

ANEJO Nº8.- ESTUDIO DE INUNDABILIDAD

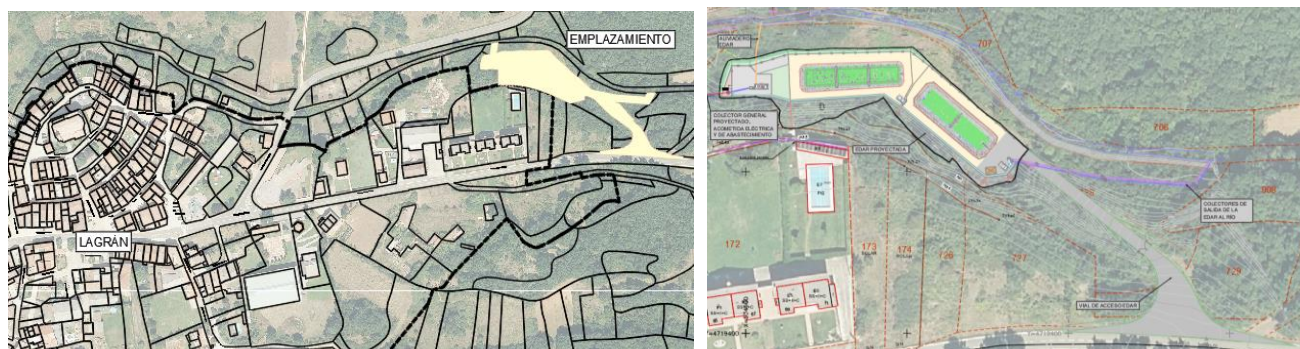
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1. INTRODUCCIÓN

En 2016, la Agencia Vasca del Agua redactó el «Proyecto de la EDAR de Lagrán, TM Lagrán, Álava». Este proyecto realizado por INGENIERÍA Y PROYECTOS en el año 2016 incluía un estudio sobre la influencia de este proyecto en la inundabilidad del entorno. La planta de la actuación ha variado con respecto al proyecto original, lo que hace necesario hacer una nueva valoración de su influencia en la inundabilidad.

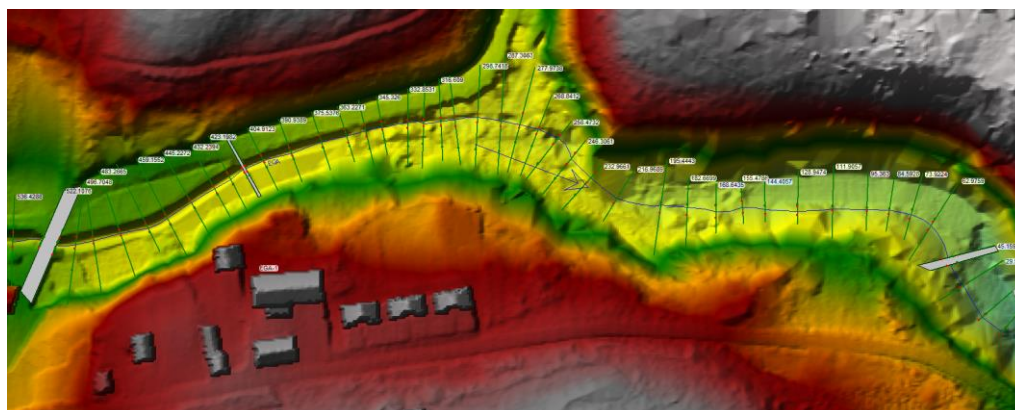
El objetivo del presente anejo es analizar el efecto del nuevo proyecto en la inundabilidad del entorno.

Tal y como muestran las imágenes siguientes, la planta de la EDAR se ubica en la margen derecha del río Ega, aguas abajo del núcleo de población.



2. METODOLOGÍA

Se han realizado unos perfiles transversales al cauce del río Ega a lo largo de un tramo de 550 m de longitud. Estos perfiles incluyen un puente y dos pequeñas pasarelas. El extremo de aguas abajo del modelo se ubica a 250 m del inicio de la planta de actuaciones de la EDAR, una distancia suficiente para que la condición de contorno de aguas abajo no tenga influencia en los resultados.



Se ha elaborado un modelo unidimensional HEC-RAS a partir de esta información geométrica. Los caudales utilizados en el modelo son los estimados por la Agencia Vasca del Agua en el estudio «Mapa de caudales extremos en la CAPV»:

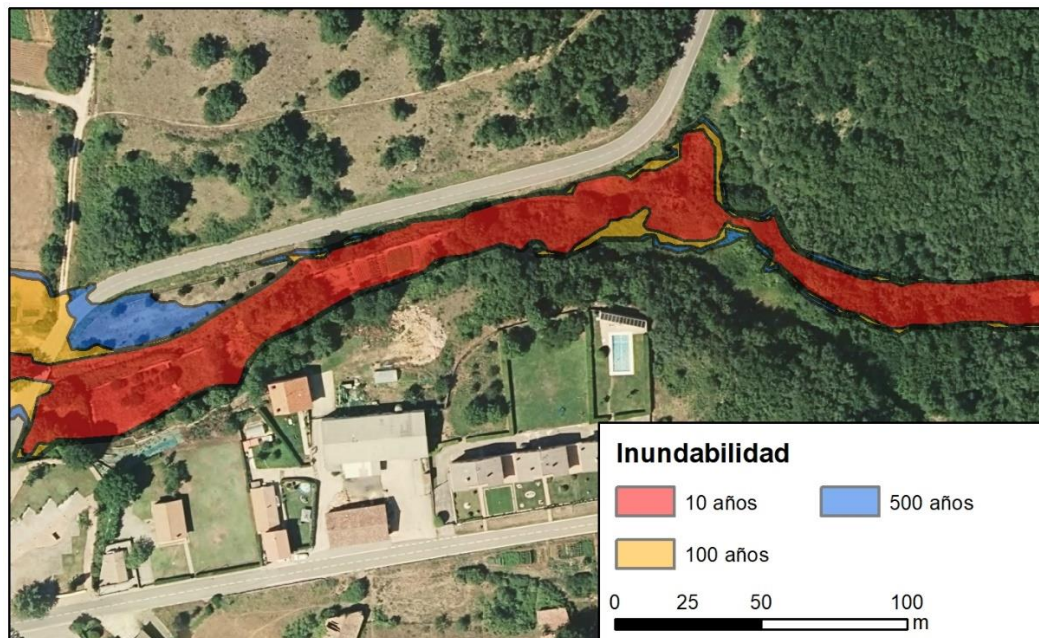
Periodo de retorno	10 años	100 años	500 años
Caudal (m ³ /s)	12	19	25

A continuación, se han delimitado las zonas inundables a partir de los resultados del modelo hidráulico, comprobando su extensión en base a las características topográficas del terreno. No se dispone de información sobre inundaciones históricas en la zona de estudio, por lo que no se han hecho correcciones adicionales.

Para analizar el efecto del proyecto en la inundabilidad se ha modificado la geometría de las secciones transversales afectadas por las actuaciones. Para ello se ha utilizado la información geométrica del proyecto. Finalmente, se han analizado las diferencias con respecto a la situación actual a partir de los resultados del modelo hidráulico.

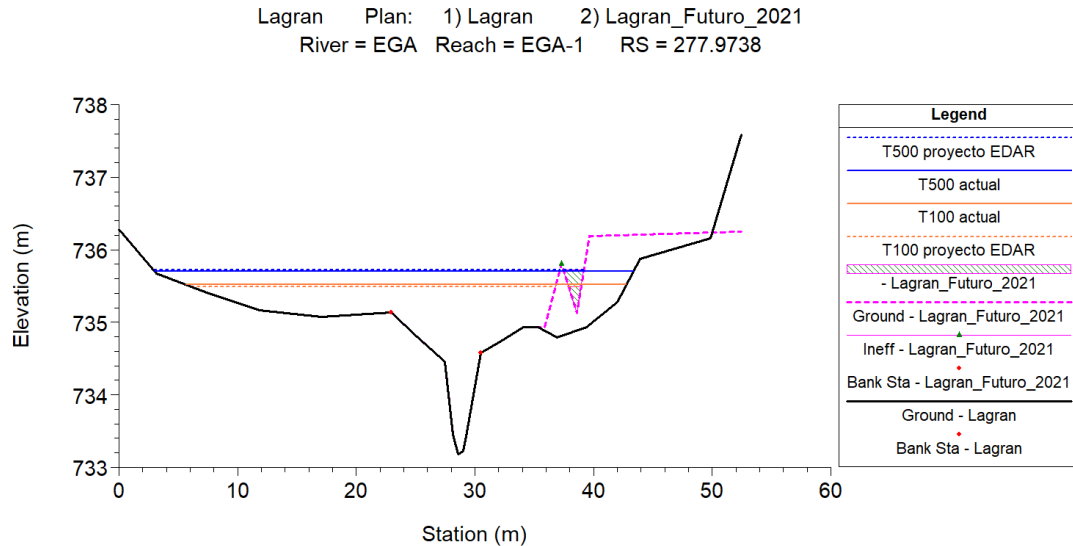
3. RESULTADOS

La imagen siguiente muestra la inundabilidad actual del río Ega en la zona de estudio, de acuerdo con los resultados del modelo hidráulico elaborado. La llanura de inundación del río Ega es muy estrecha y las superficies de inundación son relativamente pequeñas.

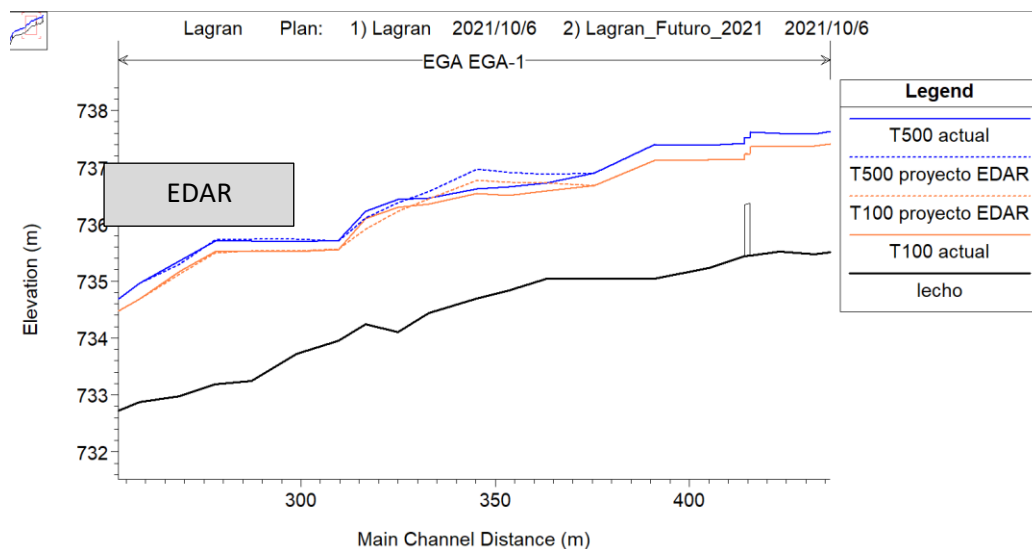


La planta del proyecto afecta a 12 de las secciones transversales del modelo hidráulico. En algunos casos el proyecto excava el terreno existente y en otros se producen rellenos. Estas modificaciones del terreno alteran la geometría de las secciones transversales y la disposición de otros elementos que afectan al comportamiento hidráulico del tramo, en particular las zonas de flujo inefectivo. La imagen siguiente muestra una de las secciones

transversales afectadas por el proyecto; en ella se puede observar la geometría original del terreno (negro) y la geometría futura (línea rosa punteada).



Estos cambios en la geometría del modelo hidráulico producen pequeñas variaciones en la lámina de agua que se aprecian en la figura anterior. La figura siguiente muestra esas variaciones de la lámina de agua para las avenidas de periodo de retorno de 100 y 500 años a lo largo del perfil longitudinal del río.



El efecto hidráulico de la EDAR se prolonga a lo largo de un tramo de 54 m aguas arriba. La sobreelevación máxima de la lámina de agua se alcanza a una distancia de unos 30 m aguas arriba de la EDAR. Esta sobreelevación máxima es de 24 y 34 cm para las avenidas de periodo de retorno de 100 y 500 años, respectivamente. Sin embargo, tal y como puede observarse en el perfil de la figura anterior, el efecto hidráulico de la EDAR es muy localizado y no llega a alcanzar el puente ubicado aguas arriba.

La elevación de la lámina de agua producida por la EDAR no tiene un efecto apreciable en la extensión de las superficies de inundación a la escala del estudio. Finalmente, se comprueba que no existe ningún elemento vulnerable dentro de la zona inundable que sea afectado por este aumento de la lámina de agua.

4. CONCLUSIONES

- La planta del proyecto de EDAR de Lagrán se ubica dentro de la zona inundable del río Ega.
- El proyecto de EDAR produce un aumento local de la lámina de agua que no genera alteraciones apreciables de las superficies inundables y no supone un aumento del riesgo, al no existir elementos vulnerables en la zona afectada.

Lagrán, marzo de 2022

El autor del estudio



Jorge Roa González

Ingeniero de Caminos, Canales y Puertos

Colegiado 26850

La directora de proyecto

Leticia Oliva Ibarrola

Ingeniero Civil

5. ANEXO 1: RESULTADOS ESTADO ACTUAL

5.1. LISTADOS Modelo Hec-Ras Estado Actual

HEC-RAS Plan: Lagran_actual River: EGA Reach: EGA-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)	Top Width (m)	Froude # Chl
EGA-1	536.4288	T10	12.00	736.91	738.78		738.87	0.002013	1.37	9.29	32.93	0.39
EGA-1	536.4288	T25	14.00	736.91	738.69		738.84	0.003466	1.74	8.44	32.23	0.51
EGA-1	536.4288	T50	17.00	736.91	738.72		738.93	0.004720	2.05	8.72	32.47	0.59
EGA-1	536.4288	T100	19.00	736.91	738.77		739.01	0.005118	2.18	9.24	32.89	0.62
EGA-1	536.4288	T500	25.00	736.91	738.79	738.66	739.19	0.008444	2.82	9.42	33.03	0.80
EGA-1	522.1076	T10	12.00	736.49	738.14	738.11	738.68	0.014451	3.24	3.70	15.09	0.95
EGA-1	522.1076	T25	14.00	736.49	738.60	738.60	738.77	0.005001	2.07	11.03	36.44	0.58
EGA-1	522.1076	T50	17.00	736.49	738.66	738.66	738.84	0.005269	2.19	13.25	38.75	0.60
EGA-1	522.1076	T100	19.00	736.49	738.76	738.69	738.90	0.003936	1.98	17.07	42.29	0.53
EGA-1	522.1076	T500	25.00	736.49	738.79	738.79	738.99	0.005835	2.45	18.34	43.40	0.64
EGA-1	518.474		Mult Open									
EGA-1	514.8399	T10	12.00	736.21	737.57	737.57	738.17	0.012216	3.43	3.50	6.56	1.00
EGA-1	514.8399	T25	14.00	736.21	737.70	737.70	738.37	0.011953	3.62	3.86	7.09	1.01
EGA-1	514.8399	T50	17.00	736.21	737.88	737.88	738.64	0.011440	3.87	4.40	7.87	1.01
EGA-1	514.8399	T100	19.00	736.21	737.99	737.99	738.82	0.011263	4.02	4.72	9.11	1.01
EGA-1	514.8399	T500	25.00	736.21	738.59	738.59	738.79	0.007060	2.37	16.85	43.37	0.73
EGA-1	505.5815	T10	12.00	736.19	737.54		737.61	0.002292	1.35	11.77	27.40	0.42
EGA-1	505.5815	T25	14.00	736.19	737.67		737.74	0.001874	1.32	14.01	28.08	0.39
EGA-1	505.5815	T50	17.00	736.19	737.84		737.91	0.001528	1.31	17.13	29.25	0.36
EGA-1	505.5815	T100	19.00	736.19	737.95		738.01	0.001403	1.32	19.24	32.75	0.35
EGA-1	505.5815	T500	25.00	736.19	738.24		738.32	0.001500	1.54	27.45	43.93	0.37
EGA-1	496.7048	T10	12.00	736.03	737.47		737.58	0.002987	1.74	9.18	27.77	0.50
EGA-1	496.7048	T25	14.00	736.03	737.59		737.71	0.002860	1.80	10.38	28.18	0.49
EGA-1	496.7048	T50	17.00	736.03	737.75		737.88	0.002744	1.90	12.07	28.74	0.49
EGA-1	496.7048	T100	19.00	736.03	737.84		737.99	0.002787	2.00	13.09	29.72	0.50
EGA-1	496.7048	T500	25.00	736.03	738.11		738.29	0.002886	2.25	17.14	41.62	0.52
EGA-1	483.2665	T10	12.00	735.75	737.36		737.53	0.004131	2.12	7.80	25.41	0.58
EGA-1	483.2665	T25	14.00	735.75	737.49		737.66	0.003899	2.17	8.87	25.65	0.57
EGA-1	483.2665	T50	17.00	735.75	737.65		737.83	0.003694	2.27	10.36	25.98	0.56
EGA-1	483.2665	T100	19.00	735.75	737.75		737.94	0.003624	2.33	11.27	26.18	0.56
EGA-1	483.2665	T500	25.00	735.75	738.01	737.54	738.25	0.003705	2.59	15.70	43.04	0.58
EGA-1	469.6528	T10	12.00	735.71	737.29		737.47	0.003831	2.00	6.78	16.97	0.57
EGA-1	469.6528	T25	14.00	735.71	737.39		737.60	0.003903	2.13	7.52	17.26	0.58
EGA-1	469.6528	T50	17.00	735.71	737.53		737.77	0.004016	2.31	8.61	19.87	0.60
EGA-1	469.6528	T100	19.00	735.71	737.62	737.25	737.88	0.003958	2.39	9.77	25.04	0.60
EGA-1	469.6528	T500	25.00	735.71	738.00	737.46	738.19	0.002586	2.22	17.76	34.53	0.50
EGA-1	459.1552	T10	12.00	735.85	737.25		737.43	0.004092	1.95	6.78	15.81	0.58
EGA-1	459.1552	T25	14.00	735.85	737.35		737.56	0.004066	2.06	7.55	16.35	0.59
EGA-1	459.1552	T50	17.00	735.85	737.50		737.73	0.004081	2.22	8.62	17.08	0.60
EGA-1	459.1552	T100	19.00	735.85	737.59		737.84	0.004068	2.31	9.32	17.54	0.61
EGA-1	459.1552	T500	25.00	735.85	737.79	737.42	738.14	0.004742	2.73	11.64	26.26	0.67
EGA-1	445.2272	T10	12.00	735.57	737.18		737.37	0.003987	2.03	6.77	21.52	0.58
EGA-1	445.2272	T25	14.00	735.57	737.28		737.50	0.004138	2.18	7.45	21.87	0.59
EGA-1	445.2272	T50	17.00	735.57	737.41		737.67	0.004382	2.38	8.39	22.32	0.62
EGA-1	445.2272	T100	19.00	735.57	737.49		737.77	0.004488	2.50	9.01	22.61	0.63
EGA-1	445.2272	T500	25.00	735.57	737.72		738.07	0.004768	2.82	10.84	24.94	0.67
EGA-1	432.2394	T10	12.00	735.48	737.11		737.32	0.004077	2.13	6.65	16.90	0.58
EGA-1	432.2394	T25	14.00	735.48	737.20		737.44	0.004426	2.31	7.22	17.17	0.61
EGA-1	432.2394	T50	17.00	735.48	737.31		737.60	0.004990	2.57	7.97	17.50	0.66
EGA-1	432.2394	T100	19.00	735.48	737.37		737.70	0.005393	2.74	8.41	18.21	0.69
EGA-1	432.2394	T500	25.00	735.48	737.58	737.32	738.00	0.005781	3.09	10.16	19.70	0.73
EGA-1	423.1982	T10	12.00	735.52	737.09		737.27	0.004720	1.90	6.39	16.88	0.60
EGA-1	423.1982	T25	14.00	735.52	737.18		737.39	0.004878	2.04	7.00	17.89	0.61
EGA-1	423.1982	T50	17.00	735.52	737.29		737.54	0.005176	2.24	7.87	18.78	0.64
EGA-1	423.1982	T100	19.00	735.52	737.36		737.64	0.005375	2.37	8.43	19.23	0.66
EGA-1	423.1982	T500	25.00	735.52	737.59		737.92	0.005229	2.60	10.57	21.81	0.67
EGA-1	415.7446	T10	12.00	735.45	737.09	736.68	737.22	0.003003	1.88	8.31	17.59	0.50
EGA-1	415.7446	T25	14.00	735.45	737.18	736.76	737.33	0.003172	2.01	9.11	17.92	0.52
EGA-1	415.7446	T50	17.00	735.45	737.30	736.88	737.48	0.003444	2.20	10.21	19.65	0.55
EGA-1	415.7446	T100	19.00	735.45	737.37	736.95	737.57	0.003599	2.31	11.04	21.80	0.56
EGA-1	415.7446	T500	25.00	735.45	737.61	737.15	737.84	0.003496	2.50	14.40	23.02	0.57
EGA-1	415.012		Mult Open									
EGA-1	414.2921	T10	12.00	735.44	736.78		737.05	0.008736	2.56	5.53	16.81	0.76
EGA-1	414.2921	T25	14.00	735.44	736.88		737.18	0.008377	2.66	6.29	17.41	0.76
EGA-1	414.2921	T50	17.00	735.44	737.05		737.36	0.007511	2.73	7.59	18.36	0.73
EGA-1	414.2921	T100	19.00	735.44	737.15		737.46	0.007103	2.78	8.45	18.93	0.72
EGA-1	414.2921	T500	25.00	735.44	737.43		737.75	0.006065	2.87	11.13	20.53	0.68
EGA-1	404.9123	T10	12.00	735.23	736.77		736.95	0.004063	2.02	7.07	17.18	0.57
EGA-1	404.9123	T25	14.00	735.23	736.88		737.08	0.004164	2.16	7.82	17.49	0.58
EGA-1	404.9123	T50	17.00	735.23	737.03		737.27	0.004158	2.32	8.99	17.97	0.59
EGA-1	404.9123	T100	19.00	735.23	737.13		737.38	0.004183	2.42	9.73	18.26	0.60
EGA-1	404.9123	T500	25.00	735.23	737.39		737.69	0.004234	2.68	11.84	19.04	0.62

