

Comune di Seriate  
Provincia di Bergamo



# PIANO DI GOVERNO DEL TERRITORIO

COMPONENTE GEOLOGICA, IDROGEOLOGICA E SISMICA

## Studio idrologico idraulico del Fiume Serio

A.1 - Allegato idraulico

Tabulati, sezioni e profili delle modellazioni idrauliche

data elaborazione 11/2021

Adottato con DCC n° \_\_ del \_\_.\_\_.2021 | Approvato con DCC n° \_\_ del \_\_.\_\_.2021

### ***Raggruppamento Temporaneo di Professionisti Mandatario***



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### ***Mandante***

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HEC-RAS River: Serio Reach: Serio Profile: Max WS (Continued)

Reach	River Sta	Profile	Plan	Q Total (m <sup>3</sup> /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 (m <sup>2</sup> )	Top Width (m)	Froude # Chl
Serio	7590	Max WS	SA_Q200_SCS	766.17	236.69	240.68		241.76	0.009898	4.59	166.96	64.31	0.91
Serio	7590	Max WS	SA_Q200_Clark	757.33	236.69	240.65		241.73	0.010067	4.59	164.85	64.22	0.92
Serio	7590	Max WS	SA_Q50_SCS	556.51	236.69	240.03	240.00	241.03	0.012387	4.43	125.51	60.69	0.98
Serio	7590	Max WS	SA_Q50_Clark	553.25	236.69	240.02	240.00	241.02	0.012419	4.43	124.84	60.54	0.99
Serio	7589			Lat Struct									
Serio	7588			Lat Struct									
Serio	7433	Max WS	SA_Q200_SCS	766.04	232.92	239.53		240.17	0.002970	3.54	216.15	46.51	0.52
Serio	7433	Max WS	SA_Q200_Clark	755.13	232.92	239.48		240.12	0.002967	3.53	214.09	46.37	0.52
Serio	7433	Max WS	SA_Q50_SCS	556.49	232.92	238.69		239.19	0.002692	3.12	178.25	43.77	0.49
Serio	7433	Max WS	SA_Q50_Clark	553.24	232.92	238.68		239.17	0.002684	3.11	177.68	43.73	0.49
Serio	7240	Max WS	SA_Q200_SCS	767.71	233.78	239.10	237.67	239.79	0.000864	3.68	208.88	47.45	0.56
Serio	7240	Max WS	SA_Q200_Clark	755.96	233.78	239.07	237.64	239.75	0.000860	3.65	207.10	47.43	0.56
Serio	7240	Max WS	SA_Q50_SCS	556.49	233.78	238.30	237.08	238.84	0.000852	3.26	170.71	47.10	0.55
Serio	7240	Max WS	SA_Q50_Clark	553.24	233.78	238.29	237.08	238.82	0.000851	3.25	170.13	47.10	0.55
Serio	7235			Bridge									
Serio	7229	Max WS	SA_Q200_SCS	767.65	233.78	238.26		239.31	0.006730	4.55	168.73	47.09	0.77
Serio	7229	Max WS	SA_Q200_Clark	817.52	233.78	238.22		239.44	0.007876	4.89	167.05	47.07	0.83
Serio	7229	Max WS	SA_Q50_SCS	556.50	233.78	237.54		238.41	0.007099	4.11	135.32	46.78	0.77
Serio	7229	Max WS	SA_Q50_Clark	553.24	233.78	237.53		238.39	0.007106	4.10	134.78	46.78	0.77
Serio	7228			Lat Struct									
Serio	7227			Lat Struct									
Serio	7086	Max WS	SA_Q200_SCS	767.61	232.29	237.00		238.46	0.009782	5.36	143.20	41.53	0.92
Serio	7086	Max WS	SA_Q200_Clark	756.98	232.29	236.96		238.42	0.009835	5.34	141.64	41.46	0.92
Serio	7086	Max WS	SA_Q50_SCS	556.43	232.29	236.24		237.48	0.010474	4.95	112.52	38.99	0.93
Serio	7086	Max WS	SA_Q50_Clark	553.18	232.29	236.22		237.47	0.010484	4.94	112.04	38.95	0.93
Serio	6953	Max WS	SA_Q200_SCS	759.70	231.39	235.75		236.73	0.006376	4.39	173.16	50.77	0.76
Serio	6953	Max WS	SA_Q200_Clark	749.13	231.39	235.71		236.69	0.006379	4.37	171.33	50.54	0.76
Serio	6953	Max WS	SA_Q50_SCS	554.17	231.39	234.95		235.81	0.007006	4.12	134.47	46.90	0.78
Serio	6953	Max WS	SA_Q50_Clark	551.00	231.39	234.93		235.80	0.007025	4.12	133.85	46.87	0.78
Serio	6885	Max WS	SA_Q200_SCS	749.09	230.25	235.23		235.77	0.003009	3.25	230.21	59.98	0.53
Serio	6885	Max WS	SA_Q200_Clark	738.65	230.25	235.19		235.73	0.002989	3.24	228.24	59.68	0.53
