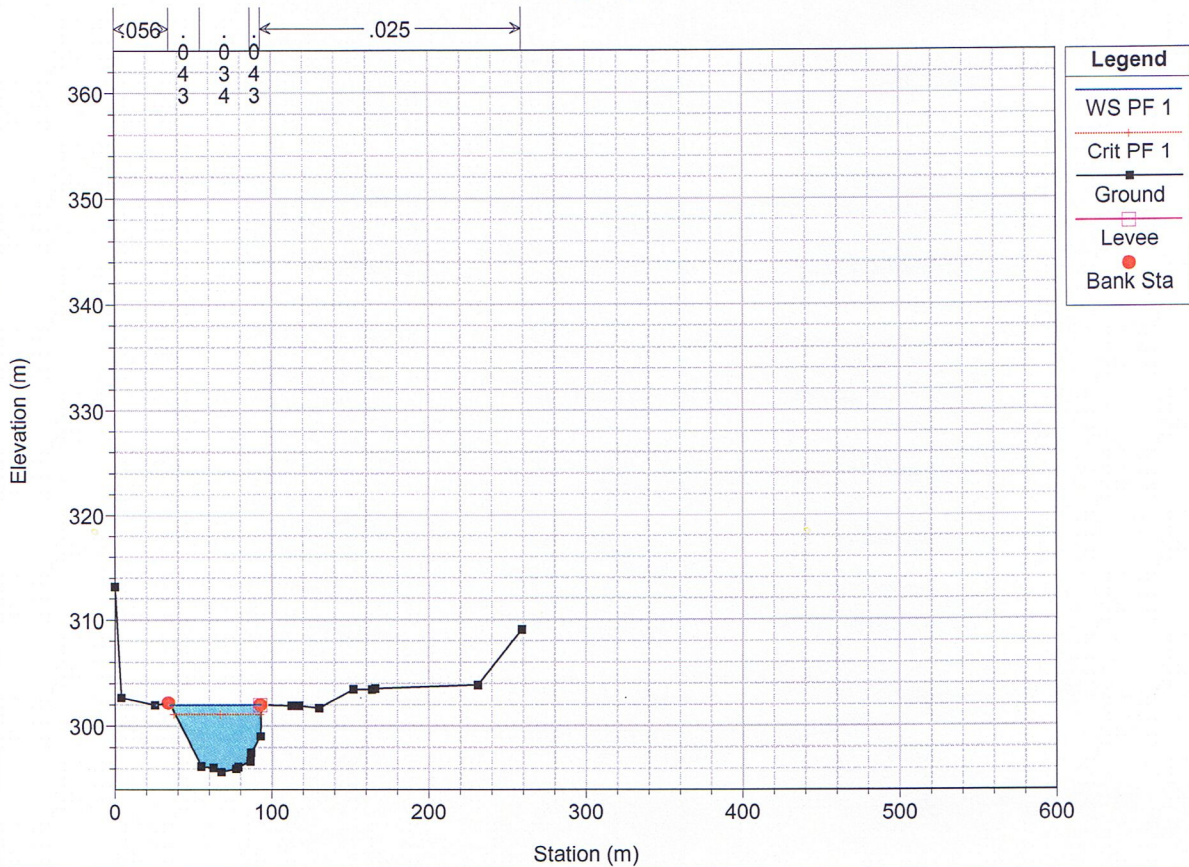
Legend	
WS PF 1	—
Crit PF 1	- - -
Ground	■
Levee	—
Bank Sta	●