HEC-RAS Plan: Lagran_actual River: EGA Reach: EGA-1 (Continued)

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
EGA-1	390.9389	T10	12.00	735.05	736.75		736.89	0.002883	1.75	7.74	17.92	0.49
EGA-1	390.9389	T25	14.00	735.05	736.86		737.02	0.002961	1.87	8.51	18.34	0.50
EGA-1	390.9389	T50	17.00	735.05	737.02		737.20	0.002954	2.00	9.73	18.98	0.51
EGA-1	390.9389	T100	19.00	735.05	737.12		737.32	0.002968	2.09	10.50	19.83	0.51
EGA-1	390.9389	T500	25.00	735.05	737.39		737.62	0.002931	2.29	13.18	24.27	0.52
EGA-1	375.5376	T10	12.00	735.04	736.49	736.39	736.80	0.010177	2.45	4.92	15.46	0.83
EGA-1	375.5376	T25	14.00	735.04	736.53	736.47	736.91	0.011977	2.74	5.15	15.64	0.91
EGA-1	375.5376	T50	17.00	735.04	736.60	736.60	737.09	0.013774	3.09	5.57	15.97	0.99
EGA-1	375.5376	T100	19.00	735.04	736.68	736.68	737.20	0.013316	3.19	6.06	16.34	0.98
EGA-1	375.5376	T500	25.00	735.04	736.90	736.90	737.50	0.012173	3.46	7.50	17.36	0.97
EGA-1	363.2271	T10	12.00	735.04	736.45		736.67	0.007258	2.06	6.08	13.77	0.71
EGA-1	363.2271	T25	14.00	735.04	736.49		736.75	0.008477	2.29	6.41	13.87	0.77
EGA-1	363.2271	T50	17.00	735.04	736.55	736.49	736.88	0.010255	2.60	6.87	14.00	0.85
EGA-1	363.2271	T100	19.00	735.04	736.59	736.55	736.97	0.011127	2.77	7.22	14.10	0.89
EGA-1	363.2271	T500	25.00	735.04	736.73	736.73	737.21	0.012536	3.15	8.38	14.74	0.97
EGA-1	353.5047	T10	12.00	734.84	736.30	736.30	736.57	0.011009	2.42	5.83	13.91	0.84
EGA-1	353.5047	T25	14.00	734.84	736.37	736.37	736.66	0.010947	2.52	6.60	14.09	0.84
EGA-1	353.5047	T50	17.00	734.84	736.46	736.46	736.77	0.011172	2.67	7.58	14.33	0.86
EGA-1	353.5047	T100	19.00	734.84	736.51	736.51	736.85	0.011478	2.78	8.14	14.46	0.88
EGA-1	353.5047	T500	25.00	734.84	736.65	736.65	737.04	0.011930	3.03	9.76	14.85	0.91
EGA-1	345.326	T10	12.00	734.69	736.39		736.47	0.002905	1.48	10.47	12.86	0.45
EGA-1	345.326	T25	14.00	734.69	736.44		736.53	0.003356	1.62	11.09	12.98	0.49
EGA-1	345.326	T50	17.00	734.69	736.50		736.62	0.004009	1.82	11.89	13.08	0.54
EGA-1	345.326	T100	19.00	734.69	736.54		736.68	0.004406	1.95	12.39	13.13	0.57
EGA-1	345.326	T500	25.00	734.69	736.62		736.82	0.005787	2.35	13.54	13.24	0.66
EGA-1	332.8531	T10	12.00	734.44	736.21	736.21	736.40	0.007720	2.17	7.98	20.29	0.62
EGA-1	332.8531	T25	14.00	734.44	736.26	736.26	736.46	0.007912	2.25	9.12	20.34	0.63
EGA-1	332.8531	T50	17.00	734.44	736.33	736.33	736.54	0.008509	2.39	10.45	20.40	0.66
EGA-1	332.8531	T100	19.00	734.44	736.36	736.36	736.59	0.009311	2.53	11.03	20.42	0.69
EGA-1	332.8531	T500	25.00	734.44	736.45	736.45	736.72	0.010602	2.79	12.99	20.50	0.74
EGA-1	324.9519	T10	12.00	734.10	735.95	735.61	736.18	0.007096	2.34	7.74	21.21	0.66
EGA-1	324.9519	T25	14.00	734.10	735.93	735.69	736.28	0.010746	2.85	7.31	21.06	0.81
EGA-1	324.9519	T50	17.00	734.10	736.24	735.80	736.36	0.003724	1.94	14.02	23.21	0.49
EGA-1	324.9519	T100	19.00	734.10	736.29		736.42	0.003716	1.98	15.30	23.60	0.50
EGA-1	324.9519	T500	25.00	734.10	736.43		736.57	0.003753	2.11	18.76	24.62	0.51
EGA-1	316.609	T10	12.00	734.24	735.65	735.65	736.03	0.012503	2.85	4.75	9.81	0.91
EGA-1	316.609	T25	14.00	734.24	735.75	735.75	736.16	0.012171	2.97	5.43	12.12	0.91
EGA-1	316.609	T50	17.00	734.24	736.03	736.03	736.30	0.006496	2.54	9.56	22.94	0.69
EGA-1	316.609	T100	19.00	734.24	736.10	736.10	736.36	0.006267	2.57	11.04	23.31	0.69
EGA-1	316.609	T500	25.00	734.24	736.22	736.22	736.51	0.006697	2.81	13.95	23.97	0.72
EGA-1	309.7172	T10	12.00	733.95	735.27	735.27	735.59	0.012029	2.61	5.22	9.60	0.88
EGA-1	309.7172	T25	14.00	733.95	735.38	735.38	735.69	0.010125	2.59	6.52	13.40	0.82
EGA-1	309.7172	T50	17.00	733.95	735.50	735.50	735.81	0.009303	2.67	8.14	14.93	0.80
EGA-1	309.7172	T100	19.00	733.95	735.56	735.56	735.88	0.009133	2.74	9.07	15.75	0.80
EGA-1	309.7172	T500	25.00	733.95	735.71	735.71	736.06	0.009004	2.95	11.73	19.02	0.81
EGA-1	298.7418	T10	12.00	733.72	735.22		735.37	0.004361	1.90	9.29	20.85	0.57
EGA-1	298.7418	T25	14.00	733.72	735.32		735.45	0.003880	1.89	11.29	22.08	0.54
EGA-1	298.7418	T50	17.00	733.72	735.44		735.57	0.003464	1.91	14.15	24.70	0.52
EGA-1	298.7418	T100	19.00	733.72	735.51		735.64	0.003204	1.90	16.07	25.91	0.51
EGA-1	298.7418	T500	25.00	733.72	735.70		735.81	0.002778	1.92	20.89	26.69	0.48
EGA-1	287.3083	T10	12.00	733.24	735.25		735.32	0.001564	1.24	13.59	25.14	0.35
EGA-1	287.3083	T25	14.00	733.24	735.34		735.41	0.001530	1.28	15.81	26.62	0.35
EGA-1	287.3083	T50	17.00	733.24	735.46		735.53	0.001471	1.33	19.08	28.66	0.35
EGA-1	287.3083	T100	19.00	733.24	735.53		735.60	0.001440	1.36	21.19	29.90	0.35
EGA-1	287.3083	T500	25.00	733.24	735.71		735.78	0.001431	1.45	26.73	32.94	0.35
EGA-1	277.9738	T10	12.00	733.18	735.21		735.29	0.003949	1.45	11.08	30.42	0.51
EGA-1	277.9738	T25	14.00	733.18	735.31		735.39	0.002961	1.36	14.48	32.99	0.45
EGA-1	277.9738	T50	17.00	733.18	735.45		735.51	0.002249	1.29	19.02	35.72	0.40
EGA-1	277.9738	T100	19.00	733.18	735.52		735.58	0.001991	1.27	21.79	37.17	0.38
EGA-1	277.9738	T500	25.00	733.18	735.70		735.76	0.001647	1.28	28.91	40.37	0.35
EGA-1	268.8412	T10	12.00	732.97	734.87	734.87	735.21	0.010826	2.64	5.21	10.41	0.78
EGA-1	268.8412	T25	14.00	732.97	734.99	734.99	735.32	0.009640	2.65	6.51	12.08	0.74
EGA-1	268.8412	T50	17.00	732.97	735.11	735.11	735.44	0.009206	2.75	8.08	13.82	0.74
EGA-1	268.8412	T100	19.00	732.97	735.17	735.17	735.52	0.009227	2.84	8.99	14.73	0.74
EGA-1	268.8412	T500	25.00	732.97	735.35	735.35	735.70	0.008713	2.98	11.85	16.92	0.74
EGA-1	258.4732	T10	12.00	732.87	734.33	734.33	734.78	0.017943	2.98	4.03	4.51	1.01
EGA-1	258.4732	T25	14.00	732.87	734.44	734.44	734.92	0.017831	3.08	4.54	4.76	1.01
EGA-1	258.4732	T50	17.00	732.87	734.59	734.59	735.12	0.016912	3.23	5.29	5.36	0.99
EGA-1	258.4732	T100	19.00	732.87	734.68	734.68	735.24	0.016117	3.30	5.83	5.83	0.97
EGA-1	258.4732	T500	25.00	732.87	734.97	734.97	735.55	0.013999	3.43	7.69	7.42	0.93
EGA-1	246.3061	T10	12.00	732.55	734.01		734.15	0.003574	1.66	7.34	7.60	0.51
EGA-1	246.3061	T25	14.00	732.55	734.08		734.25	0.003931	1.81	7.89	8.14	0.54
EGA-1	246.3061	T50	17.00	732.55	734.17		734.38	0.004515	2.04	8.61	8.81	0.59
EGA-1	246.3061	T100	19.00	732.55	734.22		734.46	0.004916	2.18	9.06	9.20	0.62

IEC-RAS Plan: Lagran_ actual River: EGA Reach: EGA-1 (Continued)													
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	
EGA-1	246.3061	T500	25.00	732.55	734.34		734.67	0.006220	2.60	10.20	10.12	0.70	
EGA-1	232.9661	T10	12.00	732.30	734.00		734.11	0.002056	1.46	8.85	7.59	0.40	
EGA-1	232.9661	T25	14.00	732.30	734.07		734.20	0.002397	1.61	9.36	7.67	0.43	
EGA-1	232.9661	T50	17.00	732.30	734.15		734.32	0.002948	1.83	10.01	7.78	0.48	
EGA-1	232.9661	T100	19.00	732.30	734.20		734.39	0.003346	1.98	10.36	7.84	0.51	
EGA-1	232.9661	T500	25.00	732.30	734.30		734.59	0.004693	2.42	11.19	7.97	0.61	
EGA-1	216.9689	T10	12.00	732.22	733.75	733.75	734.03	0.009031	2.41	6.13	13.01	0.74	
EGA-1	216.9689	T25	14.00	732.22	733.83	733.83	734.11	0.009106	2.50	7.14	13.37	0.75	
EGA-1	216.9689	T50	17.00	732.22	733.92	733.92	734.22	0.009396	2.64	8.41	13.82	0.76	
EGA-1	216.9689	T100	19.00	732.22	733.98	733.98	734.29	0.009559	2.72	9.20	14.08	0.77	
EGA-1	216.9689	T500	25.00	732.22	734.12	734.12	734.47	0.010341	2.97	11.18	14.73	0.81	
EGA-1	195.4443	T10	12.00	731.95	733.51	733.26	733.76	0.008174	2.32	6.23	13.31	0.69	
EGA-1	195.4443	T25	14.00	731.95	733.58	733.56	733.85	0.008462	2.43	7.22	13.61	0.70	
EGA-1	195.4443	T50	17.00	731.95	733.69	733.66	733.97	0.008392	2.52	8.73	14.06	0.71	
EGA-1	195.4443	T100	19.00	731.95	733.76	733.72	734.04	0.008164	2.55	9.76	14.36	0.70	
EGA-1	195.4443	T500	25.00	731.95	733.95		734.22	0.007717	2.64	12.53	15.13	0.69	
EGA-1	182.6699	T10	12.00	731.72	733.60		733.66	0.001967	1.29	12.31	14.78	0.35	
EGA-1	182.6699	T25	14.00	731.72	733.67		733.74	0.002105	1.37	13.44	14.90	0.36	
EGA-1	182.6699	T50	17.00	731.72	733.78		733.86	0.002290	1.47	14.98	15.06	0.38	
EGA-1	182.6699	T100	19.00	731.72	733.84		733.93	0.002389	1.53	15.97	15.16	0.39	
EGA-1	182.6699	T500	25.00	731.72	734.01		734.12	0.002676	1.70	18.58	15.43	0.42	
EGA-1	168.6435	T10	12.00	731.74	733.57		733.63	0.001609	1.26	12.05	12.93	0.34	
EGA-1	168.6435	T25	14.00	731.74	733.64		733.72	0.001804	1.36	12.96	13.05	0.36	
EGA-1	168.6435	T50	17.00	731.74	733.73		733.82	0.002079	1.51	14.19	13.21	0.39	
EGA-1	168.6435	T100	19.00	731.74	733.79		733.89	0.002240	1.59	14.97	13.31	0.41	
EGA-1	168.6435	T500	25.00	731.74	733.95		734.08	0.002714	1.83	17.03	13.57	0.45	
EGA-1	155.4786	T10	12.00	731.90	733.34	733.34	733.58	0.009116	2.34	6.68	13.54	0.74	
EGA-1	155.4786	T25	14.00	731.90	733.40	733.40	733.65	0.009549	2.47	7.45	13.62	0.76	
EGA-1	155.4786	T50	17.00	731.90	733.47	733.47	733.75	0.010105	2.63	8.51	13.74	0.79	
EGA-1	155												

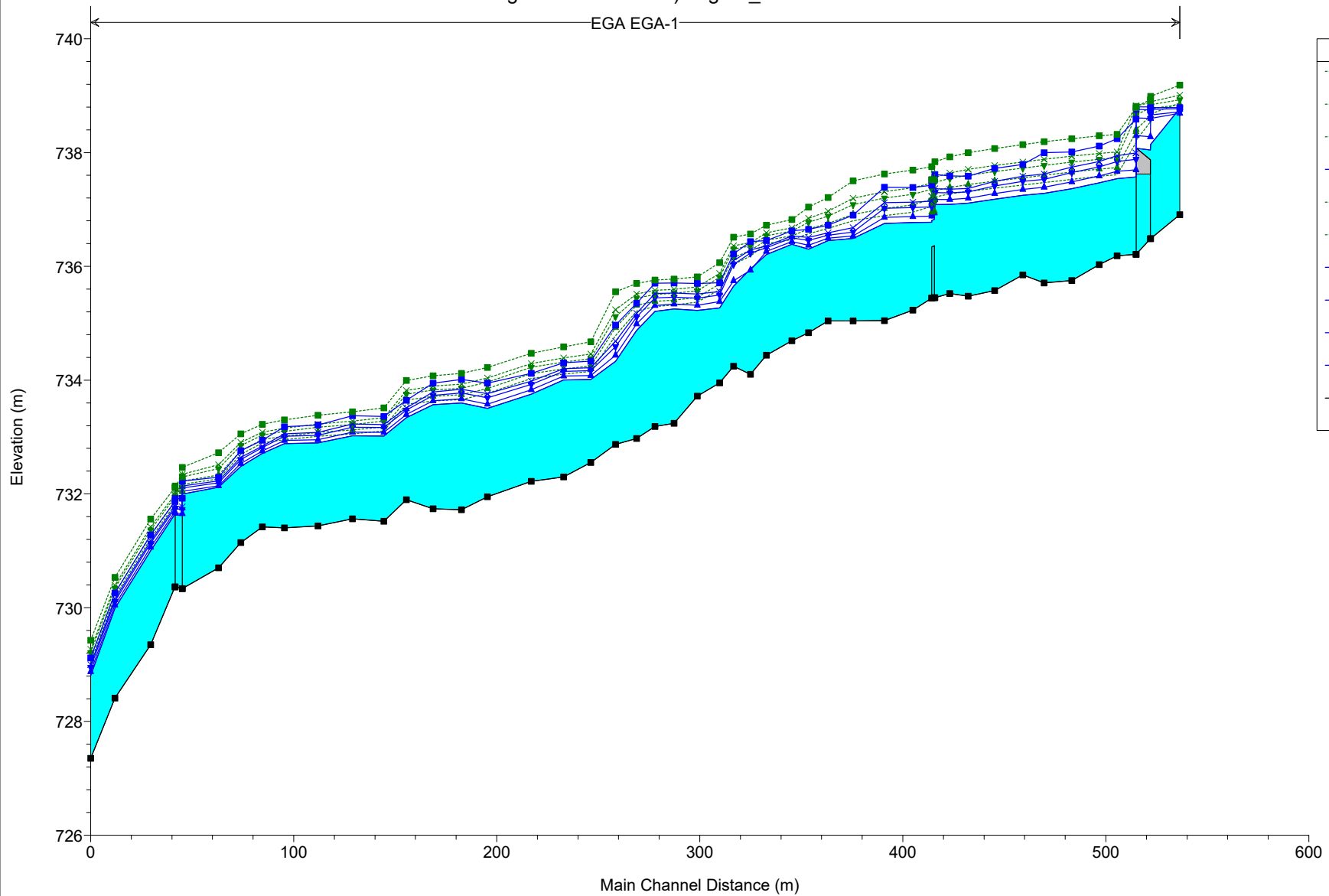
HEC-RAS Plan: Lagran_actual River: EGA Reach: EGA-1 (Continued)

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)	
EGA-1	41.4623	T10	12.00	730.37	731.64	731.64	731.82	0.007265	2.05	8.72	24.35	0.68
EGA-1	41.4623	T25	14.00	730.37	731.69	731.69	731.87	0.007684	2.16	9.76	24.38	0.71
EGA-1	41.4623	T50	17.00	730.37	731.74	731.74	731.94	0.008246	2.31	11.15	24.42	0.74
EGA-1	41.4623	T100	19.00	730.37	731.78	731.78	731.99	0.008718	2.42	11.92	24.44	0.76
EGA-1	41.4623	T500	25.00	730.37	731.87	731.87	732.11	0.009632	2.66	14.15	24.50	0.80
EGA-1	29.5774	T10	12.00	729.35	731.00	731.00	731.22	0.006887	2.18	7.74	21.40	0.61
EGA-1	29.5774	T25	14.00	729.35	731.06	731.06	731.28	0.007146	2.27	9.03	21.43	0.62
EGA-1	29.5774	T50	17.00	729.35	731.14	731.14	731.37	0.007628	2.41	10.60	21.46	0.64
EGA-1	29.5774	T100	19.00	729.35	731.18	731.18	731.42	0.008060	2.51	11.44	21.48	0.66
EGA-1	29.5774	T500	25.00	729.35	731.28	731.28	731.56	0.009172	2.78	13.62	21.58	0.71
EGA-1	11.8817	T10	12.00	728.41	729.99	729.99	730.20	0.007213	2.19	7.93	20.19	0.61
EGA-1	11.8817	T25	14.00	728.41	730.04	730.04	730.26	0.007623	2.29	9.04	20.21	0.62
EGA-1	11.8817	T50	17.00	728.41	730.11	730.11	730.34	0.008305	2.45	10.41	20.23	0.65
EGA-1	11.8817	T100	19.00	728.41	730.15	730.15	730.39	0.008718	2.54	11.22	20.25	0.67
EGA-1	11.8817	T500	25.00	728.41	730.26	730.26	730.53	0.009892	2.80	13.34	20.28	0.71
EGA-1	0	T10	12.00	727.35	728.81	728.81	729.04	0.008092	2.27	6.90	17.11	0.68
EGA-1	0	T25	14.00	727.35	728.88	728.88	729.12	0.008083	2.34	8.09	17.14	0.69
EGA-1	0	T50	17.00	727.35	728.96	728.96	729.21	0.008539	2.49	9.42	17.18	0.71
EGA-1	0	T100	19.00	727.35	729.00	729.00	729.27	0.008858	2.58	10.20	17.21	0.72
EGA-1	0	T500	25.00	727.35	729.12	729.12	729.43	0.009845	2.84	12.20	17.27	0.77

