






CONSORCIO PROSPERIDAD 2015			CONSTRUCCIÓN Y OPTIMIZACIÓN DEL SISTEMA DE ALCANTARILLADO SANITARIO Y PLUVIAL Y SISTEMA DE TRATAMIENTO DE AGUAS RESIDUALES DEL MUNICIPIO DE CHARALÁ, DEPARTAMENTO DE SANTANDER - ETAPA I														<div>Findeter</div> <div>Financiera del Desarrollo</div>	
			CONTRATO PAF-ATF-O-137-2015															
			CONSULTOR CONSORCIO PROSPERIDAD 2015 - MUNICIPIO DE CHARALÁ															
			TOPOLOGÍA DE TRAMOS DE LA RED DE ALCANTARILLADO SANITARIO PROYECTADA															
			Tramo	Pozo		Tipo de Tramo	Etapa de Construcción	Longitud (m)	Diámetro Nominal (")	Material	n Manning	Cota Rasante		Recubrimiento		Cota Clave		
Inicial	Final	Inicial	Final	Inicial	Final							Inicial	Final	Inicial	Final			
1P-2P	1P	2P	Existente		17.33	36	CRCII	0.013	1289.00	1289.20	1.00	1.41	1288.00	1287.79	1287.10	1286.89	1.21%	0.08
2P-3P	2P	3P	Existente		26.83	36	CRCII	0.013	1289.20	1288.51	1.49	1.04	1287.71	1287.47	1286.81	1286.57	0.89%	0.05
3P-4P	3P	4P	Existente		21.12	36	CRCII	0.013	1288.51	1288.25	1.09	1.12	1287.42	1287.13	1286.52	1286.23	1.37%	0.08
4P-5P	4P	5P	Existente		37.67	36	CRCII	0.013	1288.25	1287.90	1.20	1.37	1287.05	1286.53	1286.15	1285.63	1.38%	0.00
5P-6P	5P	6P	Existente		48.50	36	CRCII	0.013	1287.90	1286.57	1.37	0.70	1286.53	1285.87	1285.63	1284.97	1.36%	0.04
6P-7P	6P	7P	Existente		29.64	36	CRCII	0.013	1286.57	1285.93	0.74	0.59	1285.83	1285.34	1284.93	1284.44	1.65%	-0.09
7P-8P	7P	8P	Existente		35.57	32	CRCII	0.013	1285.93	1285.66	0.60	1.04	1285.33	1284.62	1284.53	1283.82	2.00%	0.00
8P-9P	8P	9P	Existente		61.57	32	CRCII	0.013	1285.66	1283.68	1.04	0.30	1284.62	1283.38	1283.82	1282.58	2.01%	0.75
9P-10P	9P	10P	Existente		31.62	36	CRCII	0.013	1283.68	1283.52	0.95	1.58	1282.73	1281.94	1281.83	1281.04	2.50%	0.16
10P-11P	10P	11P	Existente		20.07	36	CRCII	0.013	1283.52	1279.83	1.74	0.75	1281.78	1279.08	1280.88	1278.18	13.45%	1.25
11P-P001	11P	P001	Existente		8.45	36	CRCII	0.013	1279.83	1278.45	2.00	1.05	1277.83	1277.40	1276.93	1276.50	5.06%	0.00
P001-12P	P001	12P	Existente		19.62	36	CRCII	0.013	1278.45	1277.88	1.05	1.47	1277.40	1276.41	1276.50	1275.51	5.06%	0.00
12P-13P	12P	13P	Existente		50.73	36	CRCII	0.013	1277.88	1274.91	1.47	0.70	1276.41	1274.21	1275.51	1273.31	4.34%	0.01
13P-P002	13P	P002	Existente		8.15	36	CRCII	0.013	1274.91	1274.80	0.71	0.97	1274.20	1273.83	1273.30	1272.93	4.56%	3.95
P002-14P	P002	14P	Proyectado	1	15.95	48	PEAD	0.011	1274.80	1274.50	4.62	4.46	1270.18	1270.04	1268.98	1268.84	0.89%	0.00
14P-15P	14P	15P	Proyectado	1	43.43	48	PEAD	0.011	1274.50	1271.65	4.46	2.00	1270.04	1269.65	1268.84	1268.45	0.89%	1.76
15P-P003	15P	P003	Proyectado	1	37.28	48	PEAD	0.011	1271.65	1267.45	3.76	1.00	1267.89	1266.45	1266.69	1265.25	3.87%	2.58
P003-15PA	P003	15PA	Proyectado	1	45.50	48	PEAD	0.011	1267.45	1263.44	3.58	1.00	1263.87	1262.44	1262.67	1261.24	3.15%	0.74
15PA-15PB	15PA	15PB	Proyectado	1	51.27	48	PEAD	0.011	1263.44	1262.45	1.74	1.63	1261.70	1260.82	1260.50	1259.62	1.71%	1.71
15PB-DP1	15PB	DP1	Proyectado	1	32.38	48	PEAD	0.011	1262.45	1257.80	3.34	0.00	1259.11	1257.80	1257.91	1256.60	4.05%	0.00
P004-P005	P004	P005	Proyectado	1	31.82	12	PEAD	0.011	1286.75	1286.40	0.74	0.73	1286.01	1285.67	1285.70	1285.36	1.06%	0.05
P005-6P	P005	6P	Proyectado	1	8.33	15	PEAD	0.011	1286.40	1286.57	0.71	0.94	1285.69	1285.63	1285.31	1285.25	0.78%	0.00
P006-P007	P006	P007	Proyectado	1	82.56	18	PEAD	0.011	1289.40	1285.98	1.00	0.41	1288.40	1285.57	1287.94	1285.11	3.43%	0.00
P007-7P	P007	7P	Proyectado	1	6.18	18	PEAD	0.011	1285.98	1285.93	0.41	0.47	1285.57	1285.46	1285.11	1285.00	1.82%	0.00
P008-P001	P008	P001	Proyectado	1	10.57	12	PEAD	0.011	1279.05	1278.45	1.00	1.00	1278.05	1277.45	1277.74	1277.14	5.68%	0.00
P009-P010	P009	P010	Proyectado	1	72.97	15	PEAD	0.011	1280.70	1279.00	1.70	1.00	1279.00	1278.00	1278.62	1277.62	1.37%	0.09
P010-P011	P010	P011	Proyectado	1	20.02	18	PEAD	0.011	1279.00	1279.10	1.01	1.31	1277.99	1277.79	1277.53	1277.33	0.98%	0.70
P011-P012	P011	P012	Proyectado	1	90.92	24	PEAD	0.011	1279.10	1278.30	1.86	1.61	1277.24	1276.69	1276.63	1276.08	0.60%	1.27
P012-P013	P012	P013	Proyectado	1	4.56	24	PEAD	0.011	1278.30	1278.25	2.88	2.86	1275.42	1275.39	1274.81	1274.78	0.60%	0.03
P013-P013A	P013	P013A	Proyectado	1	7.55	24	PEAD	0.011	1278.25	1278.10	2.89	2.79	1275.36	1275.31	1274.75	1274.70	0.63%	0.00
P013A-17P	P013A	17P	Proyectado	1	81.83	24	PEAD	0.011	1278.10	1277.00	2.79	2.20	1275.31	1274.80	1274.70	1274.19	0.63%	0.26