1 cm Horiz. = 48.20826 m 1 cm Vert. = 7.208123 m

ZognoHecRasDef Plan: PlanDEF 01 05/12/2013
RS = 19.3*

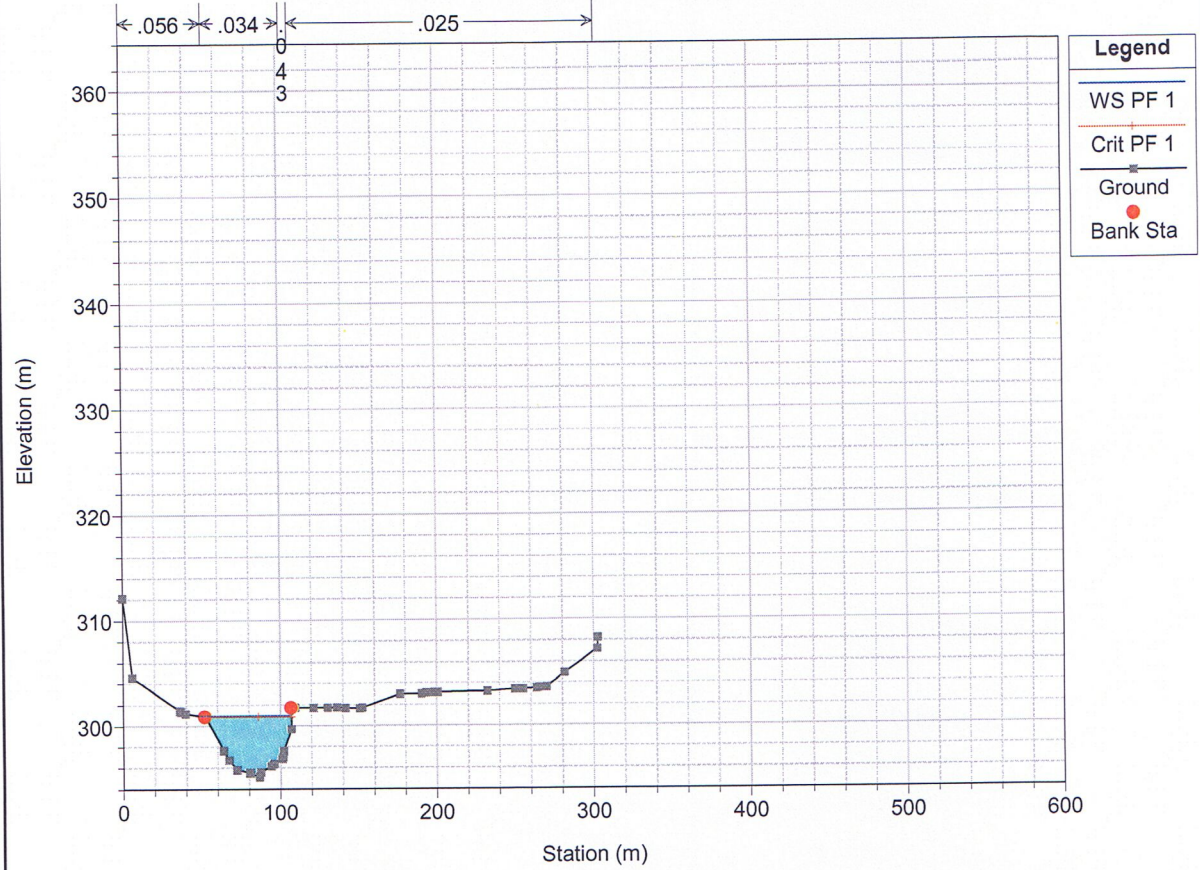


ZognoHecRasDef Plan: PlanDEF 01 05/12/2013
RS = 19

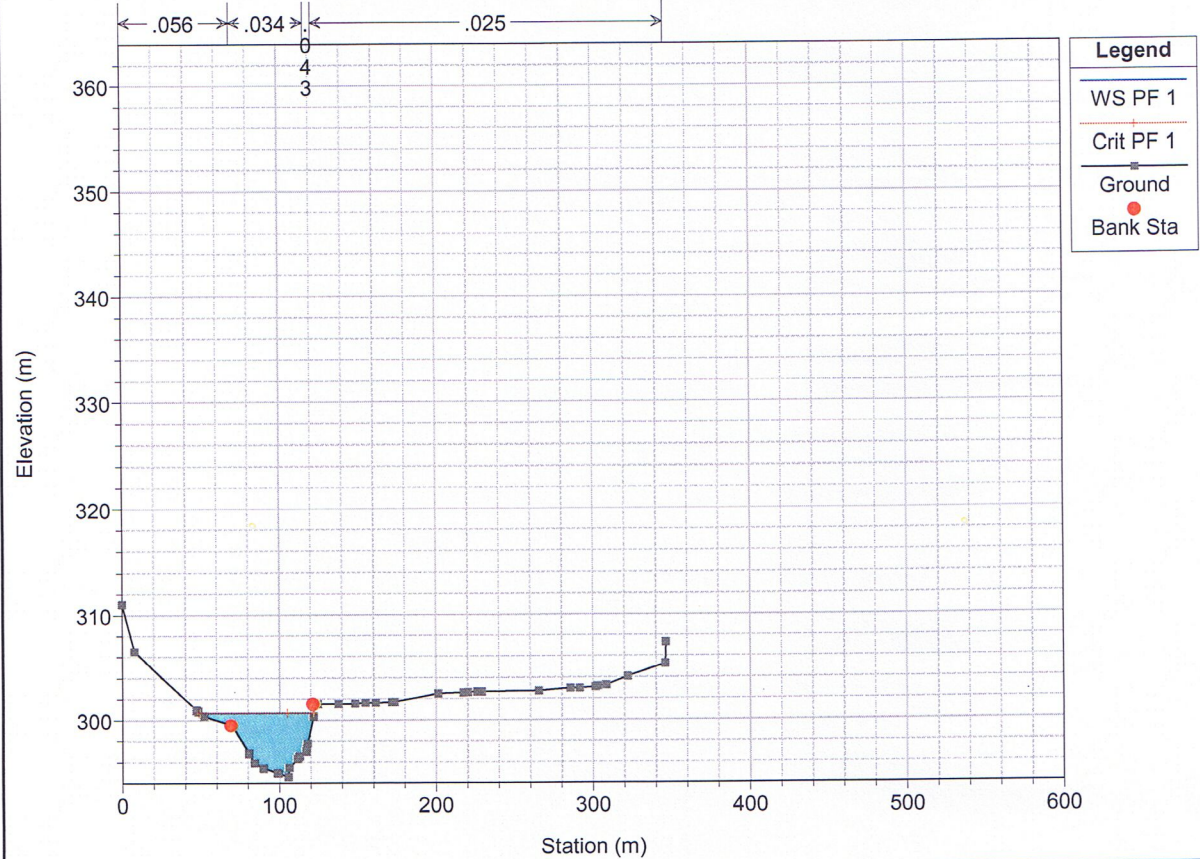


1 cm Horiz. = 48.20826 m 1 cm Vert. = 7.208123 m

ZognoHecRasDef Plan: PlanDEF 01 05/12/2013
RS = 18.6*

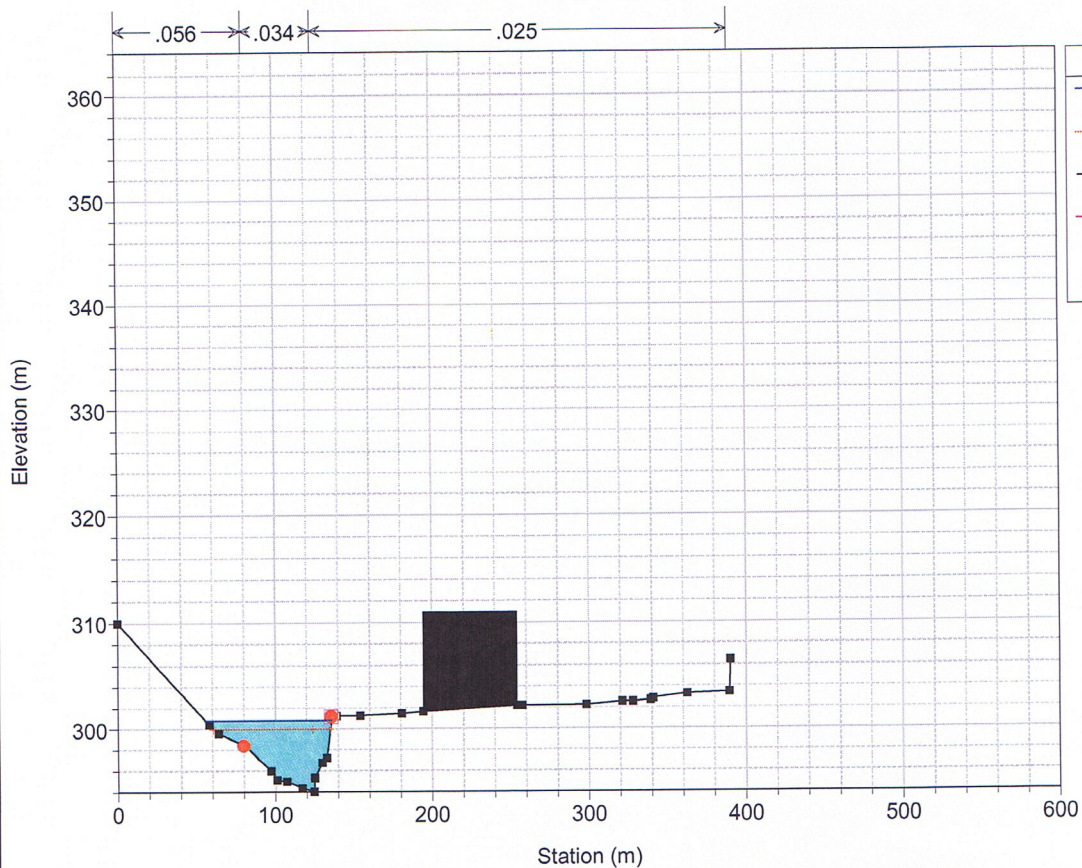


ZognoHecRasDef Plan: PlanDEF 01 05/12/2013
RS = 18.3*



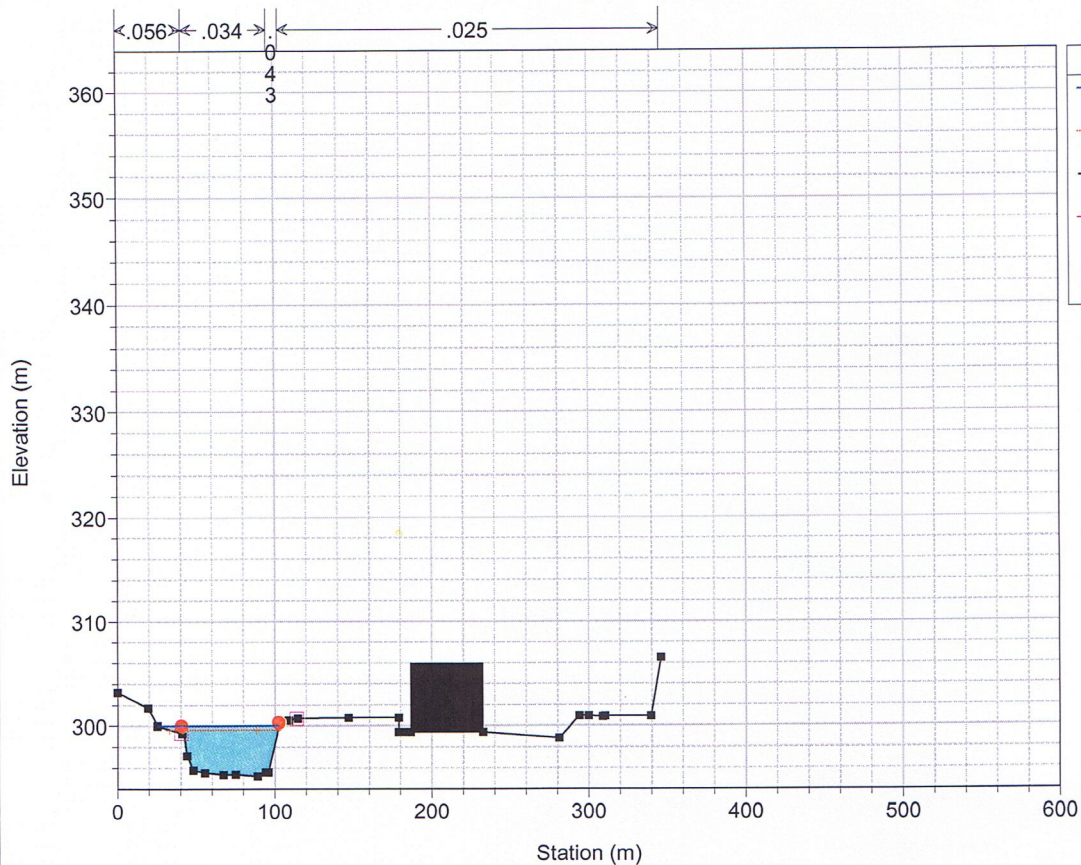
1 cm Horiz. = 48.20826 m 1 cm Vert. = 7.208123 m

ZognoHecRasDef Plan: PlanDEF 01 05/12/2013
RS = 18



Legend	
WS PF 1	Blue line
Crit PF 1	Red line
Ground	Black line with square markers
Levee	Black rectangle
Bank Sta	Red dot