5.2. PERFIL LONGITUDIAL Modelo Hec-Ras Estado Actual

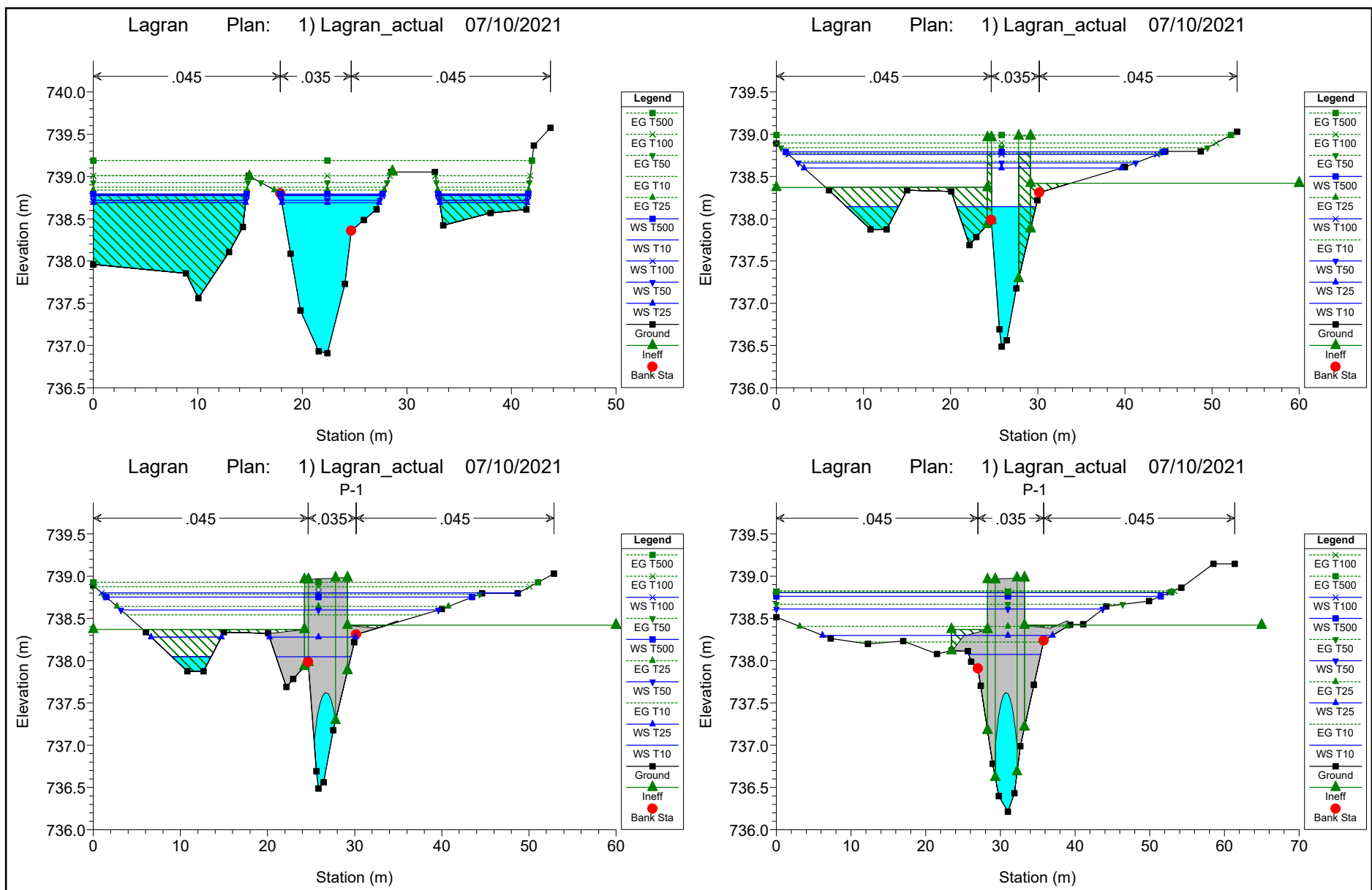
Lagran Plan: 1) Lagran_actual 07/10/2021

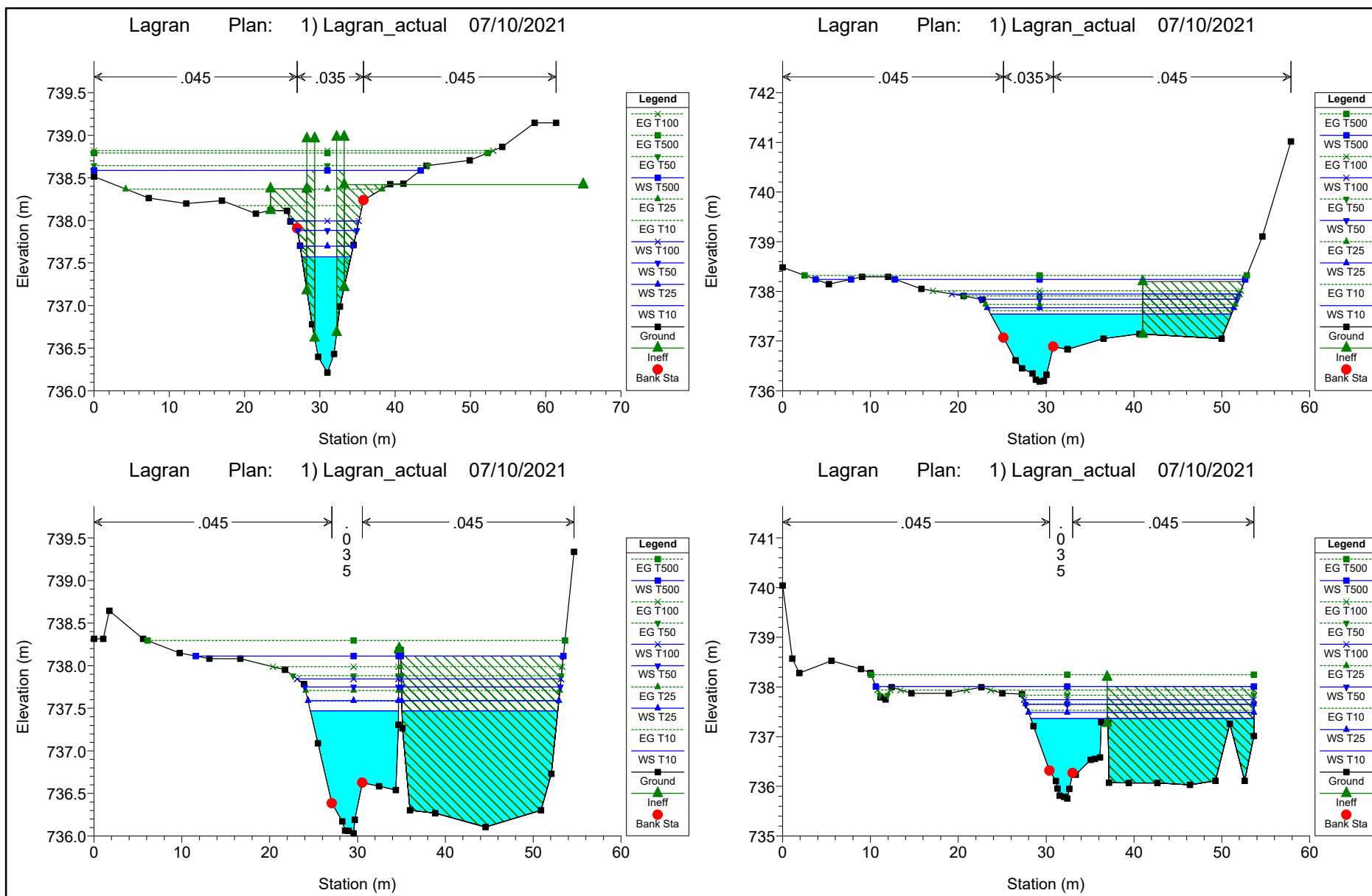
EGA EGA-1

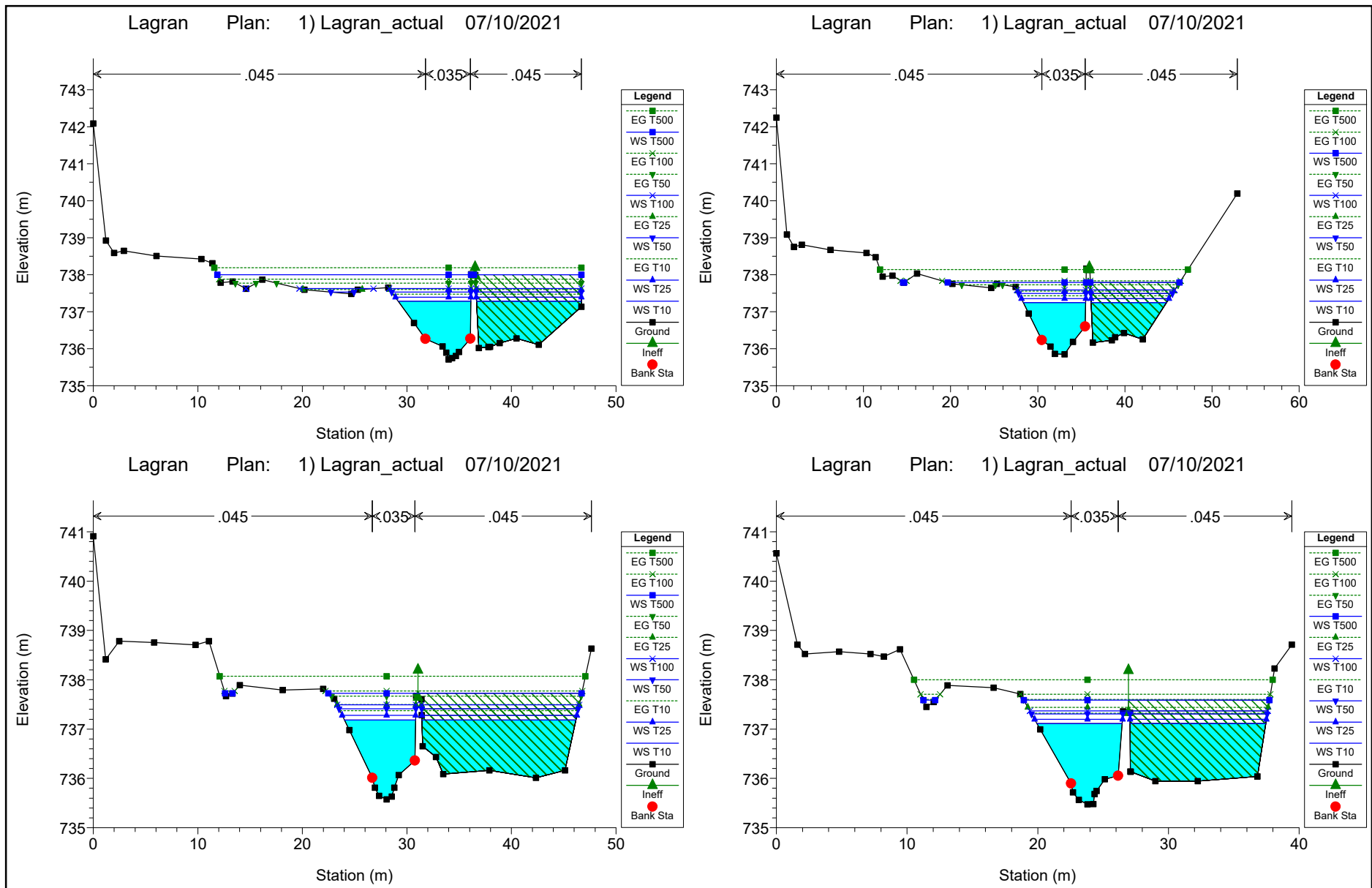


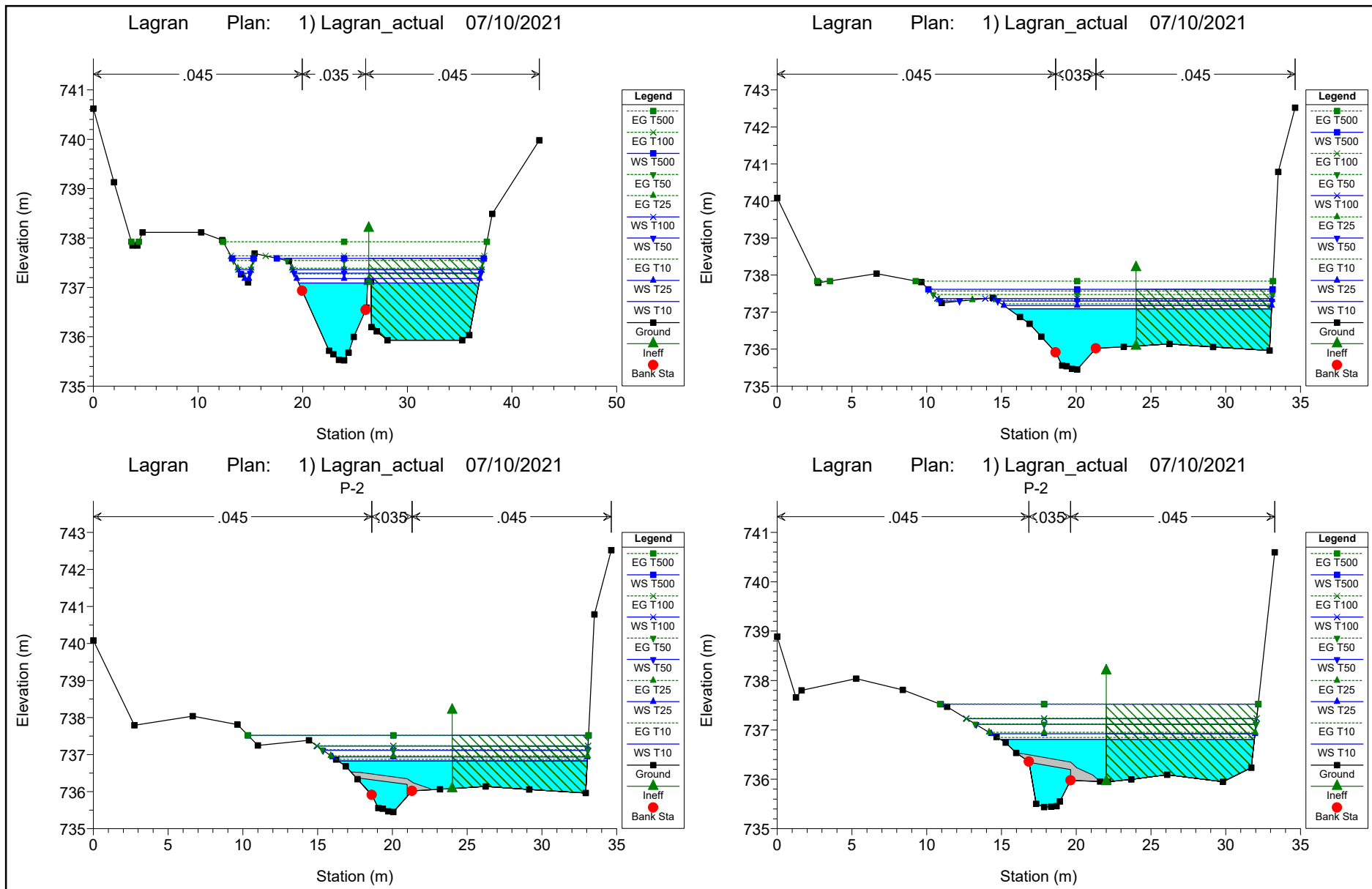
Legend	
EG T500	■
EG T100	×
EG T50	▼
WS T500	■
EG T25	▲
EG T10	×
WS T100	×
WS T50	▼
WS T25	▲
WS T10	×
Ground	■

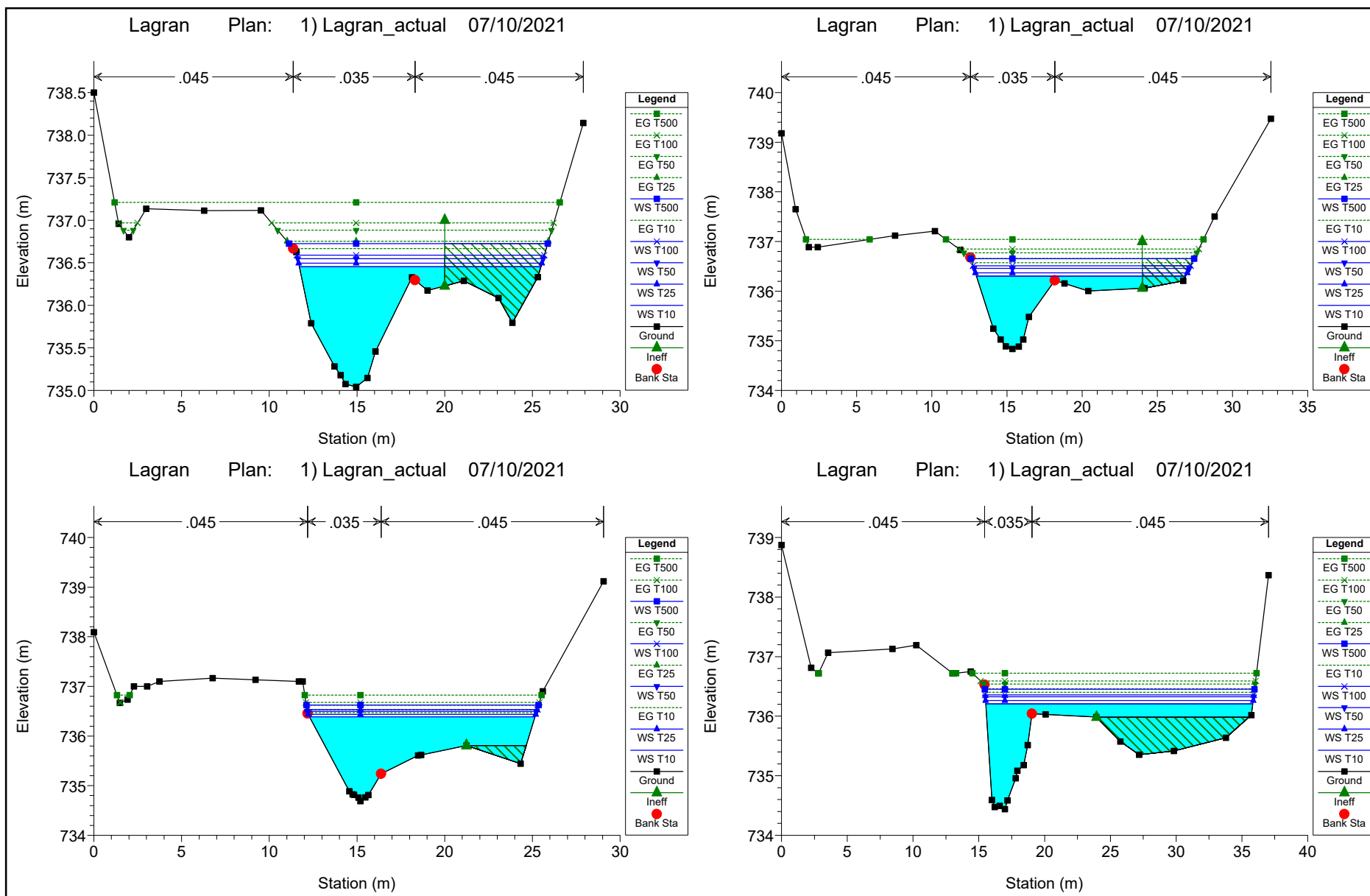
5.3. SECCIONES TRANSVERSALES Modelo Hec-Ras Estado Actual