17P-18P	17P	18P	Proyectado	1	40.64	30	PEAD	0.011	1277.00	1276.62	2.30	2.12	1274.70	1274.50	1273.93	1273.73	0.50%	0.05
18P-18PA	18P	18PA	Proyectado	1	6.96	30	PEAD	0.011	1276.62	1276.90	2.17	2.49	1274.45	1274.41	1273.68	1273.64	0.53%	0.00
18PA-P112	18PA	P112	Proyectado	1	40.71	30	PEAD	0.011	1276.90	1277.55	2.49	3.35	1274.41	1274.20	1273.64	1273.43	0.53%	0.36
P112-21P	P112	21P	Proyectado	1	57.49	36	PEAD	0.011	1277.55	1275.92	3.58	2.31	1273.97	1273.61	1273.07	1272.71	0.63%	0.06
21P-22P	21P	22P	Proyectado	1	9.57	36	PEAD	0.011	1275.92	1275.83	2.37	2.35	1273.55	1273.48	1272.65	1272.58	0.71%	0.01
22P-P014	22P	P014	Proyectado	1	41.99	36	PEAD	0.011	1275.83	1277.30	2.36	4.13	1273.47	1273.17	1272.57	1272.27	0.72%	0.17
P014-P111	P014	P111	Proyectado	1	67.29	40	PEAD	0.011	1277.30	1274.72	4.20	2.12	1273.10	1272.60	1272.10	1271.60	0.74%	0.00
P111-P015	P111	P015	Proyectado	1	54.74	42	PEAD	0.011	1274.72	1276.60	2.07	4.28	1272.65	1272.32	1271.60	1271.27	0.61%	0.02
P015-P016	P015	P016	Proyectado	1	89.62	42	PEAD	0.011	1276.60	1274.30	4.30	2.57	1272.30	1271.73	1271.25	1270.68	0.64%	0.41
P016-P110	P016	P110	Proyectado	1	67.67	42	PEAD	0.011	1274.30	1272.65	2.98	2.06	1271.32	1270.59	1270.27	1269.54	1.08%	0.06
P110-P002	P110	P002	Proyectado	1	38.86	42	PEAD	0.011	1272.65	1274.80	2.12	4.71	1270.53	1270.09	1269.48	1269.04	1.13%	0.00


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Tramo	Pozo		Tipo de Tramo	Etapa de Construcción	Longitud (m)	Diámetro Nominal (")	Material	n Manning	Cota Rasante		Recubrimiento		Cota Clave		Cota Batea		Pendiente (%)	Caída al Final del Tramo
	Inicial	Final							Inicial	Final	Inicial	Final	Inicial	Final				
P017-P013	P017	P013	Proyectado	1	35.31	10	PEAD	0.011	1279.30	1278.25	1.00	1.00	1278.30	1277.25	1278.05	1277.00	2.97%	0.00
P018-P019	P018	P019	Proyectado	1	61.69	10	PEAD	0.011	1293.10	1283.60	1.00	1.00	1292.10	1282.60	1291.85	1282.35	15.40%	0.51
P019-P020	P019	P020	Proyectado	1	27.31	12	PEAD	0.011	1283.60	1280.40	1.45	1.00	1282.15	1279.40	1281.84	1279.09	10.08%	0.07
P020-P021	P020	P021	Proyectado	1	88.72	15	PEAD	0.011	1280.40	1277.00	1.00	1.39	1279.40	1275.61	1279.02	1275.23	4.27%	0.61
P021-17P	P021	17P	Proyectado	1	4.80	15	PEAD	0.011	1277.00	1277.00	2.00	2.20	1275.00	1274.80	1274.62	1274.42	4.27%	0.00
P022-17P	P022	17P	Proyectado	1	57.62	10	PEAD	0.011	1278.30	1277.00	1.00	0.71	1277.30	1276.29	1277.05	1276.04	1.76%	0.00
P023-P024	P023	P024	Proyectado	1	89.17	15	PEAD	0.011	1284.90	1284.00	1.00	1.78	1283.90	1282.22	1283.52	1281.84	1.88%	0.07
P024-P025	P024	P025	Proyectado	1	101.64	18	PEAD	0.011	1284.00	1283.45	1.77	2.95	1282.23	1280.50	1281.77	1280.04	1.70%	0.51
P025-P112	P025	P112	Proyectado	1	90.72	18	PEAD	0.011	1283.45	1277.55	3.46	1.00	1279.99	1276.55	1279.53	1276.09	3.79%	0.00
P026-P027	P026	P027	Proyectado	1	95.92	12	PEAD	0.011	1282.80	1279.10	1.00	1.00	1281.80	1278.10	1281.49	1277.79	3.86%	0.28
P027-P112	P027	P112	Proyectado	1	107.94	18	PEAD	0.011	1279.10	1277.55	1.13	2.16	1277.97	1275.39	1277.51	1274.93	2.39%	0.00
19P-20P	19P	20P	Existente		49.16	36	CRCII	0.013	1276.72	1276.26	0.46	0.29	1276.26	1275.97	1275.36	1275.07	0.59%	0.03
20P-21P	20P	21P	Existente		28.90	36	CRCII	0.013	1276.26	1275.92	0.32	0.70	1275.94	1275.22	1275.04	1274.32	2.49%	0.00
22PA-22PB	22PA	22PB	Existente		54.54	24	CRCII	0.013	1278.20	1276.32	1.00	1.08	1277.20	1275.24	1276.60	1274.64	3.59%	0.18
22PB-22P	22PB	22P	Existente		28.62	24	CRCII	0.013	1276.32	1275.83	1.26	1.25	1275.06	1274.58	1274.46	1273.98	1.68%	0.00
P028-P029	P028	P029	Proyectado	1	43.16	15	PEAD	0.011	1293.70	1288.40	0.50	0.81	1293.20	1287.59	1292.82	1287.21	13.00%	0.19
P029-P030	P029	P030	Proyectado	1	47.48	15	PEAD	0.011	1288.40	1284.75	1.00	0.99	1287.40	1283.76	1287.02	1283.38	7.66%	0.09
P030-P031	P030	P031	Proyectado	1	84.81	18	PEAD	0.011	1284.75	1280.85	1.00	1.00	1283.75	1279.85	1283.29	1279.39	4.60%	0.86
P031-P014	P031	P014	Proyectado	1	92.02	24	PEAD	0.011	1280.85	1277.30	1.71	1.00	1279.14	1276.30	1278.53	1275.69	3.09%	0.00
P032-P033	P032	P033	Proyectado	6	30.24	15	PEAD	0.011	1297.50	1299.00	1.00	2.77	1296.50	1296.23	1296.12	1295.85	0.90%	2.61
P033-P113	P033	P113	Proyectado	1	11.66	15	PEAD	0.011	1299.00	1292.75	5.38	1.00	1293.62	1291.75	1293.24	1291.37	16.07%	0.71
P113-P034	P113	P034	Proyectado	1	23.25	15	PEAD	0.011	1292.75	1287.00	1.71	1.00	1291.04	1286.00	1290.66	1285.62	21.66%	1.44