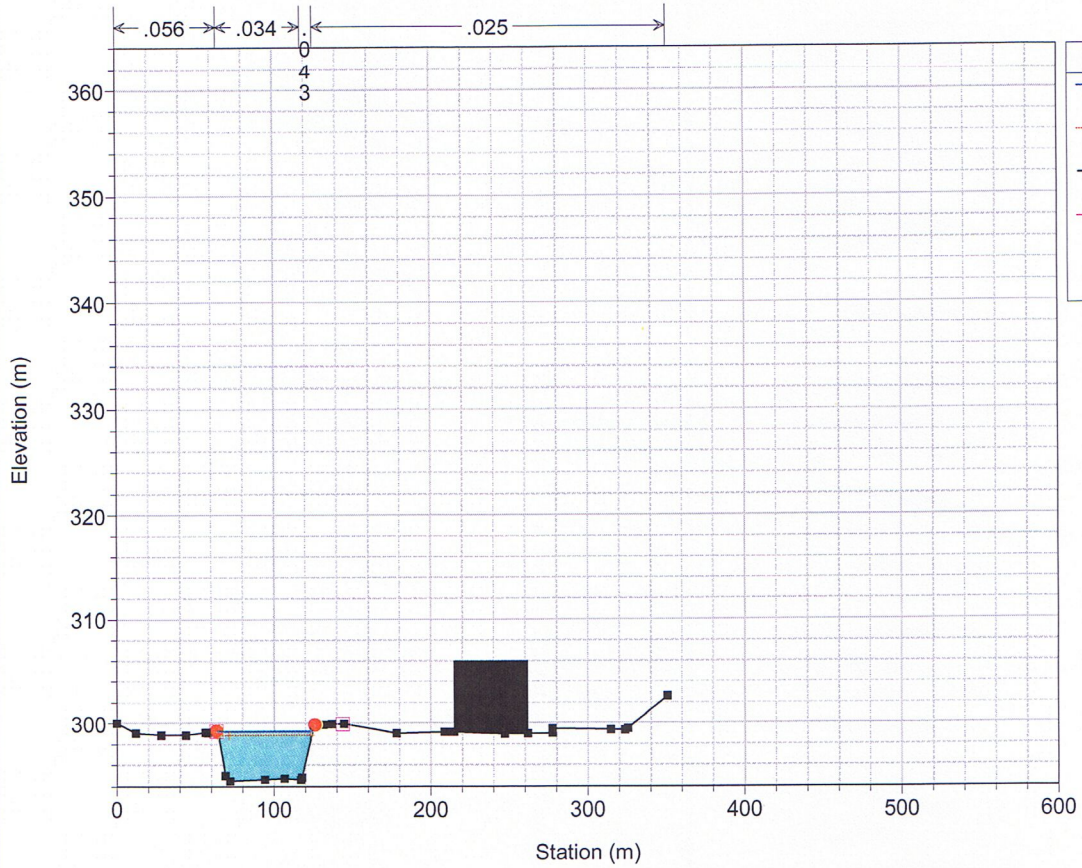
ZognoHecRasDef Plan: PlanDEF 01 05/12/2013
RS = 17



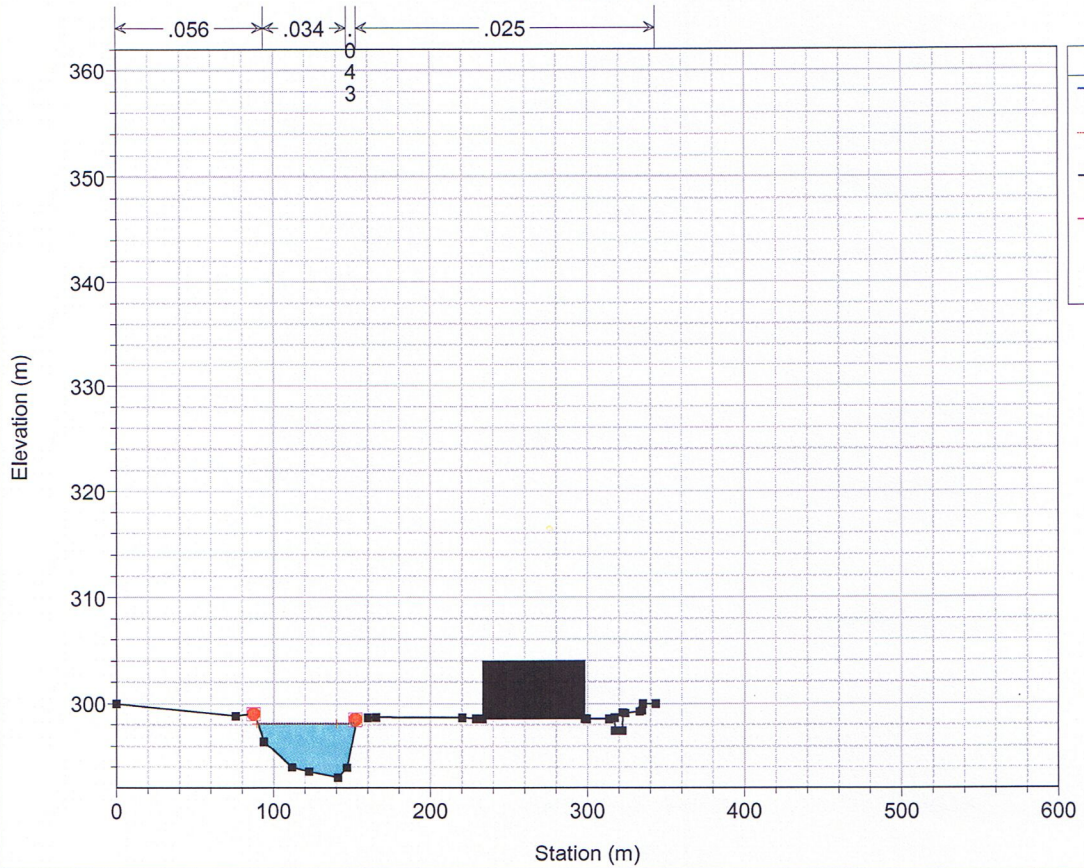
Legend	
WS PF 1	Blue line
Crit PF 1	Red line
Ground	Black line with square markers
Levee	Black rectangle
Bank Sta	Red dot