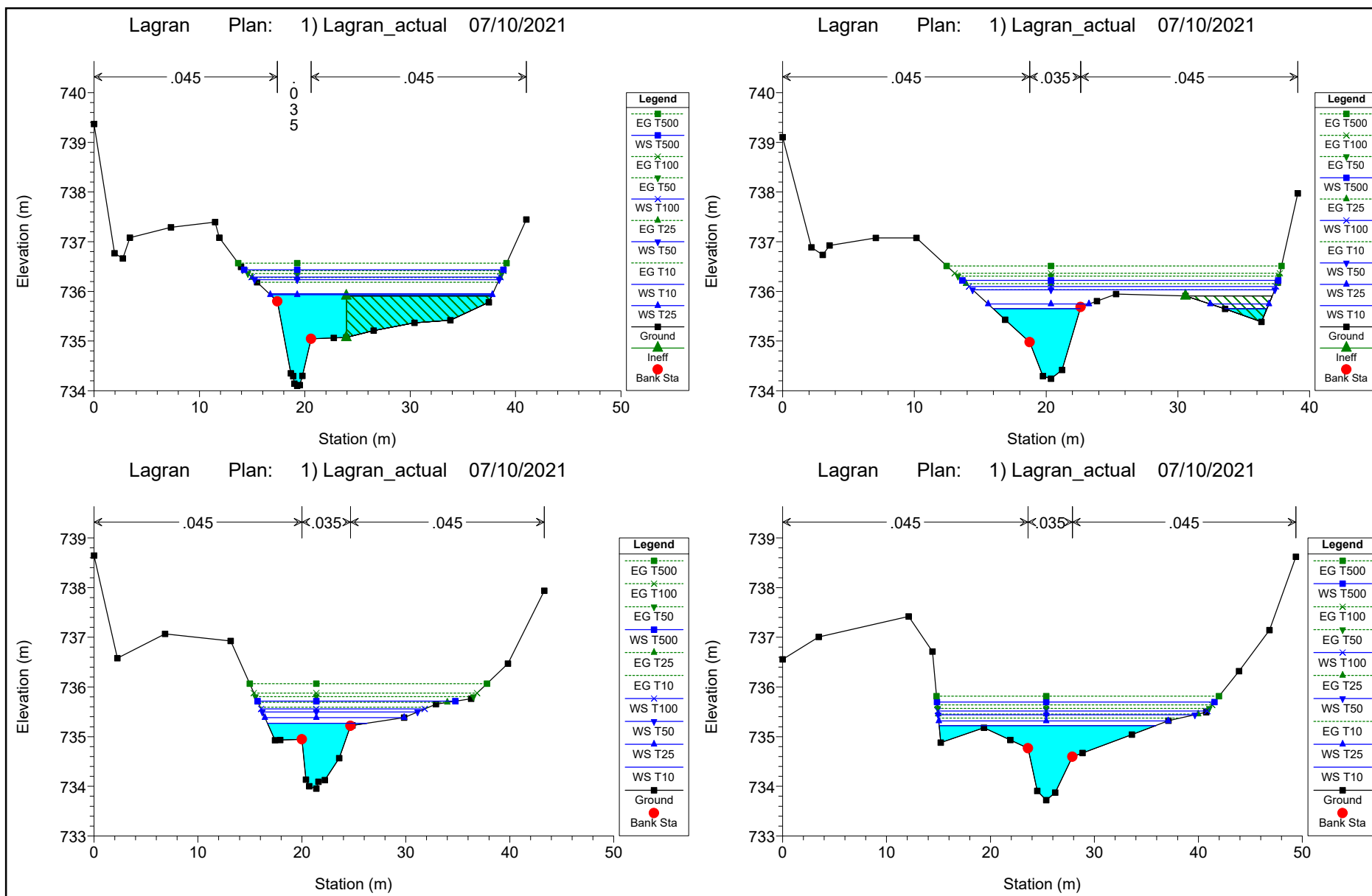


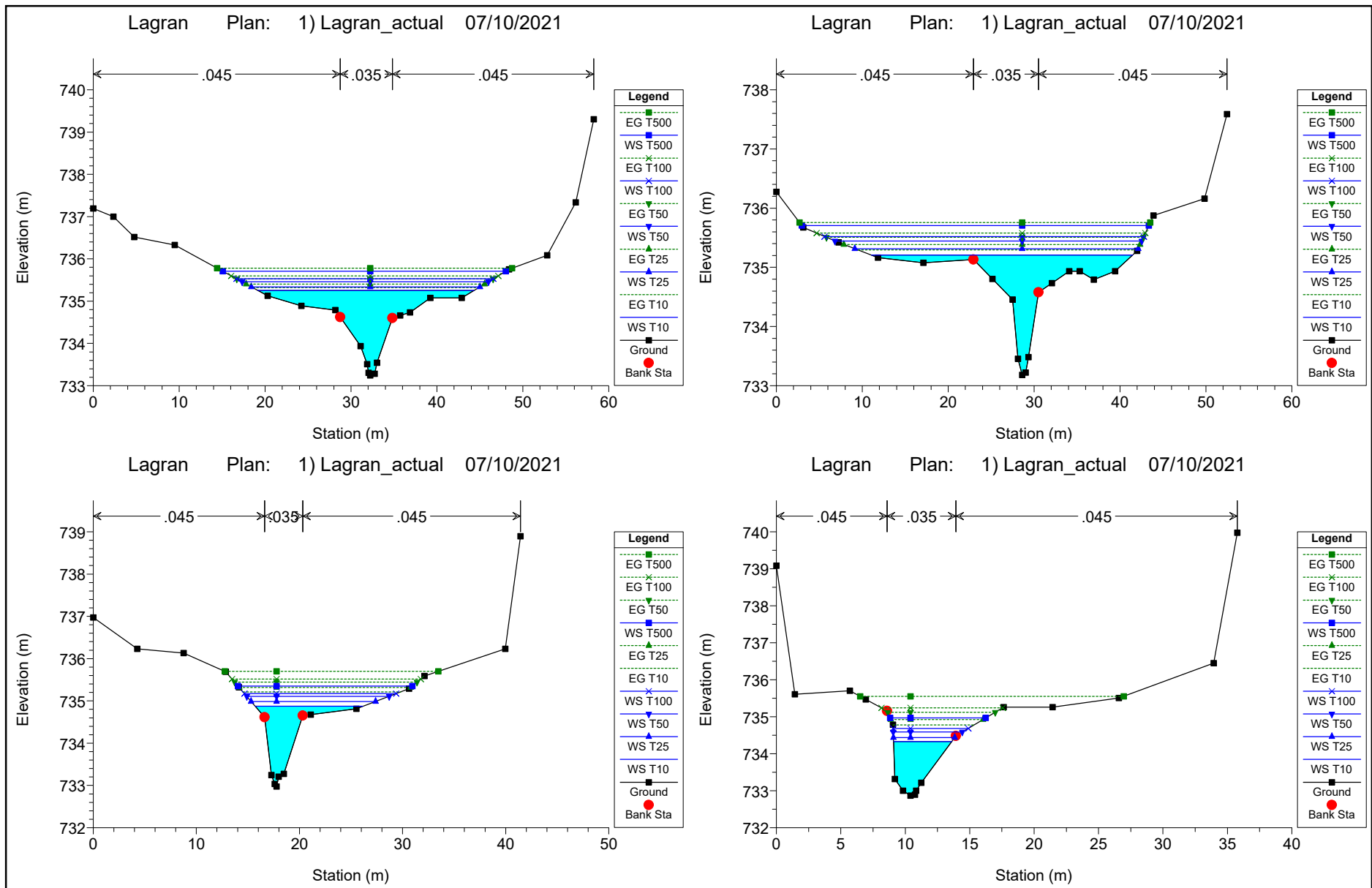


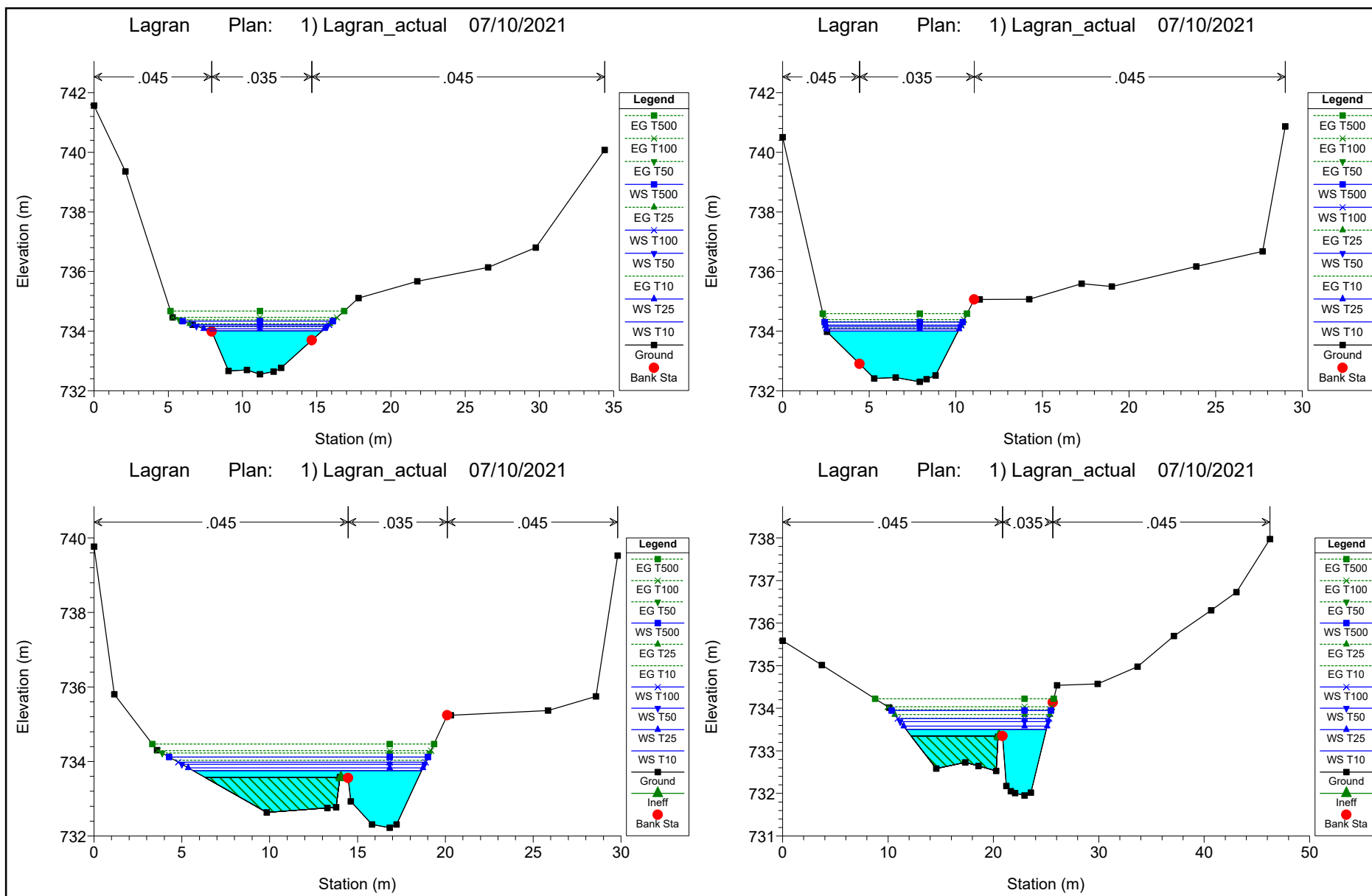


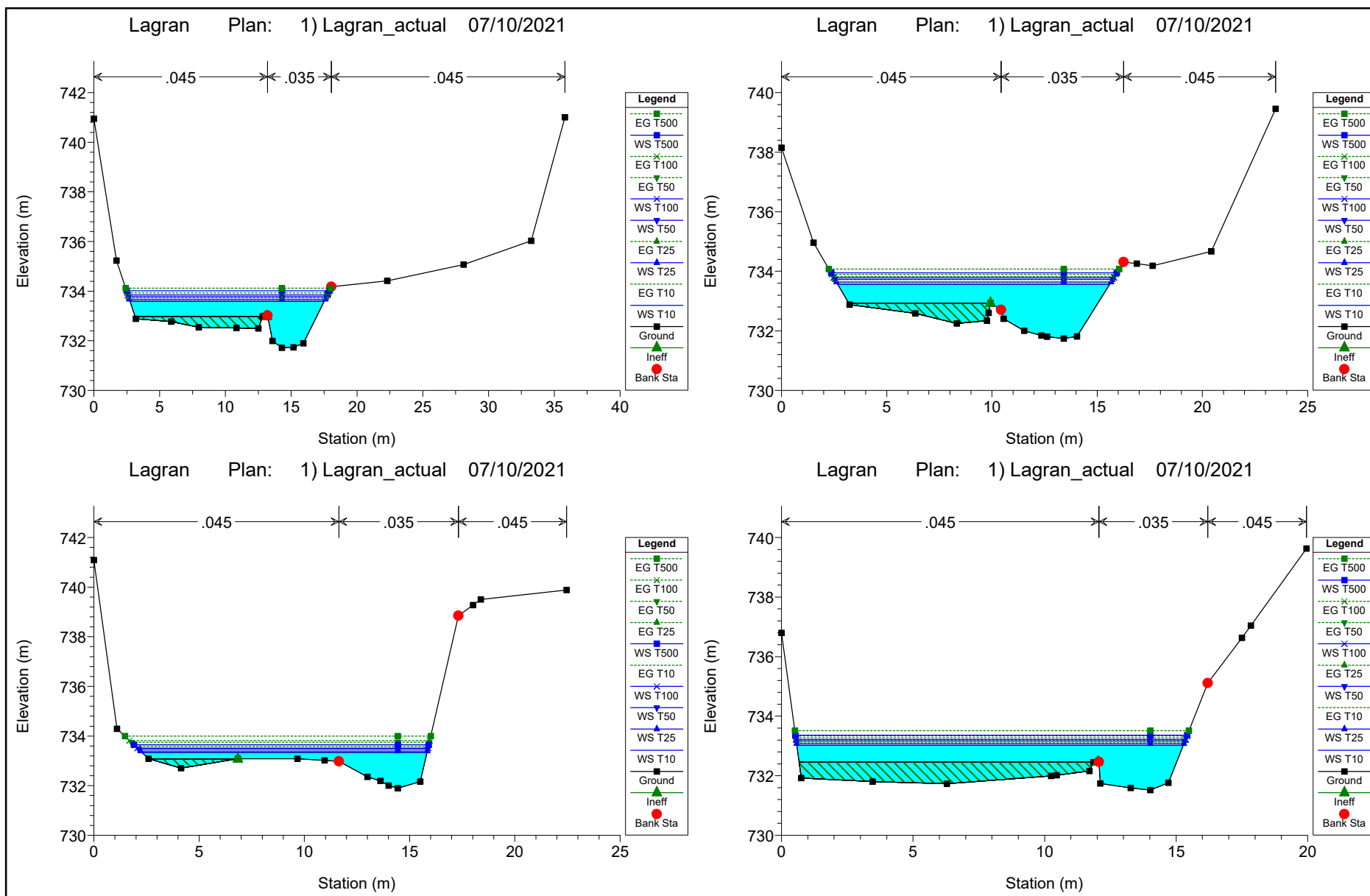


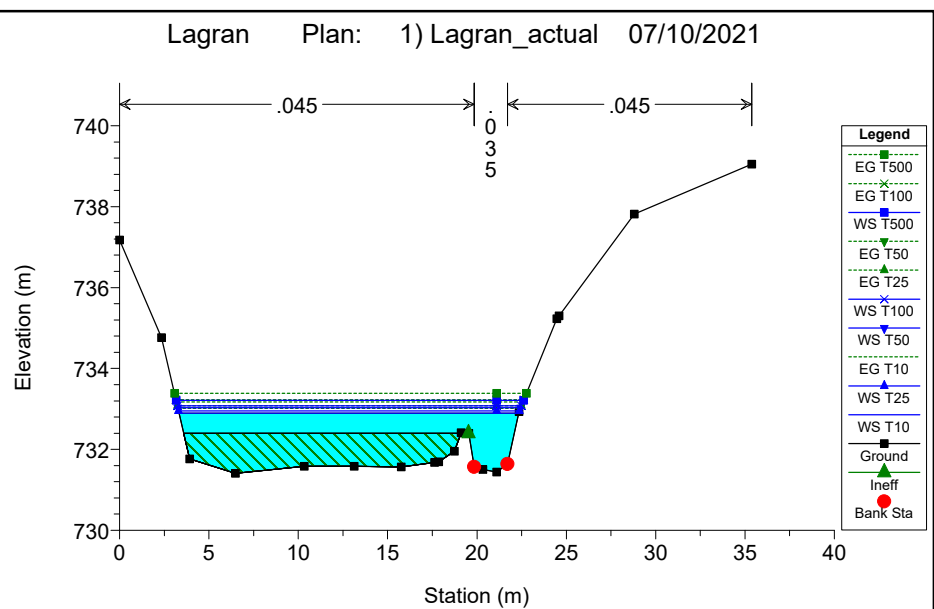
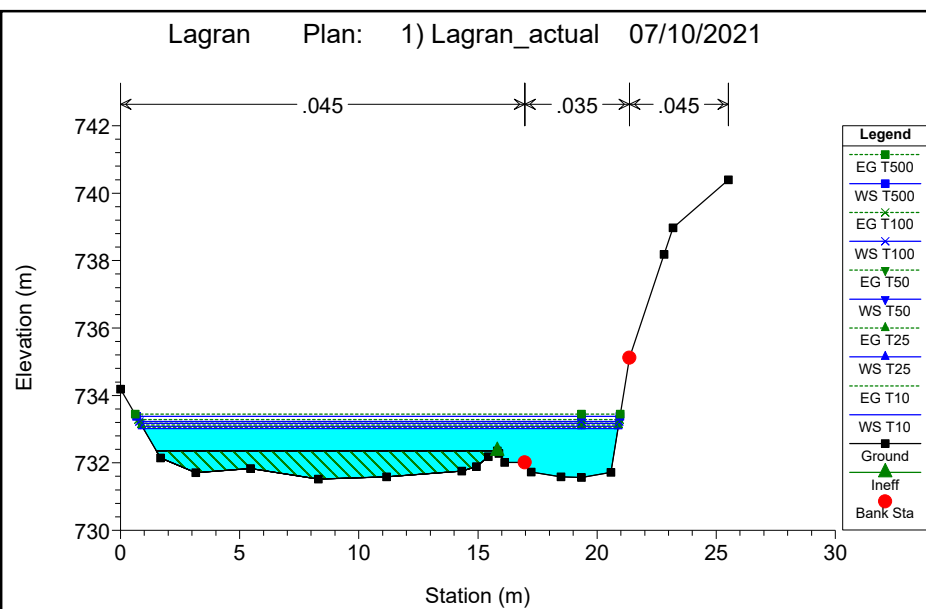