P034-P035	P034	P035	Proyectado	1	111.06	24	PEAD	0.011	1287.00	1284.45	2.21	1.66	1284.79	1282.79	1284.18	1282.18	1.80%	0.25
P035-P036	P035	P036	Proyectado	1	91.01	24	PEAD	0.011	1284.45	1282.70	1.91	1.93	1282.54	1280.77	1281.93	1280.16	1.94%	2.07
P036-P037	P036	P037	Proyectado	1	51.89	24	PEAD	0.011	1282.70	1275.00	4.00	1.00	1278.70	1274.00	1278.09	1273.39	9.05%	0.00
P037-P038	P037	P038	Proyectado	1	42.58	24	PEAD	0.011	1275.00	1273.40	1.00	1.00	1274.00	1272.40	1273.39	1271.79	3.76%	0.16
P038-P016	P038	P016	Proyectado	1	32.11	30	PEAD	0.011	1273.40	1274.30	1.00	2.22	1272.40	1272.08	1271.63	1271.31	1.00%	0.00
P039-P040	P039	P040	Proyectado	1	88.72	15	PEAD	0.011	1276.30	1276.05	1.00	1.45	1275.30	1274.60	1274.92	1274.22	0.79%	0.96
P040-P041	P040	P041	Proyectado	1	48.37	15	PEAD	0.011	1276.05	1274.50	2.41	1.87	1273.64	1272.63	1273.26	1272.25	2.09%	1.27
P041-P042	P041	P042	Proyectado	1	37.58	15	PEAD	0.011	1274.50	1267.95	3.14	1.00	1271.36	1266.95	1270.98	1266.57	11.73%	1.15
P042-P003	P042	P003	Proyectado	1	12.52	15	PEAD	0.011	1267.95	1267.45	2.15	2.08	1265.80	1265.37	1265.42	1264.99	3.44%	0.00
P043-P114	P043	P114	Proyectado	6	85.96	12	PEAD	0.011	1278.60	1276.45	1.00	1.00	1277.60	1275.45	1277.29	1275.14	2.50%	0.42
P114-P115	P114	P115	Proyectado	6	90.59	15	PEAD	0.011	1276.45	1274.00	1.35	1.71	1275.10	1272.29	1274.72	1271.91	3.10%	0.74
P115-P116	P115	P116	Proyectado	6	72.80	18	PEAD	0.011	1274.00	1269.90	2.37	1.55	1271.63	1268.35	1271.17	1267.89	4.51%	1.05
P116-15PB	P116	15PB	Proyectado	6	99.40	24	PEAD	0.011	1269.90	1262.45	2.45	2.21	1267.45	1260.24	1266.84	1259.63	7.25%	0.00


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Tramo	Pozo		Tipo de Tramo	Etapa de Construcción	Longitud (m)	Diámetro Nominal (")	Material	n Manning	Cota Rasante		Recubrimiento		Cota Clave		Cota Batea		Pendiente (%)	Caída al Final del Tramo
	Inicial	Final							Inicial	Final	Inicial	Final	Inicial	Final	Inicial	Final		
P044-P045	P044	P045	Proyectado	1	7.64	15	PEAD	0.011	1292.75	1291.90	1.00	1.00	1291.75	1290.90	1291.37	1290.52	11.06%	0.08
P045-P046	P045	P046	Proyectado	1	25.38	18	PEAD	0.011	1291.90	1290.75	1.00	1.00	1290.90	1289.75	1290.44	1289.29	4.52%	0.06
P046-P047	P046	P047	Proyectado	1	22.64	18	PEAD	0.011	1290.75	1290.30	1.06	1.70	1289.69	1288.60	1289.23	1288.14	4.82%	0.00
P047-P048	P047	P048	Proyectado	1	57.96	18	PEAD	0.011	1290.30	1289.25	1.70	2.46	1288.60	1286.79	1288.14	1286.33	3.12%	0.00
P048-P049	P048	P049	Proyectado	1	78.14	24	PEAD	0.011	1289.25	1287.45	2.31	1.14	1286.94	1286.31	1286.33	1285.70	0.80%	0.99
P049-P050	P049	P050	Proyectado	1	97.50	24	PEAD	0.011	1287.45	1287.25	2.13	3.34	1285.32	1283.91	1284.71	1283.30	1.45%	0.00
P050-P051	P050	P051	Proyectado	1	69.51	30	PEAD	0.011	1287.25	1287.65	3.18	3.98	1284.07	1283.67	1283.30	1282.90	0.57%	0.01
P051-P052	P051	P052	Proyectado	1	31.58	30	PEAD	0.011	1287.65	1285.55	3.99	2.07	1283.66	1283.48	1282.89	1282.71	0.58%	0.46
P052-DP3	P052	DP3	Proyectado	1	36.84	30	PEAD	0.011	1285.55	1282.26	2.53	0.01	1283.02	1282.25	1282.25	1281.48	2.08%	0.00
P053-P049	P053	P049	Proyectado	1	61.45	12	PEAD	0.011	1288.90	1287.45	1.00	1.00	1287.90	1286.45	1287.59	1286.14	2.36%	0.00
23P-24P	23P	24P	Existente		36.76	12	PVC	0.011	1286.97	1287.29	0.68	1.30	1286.29	1285.99	1286.01	1285.71	0.81%	0.54
24P-25P	24P	25P	Proyectado	1	26.01	12	PEAD	0.011	1287.29	1285.00	1.81	1.00	1285.48	1284.00	1285.17	1283.69	5.70%	0.00
25P-P052	25P	P052	Proyectado	1	1.78	12	PEAD	0.011	1285.00	1285.55	1.00	1.57	1284.00	1283.98	1283.69	1283.67	1.23%	0.00
P054-P055	P054	P055	Proyectado	1	18.10	18	PEAD	0.011	1295.10	1293.90	1.00	1.10	1294.10	1292.80	1293.64	1292.34	7.16%	0.05
P055-26P	P055	26P	Proyectado	1	91.87	24	PEAD	0.011	1293.90	1289.49	1.00	0.33	1292.90	1289.16	1292.29	1288.55	4.07%	0.66
26P-27P	26P	27P	Existente		63.50	24	CRCII	0.013	1289.49	1286.01	1.00	1.10	1288.49	1284.91	1287.89	1284.31	5.64%	0.84
27P-28P	27P	28P	Proyectado	1	33.21	30	PEAD	0.011	1286.01	1284.82	1.77	1.65	1284.24	1283.17	1283.47	1282.40	3.23%	0.02
28P-DP4	28P	DP4	Proyectado	1	9.96	30	PEAD	0.011	1284.82	1282.83	1.67	0.01	1283.15	1282.82	1282.38	1282.05	3.27%	0.00
P056-P057	P056	P057	Proyectado	6	34.79	12	PEAD	0.011	1292.70	1291.30	1.00	1.00	1291.70	1290.30	1291.39	1289.99	4.02%	0.12
P057-P058	P057	P058	Proyectado	6	21.91	15	PEAD	0.011	1291.30	1290.40	1.05	1.00	1290.25	1289.40	1289.87	1289.02	3.88%	0.08
P058-P059	P058	P059	Proyectado	6	82.98	18	PEAD	0.011	1290.40	1287.80	1.00	1.00	1289.40	1286.80	1288.94	1286.34	3.13%	0.24