1 cm Horiz. = 48.20826 m 1 cm Vert. = 7.208123 m

ZognoHecRasDef Plan: PlanDEF 01 05/12/2013
RS = 16

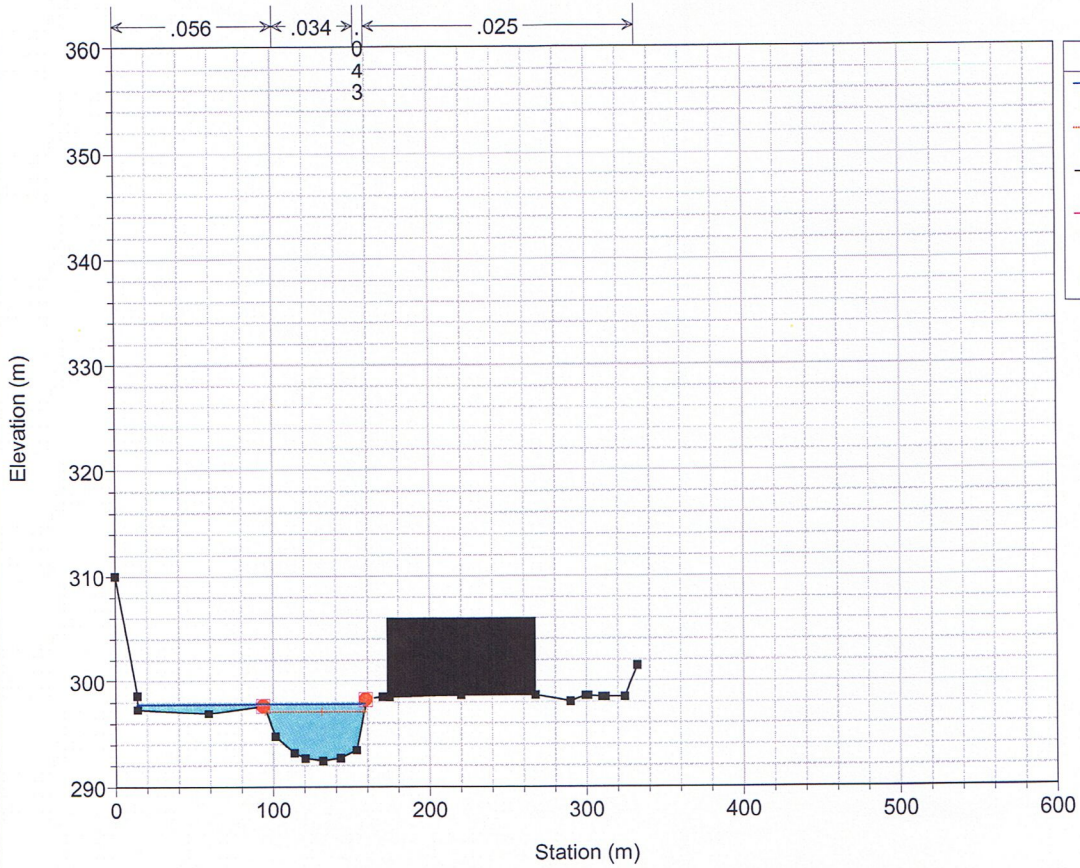


ZognoHecRasDef Plan: PlanDEF 01 05/12/2013
RS = 15

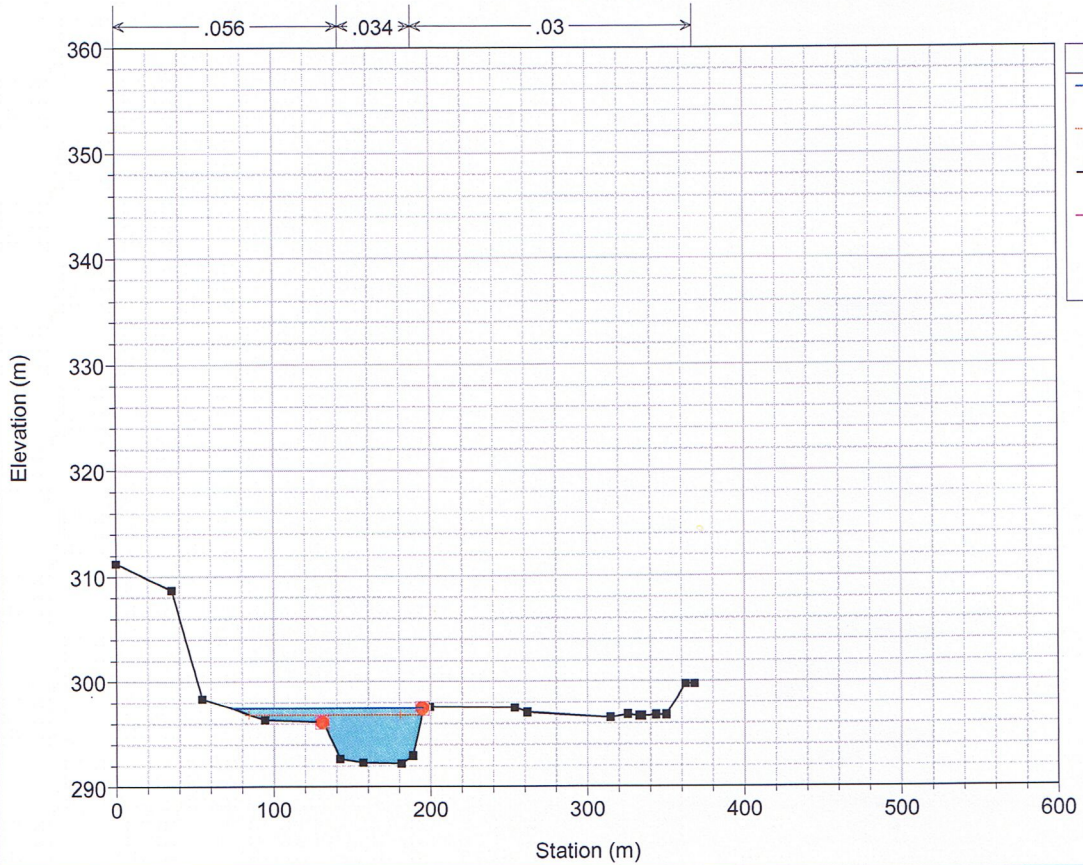


1 cm Horiz. = 48.20826 m 1 cm Vert. = 7.208123 m

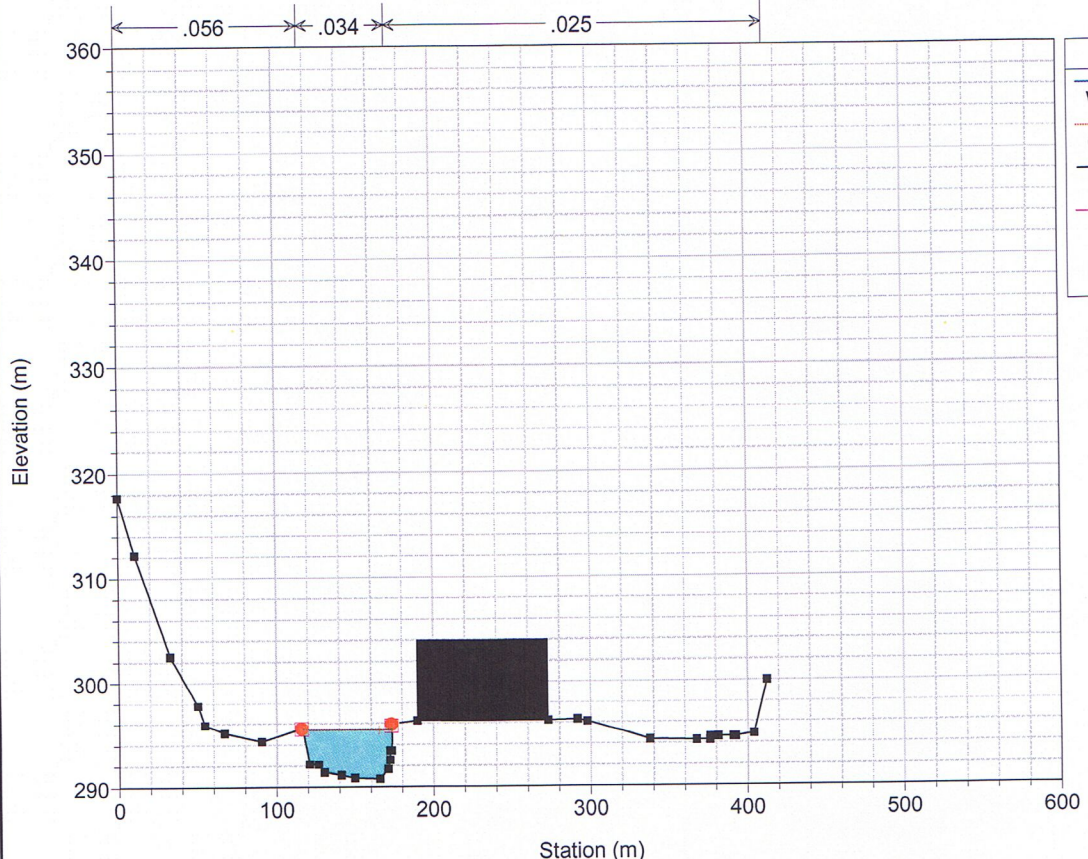
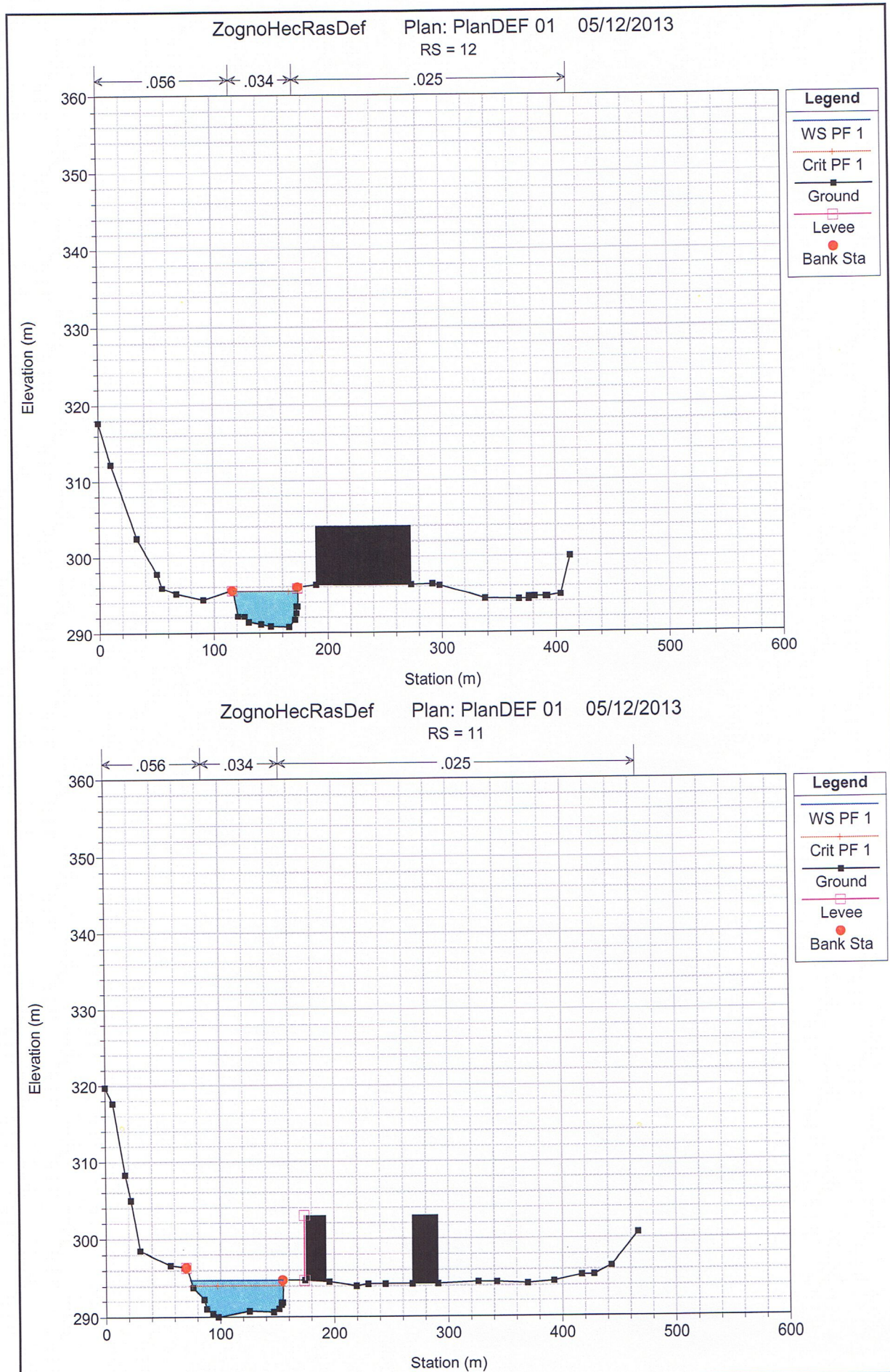
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RS = 14