Serio	6885	Max WS	SA_Q50_SCS	549.97	230.25	234.39		234.85	0.003182	3.02	182.10	55.75	0.53
Serio	6885	Max WS	SA_Q50_Clark	546.82	230.25	234.37		234.84	0.003188	3.02	181.30	55.71	0.53
Serio	6700	Max WS	SA_Q200_SCS	717.83	228.69	234.73		235.29	0.002826	3.32	216.03	49.22	0.51
Serio	6700	Max WS	SA_Q200_Clark	710.47	228.69	234.69		235.25	0.002835	3.31	214.35	49.19	0.51
Serio	6700	Max WS	SA_Q50_SCS	540.75	228.69	233.83		234.33	0.003100	3.13	172.87	47.15	0.52
Serio	6700	Max WS	SA_Q50_Clark	537.84	228.69	233.81		234.31	0.003109	3.12	172.11	47.15	0.52
Serio	6460	Max WS	SA_Q200_SCS	774.47	227.61	233.20		234.56	0.007162	5.17	149.77	29.74	0.74
Serio	6460	Max WS	SA_Q200_Clark	765.31	227.61	233.16		234.51	0.007125	5.14	148.84	29.74	0.73
Serio	6460	Max WS	SA_Q50_SCS	564.61	227.61	232.40		233.42	0.006366	4.47	126.26	29.74	0.69
Serio	6460	Max WS	SA_Q50_Clark	561.21	227.61	232.39		233.40	0.006353	4.46	125.84	29.74	0.69
Serio	6256	Max WS	SA_Q200_SCS	775.01	227.14	231.67		232.88	0.007699	4.88	158.92	45.25	0.83
Serio	6256	Max WS	SA_Q200_Clark	765.55	227.14	231.65		232.85	0.007671	4.85	157.82	45.19	0.83
Serio	6256	Max WS	SA_Q50_SCS	558.43	227.14	231.03		231.96	0.007093	4.28	130.48	42.70	0.78
Serio	6256	Max WS	SA_Q50_Clark	555.08	227.14	231.02		231.95	0.007086	4.27	129.98	42.65	0.78
Serio	6082	Max WS	SA_Q200_SCS	766.23	226.69	230.26		231.03	0.007025	3.89	197.09	77.31	0.78
Serio	6082	Max WS	SA_Q200_Clark	757.60	226.69	230.24		231.00	0.007024	3.87	195.56	77.11	0.78
Serio	6082	Max WS	SA_Q50_SCS	557.67	226.69	229.73		230.37	0.007128	3.54	157.50	71.93	0.76
Serio	6082	Max WS	SA_Q50_Clark	554.09	226.69	229.72		230.35	0.007129	3.53	156.78	71.80	0.76
Serio	6016	Max WS	SA_Q200_SCS	762.29	226.16	229.79		230.36	0.005593	3.35	227.52	93.30	0.69
Serio	6016	Max WS	SA_Q200_Clark	753.81	226.16	229.77		230.34	0.005616	3.34	225.62	93.20	0.69
Serio	6016	Max WS	SA_Q50_SCS	555.46	226.16	229.26		229.75	0.006167	3.11	178.86	88.59	0.70
Serio	6016	Max WS	SA_Q50_Clark	551.71	226.16	229.25		229.74	0.006169	3.10	177.89	88.31	0.70
Serio	5843	Max WS	SA_Q200_SCS	761.71	225.24	229.24	228.16	229.68	0.000801	2.94	258.67	84.49	0.54
Serio	5843	Max WS	SA_Q200_Clark	753.21	225.24	229.21	228.15	229.65	0.000803	2.93	256.69	84.45	0.54
Serio	5843	Max WS	SA_Q50_SCS	554.85	225.24	228.66	227.75	229.02	0.000825	2.64	210.35	83.37	0.53
Serio	5843	Max WS	SA_Q50_Clark	551.12	225.24	228.65	227.75	229.00	0.000828	2.63	209.26	83.33	0.53
Serio	5830			Bridge									
Serio	5813	Max WS	SA_Q200_SCS	761.71	225.24	228.82		229.41	0.005108	3.40	223.75	83.84	0.67
Serio	5813	Max WS	SA_Q200_Clark	753.21	225.24	228.80		229.39	0.005121	3.39	222.02	83.79	0.67
Serio	5813	Max WS	SA_Q50_SCS	554.85	225.24	228.26		228.76	0.005667	3.12	177.61	82.16	0.68
Serio	5813	Max WS	SA_Q50_Clark	551.13	225.24	228.25		228.75	0.005681	3.12	176.73	82.12	0.68
Serio	5812			Lat Struct									
Serio	5811			Lat Struct									
Serio	5576	Max WS	SA_Q200_SCS	725.56	222.08	227.28		228.37	0.006781	4.63	156.79	42.51	0.77
Serio	5576	Max WS	SA_Q200_Clark	717.98	222.08	227.26		228.34	0.006765	4.61	155.84	42.48	0.77
Serio	5576	Max WS	SA_Q50_SCS	538.05	222.08	226.71		227.55	0.006208	4.05	132.88	41.84	0.73
Serio	5576	Max WS	SA_Q50_Clark	534.61	222.08	226.70		227.53	0.006195	4.04	132.42	41.83	0.72
Serio	5394	Max WS	SA_Q200_SCS	638.81	221.47	226.10		226.82	0.005426	3.75	170.36	55.63	0.68