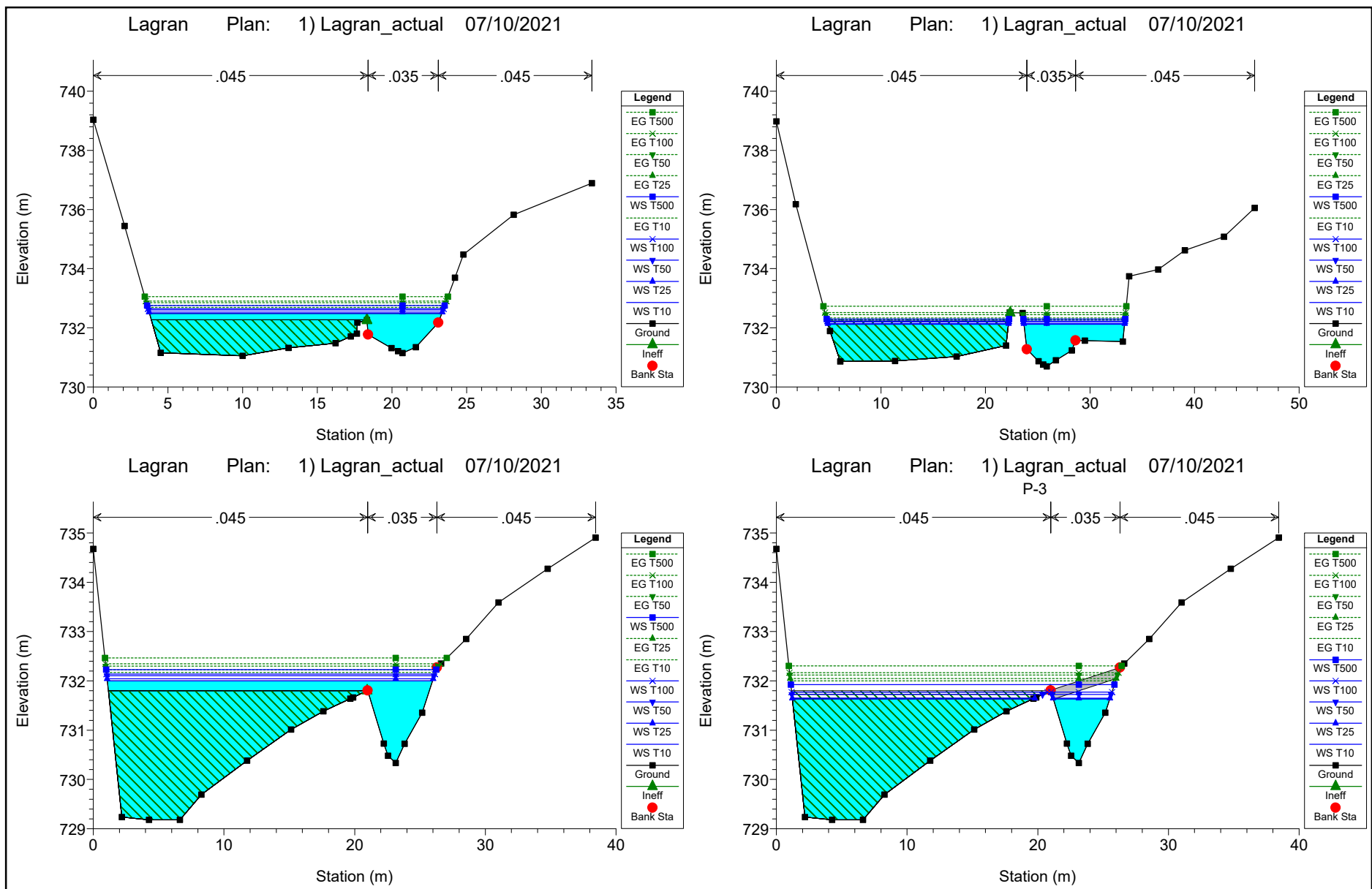


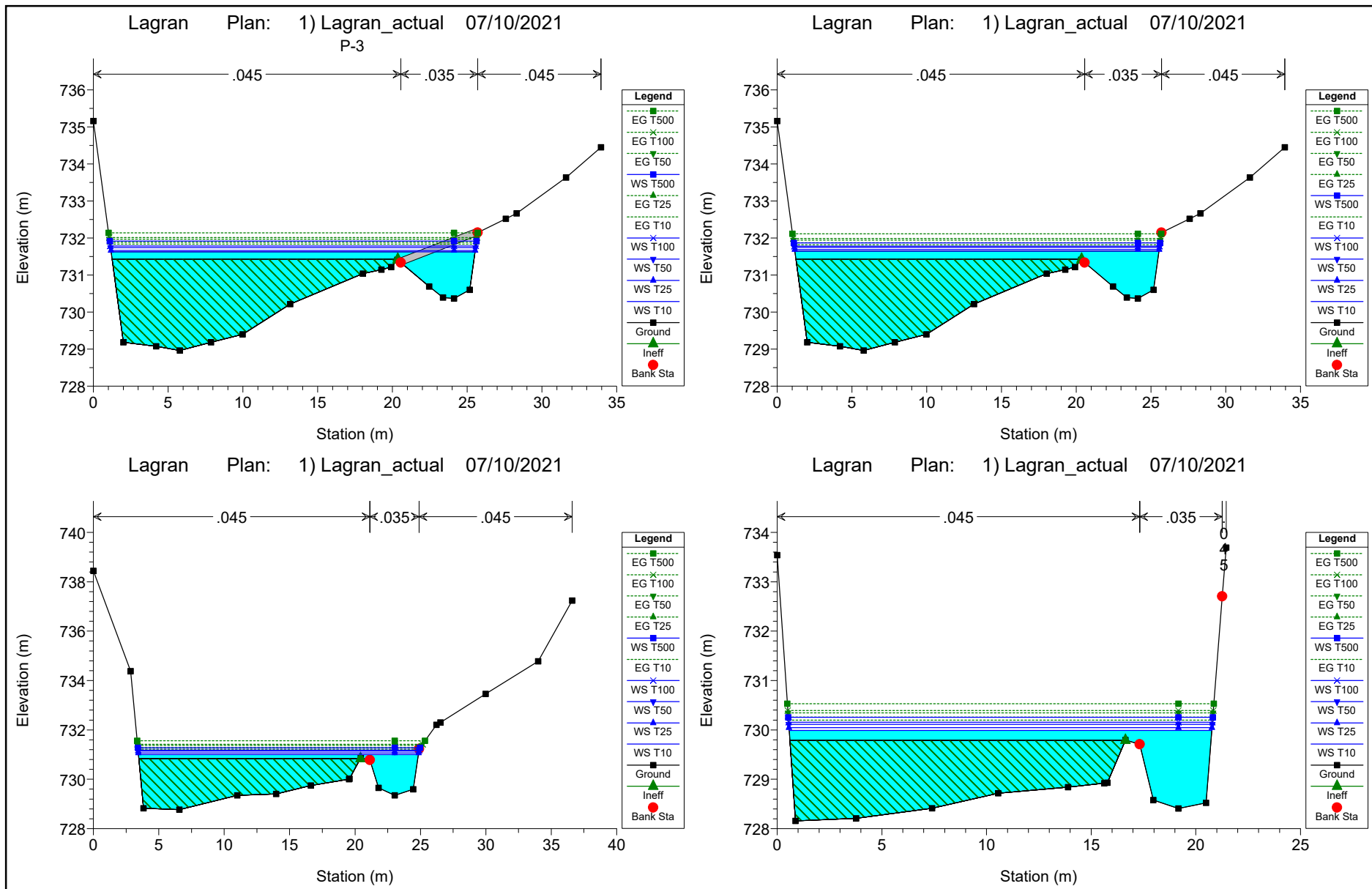




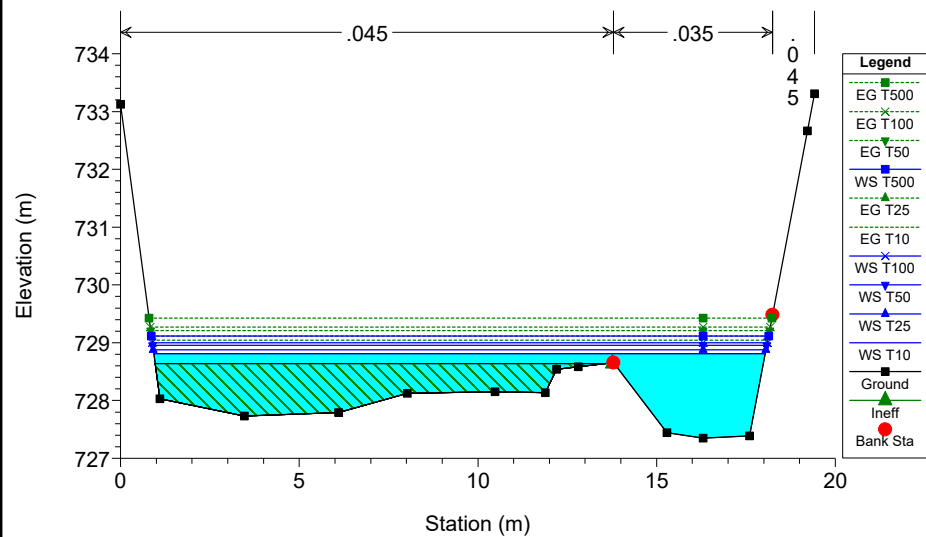








Lagran Plan: 1) Lagran_actual 07/10/2021



6. ANEXO 2: RESULTADOS ESTADO PROYECTADO

6.1. LISTADOS Modelo Hec-Ras Estado Proyectado

HEC-RAS Plan: Lagran_con EDAR River: EGA Reach: EGA-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)	Top Width (m)	Froude # Chl
EGA-1	536.4288	T10	12.00	736.91	738.78		738.87	0.002013	1.37	9.29	32.93	0.39
EGA-1	536.4288	T25	14.00	736.91	738.69		738.84	0.003466	1.74	8.44	32.23	0.51
EGA-1	536.4288	T50	17.00	736.91	738.72		738.93	0.004720	2.05	8.72	32.47	0.59
EGA-1	536.4288	T100	19.00	736.91	738.77		739.01	0.005118	2.18	9.24	32.89	0.62
EGA-1	536.4288	T500	25.00	736.91	738.79	738.66	739.19	0.008444	2.82	9.42	33.03	0.80
EGA-1	522.1076	T10	12.00	736.49	738.14	738.11	738.68	0.014451	3.24	3.70	15.09	0.95
EGA-1	522.1076	T25	14.00	736.49	738.60	738.60	738.77	0.005001	2.07	11.03	36.44	0.58
EGA-1	522.1076	T50	17.00	736.49	738.66	738.66	738.84	0.005269	2.19	13.25	38.75	0.60
EGA-1	522.1076	T100	19.00	736.49	738.76	738.69	738.90	0.003936	1.98	17.07	42.29	0.53
EGA-1	522.1076	T500	25.00	736.49	738.79	738.79	738.99	0.005835	2.45	18.34	43.40	0.64
EGA-1	518.474		Mult Open									
EGA-1	514.8399	T10	12.00	736.21	737.57	737.57	738.17	0.012209	3.43	3.50	6.56	1.00
EGA-1	514.8399	T25	14.00	736.21	737.70	737.70	738.37	0.011955	3.62	3.86	7.09	1.01
EGA-1	514.8399	T50	17.00	736.21	737.88	737.88	738.64	0.011440	3.87	4.40	7.87	1.01
EGA-1	514.8399	T100	19.00	736.21	737.99	737.99	738.82	0.011263	4.02	4.72	9.11	1.01
EGA-1	514.8399	T500	25.00	736.21	738.59	738.59	738.79	0.007060	2.37	16.85	43.37	0.73
EGA-1	505.5815	T10	12.00	736.19	737.54		737.61	0.002286	1.35	11.78	27.41	0.42
EGA-1	505.5815	T25	14.00	736.19	737.67		737.74	0.001875	1.32	14.01	28.08	0.39
EGA-1	505.5815	T50	17.00	736.19	737.84		737.91	0.001529	1.31	17.13	29.25	0.36
EGA-1	505.5815	T100	19.00	736.19	737.95		738.01	0.001404	1.32	19.24	32.75	0.35
EGA-1	505.5815	T500	25.00	736.19	738.24		738.32	0.001500	1.54	27.45	43.93	0.37
EGA-1	496.7048	T10	12.00	736.03	737.47		737.58	0.002980	1.73	9.19	27.77	0.50
EGA-1	496.7048	T25	14.00	736.03	737.59		737.71	0.002862	1.80	10.38	28.18	0.49
EGA-1	496.7048	T50	17.00	736.03	737.75		737.88	0.002745	1.90	12.07	28.74	0.49
EGA-1	496.7048	T100	19.00	736.03	737.84		737.99	0.002787	2.00	13.09	29.72	0.50
EGA-1	496.7048	T500	25.00	736.03	738.11		738.29	0.002886	2.25	17.14	41.62	0.52
EGA-1	483.2665	T10	12.00	735.75	737.37		737.53	0.004115	2.11	7.81	25.41	0.57
EGA-1	483.2665	T25	14.00	735.75	737.49		737.66	0.003904	2.18	8.87	25.65	0.57
EGA-1	483.2665	T50	17.00	735.75	737.65		737.83	0.003696	2.27	10.36	25.98	0.56
EGA-1	483.2665	T100	19.00	735.75	737.75		737.94	0.003625	2.33	11.27	26.18	0.56
EGA-1	483.2665	T500	25.00	735.75	738.01	737.54	738.25	0.003703	2.59	15.70	43.04	0.58
EGA-1	469.6528	T10	12.00	735.71	737.29		737.48	0.003815	2.00	6.79	16.98	0.57
EGA-1	469.6528	T25	14.00	735.71	737.39		737.60	0.003910	2.13	7.52	17.26	0.58
EGA-1	469.6528	T50	17.00	735.71	737.53		737.77	0.004018	2.31	8.61	19.86	0.60
EGA-1	469.6528	T100	19.00	735.71	737.62	737.25	737.88	0.003961	2.39	9.76	25.01	0.60
EGA-1	469.6528	T500	25.00	735.71	738.00	737.46	738.19	0.002584	2.22	17.76	34.53	0.50
EGA-1	459.1552	T10	12.00	735.85	737.25		737.43	0.004068	1.95	6.79	15.82	0.58
EGA-1	459.1552	T25	14.00	735.85	737.35		737.56	0.004076	2.07	7.54	16.34	0.59
EGA-1	459.1552	T50	17.00	735.85	737.50		737.73	0.004083	2.22	8.62	17.07	0.60
EGA-1	459.1552	T100	19.00	735.85	737.59		737.84	0.004071	2.31	9.32	17.54	0.61
EGA-1	459.1552	T500	25.00	735.85	737.79	737.42	738.14	0.004741	2.73	11.64	26.26	0.67
EGA-1	445.2272	T10	12.00	735.57	737.18		737.37	0.003958	2.03	6.79	21.53	0.57
EGA-1	445.2272	T25	14.00	735.57	737.28		737.50	0.004150	2.18	7.45	21.86	0.59
EGA-1	445.2272	T50	17.00	735.57	737.41		737.67	0.004385	2.38	8.39	22.32	0.62
EGA-1	445.2272	T100	19.00	735.57	737.49		737.77	0.004494	2.50	9.00	22.61	0.63
EGA-1	445.2272	T500	25.00	735.57	737.72		738.07	0.004768	2.82	10.84	24.93	0.67
EGA-1	432.2394	T10	12.00	735.48	737.12		737.32	0.004041	2.12	6.67	16.91	0.58
EGA-1	432.2394	T25	14.00	735.48	737.20		737.44	0.004444	2.31	7.21	17.16	0.61
EGA-1	432.2394	T50	17.00	735.48	737.31		737.60	0.004995	2.57	7.96	17.49	0.66
EGA-1	432.2394	T100	19.00	735.48	737.37		737.70	0.005401	2.74	8.41	18.21	0.69
EGA-1	432.2394	T500	25.00	735.48	737.58	737.32	738.00	0.005786	3.09	10.15	19.70	0.73
EGA-1	423.1982	T10	12.00	735.52	737.09		737.28	0.004663	1.90	6.41	16.90	0.59
EGA-1	423.1982	T25	14.00	735.52	737.18		737.39	0.004902	2.05	6.99	17.88	0.62
EGA-1	423.1982	T50	17.00	735.52	737.29		737.54	0.005184	2.24	7.87	18.78	0.64
EGA-1	423.1982	T100	19.00	735.52	737.36		737.64	0.005387	2.37	8.42	19.23	0.66
EGA-1	423.1982	T500	25.00	735.52	737.59		737.92	0.005232	2.60	10.56	21.80	0.67
EGA-1	415.7446	T10	12.00	735.45	737.09	736.68	737.22	0.002970	1.87	8.35	17.60	0.50
EGA-1	415.7446	T25	14.00	735.45	737.18	736.76	737.33	0.003188	2.01	9.09	17.91	0.52
EGA-1	415.7446	T50	17.00	735.45	737.29	736.88	737.48	0.003450	2.20	10.20	19.63	0.55
EGA-1	415.7446	T100	19.00	735.45	737.37	736.95	737.57	0.003607	2.32	11.03	21.78	0.56
EGA-1	415.7446	T500	25.00	735.45	737.61	737.15	737.84	0.003500	2.50	14.39	23.02	0.57
EGA-1	415.012		Mult Open									
EGA-1	414.2921	T10	12.00	735.44	736.78		737.06	0.008590	2.55	5.56	16.84	0.75
EGA-1	414.2921	T25	14.00	735.44	736.89		737.18	0.008316	2.65	6.30	17.43	0.75
EGA-1	414.2921	T50	17.00	735.44	737.04		737.35	0.007648	2.75	7.54	18.32	0.74
EGA-1	414.2921	T100	19.00	735.44	737.15		737.46	0.007104	2.78	8.45	18.93	0.72
EGA-1	414.2921	T500	25.00	735.44	737.42		737.75	0.006082	2.87	11.12	20.53	0.68
EGA-1	404.9123	T10	12.00	735.23	736.78		736.96	0.004006	2.01	7.10	17.19	0.57
EGA-1	404.9123	T25	14.00	735.23	736.88		737.08	0.004139	2.15	7.84	17.50	0.58
EGA-1	404.9123	T50	17.00	735.23	737.03		737.26	0.004218	2.33	8.95	17.95	0.60
EGA-1	404.9123	T100	19.00	735.23	737.13		737.38	0.004185	2.42	9.73	18.26	0.60
EGA-1	404.9123	T500	25.00	735.23	737.39		737.69	0.004236	2.68	11.84	19.04	0.62

HEC-RAS Plan: Lagran_con EDAR River: EGA Reach: EGA-1 (Continued)

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
EGA-1	390.9389	T10	12.00	735.05	736.76		736.90	0.002839	1.74	7.78	17.94	0.48
EGA-1	390.9389	T25	14.00	735.05	736.86		737.02	0.002943	1.86	8.53	18.35	0.50
EGA-1	390.9389	T50	17.00	735.05	737.02		737.20	0.003000	2.01	9.68	18.96	0.51
EGA-1	390.9389	T100	19.00	735.05	737.12		737.32	0.002969	2.09	10.50	19.83	0.51
EGA-1	390.9389	T500	25.00	735.05	737.39		737.62	0.002932	2.29	13.18	24.26	0.52
EGA-1	375.5376	T10	12.00	735.04	736.52		736.81	0.009131	2.37	5.09	15.59	0.79
EGA-1	375.5376	T25	14.00	735.04	736.58	736.47	736.92	0.010131	2.60	5.43	15.86	0.84
EGA-1	375.5376	T50	17.00	735.04	736.65	736.60	737.09	0.011831	2.95	5.85	16.18	0.92
EGA-1	375.5376	T100	19.00	735.04	736.68	736.68	737.20	0.013316	3.19	6.06	16.34	0.98
EGA-1	375.5376	T500	25.00	735.04	736.90	736.90	737.50	0.012173	3.46	7.50	17.36	0.97
EGA-1	363.2271	T10	12.00	735.04	736.50		736.69	0.006072	1.94	6.47	13.88	0.65
EGA-1	363.2271	T25	14.00	735.04	736.57		736.79	0.006382	2.08	7.08	14.06	0.68
EGA-1	363.2271	T50	17.00	735.04	736.67		736.92	0.006956	2.26	7.91	14.44	0.71
EGA-1	363.2271	T100	19.00	735.04	736.73		737.01	0.007192	2.39	8.40	14.75	0.73
EGA-1	363.2271	T500	25.00	735.04	736.88	736.73	737.24	0.007829	2.72	9.81	16.11	0.78
EGA-1	353.5047	T10	12.00	734.84	736.47		736.62	0.005279	1.85	7.73	14.36	0.59
EGA-1	353.5047	T25	14.00	734.84	736.56		736.71	0.005240	1.92	8.66	14.59	0.60
EGA-1	353.5047	T50	17.00	734.84	736.67		736.84	0.005252	2.02	9.92	14.88	0.60
EGA-1	353.5047	T100	19.00	734.84	736.73		736.92	0.005242	2.09	10.69	15.25	0.61
EGA-1	353.5047	T500	25.00	734.84	736.91		737.13	0.005199	2.29	12.89	17.56	0.62
EGA-1	345.326	T10	12.00	734.69	736.51		736.57	0.001904	1.27	12.07	13.10	0.37
EGA-1	345.326	T25	14.00	734.69	736.60		736.66	0.001978	1.35	13.17	13.21	0.38
EGA-1	345.326	T50	17.00	734.69	736.71		736.79	0.002092	1.47	14.66	13.66	0.40
EGA-1	345.326	T100	19.00	734.69	736.78		736.86	0.002166	1.55	15.61	14.05	0.41
EGA-1	345.326	T500	25.00	734.69	736.96		737.07	0.002351	1.75	18.30	14.79	0.44
EGA-1	332.8531	T10	12.00	734.44	736.20	736.20	736.50	0.010442	2.52	5.76	11.99	0.72
EGA-1	332.8531	T25	14.00	734.44	736.29	736.29	736.59	0.010323	2.60	6.73	12.26	0.72
EGA-1	332.8531	T50	17.00	734.44	736.38	736.38	736.71	0.010858	2.76	7.80	12.54	0.74
EGA-1	332.8531	T100	19.00	734.44	736.44	736.44	736.78	0.011241	2.86	8.43	12.71	0.76
EGA-1	332.8531	T500	25.00	734.44	736.58	736.58	736.99	0.012498	3.17	10.01	13.34	0.81
EGA-1	324.9519	T10	12.00	734.10	735.94		736.03	0.003179	1.56	9.72	12.41	0.44
EGA-1	324.9519	T25	14.00	734.10	736.03		736.13	0.003190	1.64	10.84	13.24	0.45
EGA-1	324.9519	T50	17.00	734.10	736.15		736.26	0.003297	1.76	12.34	14.29	0.46
EGA-1	324.9519	T100	19.00	734.10	736.22		736.34	0.003393	1.84	13.25	14.90	0.47
EGA-1	324.9519	T500	25.00	734.10	736.37		736.54	0.004533	2.26	15.51	16.05	0.55
EGA-1	316.609	T10	12.00	734.24	735.64	735.64	735.96	0.011274	2.69	5.51	14.69	0.86
EGA-1	316.609	T25	14.00	734.24	735.72	735.72	736.06	0.011348	2.81	6.27	15.80	0.88
EGA-1	316.609	T50	17.00	734.24	735.85	735.85	736.19	0.010314	2.90	7.73	18.28	0.85
EGA-1	316.609	T100	19.00	734.24	735.92	735.92	736.27	0.010019	2.97	8.65	19.63	0.85
EGA-1	316.609	T500	25.00	734.24	736.11	736.11	736.47	0.009042	3.10	11.45	21.24	0.82
EGA-1	309.7172	T10	12.00	733.95	735.27	735.27	735.59	0.012045	2.61	5.22	15.58	0.88
EGA-1	309.7172	T25	14.00	733.95	735.40	735.40	735.69	0.009516	2.54	6.75	20.87	0.80
EGA-1	309.7172	T50	17.00	733.95	735.50	735.50	735.80	0.009043	2.64	8.29	21.41	0.79
EGA-1	309.7172	T100	19.00	733.95	735.56	735.56	735.87	0.008951	2.71	9.16	21.71	0.80
EGA-1	309.7172	T500	25.00	733.95	735.70	735.70	736.05	0.009211	2.96	11.30	22.44	0.82
EGA-1	298.7418	T10	12.00	733.72	735.25		735.36	0.003411	1.71	10.57	27.27	0.51
EGA-1	298.7418	T25	14.00	733.72	735.33		735.44	0.003105	1.71	12.44	27.57	0.49
EGA-1	298.7418	T50	17.00	733.72	735.45		735.56	0.002760	1.71	15.08	27.99	0.47
EGA-1	298.7418	T100	19.00	733.72	735.53		735.63	0.002584	1.72	16.75	28.25	0.46
EGA-1	298.7418	T500	25.00	733.72	735.74		735.84	0.002249	1.75	21.35	28.96	0.44
EGA-1	287.3083	T10	12.00	733.24	735.25		735.32	0.001604	1.26	13.18	28.85	0.35
EGA-1	287.3083	T25	14.00	733.24	735.33		735.40	0.001595	1.31	15.13	29.99	0.36
EGA-1	287.3083	T50	17.00	733.24	735.45		735.52	0.001545	1.36	18.05	31.63	0.36
EGA-1	287.3083	T100	19.00	733.24	735.53		735.60	0.001502	1.38	20.00	32.68	0.35
EGA-1	287.3083	T500	25.00	733.24	735.74		735.81	0.001386	1.45	25.67	35.58	0.35
EGA-1	277.9738	T10	12.00	733.18	735.13	734.99	735.28	0.006910	1.81	7.79	22.22	0.66
EGA-1	277.9738	T25	14.00	733.18	735.25	735.07	735.37	0.004918	1.68	10.77	26.50	0.57
EGA-1	277.9738	T50	17.00	733.18	735.40		735.50	0.003428	1.56	14.95	29.91	0.49
EGA-1	277.9738	T100	19.00	733.18	735.49		735.58	0.002881	1.51	17.61	31.76	0.45
EGA-1	277.9738	T500	25.00	733.18	735.72		735.79	0.002023	1.43	25.13	36.00	0.39
EGA-1	268.8412	T10	12.00	732.97	734.86	734.86	735.19	0.010705	2.61	5.36	9.68	0.77
EGA-1	268.8412	T25	14.00	732.97	734.95	734.95	735.29	0.010528	2.71	6.22	10.07	0.77
EGA-1	268.8412	T50	17.00	732.97	735.06	735.06	735.42	0.010410	2.86	7.38	10.86	0.78
EGA-1	268.8412	T100	19.00	732.97	735.12	735.12	735.50	0.010489	2.96	8.07	11.41	0.79
EGA-1	268.8412	T500	25.00	732.97	735.30	735.30	735.72	0.010629	3.21	10.01	12.87	0.81
EGA-1	258.4732	T10	12.00	732.87	734.33	734.33	734.78	0.017943	2.98	4.03	10.28	1.01
EGA-1	258.4732	T25	14.00	732.87	734.44	734.44	734.92	0.017831	3.08	4.54	10.79	1.01
EGA-1	258.4732	T50	17.00	732.87	734.59	734.59	735.12	0.016912	3.23	5.29	11.74	0.99
EGA-1	258.4732	T100	19.00	732.87	734.68	734.68	735.24	0.016117	3.30	5.83	12.44	0.97
EGA-1	258.4732	T500	25.00	732.87	734.97	734.97	735.55	0.013999	3.43	7.69	14.69	0.93
EGA-1	246.3061	T10	12.00	732.55	734.02		734.16	0.003500	1.64	7.39	13.45	0.51
EGA-1	246.3061	T25	14.00	732.55	734.09		734.25	0.003841	1.80	7.95	14.14	0.54
EGA-1	246.3061	T50	17.00	732.55	734.18		734.38	0.004426	2.02	8.68	14.97	0.58
EGA-1	246.3061	T100	19.00	732.55	734.23		734.46	0.004817	2.17	9.13	15.46	0.61

HEC-RAS Plan: Lagran_con EDAR River: EGA Reach: EGA-1 (Continued)

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
EGA-1	246.3061	T500	25.00	732.55	734.35		734.68	0.006074	2.58	10.29	16.64	0.70
EGA-1	232.9661	T10	12.00	732.30	734.01		734.11	0.002024	1.45	8.90	13.23	0.39
EGA-1	232.9661	T25	14.00	732.30	734.08		734.20	0.002354	1.60	9.43	13.47	0.43
EGA-1	232.9661	T50	17.00	732.30	734.16		734.32	0.002902	1.82	10.06	13.77	0.48
EGA-1	232.9661	T100	19.00	732.30	734.21		734.39	0.003293	1.97	10.42	13.94	0.51
EGA-1	232.9661	T500	25.00	732.30	734.31		734.59	0.004604	2.41	11.27	14.32	0.61
EGA-1	216.9689	T10	12.00	732.22	733.76	733.76	734.04	0.009034	2.42	6.16	12.96	0.73
EGA-1	216.9689	T25	14.00	732.22	733.83	733.83	734.12	0.009290	2.52	7.09	13.29	0.75
EGA-1	216.9689	T50	17.00	732.22	733.93	733.93	734.23	0.009434	2.64	8.42	13.75	0.76
EGA-1	216.9689	T100	19.00	732.22	733.99	733.99	734.30	0.009611	2.73	9.20	14.01	0.77
EGA-1	216.9689	T500	25.00	732.22	734.12	734.12	734.48	0.010428	2.98	11.17	14.65	0.81
EGA-1	195.4443	T10	12.00	731.95	733.51	733.26	733.76	0.008174	2.32	6.23	13.31	0.69
EGA-1	195.4443	T25	14.00	731.95	733.58	733.56	733.85	0.008462	2.43	7.22	13.61	0.70
EGA-1	195.4443	T50	17.00	731.95	733.69	733.66	733.97	0.008392	2.52	8.73	14.06	0.71
EGA-1	195.4443	T100	19.00	731.95	733.76	733.72	734.04	0.008164	2.55	9.76	14.36	0.70
EGA-1	195.4443	T500	25.00	731.95	733.95		734.22	0.007717	2.64	12.53	15.13	0.69
EGA-1	182.6699	T10	12.00	731.72	733.60		733.66	0.001967	1.29	12.31	14.78	0.35
EGA-1	182.6699	T25	14.00	731.72	733.67		733.74	0.002105	1.37	13.44	14.90	0.36
EGA-1	182.6699	T50	17.00	731.72	733.78		733.86	0.002290	1.47	14.98	15.06	0.38
EGA-1	182.6699	T100	19.00	731.72	733.84		733.93	0.002389	1.53	15.97	15.16	0.39
EGA-1	182.6699	T500	25.00	731.72	734.01		734.12	0.002676	1.70	18.58	15.43	0.42
EGA-1	168.6435	T10	12.00	731.74	733.57		733.63	0.001609	1.26	12.05	12.93	0.34
EGA-1	168.6435	T25	14.00	731.74	733.64		733.72	0.001804	1.36	12.96	13.05	0.36
EGA-1	168.6435	T50	17.00	731.74	733.73		733.82	0.002079	1.51	14.19	13.21	0.39
EGA-1	168.6435	T100	19.00	731.74	733.79		733.89	0.002240	1.59	14.97	13.31	0.41
EGA-1	168.6435	T500	25.00	731.74	733.95		734.08	0.002714	1.83	17.03	13.57	0.45
EGA-1	155.4786	T10	12.00	731.90	733.34	733.34	733.58	0.009116	2.34	6.68	13.54	0.74
EGA-1	155.4786	T25	14.00	731.90	733.40	733.40	733.65	0.009549	2.47	7.45	13.62	0.76
EGA-1	155.4786	T50	17.00	731.90	733.47	733.47	733.75	0.010105	2.63	8.51	13.74	0.79
EGA-1	155.4786	T100	19.00	731.90	733.51	733.51	733.82	0.010759	2.77	9.06	13.80	0.82
EGA-1	155.4786	T500	25.00	731.90	733.65	733.65	733.99	0.011269	2.99	10.93	14.00	0.84
EGA-1	144.4057	T10	12.00	731.52	733.02		733.11	0.003909	1.59	10.38	14.68	0.46
EGA-1	144.4057	T25	14.00	731.52	733.08		733.18	0.004165	1.68	11.31	14.72	0.47
EGA-1	144.4057	T50	17.00	731.52	733.17		733.28	0.004512	1.81	12.57	14.77	0.49
EGA-1	144.4057	T100	19.00	731.52	733.22		733.34	0.004711	1.88	13.36	14.80	0.50
EGA-1	144.4057	T500	25.00	731.52	733.36		733.51	0.005267	2.08	15.48	14.89	0.54
EGA-1	128.9474	T10	12.00	731.56	733.02		733.06	0.001312	1.05	16.08	19.92	0.29
EGA-1	128.9474	T25	14.00	731.56	733.09		733.13	0.001426	1.12	17.36	19.99	0.30
EGA-1	128.9474	T50	17.00	731.56	733.17		733.22	0.001579	1.21	19.11	20.08	0.32
EGA-1	128.9474	T100	19.00	731.56	733.23		733.28	0.001667	1.26	20.21	20.14	0.33
EGA-1	128.9474	T500	25.00	731.56	733.38		733.44	0.001906	1.41	23.19	20.30	0.35
EGA-1	111.9057	T10	12.00	731.44	732.90		733.01	0.003573	2.10	11.11	19.00	0.57
EGA-1	111.9057	T25	14.00	731.44	732.95		733.08	0.003752	2.21	12.20	19.06	0.59
EGA-1	111.9057	T50	17.00	731.44	733.03		733.17	0.003998	2.36	13.68	19.18	0.61
EGA-1	111.9057	T100	19.00	731.44	733.08		733.23	0.004113	2.44	14.63	19.25	0.62
EGA-1	111.9057	T500	25.00	731.44	733.21		733.38	0.004485	2.69	17.13	19.43	0.66
EGA-1	95.363	T10	12.00	731.40	732.88		732.95	0.002377	1.70	13.37	19.47	0.46
EGA-1	95.363	T25	14.00	731.40	732.94		733.01	0.002587	1.82	14.42	19.55	0.48
EGA-1	95.363	T50	17.00	731.40	733.01		733.10	0.002879	1.98	15.85	19.65	0.51
EGA-1	95.363	T100	19.00	731.40	733.06		733.15	0.003033	2.08	16.78	19.72	0.53
EGA-1	95.363	T500	25.00	731.40	733.18		733.30	0.003497	2.34	19.19	19.90	0.57
EGA-1	84.5928	T10	12.00	731.42	732.71	732.71	732.90	0.007682	2.52	8.86	19.83	0.78
EGA-1	84.5928	T25	14.00	731.42	732.75	732.75	732.95	0.008255	2.68	9.67	19.91	0.81
EGA-1	84.5928	T50	17.00	731.42	732.81	732.81	733.04	0.008821	2.87	10.85	20.03	0.85
EGA-1	84.5928	T100	19.00	731.42	732.84	732.84	733.09	0.009490	3.02	11.44	20.10	0.88
EGA-1	84.5928	T500	25.00	731.42	732.94	732.94	733.23	0.010188	3.31	13.50	20.26	0.93
EGA-1	73.9224	T10	12.00	731.14	732.48	732.48	732.69	0.006626	2.19	7.77	19.57	0.71
EGA-1	73.9224	T25	14.00	731.14	732.53	732.53	732.76	0.006933	2.32	8.76	19.63	0.73
EGA-1	73.9224	T50	17.00	731.14	732.60	732.60	732.85	0.007243	2.48	10.14	19.72	0.75
EGA-1	73.9224	T100	19.00	731.14	732.64	732.64	732.90	0.007524	2.59	10.93	19.78	0.77
EGA-1	73.9224	T500	25.00	731.14	732.76	732.76	733.06	0.008045	2.85	13.17	19.92	0.81
EGA-1	62.9759	T10	12.00	730.70	732.12		732.27	0.003880	1.85	7.95	26.86	0.56
EGA-1	62.9759	T25	14.00	730.70	732.14		732.33	0.004848	2.10	8.18	26.90	0.62
EGA-1	62.9759	T50	17.00	730.70	732.20		732.44	0.005963	2.40	8.71	26.99	0.70
EGA-1	62.9759	T100	19.00	730.70	732.23		732.52	0.006757	2.60	9.00	27.05	0.75
EGA-1	62.9759	T500	25.00	730.70	732.30	732.25	732.73	0.009513	3.19	9.66	27.16	0.89
EGA-1	45.1596	T10	12.00	730.34	732.00	732.00	732.17	0.006580	2.02	8.76	24.88	0.65
EGA-1	45.1596	T25	14.00	730.34	732.04	732.04	732.23	0.006903	2.12	9.93	24.96	0.67
EGA-1	45.1596	T50	17.00	730.34	732.10	732.10	732.30	0.007455	2.26	11.40	25.05	0.70
EGA-1	45.1596	T100	19.00	730.34	732.14	732.14	732.34	0.007764	2.35	12.30	25.11	0.72
EGA-1	45.1596	T500	25.00	730.34	732.23	732.23	732.47	0.008934	2.61	14.47	25.25	0.78
EGA-1	43.311		Mult Open									

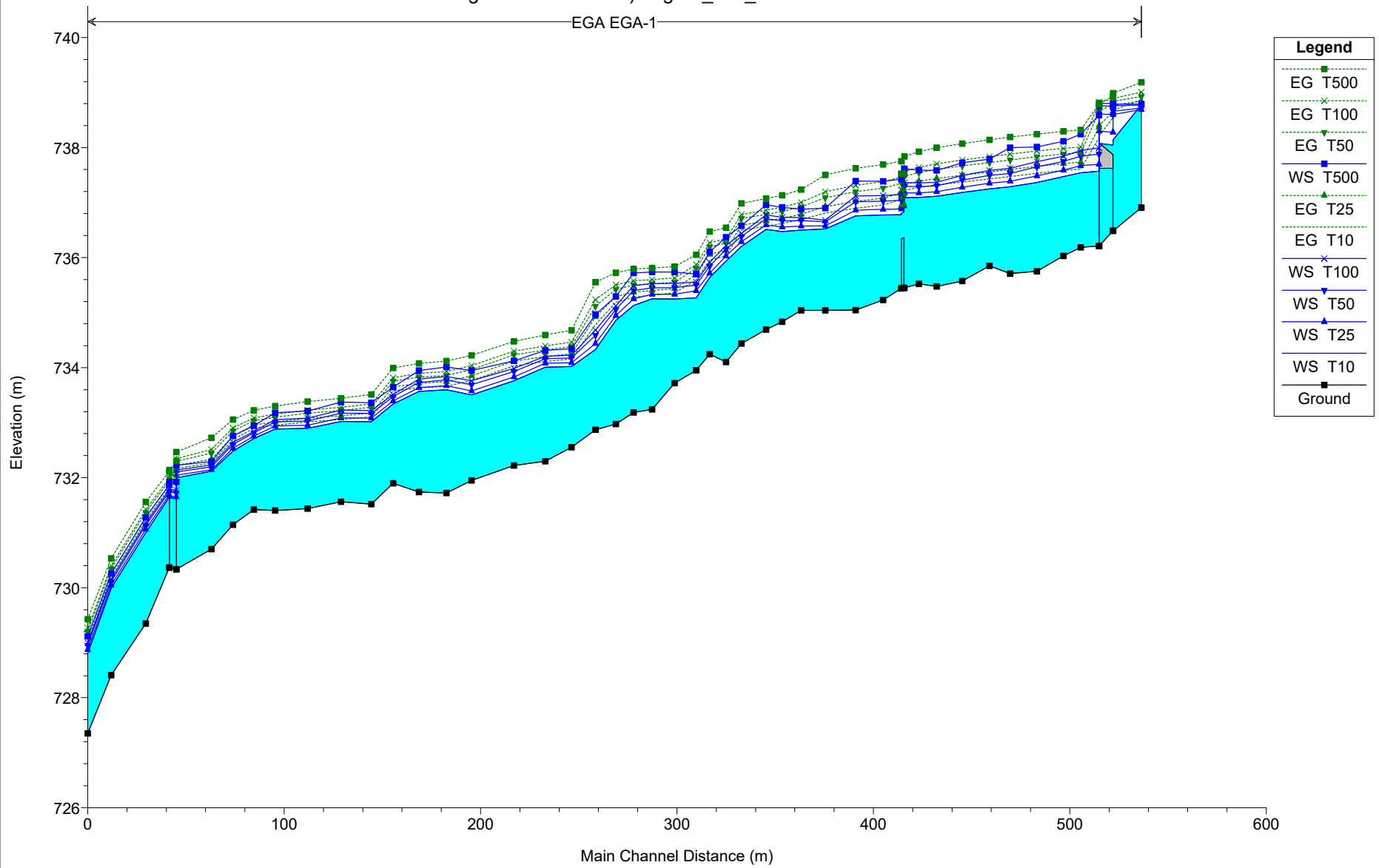
HEC-RAS Plan: Lagran_con EDAR River: EGA Reach: EGA-1 (Continued)

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)	
EGA-1	41.4623	T10	12.00	730.37	731.64	731.64	731.82	0.007265	2.05	8.72	24.35	0.68
EGA-1	41.4623	T25	14.00	730.37	731.69	731.69	731.87	0.007684	2.16	9.76	24.38	0.71
EGA-1	41.4623	T50	17.00	730.37	731.74	731.74	731.94	0.008246	2.31	11.15	24.42	0.74
EGA-1	41.4623	T100	19.00	730.37	731.78	731.78	731.99	0.008718	2.42	11.92	24.44	0.76
EGA-1	41.4623	T500	25.00	730.37	731.87	731.87	732.11	0.009632	2.66	14.15	24.50	0.80
EGA-1	29.5774	T10	12.00	729.35	731.00	731.00	731.22	0.006887	2.18	7.74	21.40	0.61
EGA-1	29.5774	T25	14.00	729.35	731.06	731.06	731.28	0.007146	2.27	9.03	21.43	0.62
EGA-1	29.5774	T50	17.00	729.35	731.14	731.14	731.37	0.007628	2.41	10.60	21.46	0.64
EGA-1	29.5774	T100	19.00	729.35	731.18	731.18	731.42	0.008060	2.51	11.44	21.48	0.66
EGA-1	29.5774	T500	25.00	729.35	731.28	731.28	731.56	0.009172	2.78	13.62	21.58	0.71
EGA-1	11.8817	T10	12.00	728.41	729.99	729.99	730.20	0.007213	2.19	7.93	20.19	0.61
EGA-1	11.8817	T25	14.00	728.41	730.04	730.04	730.26	0.007623	2.29	9.04	20.21	0.62
EGA-1	11.8817	T50	17.00	728.41	730.11	730.11	730.34	0.008305	2.45	10.41	20.23	0.65
EGA-1	11.8817	T100	19.00	728.41	730.15	730.15	730.39	0.008718	2.54	11.22	20.25	0.67
EGA-1	11.8817	T500	25.00	728.41	730.26	730.26	730.53	0.009892	2.80	13.34	20.28	0.71
EGA-1	0	T10	12.00	727.35	728.81	728.81	729.04	0.008092	2.27	6.90	17.11	0.68
EGA-1	0	T25	14.00	727.35	728.88	728.88	729.12	0.008083	2.34	8.09	17.14	0.69
EGA-1	0	T50	17.00	727.35	728.96	728.96	729.21	0.008539	2.49	9.42	17.18	0.71
EGA-1	0	T100	19.00	727.35	729.00	729.00	729.27	0.008858	2.58	10.20	17.21	0.72
EGA-1	0	T500	25.00	727.35	729.12	729.12	729.43	0.009845	2.84	12.20	17.27	0.77

6.2. PERFIL LONGITUDIAL Modelo Hec-Ras Estado Proyectado

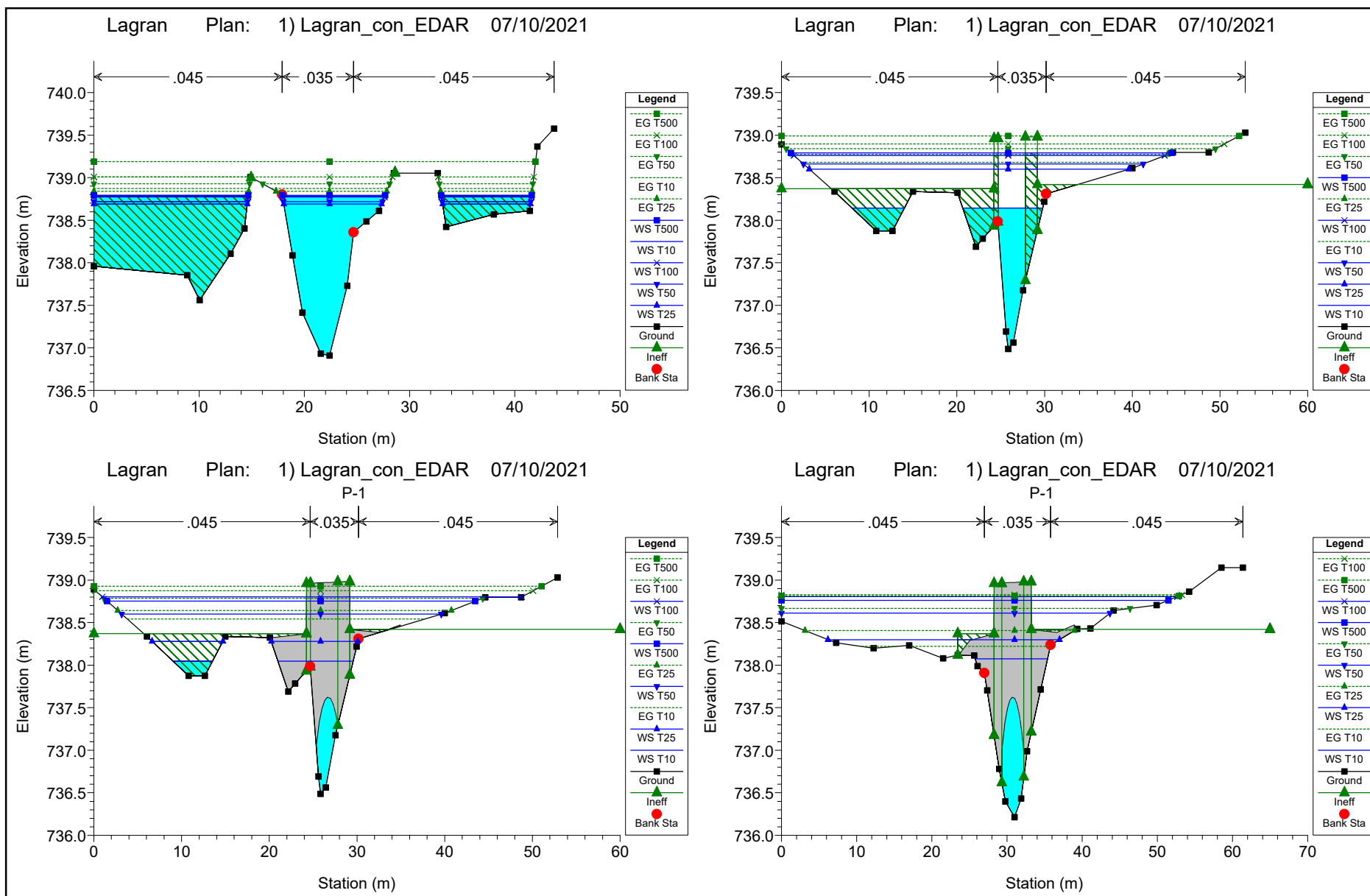
Lagran Plan: 1) Lagran_con_EDAR 07/10/2021

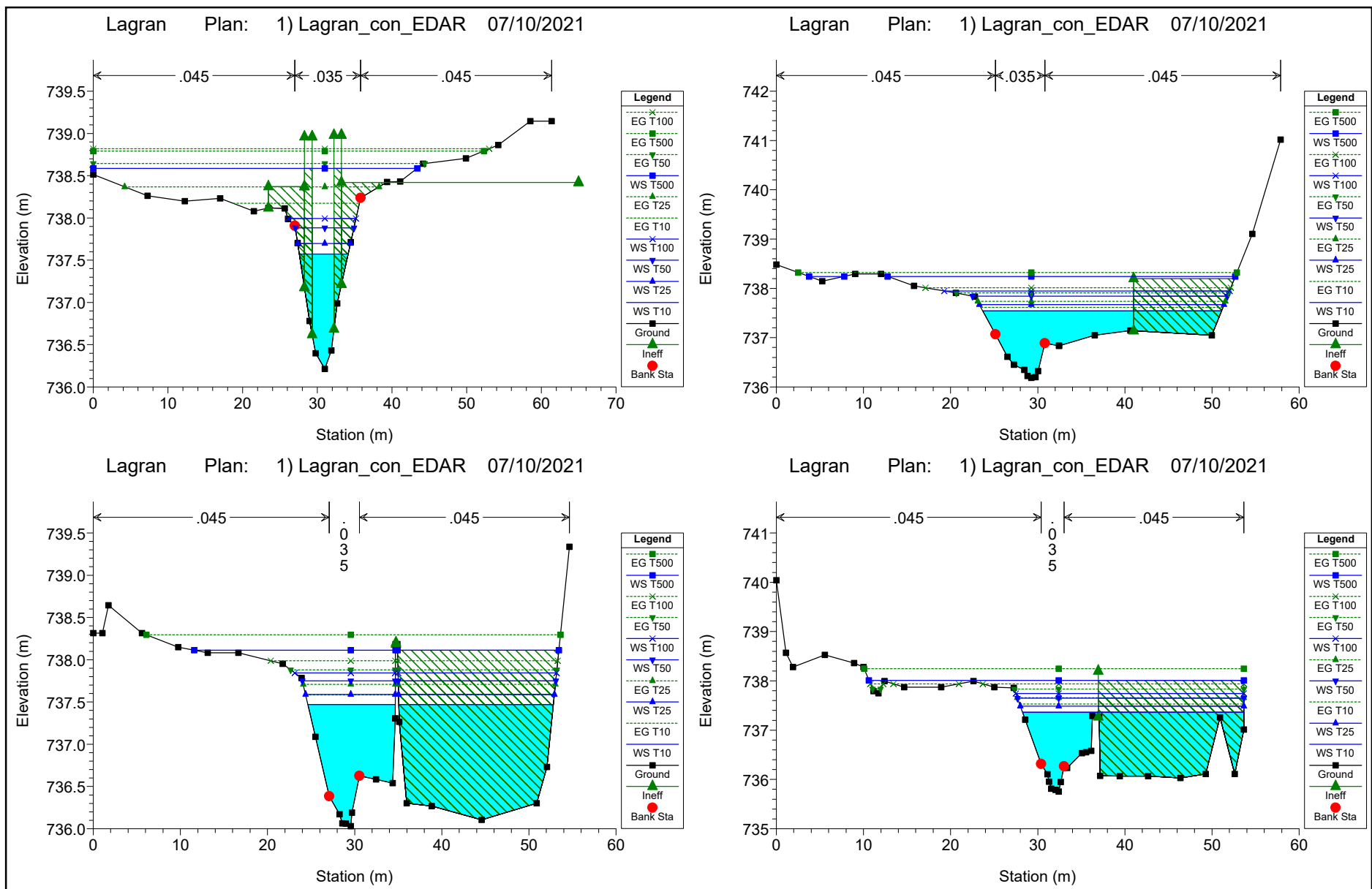
EGA EGA-1

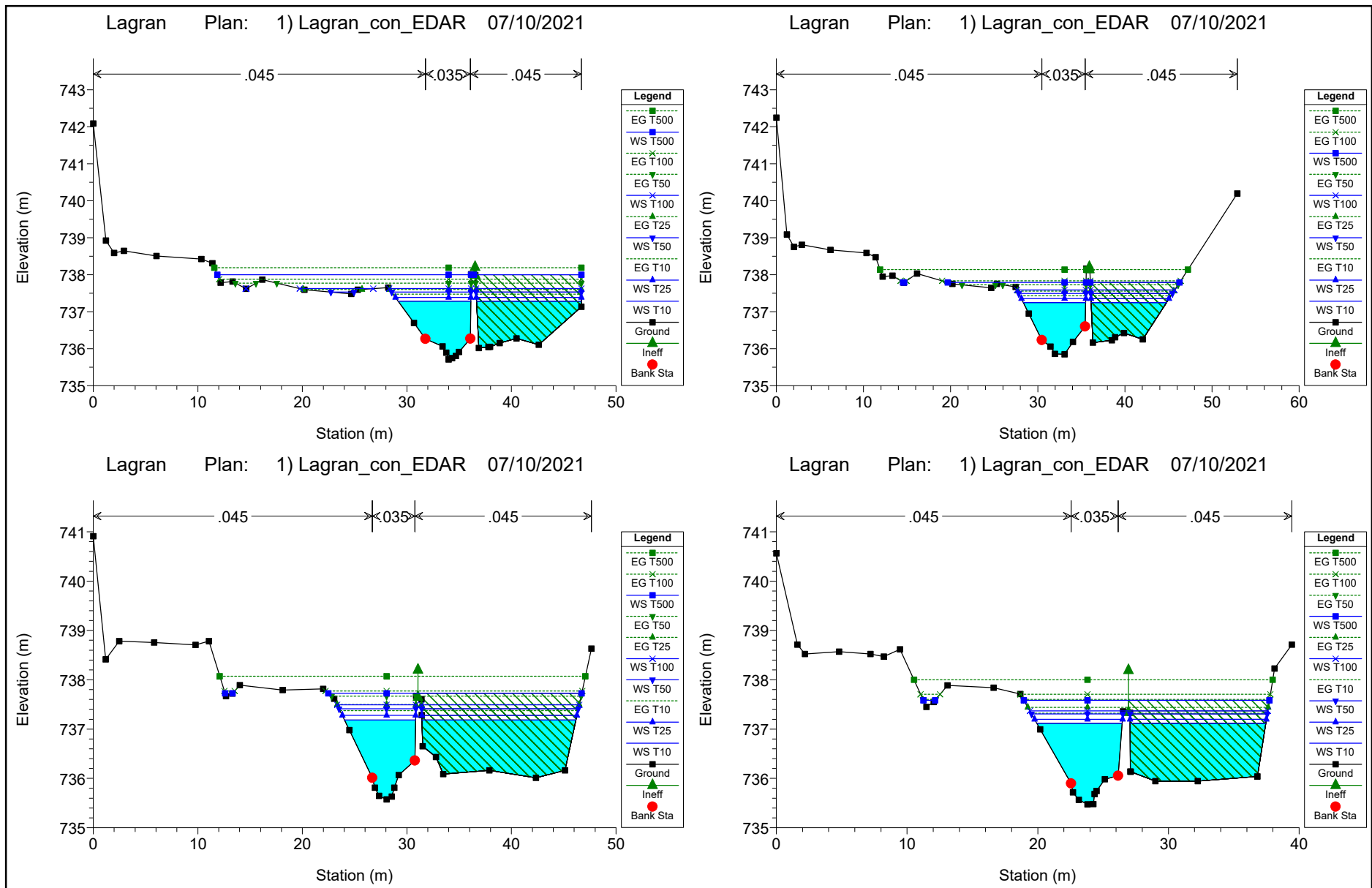


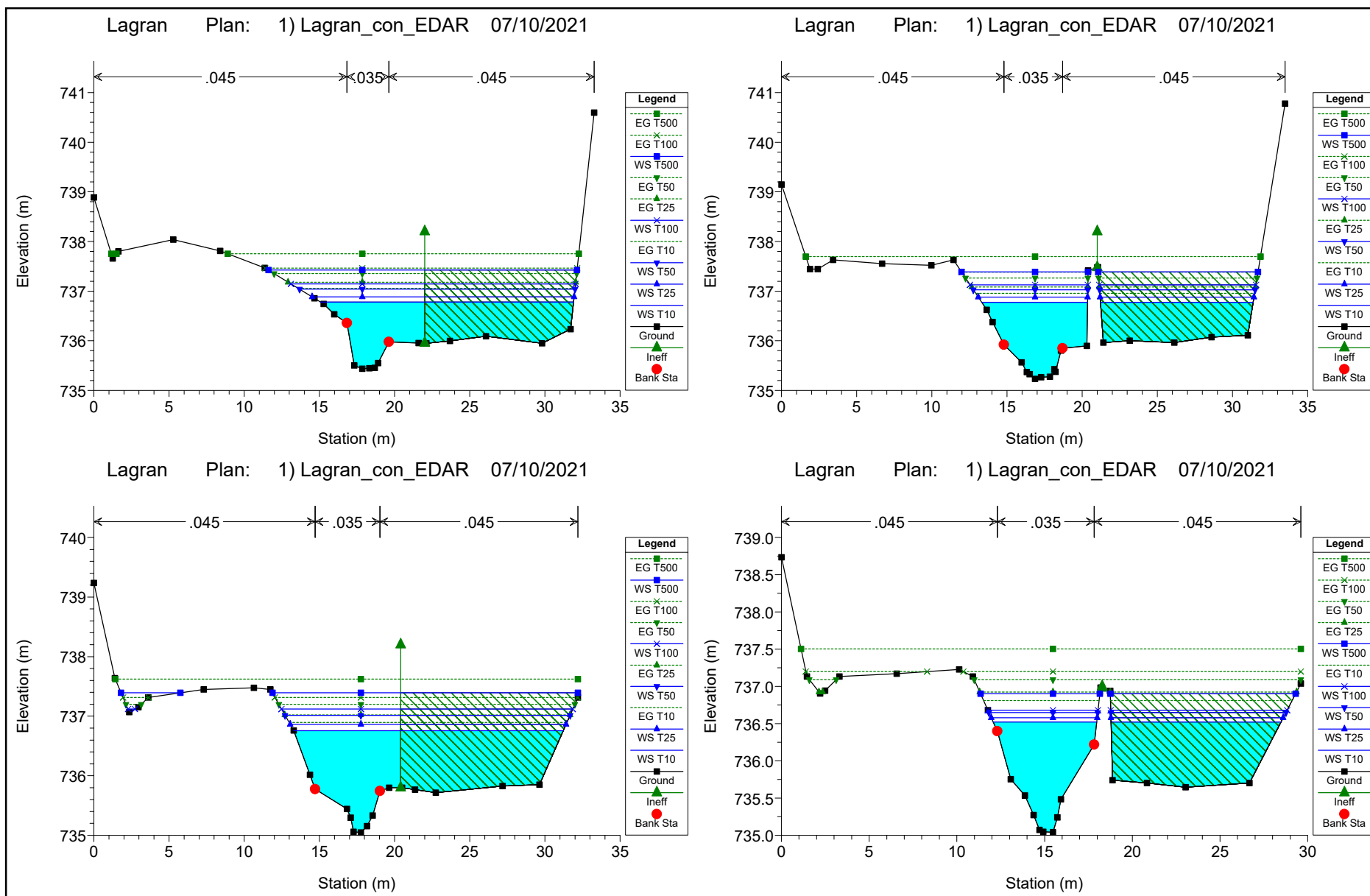
Legend	
EG T500	
EG T100	
EG T50	
WS T500	
EG T25	
EG T10	
WS T100	
WS T50	
WS T25	
WS T10	
Ground	

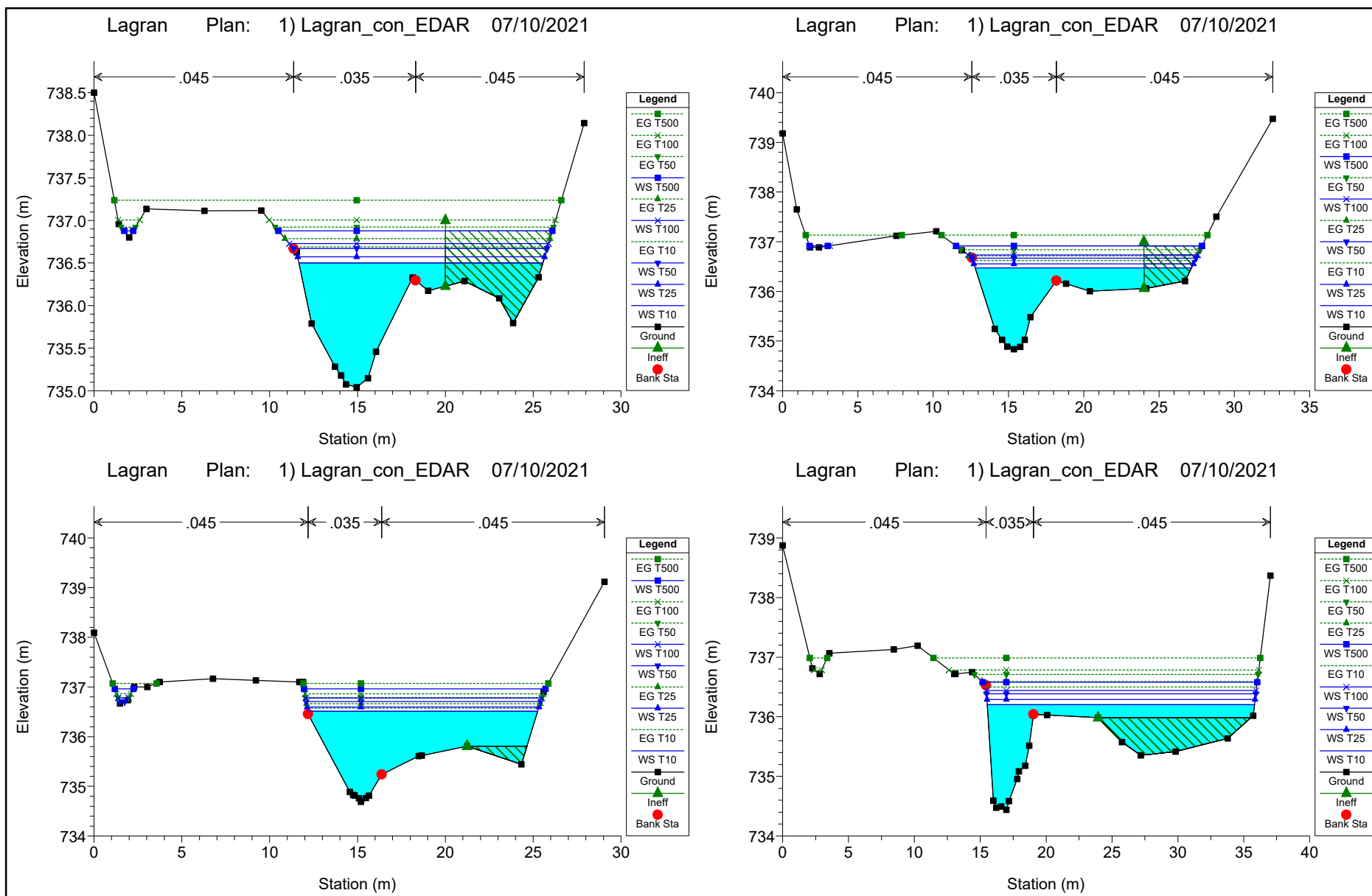
6.3. SECCIONES TRANSVERSALES Modelo Hec-Ras Estado Proyectado

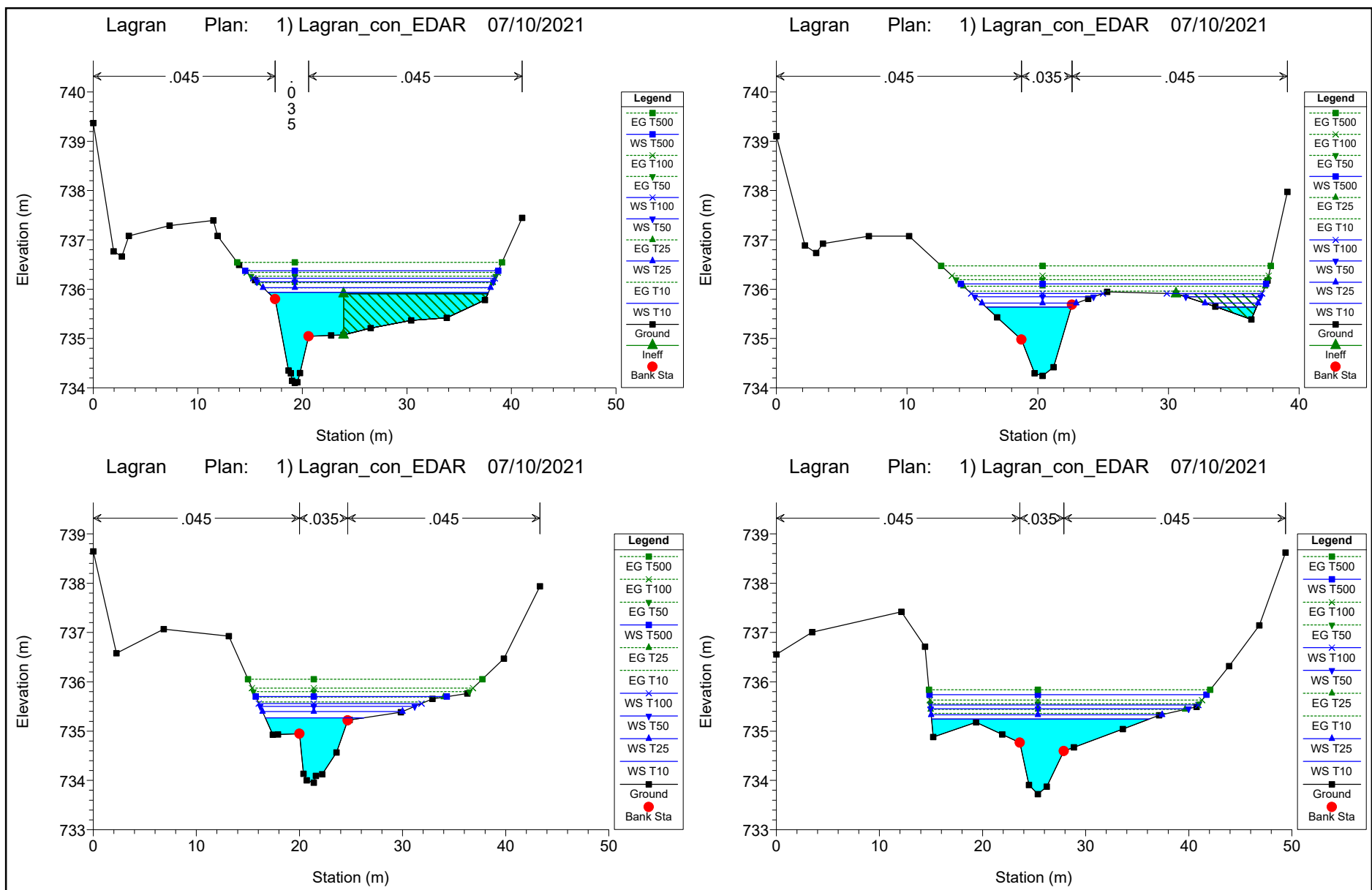


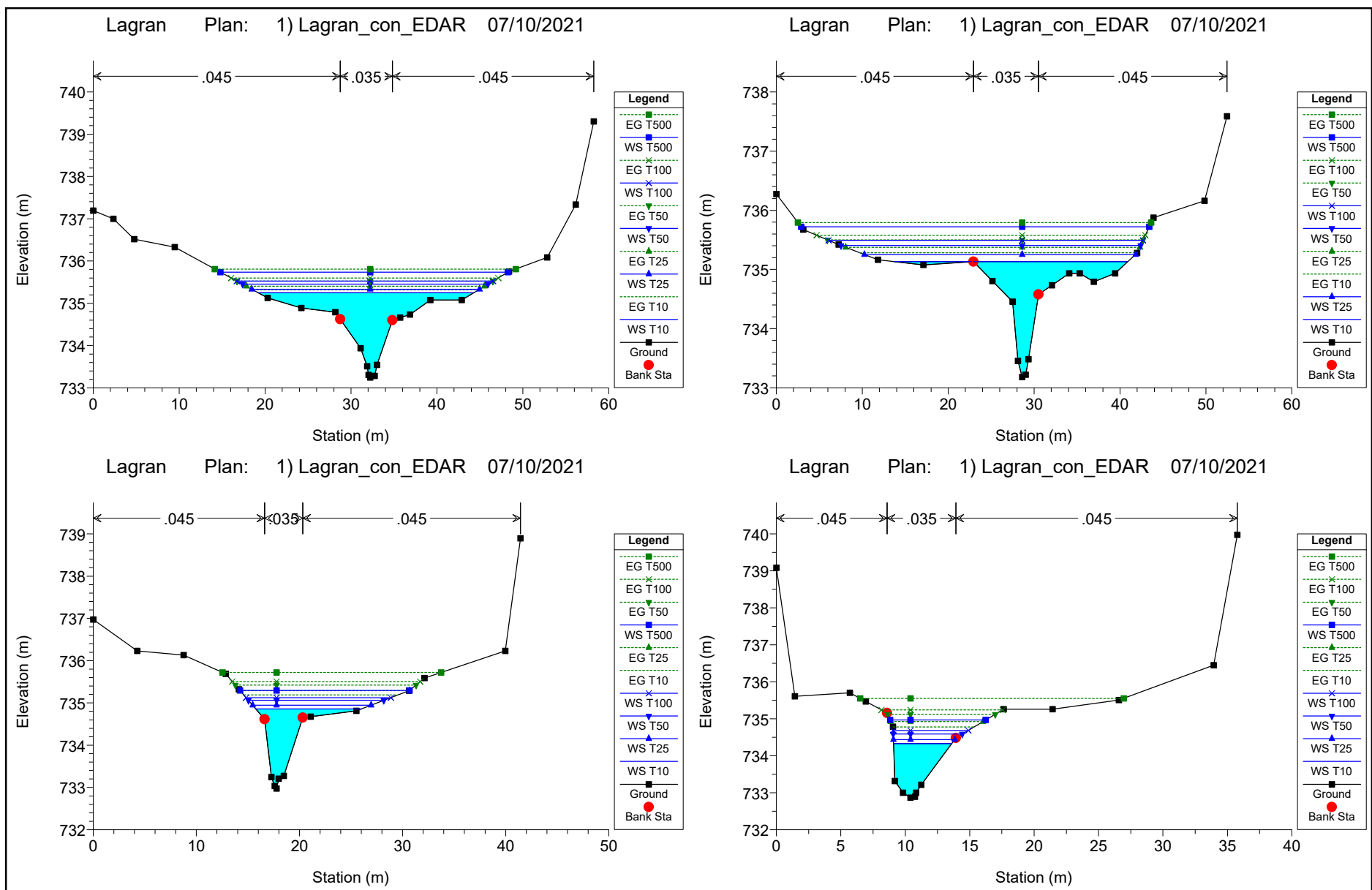


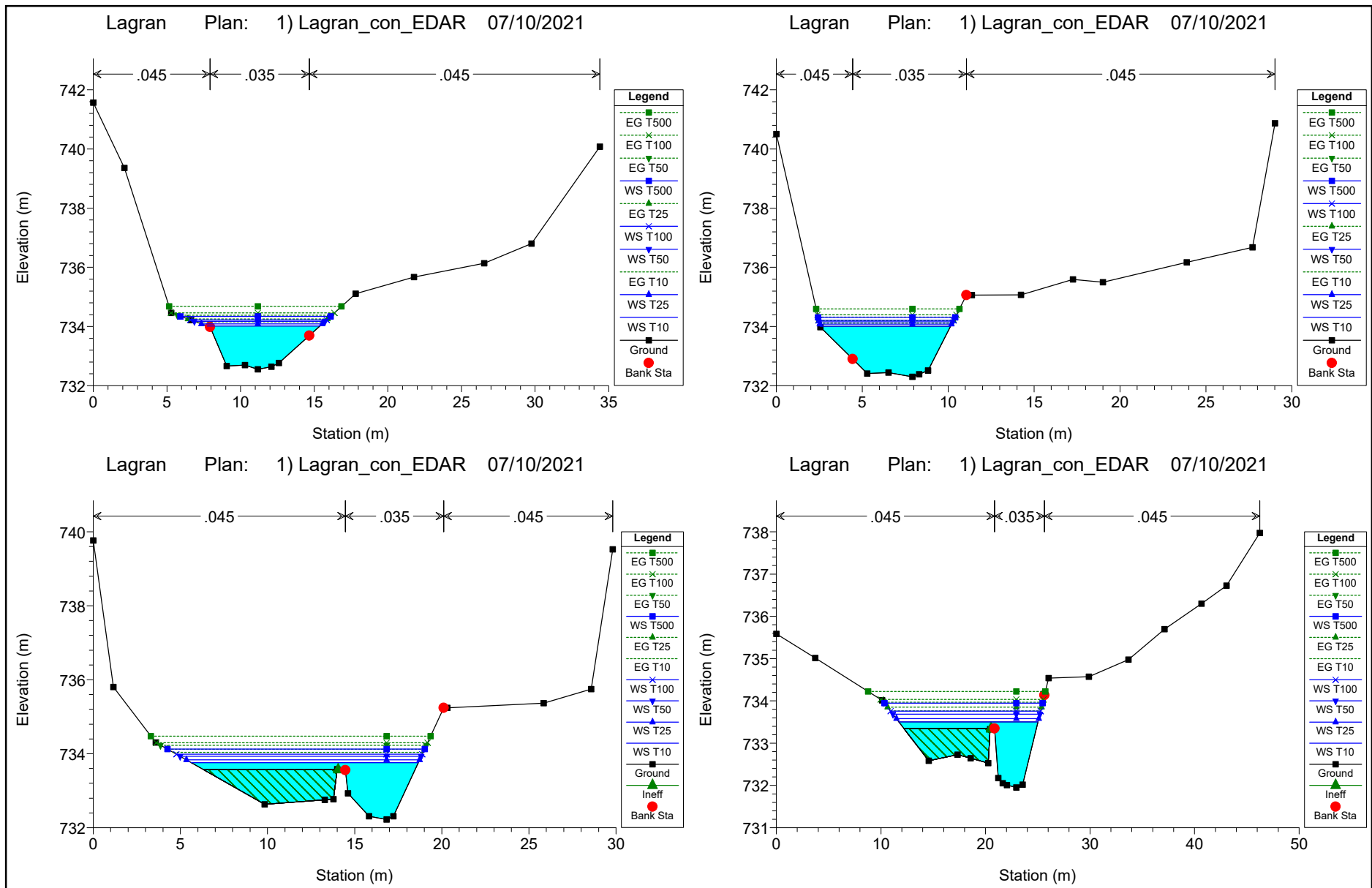


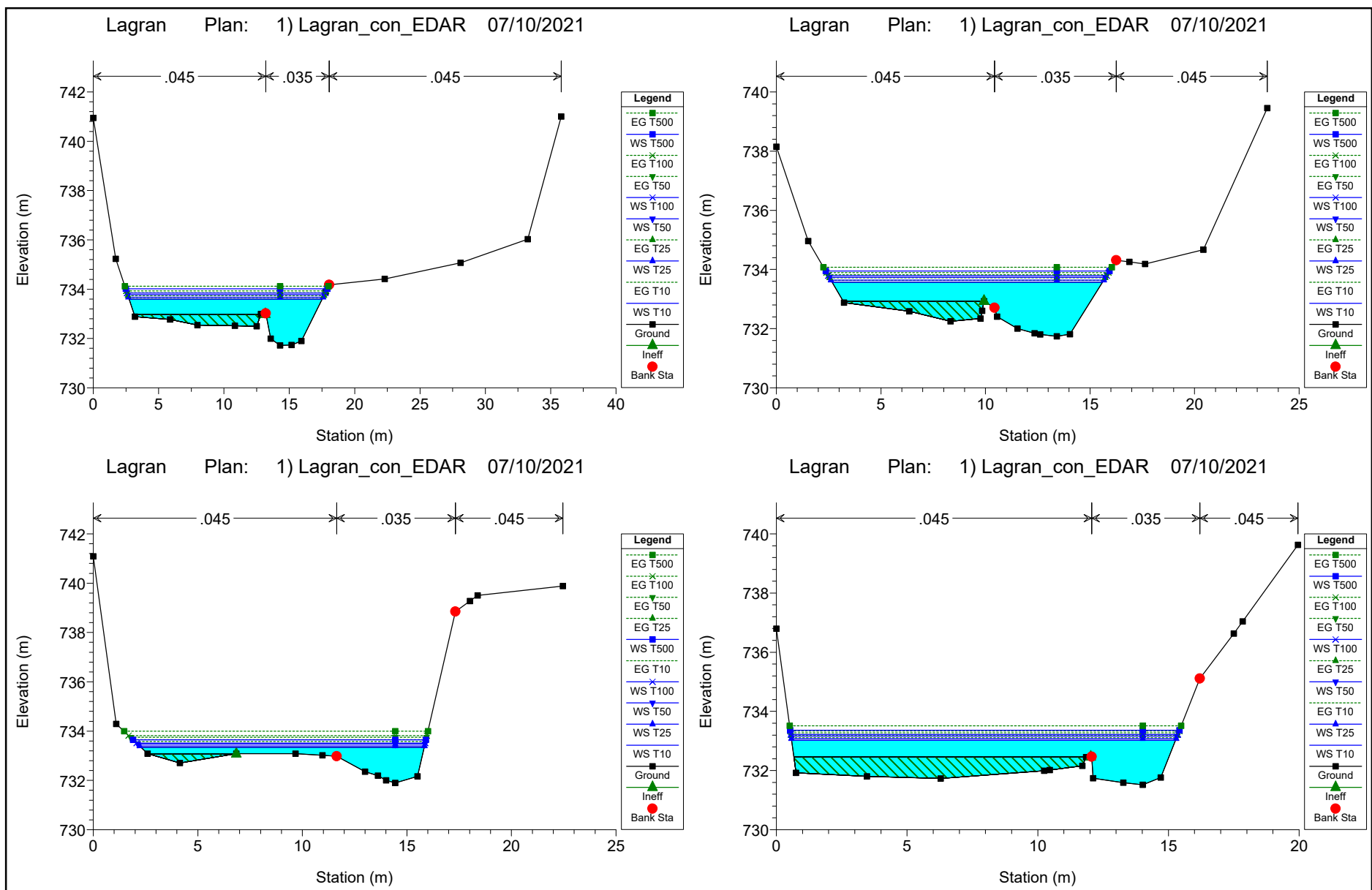


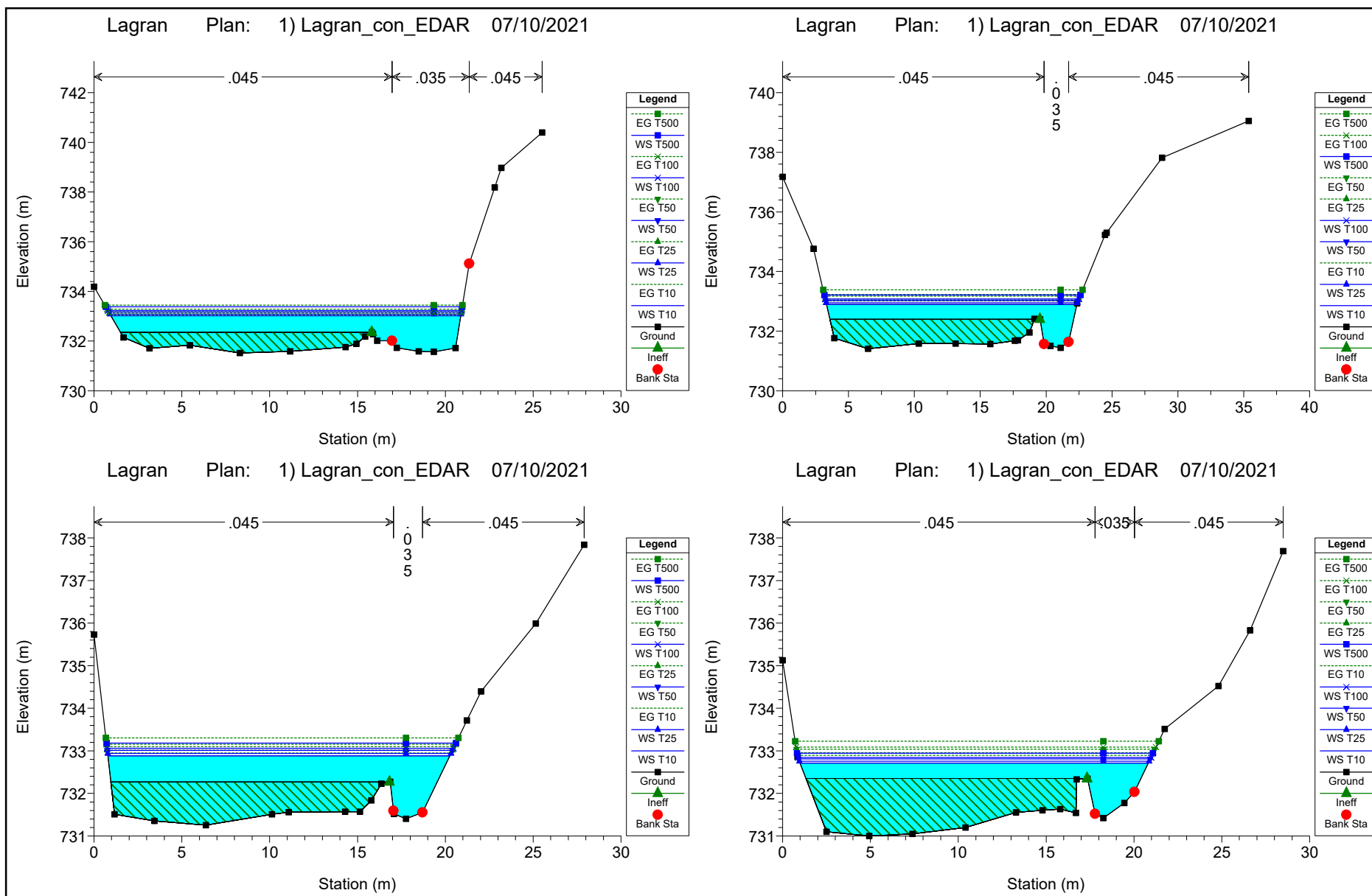


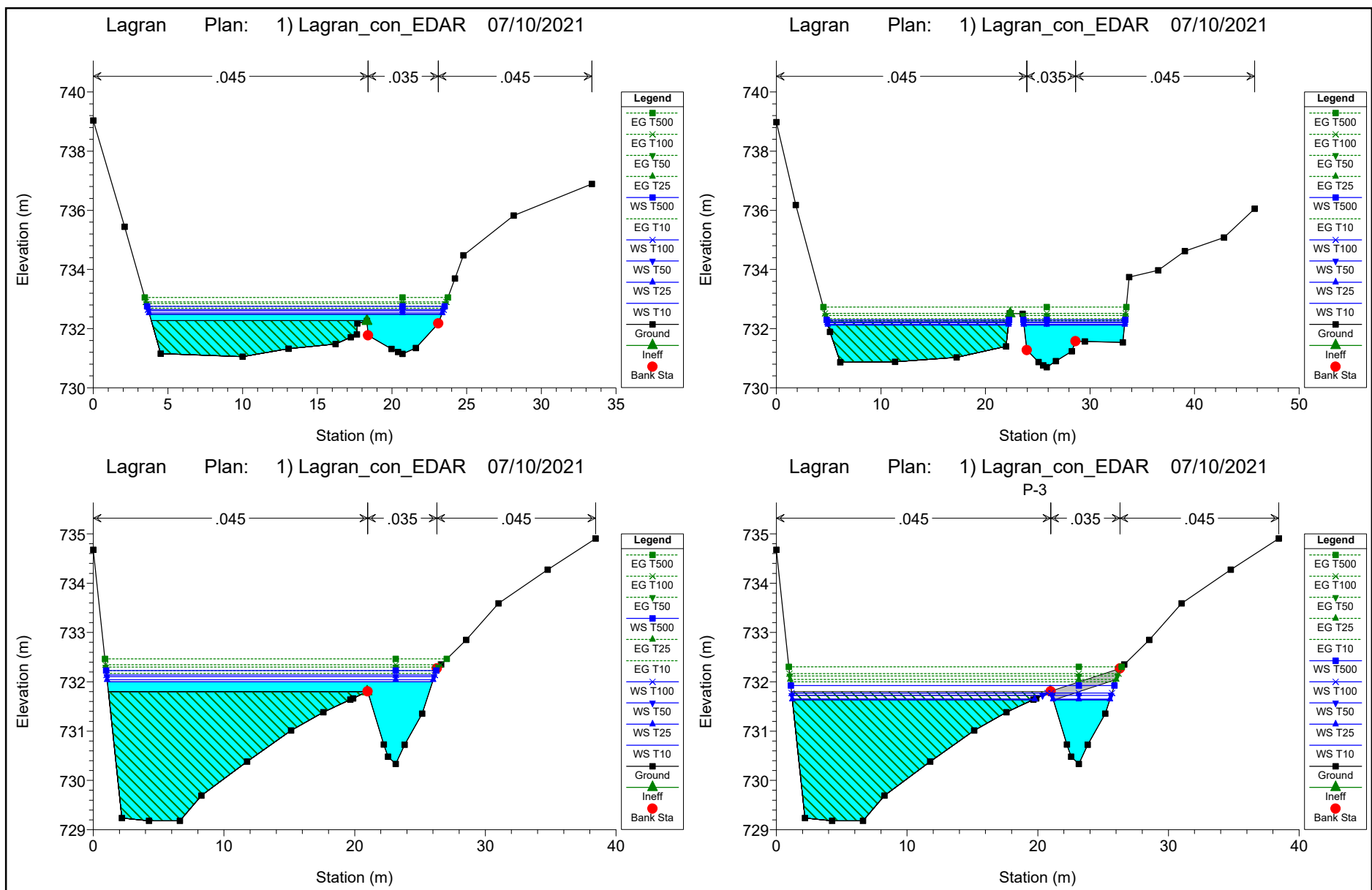


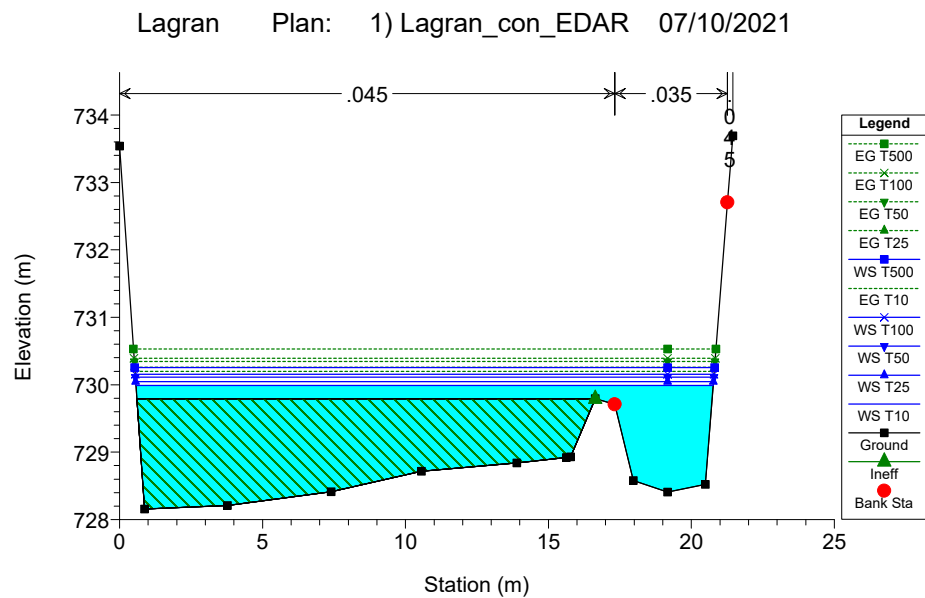
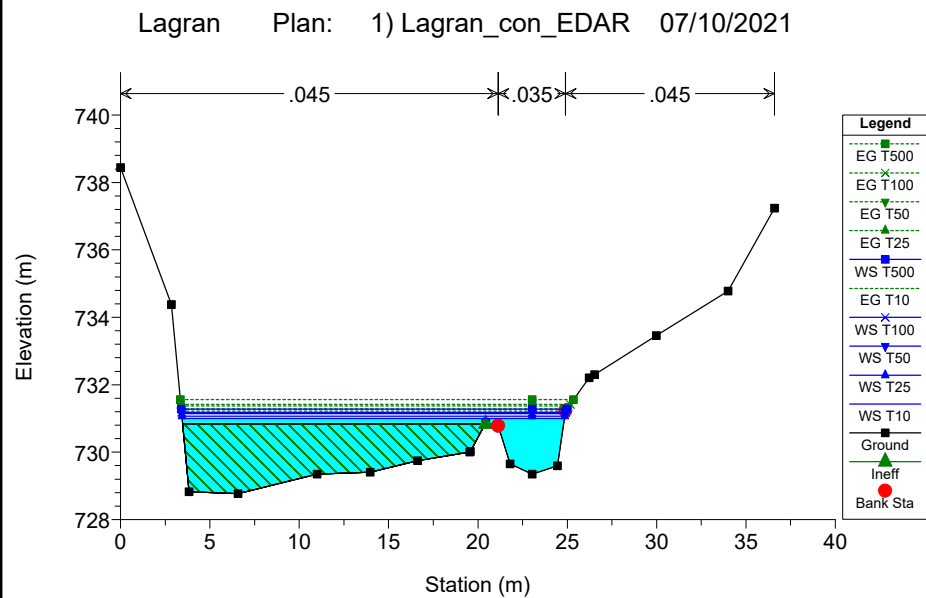
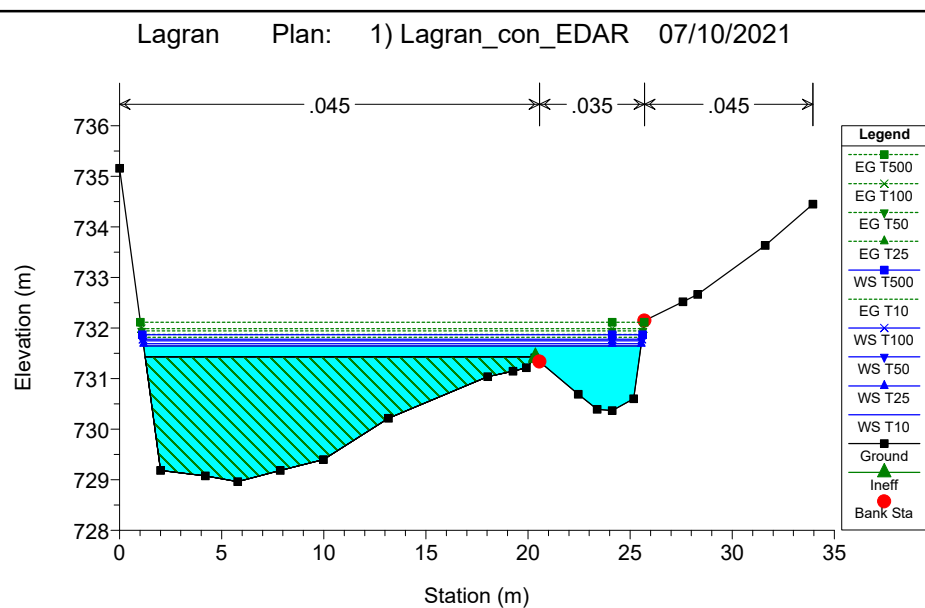
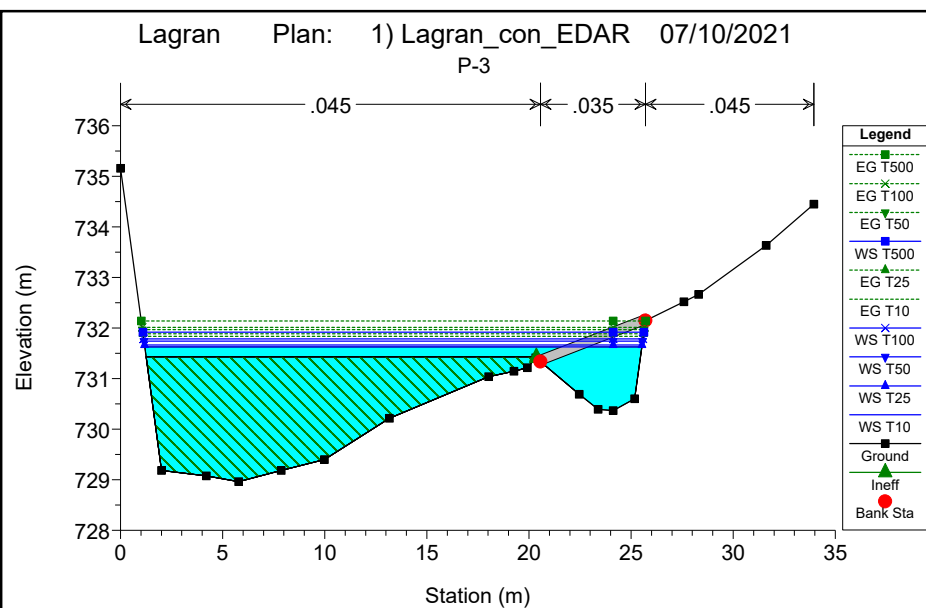












Lagran Plan: 1) Lagran_con_EDAR 07/10/2021