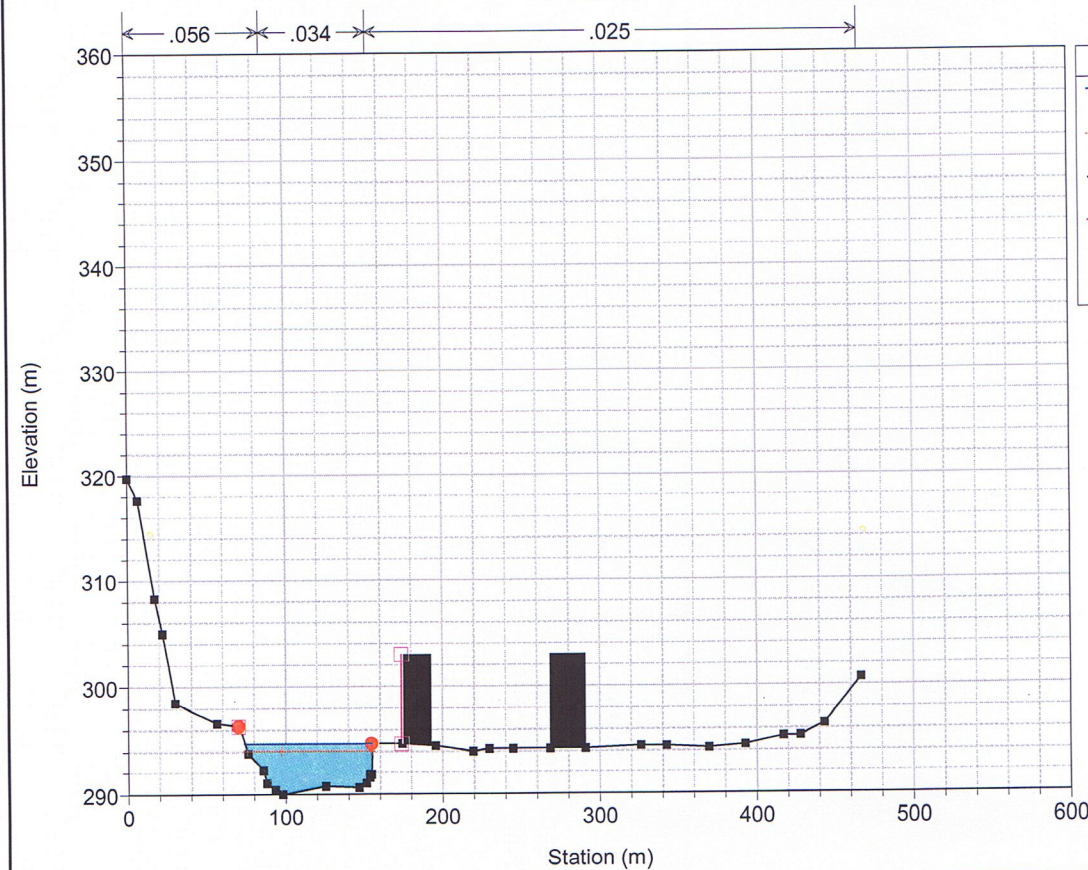
ZognoHecRasDef Plan: PlanDEF 01 05/12/2013
RS = 13