P059-27P	P059	27P	Proyectado	6	46.18	18	PEAD	0.011	1287.80	1286.01	1.24	1.17	1286.56	1284.84	1286.10	1284.38	3.73%	0.00
P060-P061	P060	P061	Proyectado	6	48.07	12	PEAD	0.011	1287.40	1287.35	1.00	1.27	1286.40	1286.08	1286.09	1285.77	0.67%	0.09
P061-P062	P061	P062	Proyectado	6	52.34	12	PEAD	0.011	1287.35	1286.60	1.36	1.09	1285.99	1285.51	1285.68	1285.20	0.92%	0.16
P062-P063	P062	P063	Proyectado	6	26.65	12	PEAD	0.011	1286.60	1285.85	1.25	1.00	1285.35	1284.85	1285.04	1284.54	1.89%	1.31
P063-P064	P063	P064	Proyectado	6	69.53	12	PEAD	0.011	1285.85	1273.10	2.31	1.00	1283.54	1272.10	1283.23	1271.79	16.45%	0.00
P064-P065	P064	P065	Proyectado	6	29.13	12	PEAD	0.011	1273.10	1270.15	1.00	1.00	1272.10	1269.15	1271.79	1268.84	10.13%	0.00
P065-P066	P065	P066	Proyectado	6	62.63	12	PEAD	0.011	1270.15	1268.10	1.00	1.75	1269.15	1266.35	1268.84	1266.04	4.47%	0.61
P066-P067	P066	P067	Proyectado	6	42.06	12	PEAD	0.011	1268.10	1263.25	2.36	1.00	1265.74	1262.25	1265.43	1261.94	8.29%	2.78
P067-DP2	P067	DP2	Proyectado	6	29.47	12	PEAD	0.011	1263.25	1249.25	3.78	0.00	1259.47	1249.25	1259.16	1248.94	34.70%	0.00
P068-P069	P068	P069	Proyectado	6	32.05	10	PEAD	0.011	1300.75	1300.45	1.00	1.41	1299.75	1299.04	1299.50	1298.79	2.23%	0.00
P069-P070	P069	P070	Proyectado	6	32.12	15	PEAD	0.011	1300.45	1300.70	1.28	1.82	1299.17	1298.88	1298.79	1298.50	0.90%	0.08
P070-P071	P070	P071	Proyectado	6	32.17	18	PEAD	0.011	1300.70	1300.45	1.82	1.85	1298.88	1298.60	1298.42	1298.14	0.88%	0.15
P071-P072	P071	P072	Proyectado	6	31.02	18	PEAD	0.011	1300.45	1299.90	2.00	1.86	1298.45	1298.04	1297.99	1297.58	1.32%	0.15
P072-P073	P072	P073	Proyectado	6	31.93	18	PEAD	0.011	1299.90	1299.80	2.01	2.45	1297.89	1297.35	1297.43	1296.89	1.69%	0.00
P073-P074	P073	P074	Proyectado	6	32.11	24	PEAD	0.011	1299.80	1299.45	2.30	2.21	1297.50	1297.24	1296.89	1296.63	0.82%	0.25
P074-P075	P074	P075	Proyectado	6	33.07	24	PEAD	0.011	1299.45	1298.80	2.46	2.33	1296.99	1296.47	1296.38	1295.86	1.56%	0.00
P075-P076	P075	P076	Proyectado	6	49.73	24	PEAD	0.011	1298.80	1298.15	2.33	2.24	1296.47	1295.91	1295.86	1295.30	1.13%	0.91
P076-P077	P076	P077	Proyectado	6	31.41	24	PEAD	0.011	1298.15	1298.00	3.15	3.51	1295.00	1294.49	1294.39	1293.88	1.62%	0.00

CONSORCIO PROSPERIDAD 2015		CONSTRUCCIÓN Y OPTIMIZACIÓN DEL SISTEMA DE ALCANTARILLADO SANITARIO Y PLUVIAL Y SISTEMA DE TRATAMIENTO DE AGUAS RESIDUALES DEL MUNICIPIO DE CHARALÁ, DEPARTAMENTO DE SANTANDER - ETAPA I														 Findeter Financiera del Desarrollo		
		CONTRATO PAF-ATF-O-137-2015																
		CONSULTOR CONSORCIO PROSPERIDAD 2015 - MUNICIPIO DE CHARALÁ																
TOPOLOGÍA DE TRAMOS DE LA RED DE ALCANTARILLADO SANITARIO PROYECTADA																		
Tramo	Pozo		Tipo de Tramo	Etapas de Construcción	Longitud (m)	Diámetro Nominal (")	Material	n Manning	Cota Rasante		Recubrimiento		Cota Clave		Cota Batea		Pendiente (%)	Caída al Final del Tramo
	Inicial	Final							Inicial	Final	Inicial	Final	Inicial	Final	Inicial	Final		
P077-P078	P077	P078	Proyectado	6	72.39	30	PEAD	0.011	1298.00	1296.85	3.35	2.60	1294.65	1294.25	1293.88	1293.48	0.55%	0.02
P078-32P	P078	32P	Proyectado	6	43.76	36	PEAD	0.011	1296.85	1296.99	2.49	2.75	1294.36	1294.24	1293.46	1293.34	0.28%	0.56
32P-DP5	32P	DP5	Proyectado	6	44.99	36	PEAD	0.011	1296.99	1294.50	3.31	1.08	1293.68	1293.42	1292.78	1292.52	0.58%	0.00
P079-P076	P079	P076	Proyectado	6	35.55	10	PEAD	0.011	1297.40	1298.15	1.00	2.74	1296.40	1295.41	1296.15	1295.16	2.79%	0.00
P080-P078	P080	P078	Proyectado	6	66.04	12	PEAD	0.011	1297.35	1296.85	1.00	1.02	1296.35	1295.83	1296.04	1295.52	0.79%	0.00
P081-30P	P081	30P	Proyectado	6	76.81	12	PEAD	0.011	1298.85	1297.29	1.00	1.98	1297.85	1295.31	1297.54	1295.00	3.31%	0.09
30P-31P	30P	31P	Proyectado	6	6.75	15	PEAD	0.011	1297.29	1297.12	2.00	2.01	1295.29	1295.11	1294.91	1294.73	2.67%	0.00
31P-32P	31P	32P	Proyectado	6	41.23	18	PEAD	0.011	1297.12	1296.99	1.93	2.20	1295.19	1294.79	1294.73	1294.33	0.97%	0.00
P082-32P	P082	32P	Proyectado	6	74.67	10	PEAD	0.011	1298.35	1296.99	0.80	0.80	1297.55	1296.19	1297.30	1295.94	1.82%	0.00
P083-P084	P083	P084	Proyectado	6	56.16	10	PEAD	0.011	1287.92	1280.45	1.00	0.63	1286.92	1279.82	1286.67	1279.57	12.64%	0.00
P084-P085	P084	P085	Proyectado	1	6.20	15	PEAD	0.011	1280.45	1280.30	0.50	0.63	1279.95	1279.67	1279.57	1279.29	4.50%	0.22