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
Serio	5394	Max WS	SA_Q200_Clark	633.30	221.47	226.09		226.80	0.005413	3.74	169.54	55.61	0.68
Serio	5394	Max WS	SA_Q50_SCS	497.29	221.47	225.72		226.28	0.004990	3.34	149.09	54.92	0.65
Serio	5394	Max WS	SA_Q50_Clark	494.45	221.47	225.71		226.27	0.004973	3.32	148.71	54.91	0.65
Serio	5262	Max WS	SA_Q200_SCS	579.59	221.90	225.73	224.89	226.15	0.000961	2.89	200.23	75.17	0.57
Serio	5262	Max WS	SA_Q200_Clark	575.33	221.90	225.71	224.88	226.14	0.000963	2.89	199.20	75.17	0.57
Serio	5262	Max WS	SA_Q50_SCS	465.87	221.90	225.38	224.64	225.74	0.000979	2.68	174.02	75.17	0.56
Serio	5262	Max WS	SA_Q50_Clark	463.34	221.90	225.37	224.64	225.74	0.000976	2.67	173.63	75.17	0.56
Serio	5260			Bridge									
Serio	5256	Max WS	SA_Q200_SCS	579.59	221.90	225.17		225.85	0.008191	3.65	158.67	75.17	0.80
Serio	5256	Max WS	SA_Q200_Clark	575.33	221.90	225.16		225.84	0.008210	3.65	157.84	75.17	0.80
Serio	5256	Max WS	SA_Q50_SCS	465.87	221.90	224.87		225.47	0.008783	3.43	135.87	75.17	0.81
Serio	5256	Max WS	SA_Q50_Clark	463.35	221.90	224.86		225.46	0.008795	3.42	135.36	75.17	0.81
Serio	5014	Max WS	SA_Q200_SCS	598.97	219.18	222.87		224.00	0.010551	4.70	127.37	49.13	0.93
Serio	5014	Max WS	SA_Q200_Clark	593.75	219.18	222.85		223.97	0.010573	4.69	126.59	49.13	0.93
Serio	5014	Max WS	SA_Q50_SCS	467.32	219.18	222.44		223.42	0.010883	4.38	106.71	47.42	0.93
Serio	5014	Max WS	SA_Q50_Clark	464.80	219.18	222.44		223.41	0.010898	4.37	106.29	47.39	0.93
Serio	4801	Max WS	SA_Q200_SCS	567.28	217.01	221.09		221.72	0.004621	3.52	161.14	48.26	0.62
Serio	4801	Max WS	SA_Q200_Clark	563.03	217.01	221.07		221.70	0.004635	3.51	160.21	48.26	0.62
Serio	4801	Max WS	SA_Q50_SCS	455.73	217.01	220.63		221.18	0.004790	3.28	138.82	48.26	0.62
Serio	4801	Max WS	SA_Q50_Clark	453.54	217.01	220.62		221.17	0.004795	3.28	138.35	48.26	0.62
Serio	4694	Max WS	SA_Q200_SCS	748.77	216.28	220.78		220.92	0.001111	1.69	444.26	148.54	0.31
Serio	4694	Max WS	SA_Q200_Clark	740.62	216.28	220.76		220.90	0.001110	1.68	441.50	148.54	0.31
Serio	4694	Max WS	SA_Q50_SCS	552.01	216.28	220.34		220.45	0.001012	1.45	379.72	148.43	0.29
Serio	4694	Max WS	SA_Q50_Clark	548.33	216.28	220.33		220.44	0.001011	1.45	378.27	148.43	0.29
Serio	4656	Max WS	SA_Q200_SCS	757.71	216.28	220.72		220.87	0.001207	1.74	434.37	146.71	0.32
Serio	4656	Max WS	SA_Q200_Clark	749.22	216.28	220.70		220.85	0.001204	1.74	431.73	146.70	0.32
Serio	4656	Max WS	SA_Q50_SCS	554.51	216.28	220.29		220.41	0.001071	1.49	372.51	146.60	0.30
Serio	4656	Max WS	SA_Q50_Clark	550.74	216.28	220.28		220.40	0.001070	1.48	371.08	146.60	0.30
Serio	4556	Max WS	SA_Q200_SCS	757.52	216.60	220.09		220.83	0.009632	3.80	199.19	98.45	0.85
Serio	4556	Max WS	SA_Q200_Clark	749.03	216.60	220.07		220.81	0.009694	3.80	197.33	98.28	0.86
Serio	4556	Max WS	SA_Q50_SCS	554.44	216.60	219.62		220.28	0.010833	3.59	154.29	90.48	0.88
Serio	4556	Max WS	SA_Q50_Clark	550.67	216.60	219.61		220.27	0.010861	3.59	153.41	90.28	0.88
Serio	4525	Max WS	SA_Q200_SCS	757.51	216.35	219.74	218.22	219.98	0.001668	2.15	351.81	113.28	0.39
Serio	4525	Max WS	SA_Q200_Clark	749.02	216.35	219.72	218.21	219.95	0.001662	2.14	349.67	113.20	0.39
Serio	4525	Max WS	SA_Q50_SCS	554.43	216.35	219.26	217.88	219.43	0.001520	1.86	297.57	111.24	0.36
Serio	4525	Max WS	SA_Q50_Clark	550.66	216.35	219.25	217.88	219.42	0.001517	1.86	296.49	111.20	0.36
Serio	4524			Inl Struct									
Serio	4522	Max WS	SA_Q200_SCS	757.52	214.42	216.28	216.23	217.11	0.012070	4.02	188.41	104.62	0.96
Serio	4522	Max WS	SA_Q200_Clark	749.03	214.42	216.27	216.22	217.09	0.012160	4.01	186.68	104.58	0.96
Serio	4522	Max WS	SA_Q50_SCS	554.43	214.42	215.84	215.90	216.61	0.016164	3.89	142.43	103.74	1.06
Serio	4522	Max WS	SA_Q50_Clark	550.67	214.42	215.83	215.89	216.60	0.016263	3.89	141.57	103.73	1.06
Serio	4364	Max WS	SA_Q200_SCS	757.52	212.02	214.58		215.29	0.009145	3.75	201.93	100.17	0.84
Serio	4364	Max WS	SA_Q200_Clark	749.03	212.02	214.56		215.27	0.009141	3.73	200.56	100.12	0.84
Serio	4364	Max WS	SA_Q50_SCS	554.44	212.02	214.18		214.77	0.009407	3.40	163.03	95.71	0.83
Serio	4364	Max WS	SA_Q50_Clark	550.67	212.02	214.17		214.76	0.009398	3.39	162.33	95.59	0.83
Serio	4046	Max WS	SA_Q200_SCS	757.51	209.08	212.22		212.68	0.005155	2.97	254.80	117.94	0.65
Serio	4046	Max WS	SA_Q200_Clark	749.02	209.08	212.21		212.66	0.005136	2.96	253.33	117.91	0.64
Serio	4046	Max WS	SA_Q50_SCS	554.43	209.08	211.89		212.23	0.004779	2.58	215.28	117.16	0.61
Serio	4046	Max WS	SA_Q50_Clark	550.67	209.08	211.88		212.22	0.004789	2.57	214.24	117.14	0.61
Serio	3970	Max WS	SA_Q200_SCS	757.52	207.43	211.70		212.25	0.008073	3.27	231.60	128.53	0.78
Serio	3970	Max WS	SA_Q200_Clark	749.02	207.43	211.69		212.23	0.008066	3.26	230.08	128.50	0.78
Serio	3970	Max WS	SA_Q50_SCS	554.43	207.43	211.37		211.81	0.008391	2.93	189.25	127.83	0.77
Serio	3970	Max WS	SA_Q50_Clark	550.66	207.43	211.37		211.80	0.008411	2.93	188.05	127.33	0.77
Serio	3402	Max WS	SA_Q200_SCS	757.50	204.02	207.14		207.64	0.008234	3.11	243.62	149.39	0.78
Serio	3402	Max WS	SA_Q200_Clark	749.01	204.02	207.13		207.62	0.008230	3.10	241.98	149.36	0.78
Serio	3402	Max WS	SA_Q50_SCS	554.43	204.02	206.79		207.22	0.008272	2.88	192.83	133.51	0.76
Serio	3402	Max WS	SA_Q50_Clark	550.67	204.02	206.79		207.21	0.008278	2.87	191.86	133.26	0.76
Serio	2570	Max WS	SA_Q200_SCS	757.51	198.55	201.86		202.18	0.004571	2.49	304.51	166.44	0.59
Serio	2570	Max WS	SA_Q200_Clark	748.97	198.55	201.85		202.16	0.004570	2.48	302.43	166.42	0.59
Serio	2570	Max WS	SA_Q50_SCS	554.43	198.55	201.58		201.82	0.004236	2.15	257.81	165.90	0.55
Serio	2570	Max WS	SA_Q50_Clark	550.65	198.55	201.58		201.81	0.004224	2.14	256.95	165.89	0.55
Serio	1985	Max WS	SA_Q200_SCS	757.51	194.98	197.96		198.33	0.007990	2.70	280.53	209.18	0.74
Serio	1985	Max WS	SA_Q200_Clark	748.94	194.98	197.95		198.32	0.008020	2.69	278.24	209.04	0.75
Serio	1985	Max WS	SA_Q50_SCS	554.42	194.98	197.68		198.00	0.008953	2.48	223.35	205.87	0.76
Serio	1985	Max WS	SA_Q50_Clark	550.64	194.98	197.68		197.99	0.008969	2.48	222.29	205.81	0.76
Serio	1443	Max WS	SA_Q200_SCS	757.50	190.15	194.19		194.48	0.005027	2.40	315.08	195.21	0.60
Serio	1443	Max WS	SA_Q200_Clark	748.92	190.15	194.17		194.47	0.005025	2.39	312.94	195.16	0.60
Serio	1443	Max WS	SA_Q50_SCS	554.42	190.15	193.89		194.12	0.005074	2.15	257.52	189.62	0.59
Serio	1443	Max WS	SA_Q50_Clark	550.65	190.15	193.88		194.12	0.005072	2.15	256.43	189.48	0.59
Serio	1087	Max WS	SA_Q200_SCS	757.50	187.98	191.95		192.38	0.007283	2.91	260.54	162.30	0.73
Serio	1087	Max WS	SA_Q200_Clark	748.91	187.98	191.94		192.37	0.007312	2.90	258.42	162.24	0.73
Serio	1087	Max WS	SA_Q50_SCS	554.40	187.98	191.65		192.00	0.007675	2.62	211.92	160.98	0.73
Serio	1087	Max WS	SA_Q50_Clark	550.63	187.98	191.64		191.99	0.007669	2.61	211.08	160.95	0.73

HEC-RAS River: Serio Reach: Serio Profile: Max WS (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
Serio	737	Max WS	SA_Q200_SCS	757.52	185.70	189.63		190.04	0.006200	2.83	268.00	152.56	0.68
Serio	737	Max WS	SA_Q200_Clark	748.90	185.70	189.62		190.02	0.006220	2.82	265.86	152.49	0.68
Serio	737	Max WS	SA_Q50_SCS	554.41	185.70	189.28		189.62	0.006588	2.57	215.44	147.86	0.68
Serio	737	Max WS	SA_Q50_Clark	550.64	185.70	189.28		189.61	0.006556	2.57	214.41	147.05	0.68
Serio	363	Max WS	SA_Q200_SCS	757.51	183.67	187.88		188.12	0.003480	2.14	354.24	200.78	0.51
Serio	363	Max WS	SA_Q200_Clark	748.88	183.67	187.87		188.10	0.003468	2.13	352.10	200.66	0.51
Serio	363	Max WS	SA_Q50_SCS	554.42	183.67	187.57		187.75	0.003455	1.90	292.30	197.31	0.50
Serio	363	Max WS	SA_Q50_Clark	550.63	183.67	187.57		187.75	0.003456	1.89	291.03	197.24	0.50
Serio	63	Max WS	SA_Q200_SCS	757.50	182.71	186.26		186.68	0.006807	2.89	262.08	155.45	0.71
Serio	63	Max WS	SA_Q200_Clark	748.88	182.71	186.24		186.66	0.006837	2.88	259.90	155.40	0.71
Serio	63	Max WS	SA_Q50_SCS	554.40	182.71	185.91		186.27	0.007604	2.65	209.39	154.06	0.73
Serio	63	Max WS	SA_Q50_Clark	550.63	182.71	185.91		186.26	0.007618	2.64	208.41	154.04	0.73
Serio	0	Max WS	SA_Q200_SCS	757.50	182.51	185.85	185.39	186.18	0.005898	2.53	299.44	195.07	0.65
Serio	0	Max WS	SA_Q200_Clark	748.88	182.51	185.84	185.38	186.16	0.005685	2.53	296.52	188.28	0.64
Serio	0	Max WS	SA_Q50_SCS	554.40	182.51	185.49	185.13	185.77	0.006104	2.36	235.34	174.94	0.65
Serio	0	Max WS	SA_Q50_Clark	550.63	182.51	185.48	185.12	185.76	0.006121	2.35	234.17	174.91	0.65

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Serio Serio



