1 cm Horiz. = 48.20826 m 1 cm Vert. = 7.208123 m

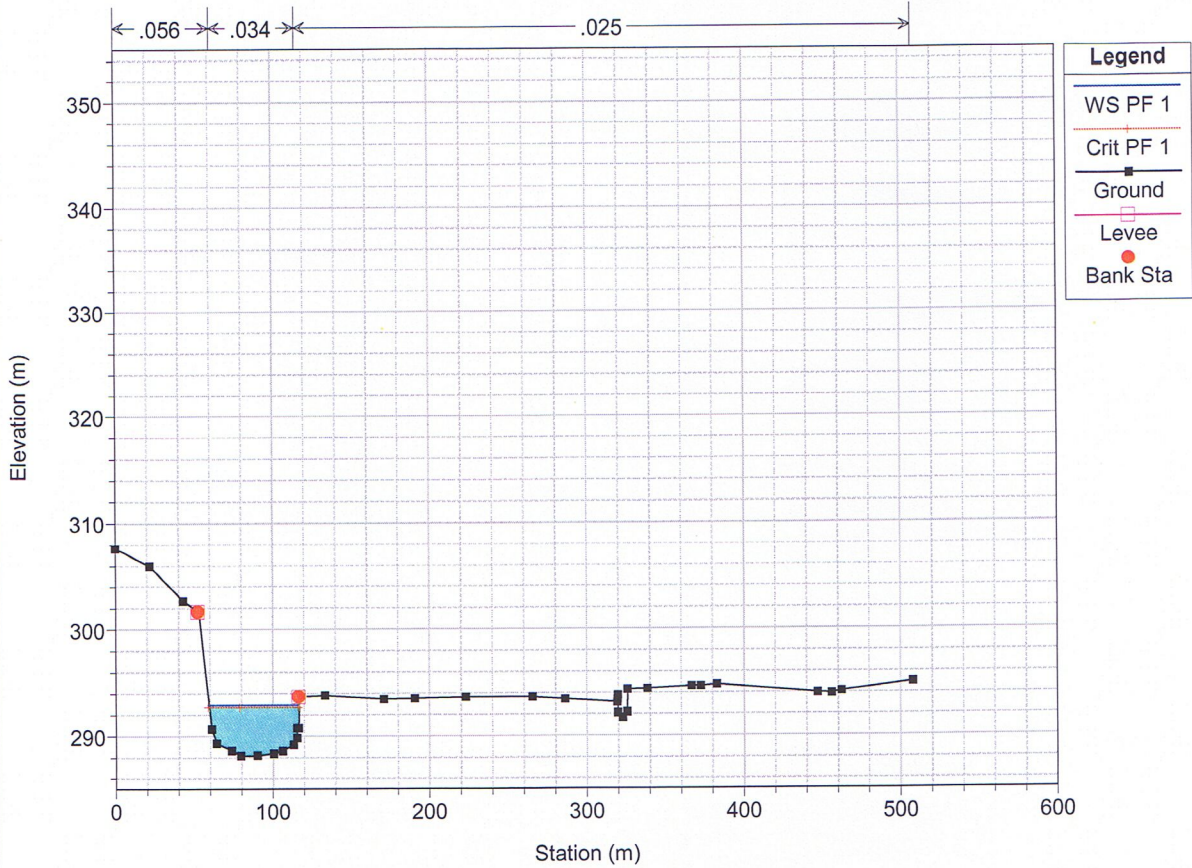


Legend	
—	WS PF 1
—	Crit PF 1
■	Ground
□	Levee
●	Bank Sta

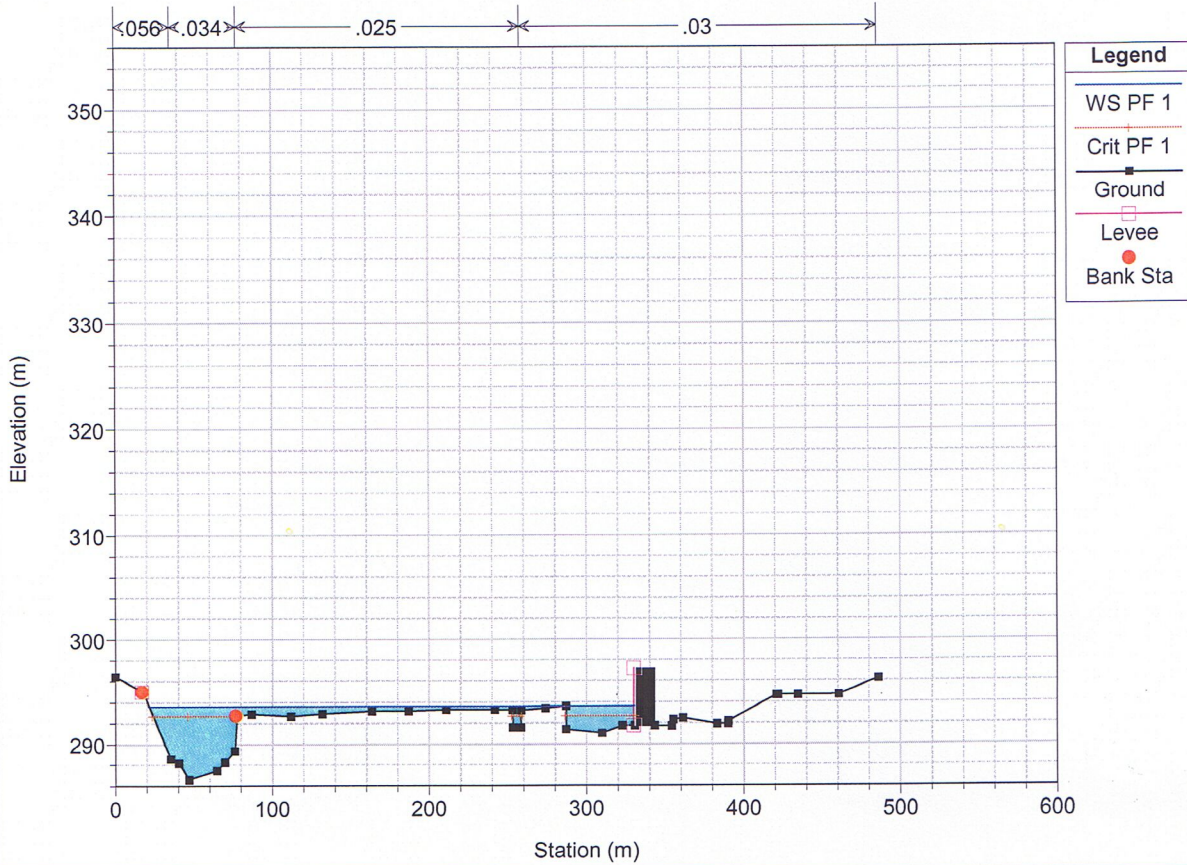


Legend	
—	WS PF 1
—	Crit PF 1
■	Ground
□	Levee
●	Bank Sta

ZognoHecRasDef Plan: PlanDEF 01 05/12/2013
RS = 10

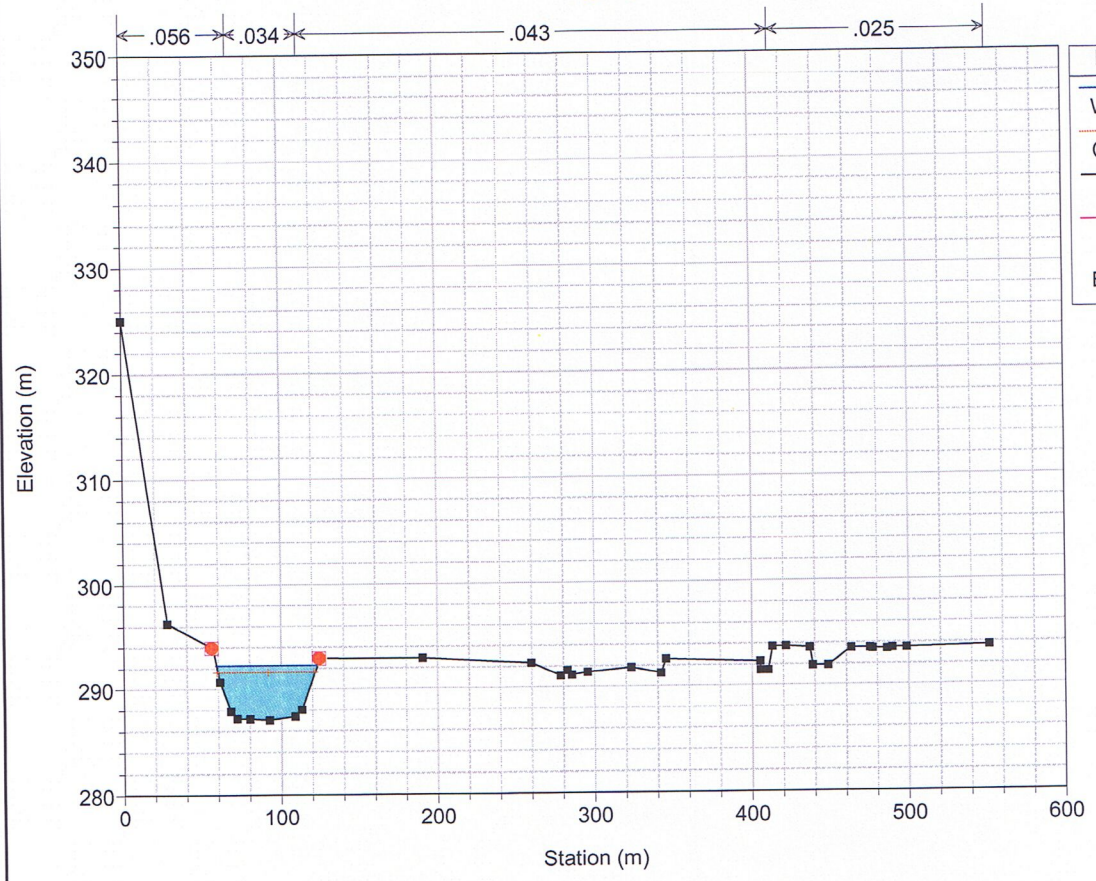


ZognoHecRasDef Plan: PlanDEF 01 05/12/2013
RS = 9