P085-P086	P085	P086	Proyectado	1	45.75	18	PEAD	0.011	1280.30	1279.70	0.77	0.91	1279.53	1278.79	1279.07	1278.33	1.62%	0.00
P086-P087	P086	P087	Proyectado	1	15.81	24	PEAD	0.011	1279.70	1279.60	0.76	0.75	1278.94	1278.85	1278.33	1278.24	0.59%	0.00
P087-DP6	P087	DP6	Proyectado	1	4.18	24	PEAD	0.011	1279.60	1279.50	0.75	0.67	1278.85	1278.83	1278.24	1278.22	0.59%	0.00
P088-P089	P088	P089	Proyectado	2	19.58	15	PEAD	0.011	1280.25	1279.20	1.00	1.00	1279.25	1278.20	1278.87	1277.82	5.34%	0.00
P089-DP7	P089	DP7	Proyectado	2	4.13	15	PEAD	0.011	1279.20	1278.00	1.00	0.00	1278.20	1278.00	1277.82	1277.62	4.91%	0.00
P090-P091	P090	P091	Proyectado	2	44.27	12	PEAD	0.011	1277.95	1277.75	1.00	1.11	1276.95	1276.64	1276.64	1276.33	0.69%	0.98
P091-P092	P091	P092	Proyectado	2	49.53	18	PEAD	0.011	1277.75	1276.90	1.94	1.43	1275.81	1275.47	1275.35	1275.01	0.68%	0.28
P092-P093	P092	P093	Proyectado	2	44.10	18	PEAD	0.011	1276.90	1278.85	1.71	4.30	1275.19	1274.55	1274.73	1274.09	1.46%	0.02
P093-P094	P093	P094	Proyectado	2	59.25	24	PEAD	0.011	1278.85	1277.30	4.17	3.01	1274.68	1274.29	1274.07	1273.68	0.66%	0.00
P094-DP8	P094	DP8	Proyectado	2	14.39	24	PEAD	0.011	1277.30	1274.50	3.01	0.30	1274.29	1274.20	1273.68	1273.59	0.66%	0.00
P095-P096	P095	P096	Proyectado	6	44.35	10	PEAD	0.011	1283.65	1282.50	1.00	1.00	1282.65	1281.50	1282.40	1281.25	2.59%	0.13
P096-P097	P096	P097	Proyectado	2	43.61	15	PEAD	0.011	1282.50	1283.35	1.00	2.20	1281.50	1281.15	1281.12	1280.77	0.80%	0.68
P097-P098	P097	P098	Proyectado	2	85.44	18	PEAD	0.011	1283.35	1280.75	2.80	2.48	1280.55	1278.27	1280.09	1277.81	2.67%	1.02
P098-P099	P098	P099	Proyectado	2	34.54	18	PEAD	0.011	1280.75	1276.75	3.50	1.59	1277.25	1275.16	1276.79	1274.70	6.06%	1.36
P099-DP9	P099	DP9	Proyectado	2	14.02	18	PEAD	0.011	1276.75	1272.08	2.95	0.00	1273.80	1272.08	1273.34	1271.62	12.24%	0.00
P100-P097	P100	P097	Proyectado	2	84.51	12	PEAD	0.011	1286.85	1283.35	1.00	1.00	1285.85	1282.35	1285.54	1282.04	4.14%	0.00
P101-P102	P101	P102	Proyectado	6	54.57	10	PEAD	0.011	1286.30	1281.20	1.00	1.00	1285.30	1280.20	1285.05	1279.95	9.35%	0.45
P102-P103	P102	P103	Proyectado	6	37.36	10	PEAD	0.011	1281.20	1274.75	1.45	0.58	1279.75	1274.17	1279.50	1273.92	14.95%	0.60
P103-P104	P103	P104	Proyectado	2	19.51	12	PEAD	0.011	1274.75	1272.35	1.12	1.00	1273.63	1271.35	1273.32	1271.04	11.69%	0.00
P104-P105	P104	P105	Proyectado	2	21.94	12	PEAD	0.011	1272.35	1270.40	1.00	1.40	1271.35	1269.00	1271.04	1268.69	10.70%	0.11
P105-P106	P105	P106	Proyectado	2	19.26	12	PEAD	0.011	1270.40	1267.69	1.51	1.00	1268.89	1266.69	1268.58	1266.38	11.40%	2.50
P106-P107	P106	P107	Proyectado	2	11.45	15	PEAD	0.011	1267.69	1261.75	3.43	1.22	1264.26	1260.53	1263.88	1260.15	32.54%	2.23
P107-P108	P107	P108	Proyectado	2	10.91	15	PEAD	0.011	1261.75	1255.75	3.45	1.00	1258.30	1254.75	1257.92	1254.37	32.54%	1.59
P108-P109	P108	P109	Proyectado	2	18.15	15	PEAD	0.011	1255.75	1248.25	2.59	1.00	1253.16	1247.25	1252.78	1246.87	32.54%	0.00
P109-DP10	P109	DP10	Proyectado	2	12.24	15	PEAD	0.011	1248.25	1245.75	1.00	0.00	1247.25	1245.75	1246.87	1245.37	12.25%	0.00

CONSORCIO PROSPERIDAD 2015			CONSTRUCCIÓN Y OPTIMIZACIÓN DEL SISTEMA DE ALCANTARILLADO SANITARIO Y PLUVIAL Y SISTEMA DE TRATAMIENTO DE AGUAS RESIDUALES DEL MUNICIPIO DE CHARALÁ, DEPARTAMENTO DE SANTANDER - ETAPA I														 Financiera del Desarrollo			
			CONTRATO PAF-ATF-O-137-2015																	
			CONSULTOR CONSORCIO PROSPERIDAD 2015 - MUNICIPIO DE CHARALÁ																	
TOPOLOGÍA DE TRAMOS DE LA RED DE ALCANTARILLADO SANITARIO PROYECTADA																				
Tramo	Pozo		Tipo de Tramo	Etapa de Construcción	Longitud (m)	Diámetro Nominal (")	Material	n Manning	Cota Rasante		Recubrimiento		Cota Clave		Cota Batea		Pendiente (%)	Caída al Final del Tramo		
	Inicial	Final							Inicial	Final	Inicial	Final	Inicial	Final						
P117-P118	P117	P118	Proyectado	6	37.10	15	PEAD	0.011	1275.80	1276.05	0.72	1.20	1275.08	1274.85	1274.70	1274.47	0.63%	0.08		
P118-P119	P118	P119	Proyectado	6	83.30	15	PEAD	0.011	1276.05	1275.45	1.28	1.69	1274.77	1273.76	1274.39	1273.38	1.21%	0.61		
P119-P120	P119	P120	Proyectado	6	73.21	15	PEAD	0.011	1275.45	1271.30	2.30	1.00	1273.15	1270.30	1272.77	1269.92	3.89%	0.57		
P120-P121	P120	P121	Proyectado	6	44.05	18	PEAD	0.011	1271.30	1268.95	1.49	1.72	1269.81	1267.23	1269.35	1266.77	5.85%	0.00		
P121-P122	P121	P122	Proyectado	6	50.54	18	PEAD	0.011	1268.95	1267.70	1.72	1.54	1267.23	1266.16	1266.77	1265.70	2.11%	0.58		
P122-P123	P122	P123	Proyectado	6	69.26	18	PEAD	0.011	1267.70	1264.00	2.12	1.22	1265.58	1262.78	1265.12	1262.32	4.05%	3.24		
P123-P124	P123	P124	Proyectado	6	20.55	18	PEAD	0.011	1264.00	1257.75	4.46	2.36	1259.54	1255.39	1259.08	1254.93	20.20%	2.29		
P124-DP11	P124	DP11	Proyectado	6	15.36	18	PEAD	0.011	1257.75	1250.00	4.65	0.00	1253.10	1250.00	1252.64	1249.54	20.20%	0.00		
P125-P126	P125	P126	Proyectado	6	64.65	10	PEAD	0.011	1285.20	1283.45	1.00	1.00	1284.20	1282.45	1283.95	1282.20	2.71%	0.41		
P126-P127	P126	P127	Proyectado	6	33.77	10	PEAD	0.011	1283.45	1281.60	1.41	1.21	1282.04	1280.39	1281.79	1280.14	4.90%	0.30		
P127-P128	P127	P128	Proyectado	6	26.30	12	PEAD	0.011	1281.60	1279.45	1.45	1.00	1280.15	1278.45	1279.84	1278.14	6.47%	0.20		
P128-P129	P128	P129	Proyectado	6	22.46	12	PEAD	0.011	1279.45	1277.70	1.20	1.00	1278.25	1276.70	1277.94	1276.39	6.90%	0.00		
P129-P130	P129	P130	Proyectado	6	93.00	12	PEAD	0.011	1277.70	1273.33	1.00	1.11	1276.70	1272.22	1276.39	1271.91	4.82%	1.74		
P130-P131	P130	P131	Proyectado	6	18.57	18	PEAD	0.011	1273.33	1271.40	2.70	1.83	1270.63	1269.57	1270.17	1269.11	5.71%	0.14		
P131-P132	P131	P132	Proyectado	6	22.93	18	PEAD	0.011	1271.40	1269.50	1.97	1.53	1269.43	1267.97	1268.97	1267.51	6.36%	0.01		
P132-P133	P132	P133	Proyectado	6	52.61	18	PEAD	0.011	1269.50	1265.60	1.54	1.00	1267.96	1264.60	1267.50	1264.14	6.39%	0.50		
P133-P134	P133	P134	Proyectado	6	81.55	18	PEAD	0.011	1265.60	1258.40	1.50	1.00	1264.10	1257.40	1263.64	1256.94	8.21%	0.00		
P134-P135	P134	P135	Proyectado	6	64.98	18	PEAD	0.011	1258.40	1254.50	1.00	1.00	1257.40	1253.50	1256.94	1253.04	6.00%	0.31		
P135-P136	P135	P136	Proyectado	6	18.80	18	PEAD	0.011	1254.50	1252.80	1.31	1.00	1253.19	1251.80	1252.73	1251.34	7.40%	0.15		
P136-P137	P136	P137	Proyectado	2	72.57	24	PEAD	0.011	1252.80	1249.50	1.00	1.00	1251.80	1248.50	1251.19	1247.89	4.55%	2.76		
P137-P146	P137	P146	Proyectado	2	16.01	24	PEAD	0.011	1249.50	1245.50	3.76	2.48	1245.74	1243.02	1245.13	1242.41	16.99%	1.29		
P146-DP12	P146	DP12	Proyectado	2	7.23	24	PEAD	0.011	1245.50	1240.50	3.77	0.00	1241.73	1240.50	1241.12	1239.89	16.99%	0.00		
P138-P139	P138	P139	Proyectado	6	26.04	10	PEAD	0.011	1279.70	1278.35	1.00	1.00	1278.70	1277.35	1278.45	1277.10	5.20%	0.01		
P139-P140	P139	P140	Proyectado	6	91.18	10	PEAD	0.011	1278.35	1276.10	1.01	0.88	1277.34	1275.22	1277.09	1274.97	2.32%	0.64		
P140-P130	P140	P130	Proyectado	6	71.20	12	PEAD	0.011	1276.10	1273.33	1.46	1.97	1274.64	1271.36	1274.33	1271.05	4.60%	0.00		
P141-P140	P141	P140	Proyectado	6	32.28	10	PEAD	0.011	1277.75	1276.10	1.00	1.00	1276.75	1275.10	1276.50	1274.85	5.11%	0.00		
P142-P143	P142	P143	Proyectado	2	33.97	10	PEAD	0.011	1273.60	1271.65	1.00	1.00	1272.60	1270.65	1272.35	1270.40	5.75%	4.13		
P143-P145	P143	P145	Proyectado	2	3.71	10	PEAD	0.011	1271.65	1266.25	5.13	1.00	1266.52	1265.25	1266.27	1265.00	34.35%	4.25		
P145-P147	P145	P147	Proyectado	2	3.22	10	PEAD	0.011	1266.25	1259.75	5.25	0.00	1261.00	1259.75	1260.75	1259.50	38.93%	4.81		
P147-P136	P147	P136	Proyectado	2	8.06	10	PEAD	0.011	1259.75	1252.80	4.81	1.00	1254.94	1251.80	1254.69	1251.55	38.93%	0.00		
P144-P143	P144	P143	Proyectado	2	29.04	10	PEAD	0.011	1271.80	1271.65	1.00	1.05	1270.80	1270.60	1270.55	1270.35	0.69%	0.00		


CONSORCIO PROSPERIDAD 2015			CONSTRUCCIÓN Y OPTIMIZACIÓN DEL SISTEMA DE ALCANTARILLADO SANITARIO Y PLUVIAL Y SISTEMA DE TRATAMIENTO DE AGUAS RESIDUALES DEL MUNICIPIO DE CHARALÁ, DEPARTAMENTO DE SANTANDER - ETAPA I														 Financiera del Desarrollo			
			CONTRATO PAF-ATF-O-137-2015																	
			CONSULTOR CONSORCIO PROSPERIDAD 2015 - MUNICIPIO DE CHARALÁ																	
			ANÁLISIS DE CAUDALES SANITARIOS EN LA RED DE ALCANTARILLADO PLUVIAL PROYECTADA																	
Tramo	Pozo Inicial	Pozo Final	Área Propia (Ha)	Área Acum (Ha)	Periodo de Retorno (Años)	Coefficiente de Escorrentía Propio	C*A	C*A Acum.	Coefficiente de Escorrentía Ponderado	Longitud de Entrada Media (m)	Pendiente de Entrada Media (%)	Tiempo de Entrada (min)	Tiempo de Recorrido Real (min)	Tiempo de Concent. Propio (min)	Tiempo de Concent. Afluente (min)	Tiempo de Concent. de Diseño (min)	Intensidad (mm/Hora)	Caudal de Diseño (L/s)		
1P-2P	1P	2P	7.04	7.04	5	0.30	2.11	2.11	0.30	782.25	0.10	36.14	0.12	36.26	0.00	36.26	62.73	368.33		
2P-3P	2P	3P	0.00	7.04	5	0.75	0.00	2.11	0.30	0.00	0.03	0.00	0.21	36.47	0.00	36.47	62.46	368.33		
3P-4P	3P	4P	0.09	7.13	5	0.75	0.06	2.18	0.31	9.48	0.01	5.00	0.14	36.61	0.00	36.61	62.28	376.77		
4P-5P	4P	5P	0.07	7.20	5	0.75	0.05	2.23	0.31	7.98	0.01	5.00	0.25	36.86	0.00	36.86	61.96	384.13		
5P-6P	5P	6P	0.10	7.30	5	0.75	0.08	2.31	0.32	11.13	0.03	5.00	0.32	37.18	0.00	37.18	61.56	394.51		
6P-7P	6P	7P	0.17	8.04	5	0.75	0.13	2.86	0.36	19.28	0.02	5.00	0.17	37.35	10.07	37.35	61.35	488.11		
7P-8P	7P	8P	0.43	9.91	5	0.75	0.32	4.26	0.43	47.71	0.01	8.70	0.17	37.52	10.03	37.52	61.14	724.43		
8P-9P	8P	9P	0.18	10.09	10	0.75	0.14	4.40	0.44	20.04	0.03	5.00	0.29	37.81	0.00	37.81	66.72	815.59		
9P-10P	9P	10P	0.94	11.03	10	0.75	0.71	5.10	0.46	104.59	0.01	14.74	0.13	37.94	0.00	37.94	66.54	944.08		
10P-11P	10P	11P	0.00	11.03	10	0.75	0.00	5.10	0.46	0.00	0.18	0.00	0.05	37.99	0.00	37.99	66.49	944.08		
11P-P001	11P	P001	0.00	11.03	10	0.75	0.00	5.10	0.46	0.00	0.16	0.00	0.03	38.01	0.00	38.01	66.45	944.08		
P001-12P	P001	12P	0.31	12.22	10	0.75	0.23	5.99	0.49	34.32	0.03	5.00	0.06	38.07	10.00	38.07	66.37	1106.08		
12P-13P	12P	13P	0.00	12.22	10	0.75	0.00	5.99	0.49	0.00	0.06	0.00	0.17	38.24	0.00	38.24	66.16	1106.08		
13P-P002	13P	P002	0.20	12.41	10	0.75	0.15	6.14	0.49	21.87	0.01	5.00	0.03	38.27	0.00	38.27	66.12	1129.07		
P002-14P	P002	14P	0.44	34.20	10	0.75	0.33	22.48	0.66	48.57	0.02	6.48	0.06	38.33	24.95	38.33	66.04	4127.43		
14P-15P	14P	15P	0.00	34.20	10	0.75	0.00	22.48	0.66	0.00	0.07	0.00	0.17	38.49	0.00	38.49	65.83	4127.43		
15P-P003	15P	P003	0.00	34.20	10	0.75	0.00	22.48	0.66	0.00	0.11	0.00	0.08	38.57	0.00	38.57	65.73	4127.43		
P003-15PA	P003	15PA	1.20	37.27	10	0.75	0.90	24.78	0.66	132.90	0.09	6.41	0.10	38.67	18.56	38.67	65.60	4519.49		
15PA-15PB	15PA	15PB	0.00	37.27	10	0.75	0.00	24.78	0.66	0.00	0.02	0.00	0.15	38.82	0.00	38.82	65.41	4519.49		
15PB-DP1	15PB	DP1	1.48	41.92	10	0.75	1.11	28.27	0.67	164.11	0.14	6.05	0.06	38.89	10.88	38.89	65.33	5134.59		
P004-P005	P004	P005	0.38	0.38	3	0.75	0.29	0.29	0.75	42.56	0.01	7.26	0.28	10.00	0.00	10.00	152.06	121.43		
P005-6P	P005	6P	0.19	0.57	3	0.75	0.14	0.43	0.75	20.65	0.02	5.00	0.07	10.07	0.00	10.07	151.22	179.36		
P006-P007	P006	P007	1.44	1.44	3	0.75	1.08	1.08	0.75	159.72	0.04	9.04	0.32	10.00	0.00	10.00	152.06	455.74		
P007-7P	P007	7P	0.00	1.44	3	0.75	0.00	1.08	0.75	0.00	0.01	0.00	0.03	10.03	0.00	10.03	151.70	455.74		
P008-P001	P008	P001	0.88	0.88	3	0.75	0.66	0.66	0.75	97.75	0.06	6.37	0.04	10.00	0.00	10.00	152.06	278.91		
P009-P010	P009	P010	0.64	0.64	3	0.75	0.48	0.48	0.75	70.67	0.02	7.28	0.50	10.00	0.00	10.00	152.06	201.66		
P010-P011	P010	P011	0.43	1.07	3	0.75	0.32	0.80	0.75	47.90	0.00	10.02	0.14	10.14	0.00	10.14	150.49	334.86		
P011-P012	P011	P012	0.66	1.73	3	0.75	0.50	1.30	0.75	73.35	0.01	10.27	0.67	10.81	0.00	10.81	143.42	516.52		
P012-P013	P012	P013	0.86	2.58	5	0.75	0.64	1.94	0.75	95.17	0.01	10.87	0.03	21.68	0.00	21.68	92.27	516.52		
P013-P013A	P013	P013A	0.13	2.91	5	0.75	0.10	2.18	0.75	14.97	0.02	5.00	0.05	21.73	10.00	21.73	92.10	558.17		
P013A-17P	P013A	17P	0.00	2.91	5	0.75	0.00	2.18	0.75	0.00	0.01	0.00	0.59	22.32	0.00	22.32	90.27	558.17		
17P-18P	17P	18P	0.37	5.48	5	0.75	0.27	4.11	0.75	40.62	0.01	7.49	0.29	22.60	30.91	31.20	70.22	802.14		
18P-18PA	18P	18PA	0.53	6.01	5	0.75	0.40	4.51	0.75	59.32	0.04	5.56	0.05	22.65	0.00	31.24	70.15	879.31		
18PA-P112	18PA	P112	0.00	6.01	5	0.75	0.00	4.51	0.75	0.00	0.02	0.00	0.28	22.93	0.00	31.52	69.68	879.31		
P112-21P	P112	21P	0.92	10.17	10	0.75	0.69	7.63	0.75	102.52	0.03	8.22	0.32	23.24	26.53	31.84	75.90	1609.80		
21P-22P	21P	22P	0.48	10.79	10	0.75	0.36	8.09	0.75	53.47	0.01	8.57	0.05	23.29	10.30	31.89	75.81	1706.01		
22P-P014	22P	P014	0.00	10.95	10	0.75	0.00	8.21	0.75	0.00	0.04	0.00	0.22	23.51	10.31	32.10	75.43	1722.12		
P014-P111	P014	P111	0.84	14.76	10	0.75	0.63	11.07	0.75	93.43	0.04	7.09	0.32	23.83	10.72	32.42	74.87	2304.62		
P111-P015	P111	P015	0.67	15.43	10	0.75	0.50	11.57	0.75	74.18	0.03	6.56	0.28	24.11	0.00	32.70	74.40	2393.55		
P015-P016	P015	P016	0.44	15.87	10	0.75	0.33	11.90	0.75	48.52	0.03	5.84	0.44	24.55	0.00	33.14	73.65	2436.62		
P016-P110	P016	P110	0.71	20.85	10	0.75	0.53	15.64	0.75	78.41	0.02	7.56	0.26	24.81	11.37	33.40	73.23	3183.33		
P110-P002	P110	P002	0.50	21.35	10	0.75	0.37	16.01	0.75	55.26	0.06	5.00	0.14	24.95	0.00	33.54	72.99	3248.75		


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Tramo	Pozo Inicial	Pozo Final	Área Propia (Ha)	Área Acum (Ha)	Periodo de Retorno (Años)	Coefficiente de Escorrentía Propio	C*A	C*A Acum.	Coefficiente de Escorrentía Ponderado	Longitud de Entrada Media (m)	Pendiente de Entrada Media (%)	Tiempo de Entrada (min)	Tiempo de Recorrido Real (min)	Tiempo de Concent. Propio (min)	Tiempo de Concent. Afluente (min)	Tiempo de Concent. de Diseño (min)	Intensidad (mm/Hora)	Caudal de Diseño (L/s)		
P017-P013	P017	P013	0.19	0.19	3	0.75	0.14	0.14	0.75	20.91	0.03	5.00	0.24	10.00	0.00	10.00	152.06	59.65		
P018-P019	P018	P019	0.25	0.25	3	0.75	0.19	0.19	0.75	28.01	0.15	5.00	0.21	10.00	0.00	10.00	152.06	79.94		
P019-P020	P019	P020	0.61	0.86	3	0.75	0.46	0.64	0.75	67.42	0.12	5.00	0.08	10.08	0.00	10.08	151.14	270.66		
P020-P021	P020	P021	0.51	1.37	3	0.75	0.38	1.03	0.75	56.78	0.04	5.53	0.33	10.42	0.00	10.42	147.48	421.26		
P021-17P	P021	17P	0.62	1.99	3	0.75	0.46	1.49	0.75	68.59	0.00	20.49	0.02	30.91	0.00	30.91	65.23	421.26		
P022-17P	P022	17P	0.22	0.22	3	0.75	0.16	0.16	0.75	24.31	0.02	5.00	0.47	10.00	0.00	10.00	152.06	69.36		
P023-P024	P023	P024	0.63	0.63	3	0.75	0.47	0.47	0.75	69.90	0.01	9.57	0.54	10.11	0.00	10.11	150.80	197.81		
P024-P025	P024	P025	1.17	1.80	3	0.75	0.88	1.35	0.75	129.67	0.01	16.05	0.58	26.16	0.00	26.16	73.92	276.83		
P025-P112	P025	P112	0.22	2.01	5	0.75	0.16	1.51	0.75	23.95	0.07	5.00	0.37	26.53	0.00	26.53	79.30	332.61		
P026-P027	P026	P027	0.35	0.35	3	0.75	0.26	0.26	0.75	38.43	0.04	5.00	0.51	10.00	0.00	10.00	152.06	109.67		
P027-P112	P027	P112	0.88	1.23	3	0.75	0.66	0.92	0.75	97.73	0.01	10.06	0.51	10.51	0.00	10.51	146.52	374.38		
19P-20P	19P	20P	0.01	0.01	3	0.75	0.01	0.01	0.75	1.11	0.01	5.00	1.86	10.00	0.00	10.00	152.06	3.17		
20P-21P	20P	21P	0.13	0.14	3	0.75	0.10	0.10	0.75	14.37	0.01	5.00	0.30	10.30	0.00	10.30	148.75	43.22		
22PA-22PB	22PA	22PB	0.01	0.01	3	0.75	0.01	0.01	0.75	1.11	0.03	5.00	1.04	10.00	0.00	10.00	152.06	3.17		
22PB-22P	22PB	22P	0.15	0.16	3	0.75	0.11	0.12	0.75	16.37	0.02	5.00	0.31	10.31	0.00	10.31	148.62	48.75		
P028-P029	P028	P029	1.40	1.40	3	0.75	1.05	1.05	0.75	155.10	0.12	6.20	0.10	10.00	0.00	10.00	152.06	442.54		
P029-P030	P029	P030	0.00	1.40	3	0.75	0.00	1.05	0.75	0.00	0.08	0.00	0.14	10.14	0.00	10.14	150.49	442.54		
P030-P031	P030	P031	0.70	2.09	5	0.75	0.52	1.57	0.75	77.65	0.05	6.09	0.27	10.41	0.00	10.41	159.93	698.52		
P031-P014	P031	P014	0.88	2.97	5	0.75	0.66	2.23	0.75	97.47	0.04	7.23	0.31	10.72	0.00	10.72	156.45	969.46		
P032-P033	P032	P033	0.61	0.61	3	0.75	0.46	0.46	0.75	67.60	0.05	5.54	0.25	10.00	0.00	10.00	152.06	192.87		
P033-P113	P033	P113	0.78	1.39	3	0.75	0.58	1.04	0.75	86.51	0.54	5.00	0.03	10.03	0.00	10.03	151.76	438.88		
P113-P034	P113	P034	0.00	1.39	3	0.75	0.00	1.04	0.75	0.00	0.25	0.00	0.05	10.07	0.00	10.07	151.25	438.88		
P034-P035	P034	P035	0.47	1.86	3	0.75	0.35	1.39	0.75	52.44	0.02	6.30	0.52	10.59	0.00	10.59	145.63	564.43		
P035-P036	P035	P036	0.74	2.60	5	0.75	0.56	1.95	0.75	82.63	0.02	8.40	0.38	10.97	0.00	10.97	153.74	834.28		
P036-P037	P036	P037	0.81	3.41	5	0.75	0.61	2.56	0.75	89.63	0.15	5.00	0.11	11.09	0.00	11.09	152.57	1084.51		
P037-P038	P037	P038	0.48	3.89	5	0.75	0.36	2.92	0.75	53.86	0.04	5.42	0.13	11.21	0.00	11.21	151.27	1228.20		
P038-P016	P038	P016	0.38	4.28	5	0.75	0.29	3.21	0.75	42.58	0.03	5.32	0.16	11.37	0.00	11.37	149.71	1335.16		
P039-P040	P039	P040	0.88	0.88	3	0.75	0.66	0.66	0.75	98.21	0.00	17.36	0.78	18.14	0.00	18.14	97.28	179.27		
P040-P041	P040	P041	0.57	1.45	3	0.75	0.43	1.09	0.75	63.42	0.03	6.20	0.26	18.40	0.00	18.40	96.25	291.89		
P041-P042	P041	P042	0.00	1.45	3	0.75	0.00	1.09	0.75	0.00	0.17	0.00	0.10	18.50	0.00	18.50	95.84	291.89		
P042-P003	P042	P003	0.42	1.87	3	0.75	0.32	1.41	0.75	46.68	0.04	5.00	0.05	18.56	0.00	18.56	95.64	373.82		
P043-P114	P043	P114	0.39	0.39	3	0.75	0.30	0.30	0.75	43.84	0.03	5.60	0.52	10.00	0.00	10.00	152.06	125.10		
P114-P115	P114	P115	0.66	1.06	3	0.75	0.50	0.79	0.75	73.88	0.03	7.09	0.41	10.41	0.00	10.41	147.59	326.03		
P115-P116	P115	P116	1.13	2.19	5	0.75	0.85	1.64	0.75	125.75	0.06	7.24	0.24	10.64	0.00	10.64	157.34	718.84		
P116-15PB	P116	15PB	0.98	3.17	5	0.75	0.74	2.38	0.75	109.19	0.07	6.13	0.24	10.88	0.00	10.88	154.75	1024.06		


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Tramo	Pozo Inicial	Pozo Final	Área Propia (Ha)	Área Acum (Ha)	Periodo de Retorno (Años)	Coefficiente de Escorrentía Propio	C*A	C*A Acum.	Coefficiente de Escorrentía Ponderado	Longitud de Entrada Media (m)	Pendiente de Entrada Media (%)	Tiempo de Entrada (min)	Tiempo de Recorrido Real (min)	Tiempo de Concent. Propio (min)	Tiempo de Concent. