



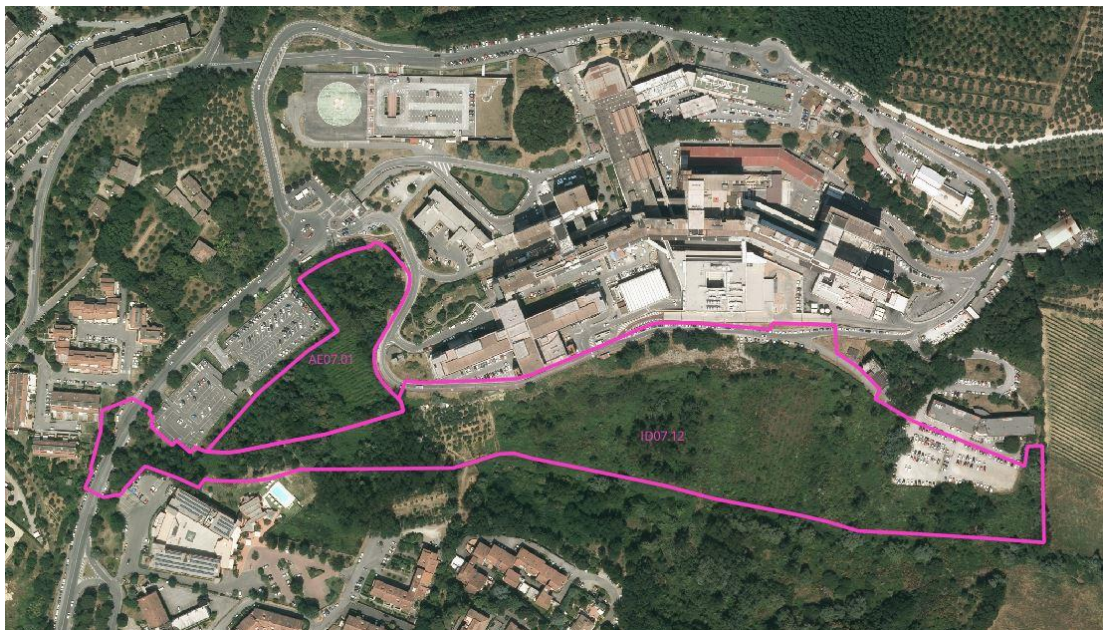
AZIENDA OSPEDALIERA UNIVERSITARIA SENESE



COMUNE DI SIENA

Provincia di Siena

**Variante al Piano Strutturale/Operativo
per l'ampliamento del Policlinico Santa Maria alle Scotte
parcheggio pubblico in Viale M. Bracci (AE07.01)
intervento diretto in Via M. Bracci, Policlinico S. Maria alle Scotte (ID07.12)**



R.03 Allegati Hec-Ras

data: Aprile 2023

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Sommario

ALLEGATI HEC-RAS "ACQUAVIVA"	1
ALLEGATI HEC-RAS "ACQUAVIVA" – Profilo Longitudinale – Tr30	2
ALLEGATI HEC-RAS "ACQUAVIVA" – Sezioni Trasversali – Tr30	4
ALLEGATI HEC-RAS "ACQUAVIVA" – Dati Idraulici – Tr30	11
ALLEGATI HEC-RAS "ACQUAVIVA" – Profilo Longitudinale – Tr200	13
ALLEGATI HEC-RAS "ACQUAVIVA" – Sezioni Trasversali – Tr200	15
ALLEGATI HEC-RAS "ACQUAVIVA" – Dati Idraulici – Tr200	22

ALLEGATI

MODELLAZIONE HEC-RAS 6.3.1 "ACQUAVIVA"

ACQUAVIVA

MODELLAZIONE PER TR=30 e 200 ANNI

DURATA DI PIOGGIA: 0.5, 1 e 2 h

Profilo longitudinale

Sezioni Trasversali

Dati idraulici

ALLEGATI

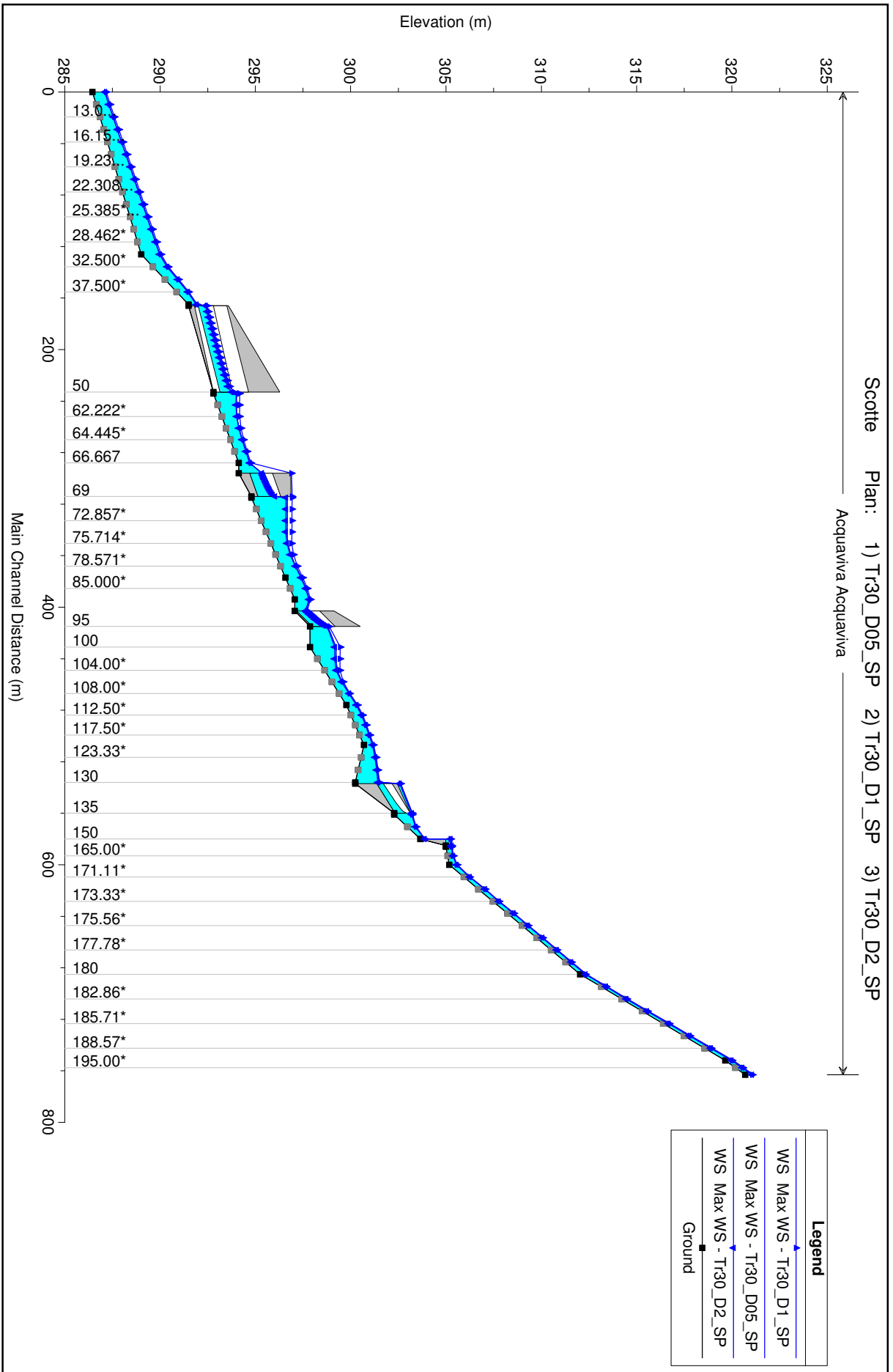
MODELLAZIONE HEC-RAS 6.3.1 "ACQUAVIVA"

ACQUAVIVA

MODELLAZIONE PER TR= 30 anni

DURATE DI PIOGGIA: 0.5, 1 e 2 h

Profilo longitudinale



ALLEGATI

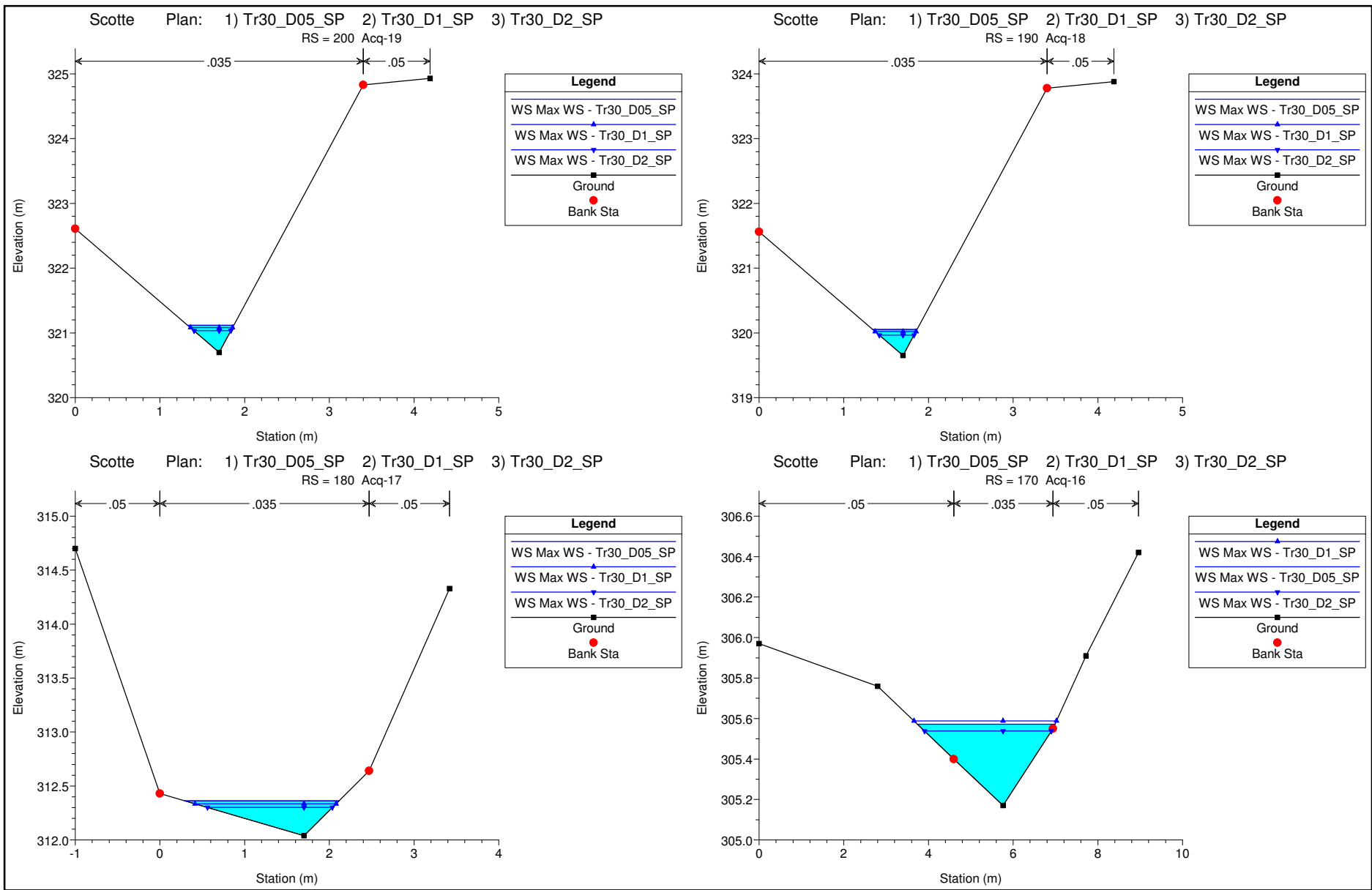
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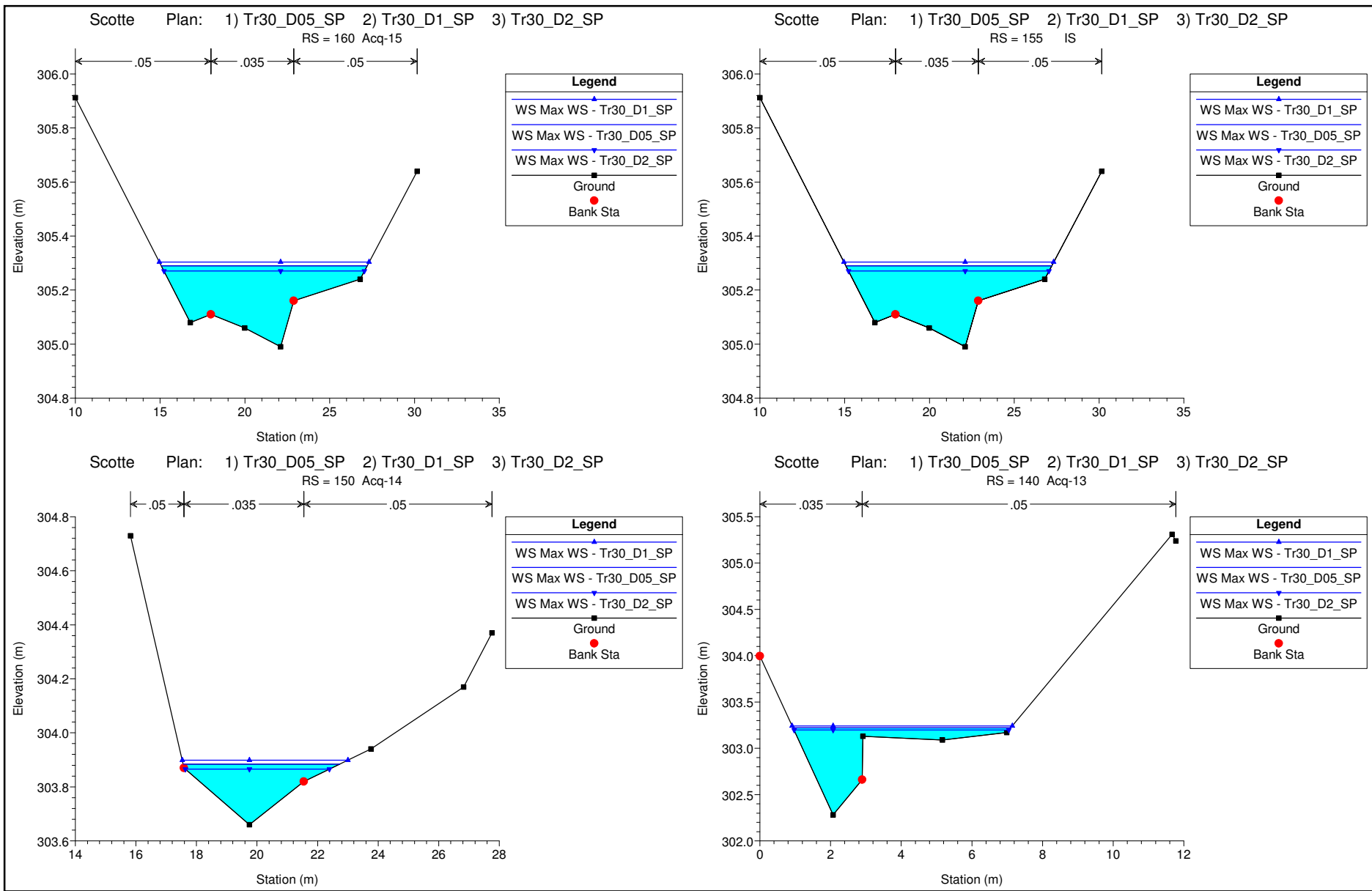
ACQUAVIVA

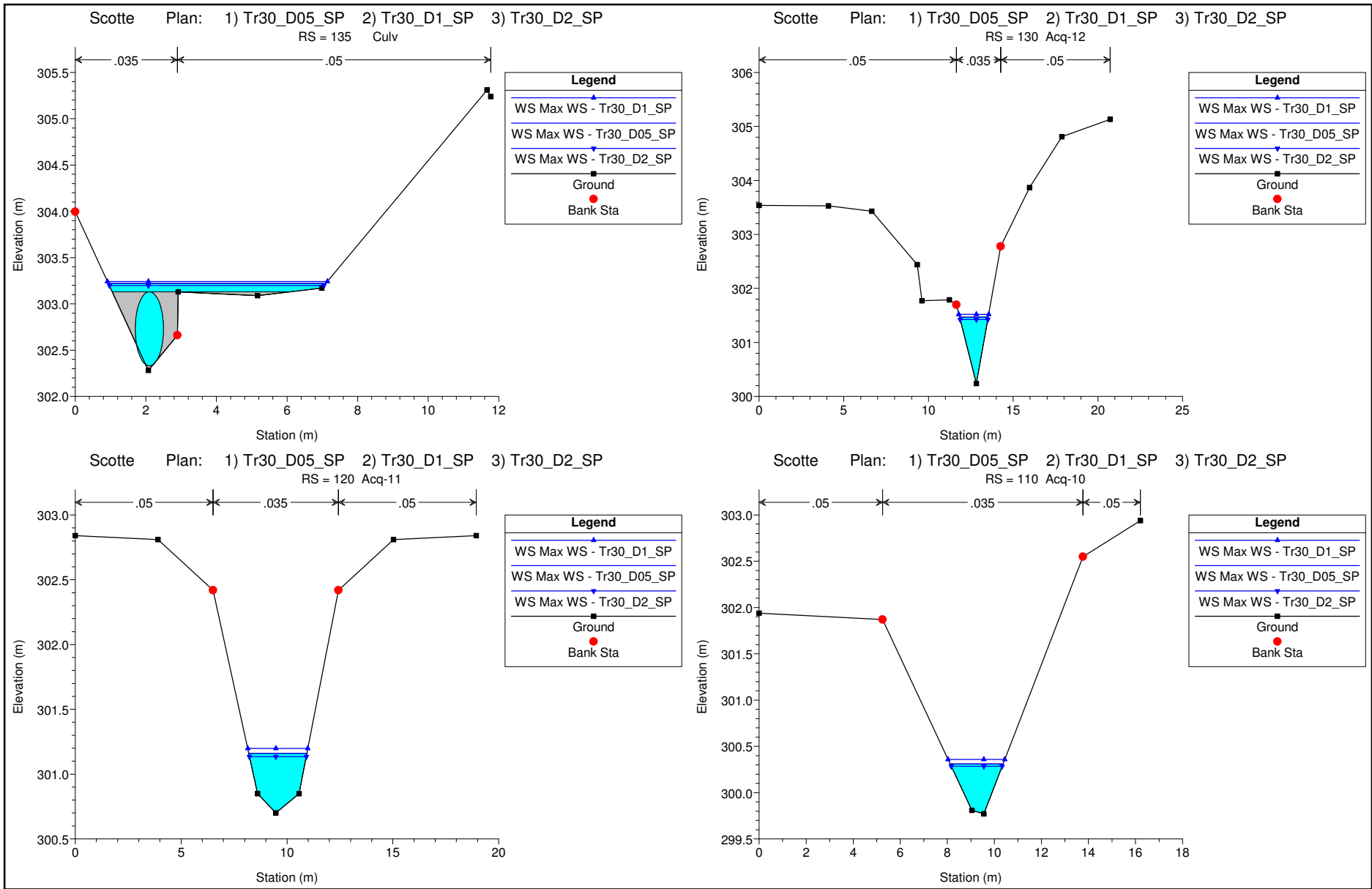
MODELLAZIONE PER TR= 30 anni

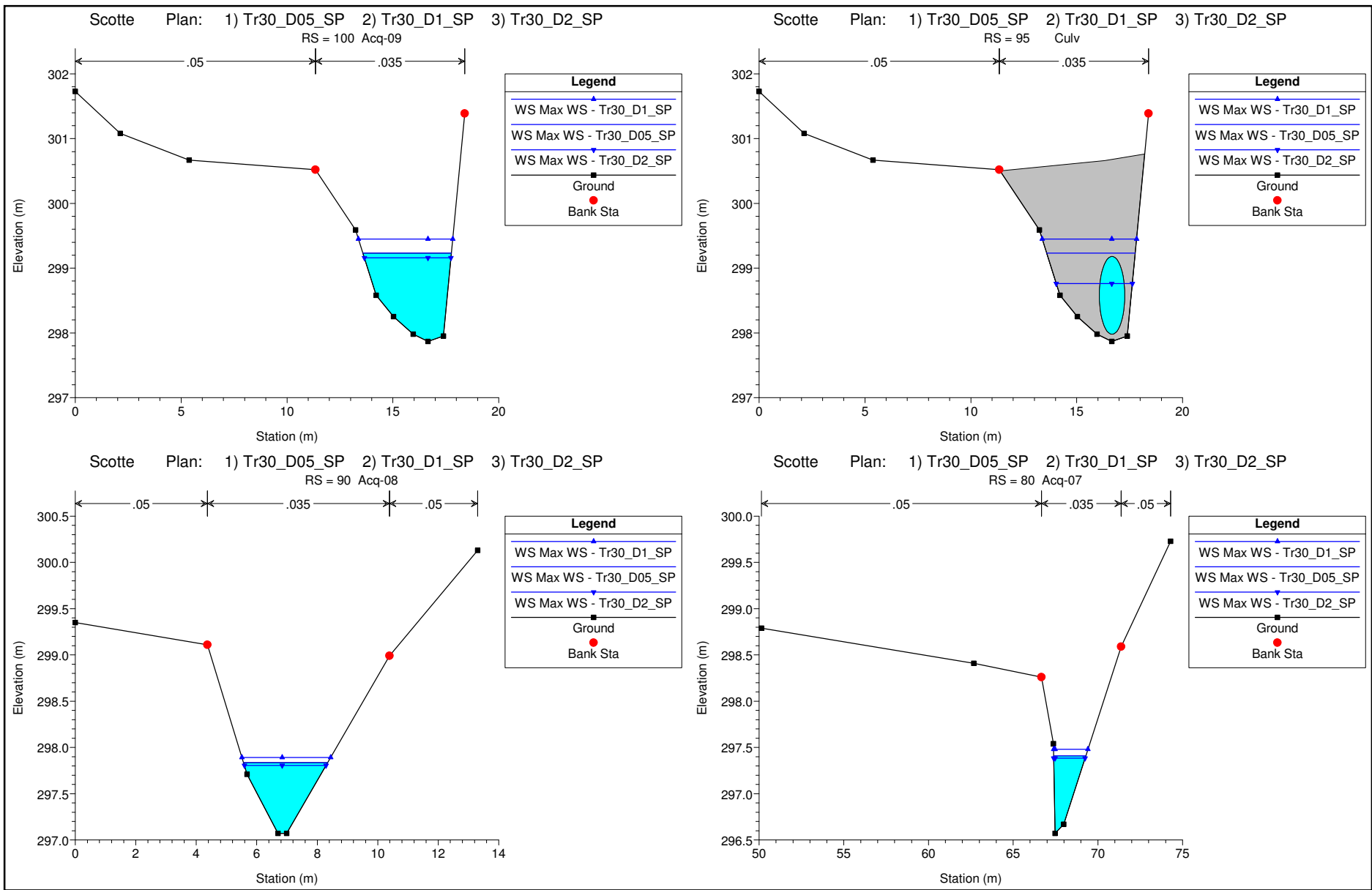
DURATE DI PIOGGIA: 0.5, 1 e 2 h

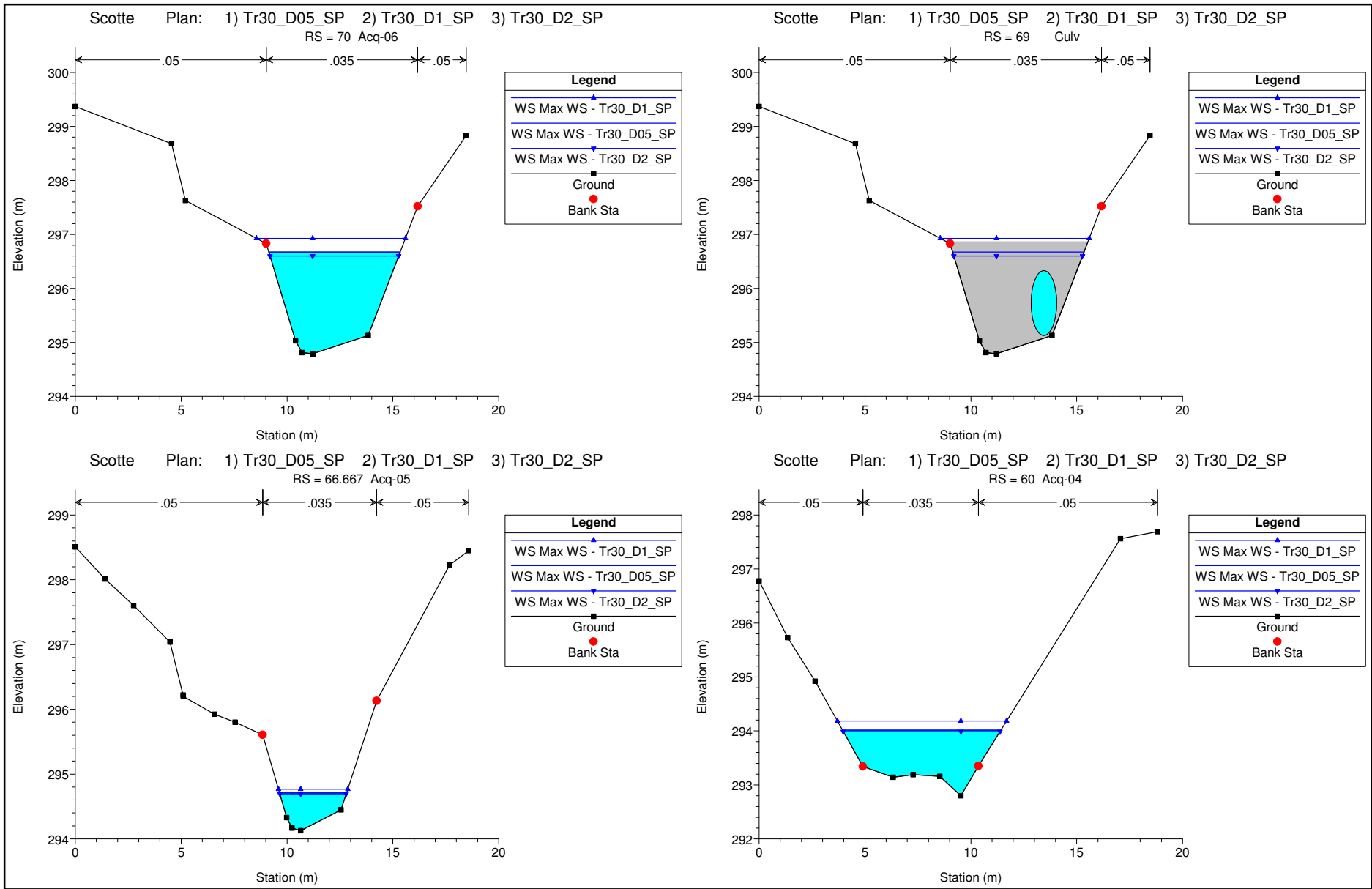
Sezioni Trasversali (da monte verso valle)

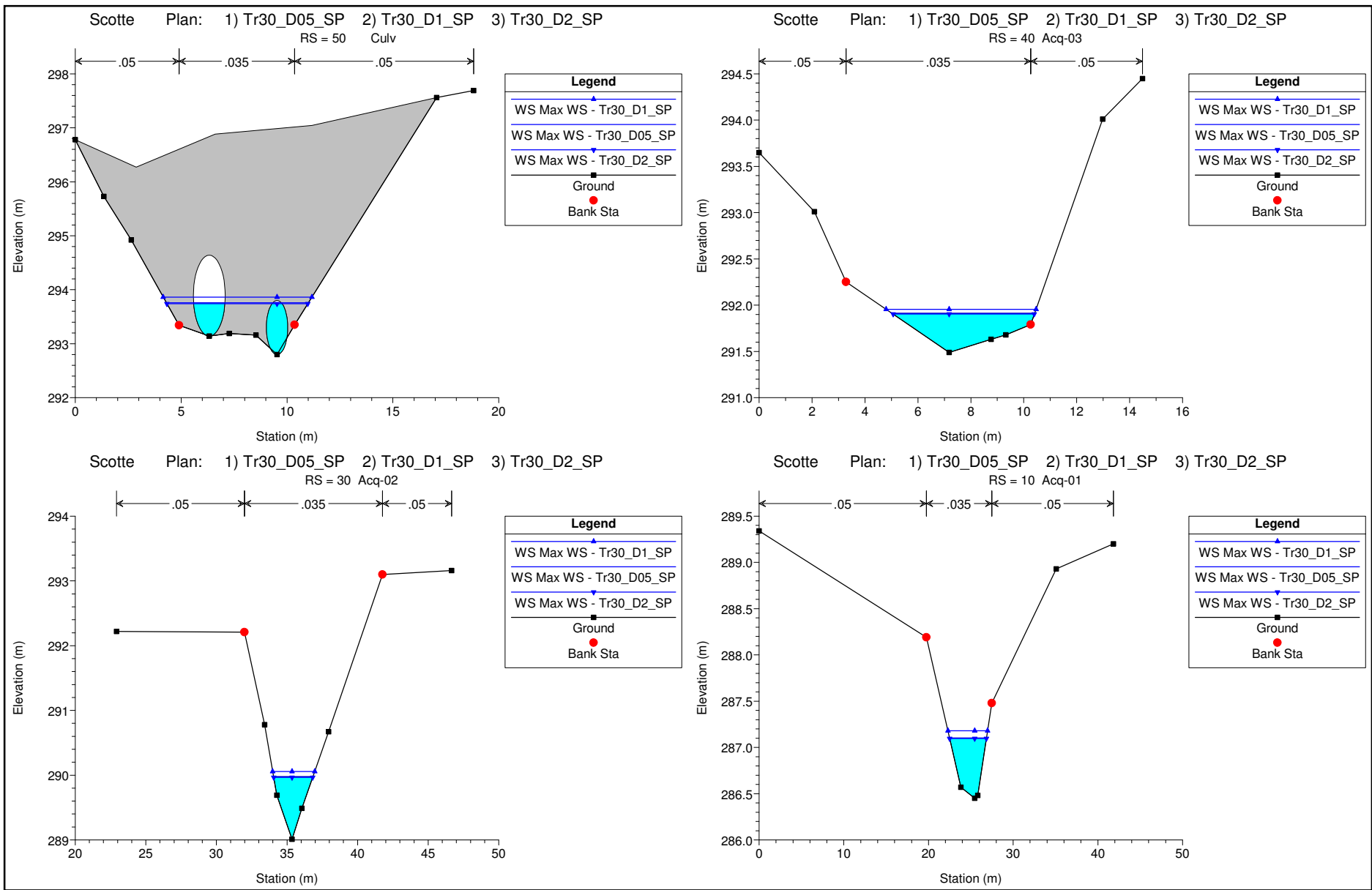












ALLEGATI

MODELLAZIONE HEC-RAS 6.3.1 "ACQUAVIVA"

ACQUAVIVA

MODELLAZIONE PER TR= 30 anni

DURATE DI PIOGGIA: 0.5, 1 e 2 h

Dati idraulici

HEC-RAS River: Acquaviva Reach: Acquaviva Profile: Max WS

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
Acquaviva	200	Max WS	Tr30_D05_SP	0.27	320.70	321.12	321.21	321.41	0.130041	2.39	0.11	0.54	1.68
Acquaviva	200	Max WS	Tr30_D1_SP	0.21	320.70	321.08	321.16	321.33	0.126185	2.22	0.09	0.50	1.63
Acquaviva	200	Max WS	Tr30_D2_SP	0.14	320.70	321.03	321.09	321.22	0.112104	1.92	0.07	0.44	1.50
Acquaviva	190	Max WS	Tr30_D05_SP	0.27	319.65	320.05	320.16	320.39	0.156309	2.56	0.11	0.52	1.83
Acquaviva	190	Max WS	Tr30_D1_SP	0.21	319.65	320.02	320.11	320.30	0.144785	2.34	0.09	0.48	1.73
Acquaviva	190	Max WS	Tr30_D2_SP	0.14	319.65	319.96	320.04	320.20	0.155099	2.17	0.06	0.41	1.75
Acquaviva	180	Max WS	Tr30_D05_SP	0.73	312.04	312.36	312.46	312.67	0.092856	2.45	0.30	1.83	1.95
Acquaviva	180	Max WS	Tr30_D1_SP	0.57	312.04	312.34	312.42	312.61	0.093098	2.31	0.25	1.67	1.92
Acquaviva	180	Max WS	Tr30_D2_SP	0.39	312.04	312.30	312.37	312.51	0.084250	2.03	0.19	1.47	1.79
Acquaviva	170	Max WS	Tr30_D05_SP	1.25	305.17	305.57	305.63	305.78	0.034654	2.06	0.66	3.25	1.32
Acquaviva	170	Max WS	Tr30_D1_SP	1.37	305.17	305.59	305.65	305.81	0.033561	2.11	0.71	3.36	1.31
Acquaviva	170	Max WS	Tr30_D2_SP	1.02	305.17	305.54	305.59	305.73	0.037166	1.96	0.55	2.99	1.33
Acquaviva	160	Max WS	Tr30_D05_SP	1.34	304.99	305.29	305.24	305.32	0.007104	0.91	1.92	12.14	0.60
Acquaviva	160	Max WS	Tr30_D1_SP	1.51	304.99	305.30	305.26	305.34	0.007139	0.95	2.08	12.37	0.61
Acquaviva	160	Max WS	Tr30_D2_SP	1.12	304.99	305.27	305.22	305.30	0.007044	0.85	1.68	11.82	0.59
Acquaviva	155			Inl Struct									
Acquaviva	150	Max WS	Tr30_D05_SP	1.34	303.66	303.88	303.98	304.21	0.120747	2.55	0.55	5.17	2.25
Acquaviva	150	Max WS	Tr30_D1_SP	1.51	303.66	303.90	303.99	304.22	0.104995	2.55	0.63	5.47	2.14
Acquaviva	150	Max WS	Tr30_D2_SP	1.12	303.66	303.87	303.95	304.18	0.139609	2.49	0.46	4.76	2.36
Acquaviva	140	Max WS	Tr30_D05_SP	1.46	302.28	303.22		303.29	0.004448	1.17	1.57	6.16	0.49
Acquaviva	140	Max WS	Tr30_D1_SP	1.69	302.28	303.24		303.32	0.005076	1.27	1.71	6.23	0.52
Acquaviva	140	Max WS	Tr30_D2_SP	1.26	302.28	303.20		303.25	0.003877	1.08	1.43	6.08	0.45
Acquaviva	135			Culvert									
Acquaviva	130	Max WS	Tr30_D05_SP	1.45	300.24	301.47		301.57	0.009911	1.40	1.04	1.69	0.57
Acquaviva	130	Max WS	Tr30_D1_SP	1.69	300.24	301.52		301.63	0.010563	1.49	1.13	1.76	0.60
Acquaviva	130	Max WS	Tr30_D2_SP	1.26	300.24	301.43		301.51	0.008875	1.30	0.97	1.63	0.54
Acquaviva	120	Max WS	Tr30_D05_SP	1.66	300.70	301.16	301.18	301.34	0.022654	1.90	0.88	2.74	1.07
Acquaviva	120	Max WS	Tr30_D1_SP	1.96	300.70	301.20	301.22	301.40	0.022656	2.00	0.98	2.84	1.08
Acquaviva	120	Max WS	Tr30_D2_SP	1.47	300.70	301.14	301.15	301.30	0.022337	1.82	0.81	2.68	1.06
Acquaviva	110	Max WS	Tr30_D05_SP	1.89	299.77	300.31	300.42	300.66	0.045670	2.63	0.72	2.25	1.49
Acquaviva	110	Max WS	Tr30_D1_SP	2.25	299.77	300.36	300.47	300.73	0.043893	2.71	0.83	2.41	1.47
Acquaviva	110	Max WS	Tr30_D2_SP	1.70	299.77	300.29	300.39	300.62	0.045914	2.56	0.66	2.17	1.48
Acquaviva	100	Max WS	Tr30_D05_SP	2.21	297.87	299.23		299.25	0.000557	0.55	4.04	4.18	0.18
Acquaviva	100	Max WS	Tr30_D1_SP	2.65	297.87	299.45		299.46	0.000453	0.53	4.98	4.45	0.16
Acquaviva	100	Max WS	Tr30_D2_SP	2.03	297.87	299.16		299.17	0.000585	0.54	3.73	4.09	0.18
Acquaviva	95			Culvert									
Acquaviva	90	Max WS	Tr30_D05_SP	2.21	297.07	297.84		298.01	0.015415	1.84	1.20	2.78	0.89
Acquaviva	90	Max WS	Tr30_D1_SP	2.65	297.07	297.89		298.08	0.015743	1.94	1.36	2.94	0.91
Acquaviva	90	Max WS	Tr30_D2_SP	2.03	297.07	297.80		297.97	0.015792	1.81	1.12	2.70	0.90
Acquaviva	80	Max WS	Tr30_D05_SP	2.33	296.57	297.41	297.47	297.74	0.036273	2.55	0.91	1.90	1.17
Acquaviva	80	Max WS	Tr30_D1_SP	2.81	296.57	297.48	297.55	297.84	0.036257	2.67	1.05	2.03	1.18
Acquaviva	80	Max WS	Tr30_D2_SP	2.15	296.57	297.38	297.44	297.70	0.035442	2.48	0.87	1.85	1.15
Acquaviva	70	Max WS	Tr30_D05_SP	2.73	294.79	296.68		296.68	0.000127	0.33	8.20	6.21	0.09
Acquaviva	70	Max WS	Tr30_D1_SP	3.37	294.79	296.93		296.93	0.000116	0.34	9.83	7.03	0.09
Acquaviva	70	Max WS	Tr30_D2_SP	2.60	294.79	296.60		296.60	0.000135	0.34	7.72	6.07	0.10
Acquaviva	69			Culvert									
Acquaviva	66.667	Max WS	Tr30_D05_SP	2.73	294.13	294.71	294.74	294.96	0.023738	2.20	1.24	3.16	1.12
Acquaviva	66.667	Max WS	Tr30_D1_SP	3.37	294.13	294.77	294.81	295.05	0.023804	2.35	1.43	3.27	1.13
Acquaviva	66.667	Max WS	Tr30_D2_SP	2.60	294.13	294.69	294.72	294.93	0.024069	2.18	1.19	3.13	1.13
Acquaviva	60	Max WS	Tr30_D05_SP	3.11	292.80	294.01		294.03	0.000597	0.62	5.45	7.48	0.21
Acquaviva	60	Max WS	Tr30_D1_SP	3.86	292.80	294.18		294.20	0.000497	0.64	6.75	7.99	0.20
Acquaviva	60	Max WS	Tr30_D2_SP	2.99	292.80	293.99		294.01	0.000616	0.62	5.25	7.40	0.21
Acquaviva	50			Culvert									
Acquaviva	40	Max WS	Tr30_D05_SP	3.11	291.49	291.91	291.99	292.19	0.042613	2.34	1.33	5.39	1.49
Acquaviva	40	Max WS	Tr30_D1_SP	3.86	291.49	291.95	292.05	292.27	0.040741	2.48	1.57	5.66	1.48
Acquaviva	40	Max WS	Tr30_D2_SP	2.99	291.49	291.90	291.98	292.18	0.043681	2.33	1.29	5.34	1.50
Acquaviva	30	Max WS	Tr30_D05_SP	3.37	289.01	289.98	290.00	290.27	0.022845	2.39	1.41	2.79	1.08
Acquaviva	30	Max WS	Tr30_D1_SP	4.21	289.01	290.06	290.10	290.39	0.023535	2.56	1.64	2.98	1.10
Acquaviva	30	Max WS	Tr30_D2_SP	3.27	289.01	289.97	289.99	290.25	0.022752	2.37	1.38	2.76	1.07
Acquaviva	10	Max WS	Tr30_D05_SP	4.18	286.45	287.10	287.13	287.36	0.020527	2.23	1.87	4.36	1.09
Acquaviva	10	Max WS	Tr30_D1_SP	5.26	286.45	287.18	287.21	287.47	0.020222	2.37	2.22	4.68	1.10
Acquaviva	10	Max WS	Tr30_D2_SP	4.12	286.45	287.10	287.12	287.35	0.020541	2.23	1.85	4.34	1.09

ALLEGATI

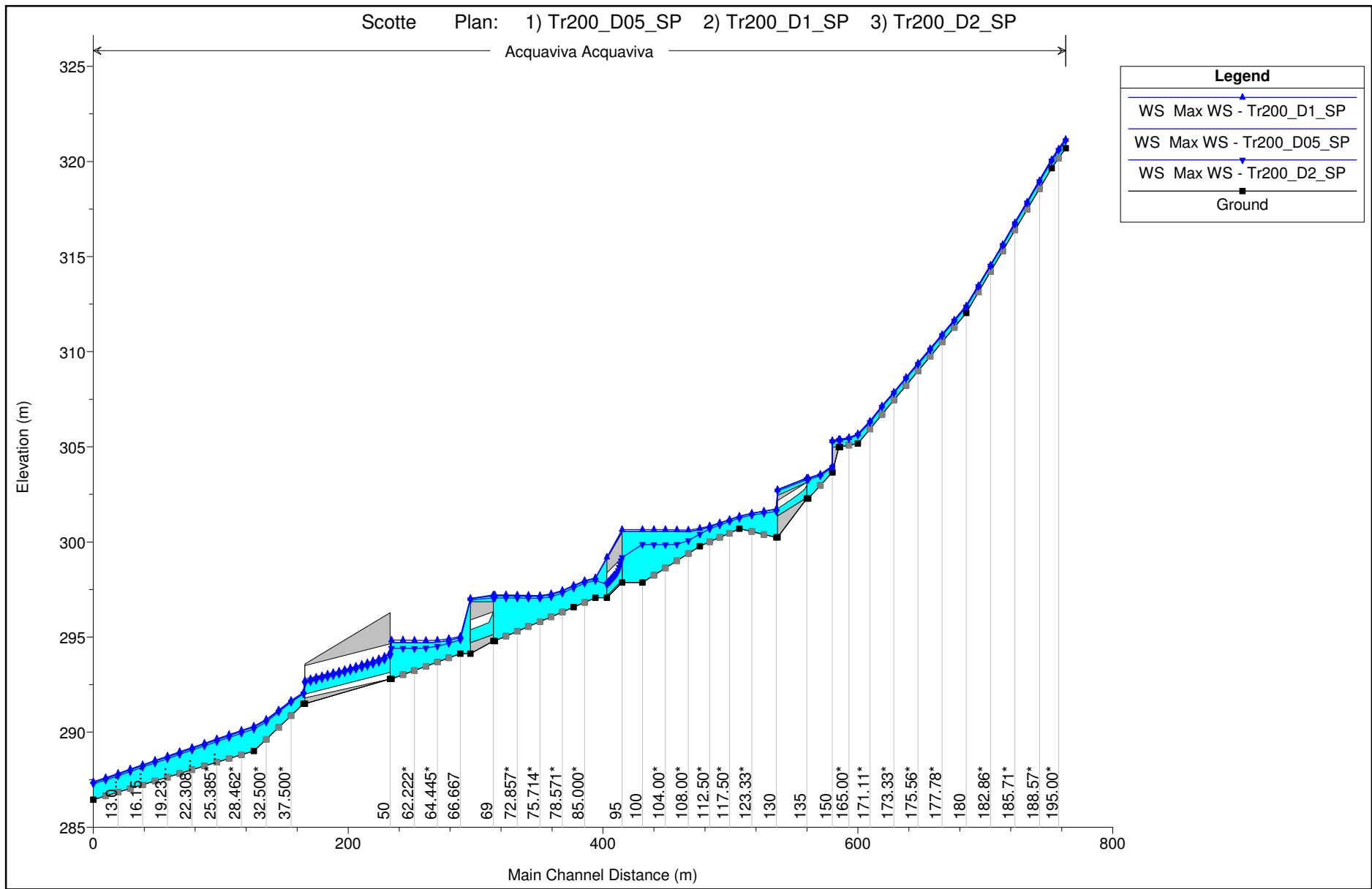
MODELLAZIONE HEC-RAS 6.3.1 "ACQUAVIVA"

ACQUAVIVA

MODELLAZIONE PER TR= 200 anni

DURATE DI PIOGGIA: 0.5, 1 e 2 h

Profilo longitudinale



ALLEGATI

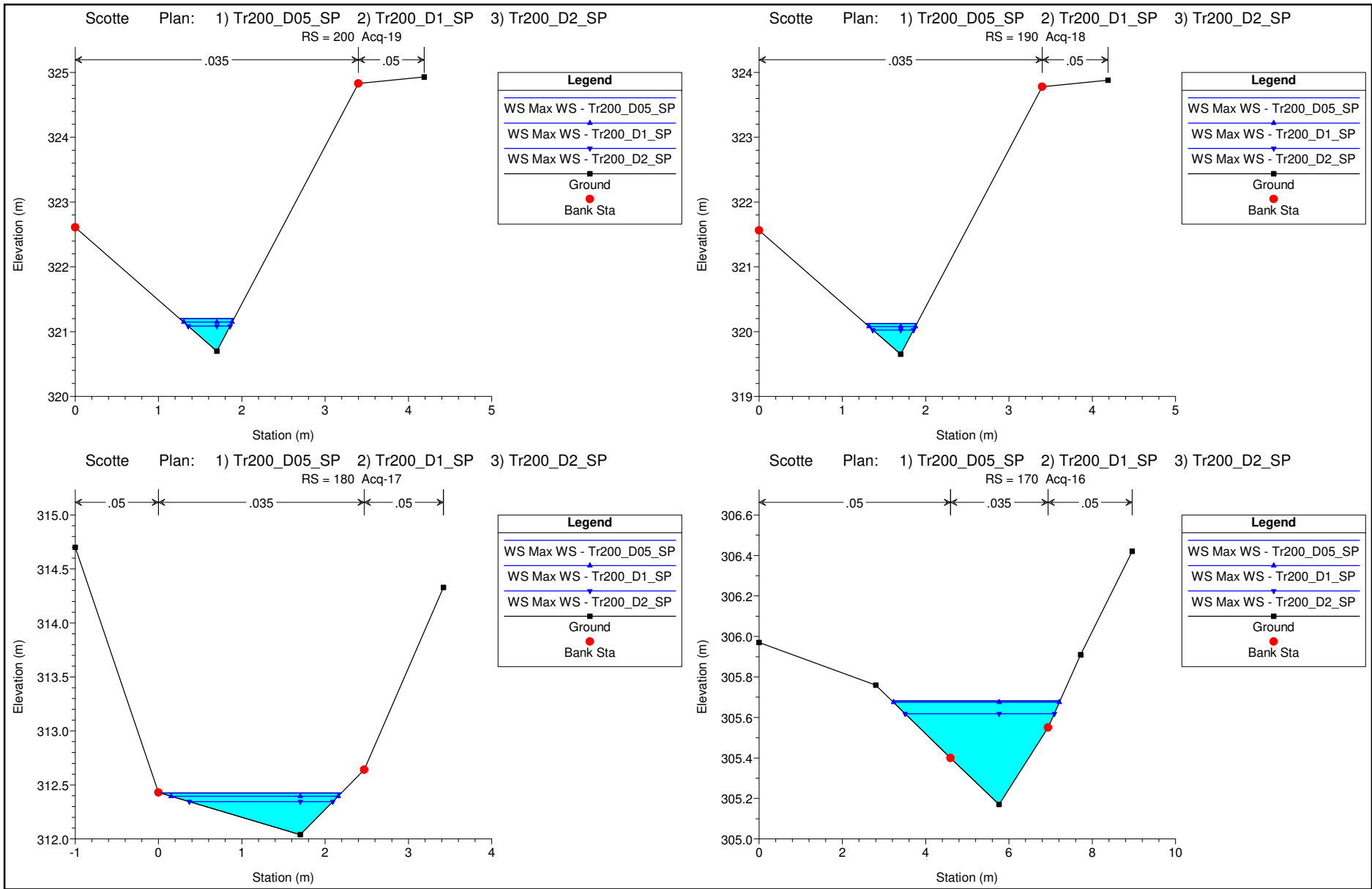
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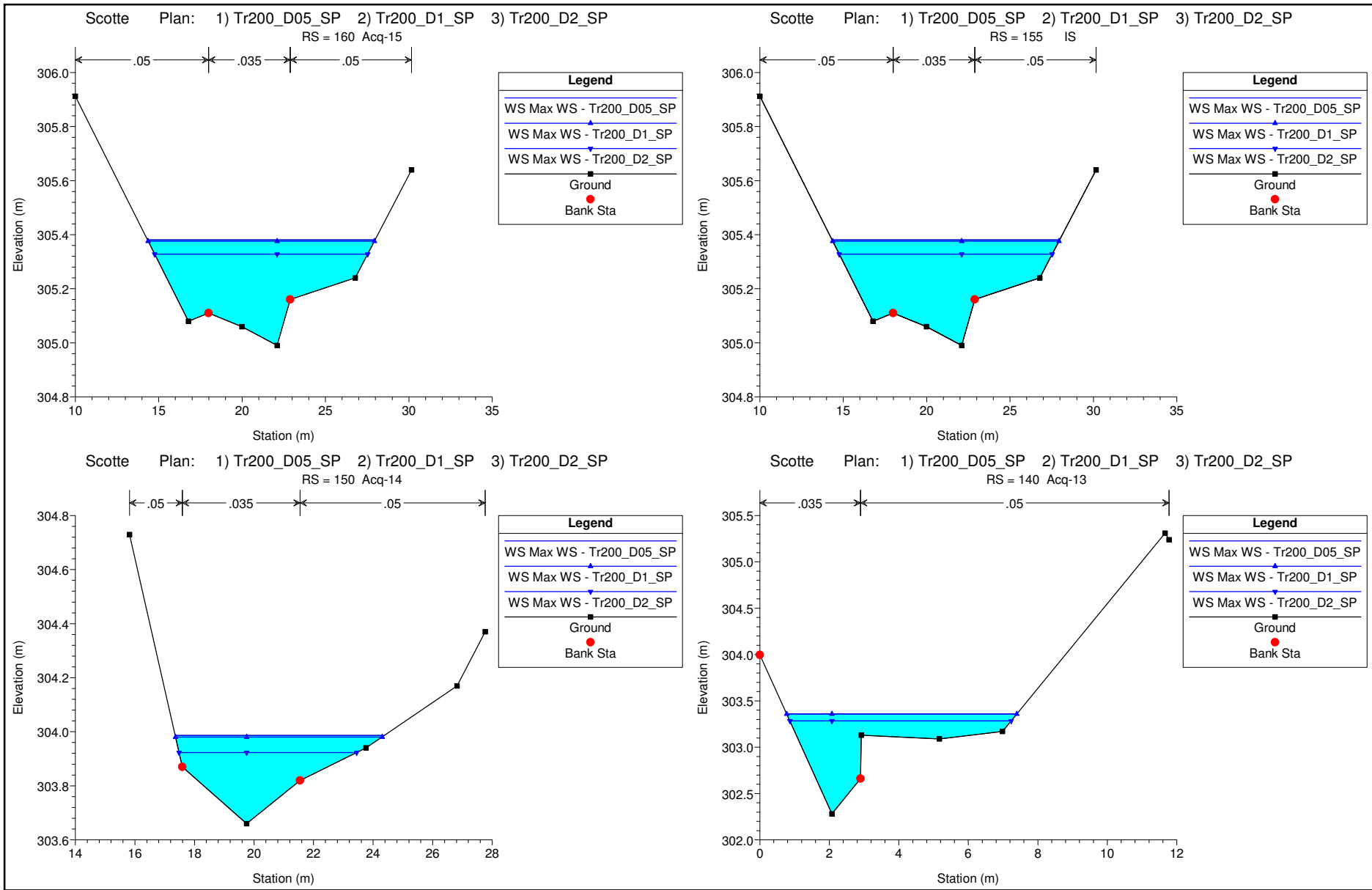
ACQUAVIVA

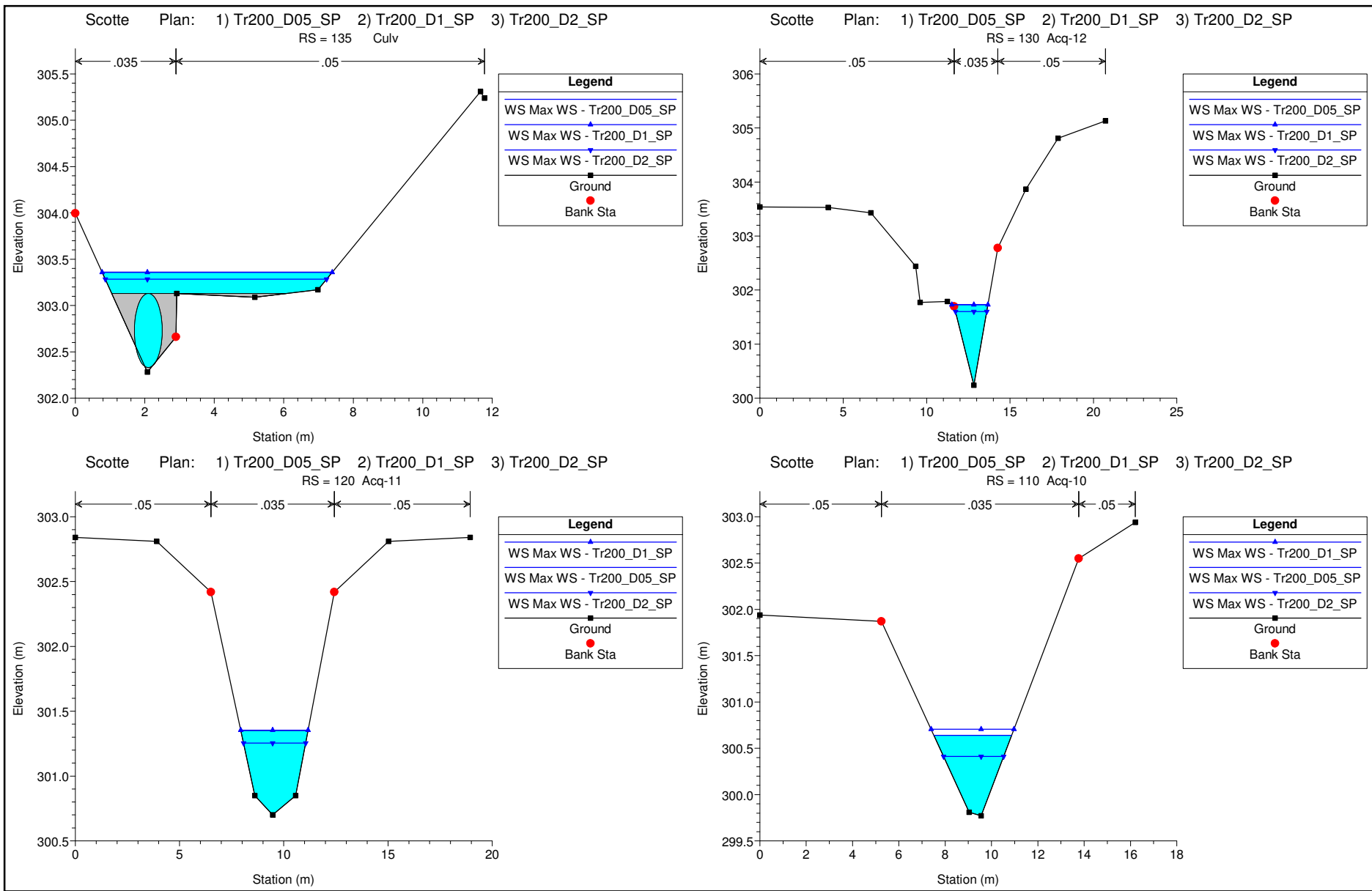
MODELLAZIONE PER TR= 200 anni

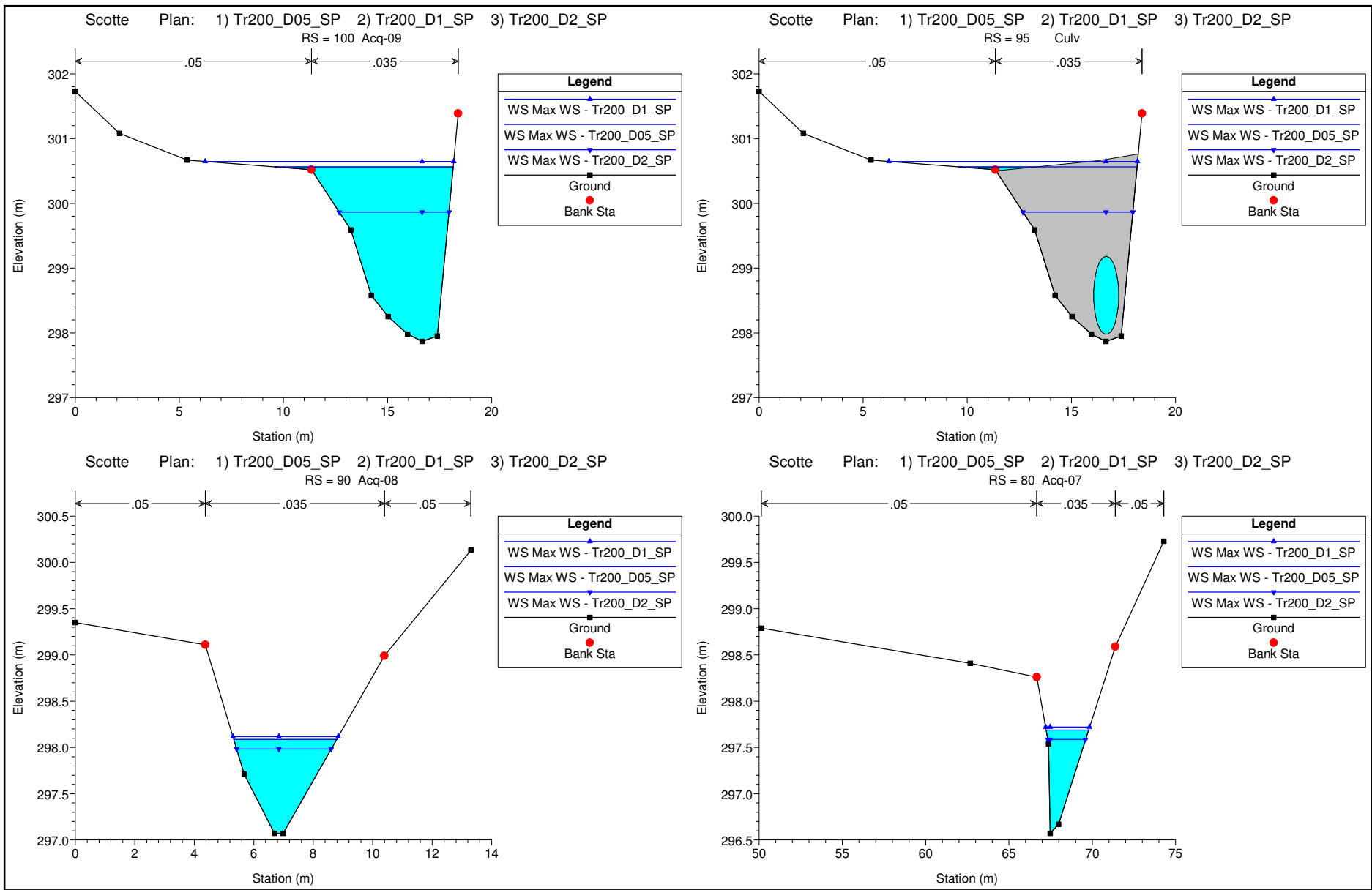
DURATE DI PIOGGIA: 0.5, 1 e 2 h

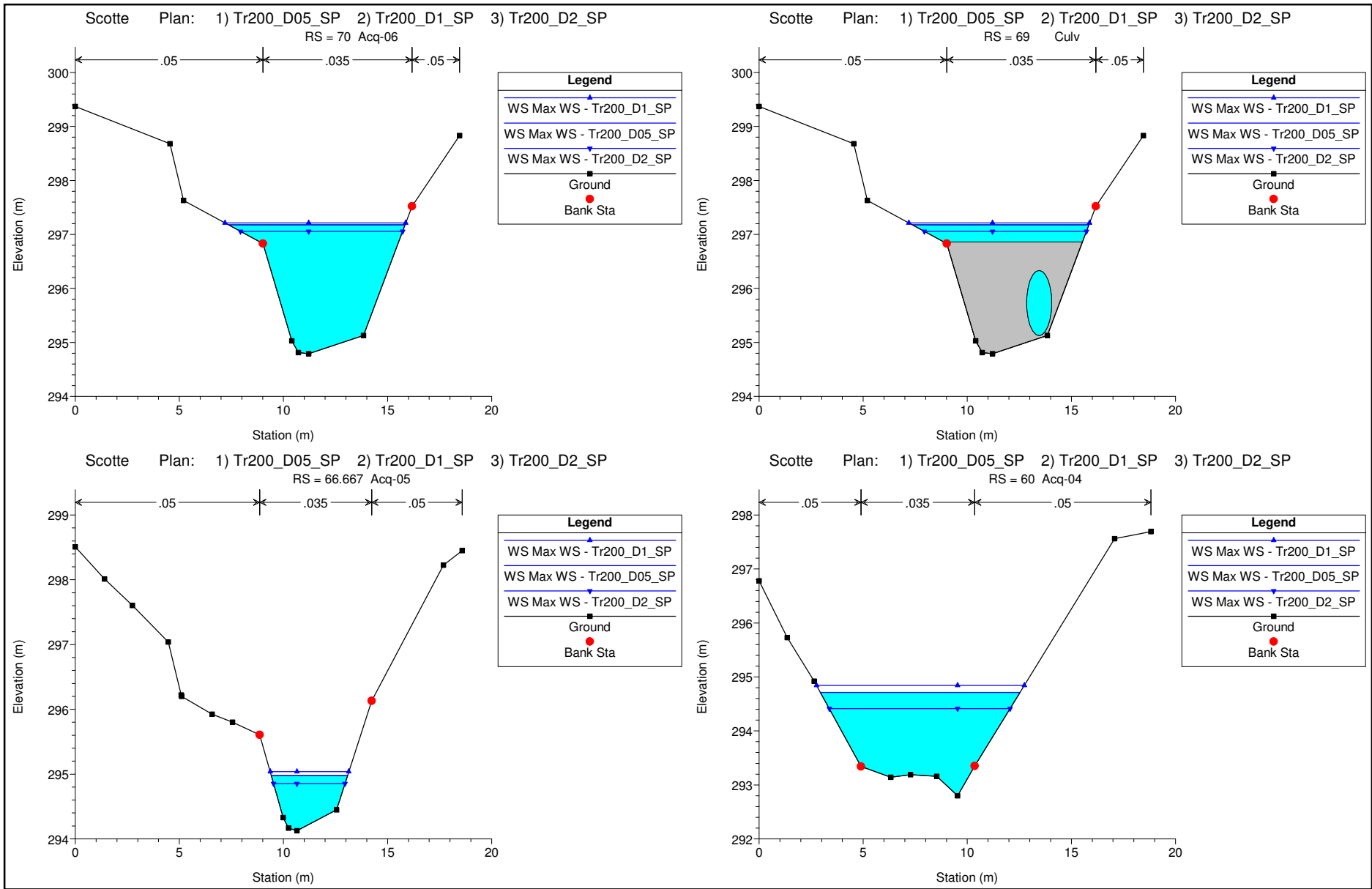
Sezioni Trasversali (da monte verso valle)

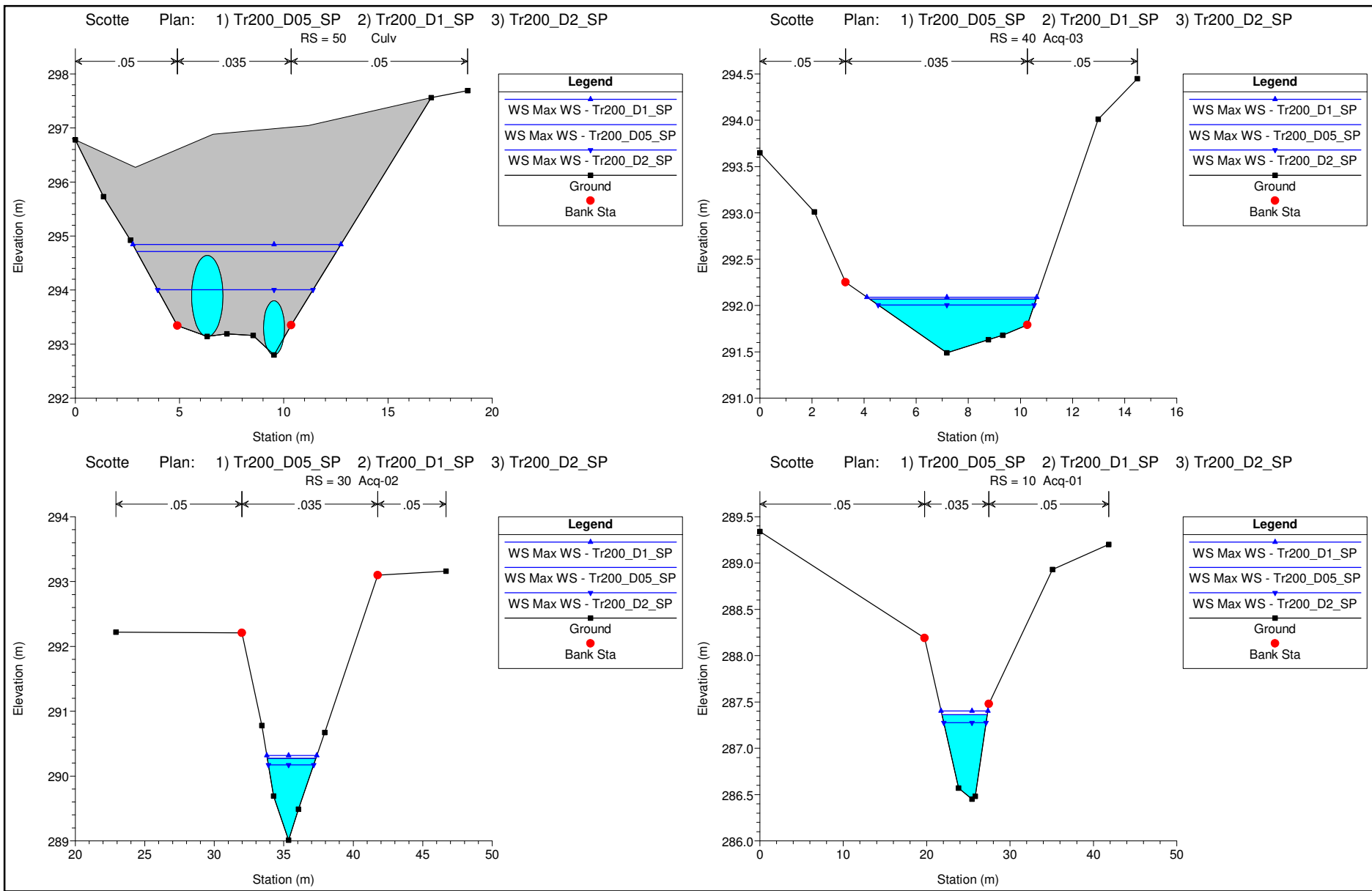












ALLEGATI

MODELLAZIONE HEC-RAS 6.3.1 "ACQUAVIVA"

ACQUAVIVA

MODELLAZIONE PER TR= 200 anni

DURATE DI PIOGGIA: 0.5, 1 e 2 h

Dati idraulici

HEC-RAS River: Acquaviva Reach: Acquaviva Profile: Max WS

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
Acquaviva	200	Max WS	Tr200_D05_SP	0.41	320.70	321.20	321.30	321.52	0.113087	2.52	0.16	0.65	1.61
Acquaviva	200	Max WS	Tr200_D1_SP	0.32	320.70	321.15	321.24	321.46	0.126671	2.47	0.13	0.58	1.67
Acquaviva	200	Max WS	Tr200_D2_SP	0.22	320.70	321.09	321.17	321.35	0.128433	2.26	0.10	0.50	1.64
Acquaviva	190	Max WS	Tr200_D05_SP	0.41	319.65	320.13	320.25	320.52	0.146300	2.78	0.15	0.62	1.82
Acquaviva	190	Max WS	Tr200_D1_SP	0.32	319.65	320.08	320.19	320.44	0.157571	2.68	0.12	0.56	1.85
Acquaviva	190	Max WS	Tr200_D2_SP	0.22	319.65	320.03	320.12	320.32	0.148888	2.39	0.09	0.49	1.76
Acquaviva	180	Max WS	Tr200_D05_SP	1.11	312.04	312.43	312.53	312.79	0.086547	2.66	0.42	2.17	1.94
Acquaviva	180	Max WS	Tr200_D1_SP	0.88	312.04	312.40	312.49	312.71	0.082860	2.47	0.36	2.00	1.87
Acquaviva	180	Max WS	Tr200_D2_SP	0.62	312.04	312.35	312.43	312.63	0.092180	2.35	0.26	1.72	1.92
Acquaviva	170	Max WS	Tr200_D05_SP	2.42	305.17	305.68	305.76	306.01	0.034884	2.63	1.06	4.03	1.40
Acquaviva	170	Max WS	Tr200_D1_SP	2.32	305.17	305.67	305.76	305.99	0.034467	2.58	1.03	3.98	1.39
Acquaviva	170	Max WS	Tr200_D2_SP	1.66	305.17	305.62	305.69	305.86	0.033115	2.25	0.82	3.58	1.32
Acquaviva	160	Max WS	Tr200_D05_SP	2.63	304.99	305.38	305.32	305.43	0.007408	1.15	3.08	13.64	0.65
Acquaviva	160	Max WS	Tr200_D1_SP	2.55	304.99	305.38	305.32	305.43	0.007390	1.14	3.02	13.57	0.65
Acquaviva	160	Max WS	Tr200_D2_SP	1.83	304.99	305.33	305.27	305.37	0.007235	1.01	2.39	12.77	0.62
Acquaviva	155			Inl Struct									
Acquaviva	150	Max WS	Tr200_D05_SP	2.63	303.66	303.99	304.08	304.30	0.057454	2.58	1.19	7.03	1.71
Acquaviva	150	Max WS	Tr200_D1_SP	2.55	303.66	303.98	304.08	304.30	0.059464	2.59	1.15	6.94	1.73
Acquaviva	150	Max WS	Tr200_D2_SP	1.83	303.66	303.92	304.02	304.25	0.089108	2.60	0.77	5.97	2.02
Acquaviva	140	Max WS	Tr200_D05_SP	2.92	302.28	303.36		303.47	0.006993	1.61	2.47	6.64	0.63
Acquaviva	140	Max WS	Tr200_D1_SP	2.87	302.28	303.36		303.46	0.006927	1.60	2.45	6.62	0.62
Acquaviva	140	Max WS	Tr200_D2_SP	2.06	302.28	303.28		303.37	0.005741	1.39	1.97	6.37	0.56
Acquaviva	135			Culvert									
Acquaviva	130	Max WS	Tr200_D05_SP	2.92	300.24	301.73		301.92	0.013848	1.90	1.53	2.17	0.70
Acquaviva	130	Max WS	Tr200_D1_SP	2.87	300.24	301.73		301.91	0.013564	1.88	1.53	2.16	0.69
Acquaviva	130	Max WS	Tr200_D2_SP	2.06	300.24	301.60		301.73	0.011463	1.62	1.27	1.87	0.63
Acquaviva	120	Max WS	Tr200_D05_SP	3.36	300.70	301.35	301.38	301.63	0.022297	2.32	1.45	3.22	1.11
Acquaviva	120	Max WS	Tr200_D1_SP	3.36	300.70	301.35	301.38	301.63	0.022051	2.31	1.45	3.23	1.10
Acquaviva	120	Max WS	Tr200_D2_SP	2.41	300.70	301.25	301.28	301.48	0.022243	2.11	1.14	2.98	1.09
Acquaviva	110	Max WS	Tr200_D05_SP	3.62	299.77	300.64	300.64	300.89	0.018501	2.21	1.64	3.36	1.01
Acquaviva	110	Max WS	Tr200_D1_SP	3.87	299.77	300.71		300.92	0.014920	2.07	1.87	3.58	0.92
Acquaviva	110	Max WS	Tr200_D2_SP	2.79	299.77	300.41	300.54	300.84	0.045916	2.91	0.96	2.59	1.52
Acquaviva	100	Max WS	Tr200_D05_SP	4.29	297.87	300.56		300.57	0.000144	0.38	11.27	8.57	0.09
Acquaviva	100	Max WS	Tr200_D1_SP	4.61	297.87	300.65		300.66	0.000141	0.39	12.13	11.95	0.09
Acquaviva	100	Max WS	Tr200_D2_SP	3.33	297.87	299.87		299.88	0.000297	0.48	6.97	5.27	0.13
Acquaviva	95			Culvert									
Acquaviva	90	Max WS	Tr200_D05_SP	4.29	297.07	298.09		298.32	0.014904	2.16	1.99	3.46	0.91
Acquaviva	90	Max WS	Tr200_D1_SP	4.61	297.07	298.12		298.36	0.014935	2.20	2.09	3.54	0.91
Acquaviva	90	Max WS	Tr200_D2_SP	3.33	297.07	297.98		298.19	0.015040	2.03	1.64	3.18	0.90
Acquaviva	80	Max WS	Tr200_D05_SP	4.54	296.57	297.69	297.80	298.14	0.036058	2.97	1.53	2.55	1.23
Acquaviva	80	Max WS	Tr200_D1_SP	4.89	296.57	297.72	297.83	298.19	0.036306	3.03	1.61	2.64	1.24
Acquaviva	80	Max WS	Tr200_D2_SP	3.53	296.57	297.59	297.67	297.97	0.034597	2.76	1.28	2.27	1.17
Acquaviva	70	Max WS	Tr200_D05_SP	5.46	294.79	297.18		297.19	0.000189	0.47	11.76	8.47	0.12
Acquaviva	70	Max WS	Tr200_D1_SP	5.91	294.79	297.21		297.23	0.000206	0.50	12.08	8.68	0.12
Acquaviva	70	Max WS	Tr200_D2_SP	4.29	294.79	297.06		297.07	0.000145	0.40	10.80	7.79	0.10
Acquaviva	69			Culvert									
Acquaviva	66.667	Max WS	Tr200_D05_SP	5.46	294.13	294.98	295.00	295.30	0.019434	2.53	2.16	3.66	1.05
Acquaviva	66.667	Max WS	Tr200_D1_SP	5.90	294.13	295.04	295.03	295.35	0.017121	2.48	2.38	3.78	1.00
Acquaviva	66.667	Max WS	Tr200_D2_SP	4.29	294.13	294.85	294.90	295.17	0.022920	2.50	1.72	3.43	1.13
Acquaviva	60	Max WS	Tr200_D05_SP	6.22	292.80	294.72		294.73	0.000295	0.65	11.44	9.60	0.16
Acquaviva	60	Max WS	Tr200_D1_SP	6.74	292.80	294.84		294.86	0.000261	0.64	12.69	9.98	0.16
Acquaviva	60	Max WS	Tr200_D2_SP	4.94	292.80	294.41		294.43	0.000399	0.65	8.68	8.68	0.18
Acquaviva	50			Culvert									
Acquaviva	40	Max WS	Tr200_D05_SP	6.22	291.49	292.07	292.19	292.47	0.037311	2.80	2.26	6.39	1.48
Acquaviva	40	Max WS	Tr200_D1_SP	6.74	291.49	292.09	292.21	292.50	0.036988	2.86	2.39	6.52	1.48
Acquaviva	40	Max WS	Tr200_D2_SP	4.94	291.49	292.01	292.11	292.37	0.040327	2.67	1.87	5.99	1.51
Acquaviva	30	Max WS	Tr200_D05_SP	6.79	289.01	290.27	290.34	290.70	0.023600	2.90	2.34	3.50	1.13
Acquaviva	30	Max WS	Tr200_D1_SP	7.37	289.01	290.32	290.38	290.76	0.023502	2.96	2.49	3.60	1.14
Acquaviva	30	Max WS	Tr200_D2_SP	5.41	289.01	290.17	290.21	290.55	0.023022	2.71	1.99	3.25	1.11
Acquaviva	10	Max WS	Tr200_D05_SP	8.50	286.45	287.36	287.42	287.73	0.020310	2.70	3.15	5.45	1.13
Acquaviva	10	Max WS	Tr200_D1_SP	9.27	286.45	287.40	287.46	287.79	0.020218	2.75	3.36	5.61	1.14
Acquaviva	10	Max WS	Tr200_D2_SP	6.83	286.45	287.28	287.32	287.60	0.020211	2.54	2.69	5.08	1.11