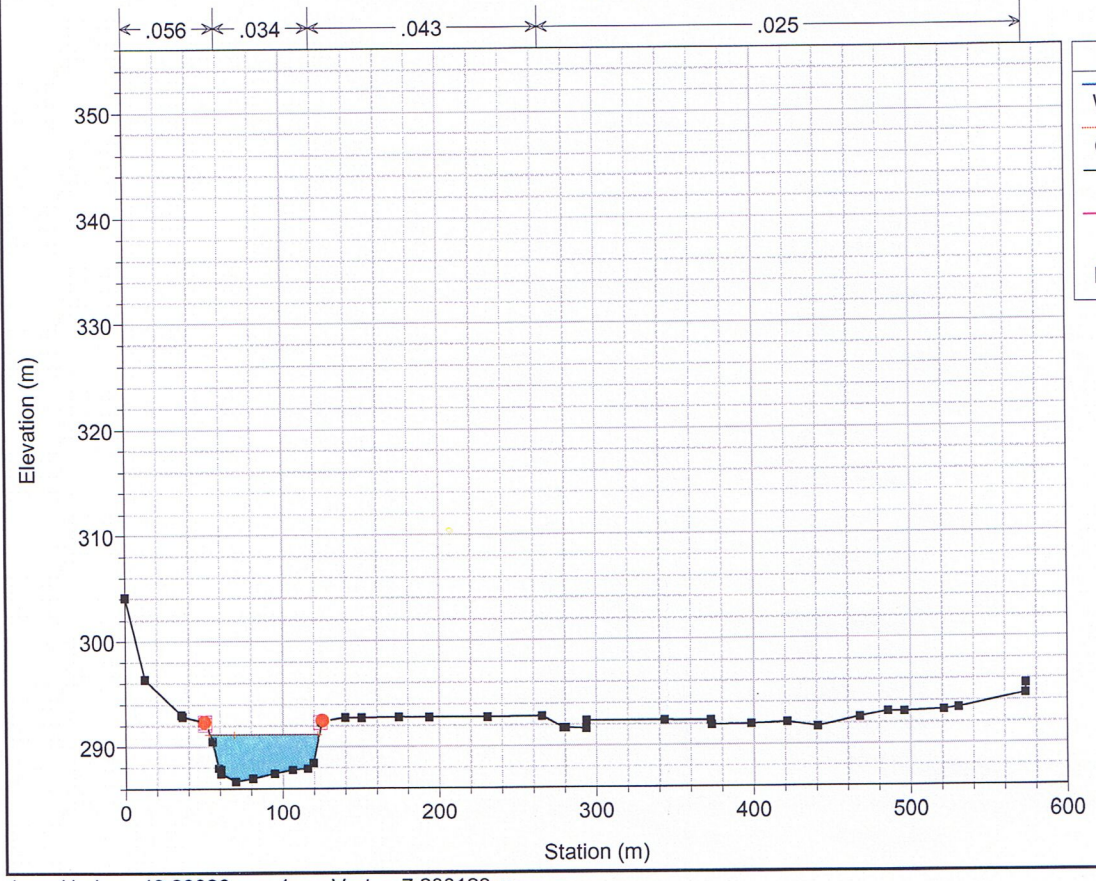


1 cm Horiz. = 48.20826 m 1 cm Vert. = 7.208123 m

ZognoHecRasDef Plan: PlanDEF 01 05/12/2013
RS = 8

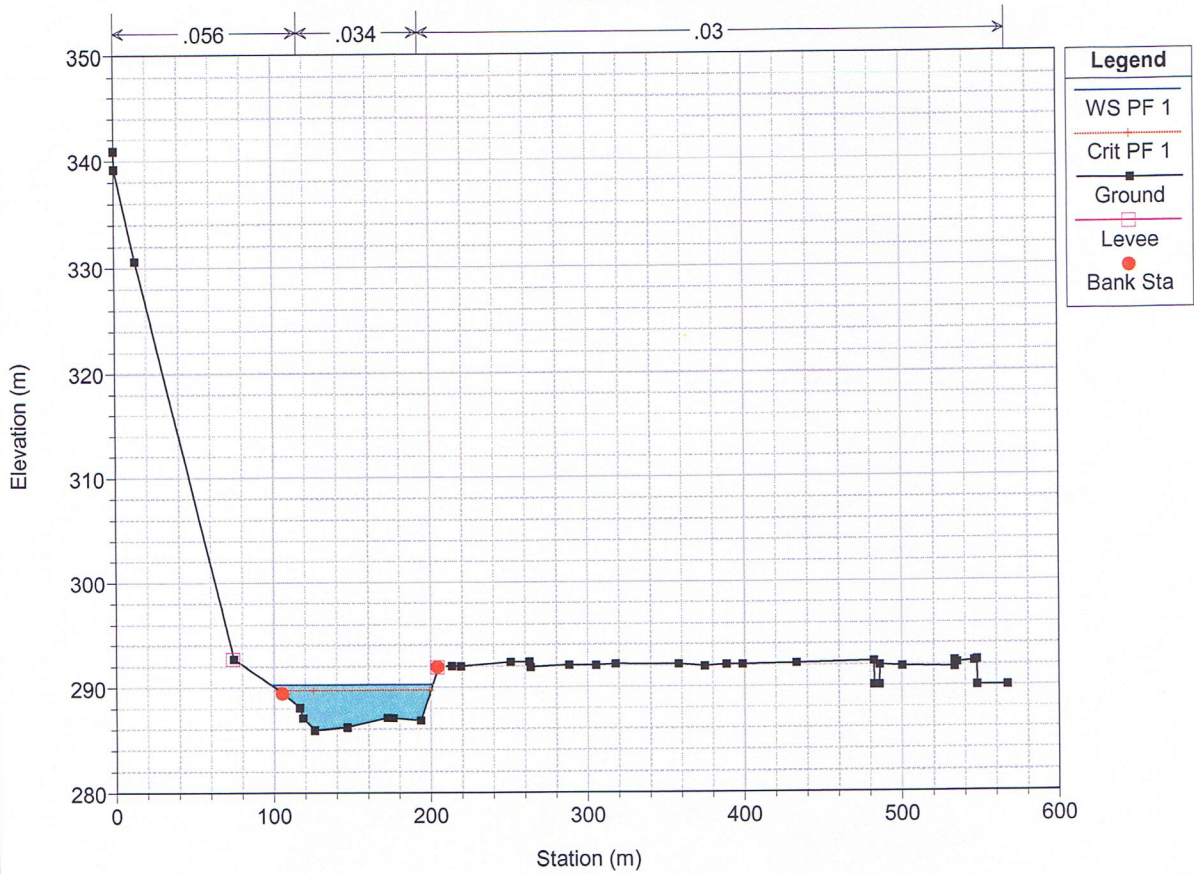


ZognoHecRasDef Plan: PlanDEF 01 05/12/2013
RS = 7

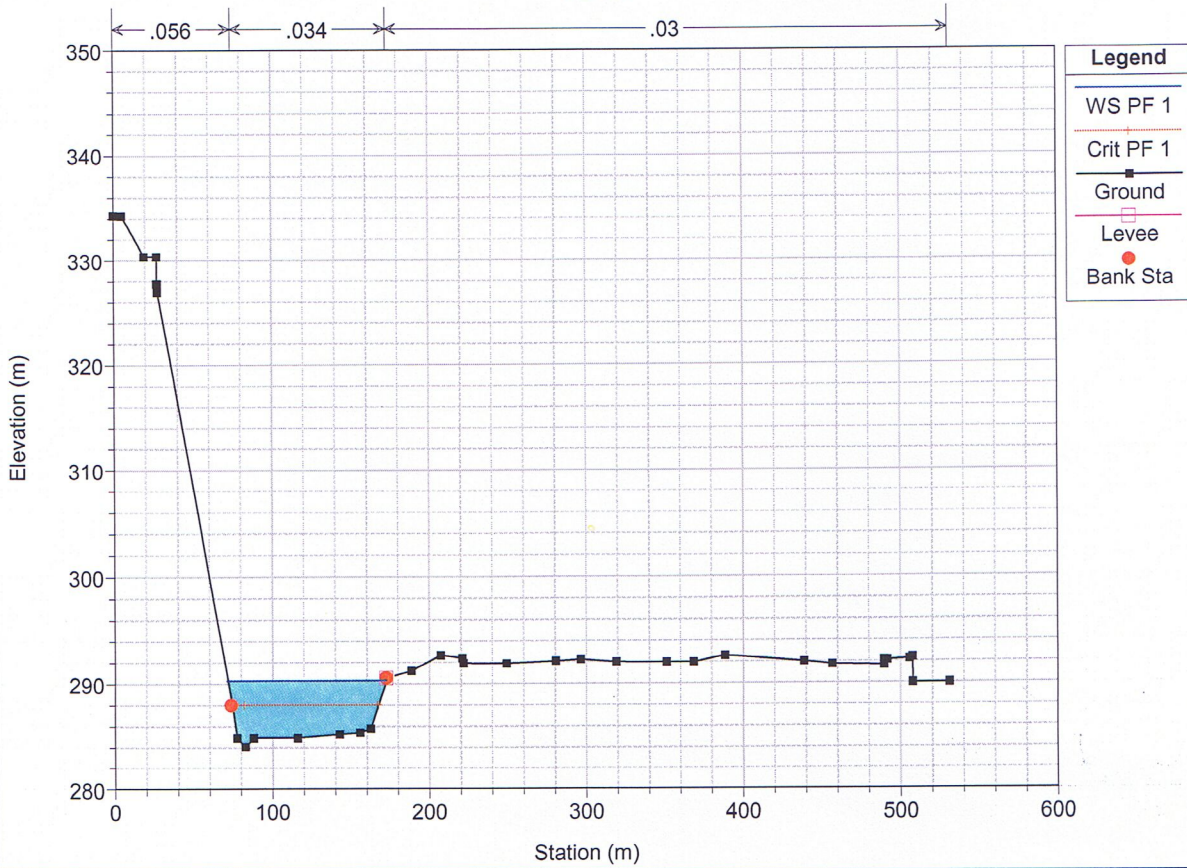


1 cm Horiz. = 48.20826 m 1 cm Vert. = 7.208123 m

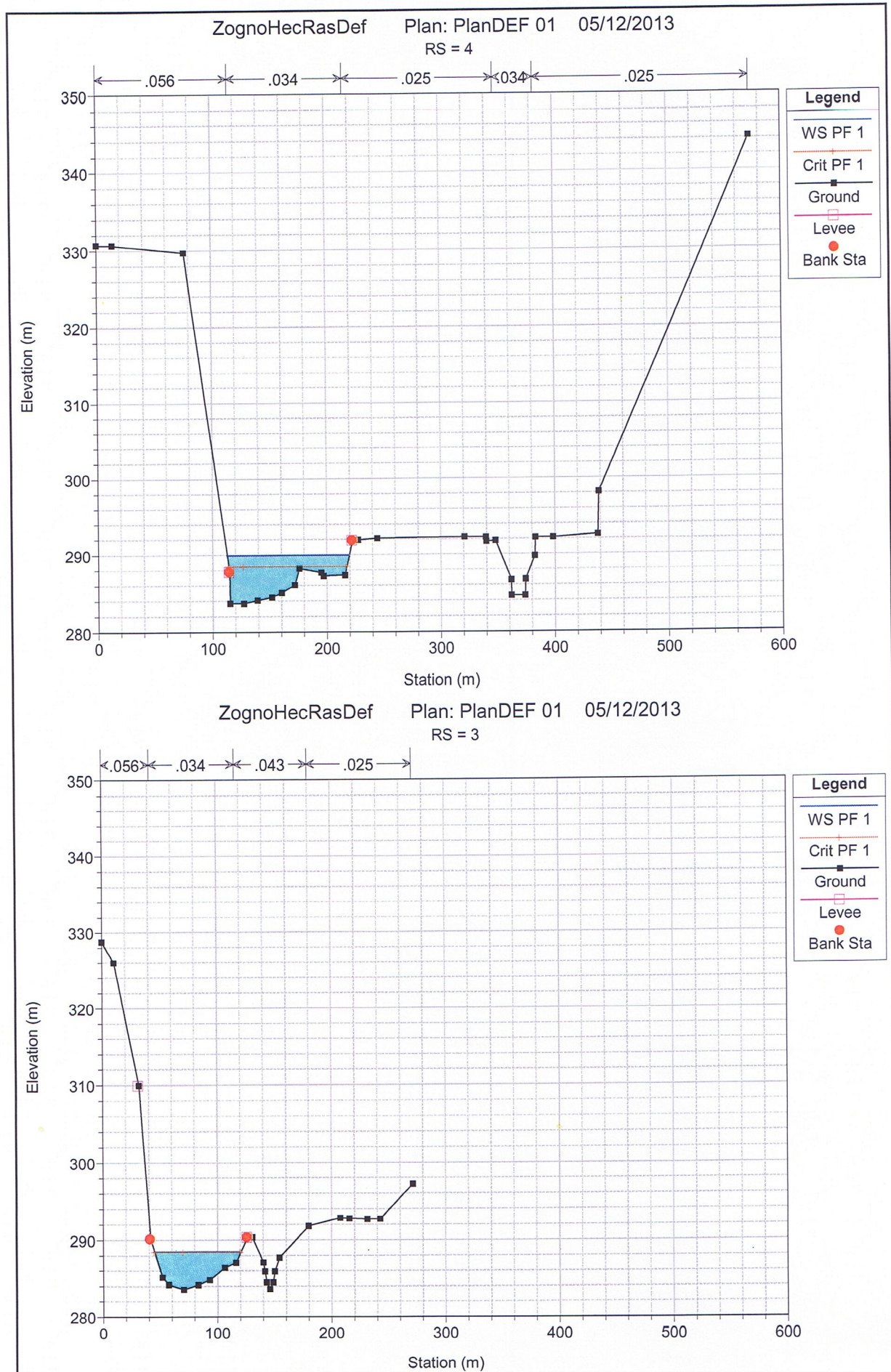
ZognoHecRasDef Plan: PlanDEF 01 05/12/2013
RS = 6



ZognoHecRasDef Plan: PlanDEF 01 05/12/2013
RS = 5

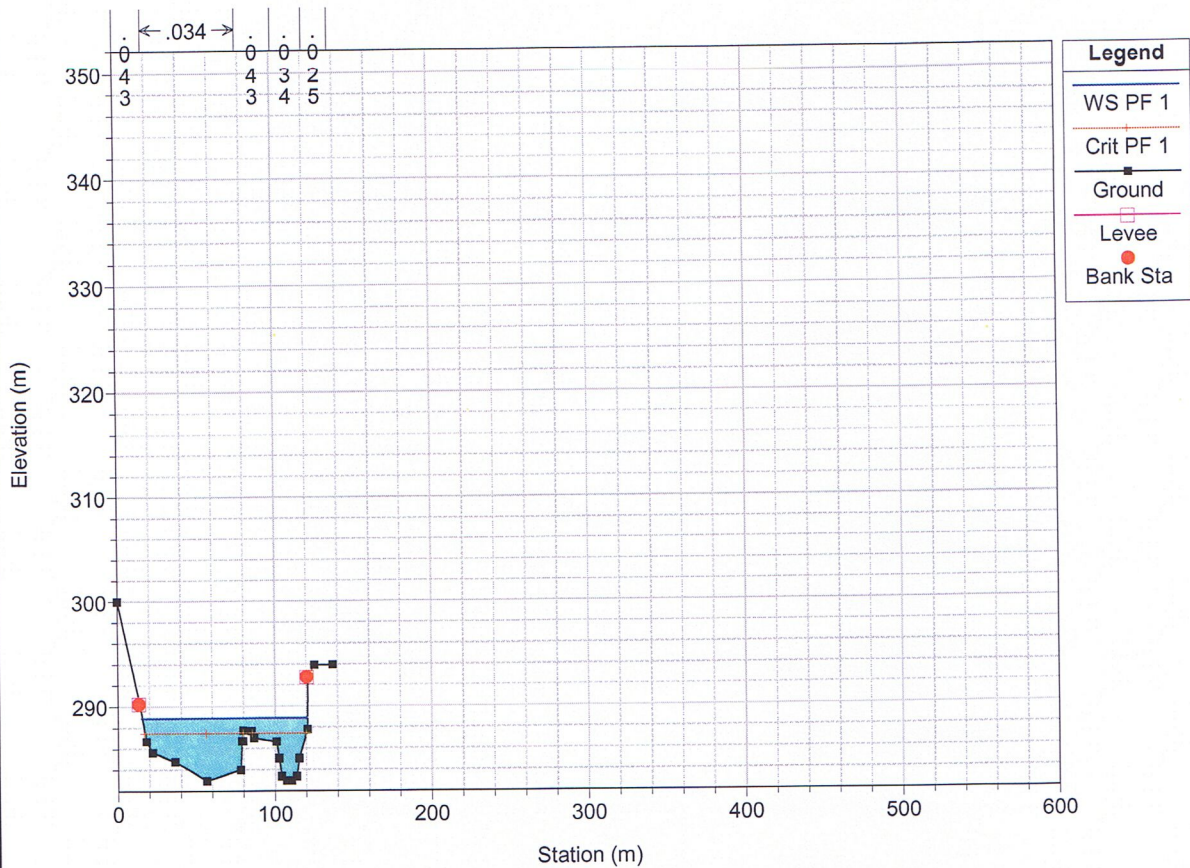


1 cm Horiz. = 48.20826 m 1 cm Vert. = 7.208123 m

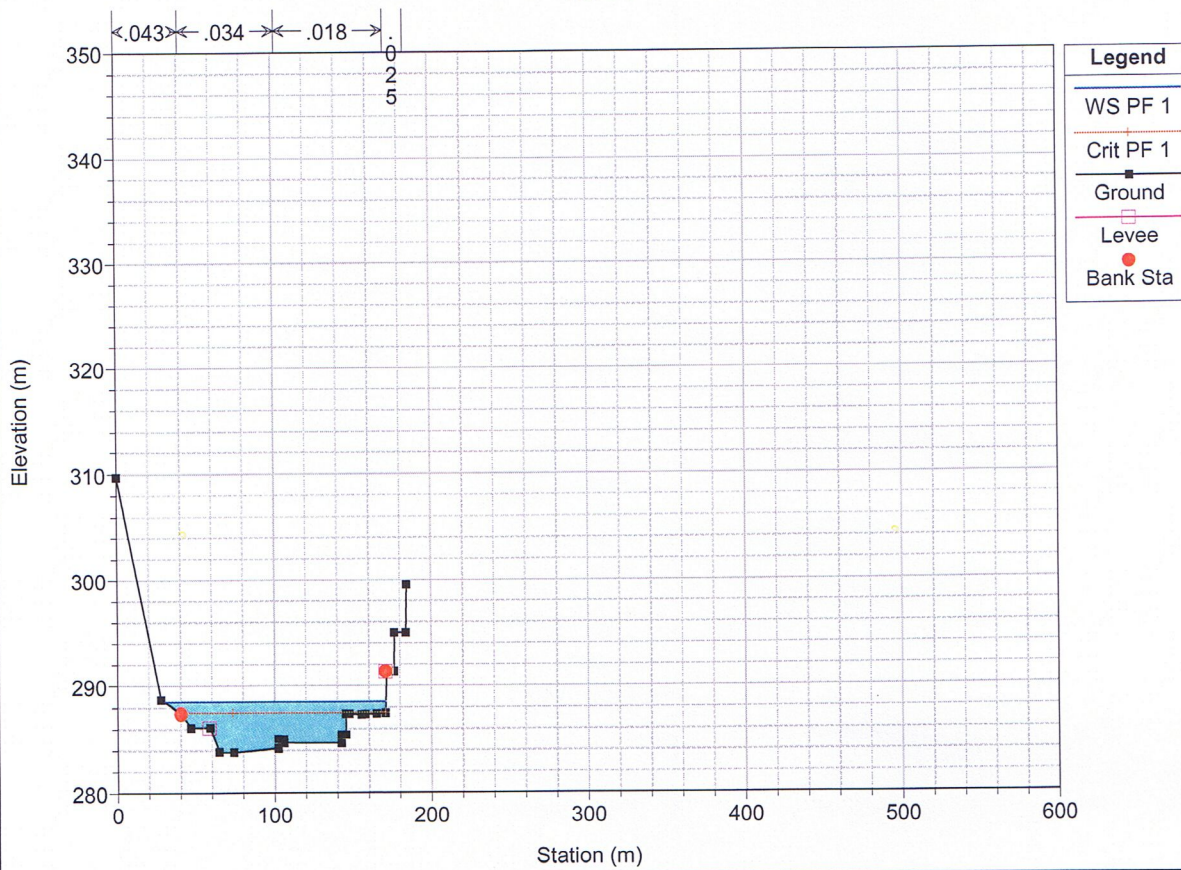


1 cm Horiz. = 48.20826 m 1 cm Vert. = 7.208123 m

ZognoHecRasDef Plan: PlanDEF 01 05/12/2013
RS = 2



ZognoHecRasDef Plan: PlanDEF 01 05/12/2013
RS = 1



1 cm Horiz. = 48.20826 m 1 cm Vert. = 7.208123 m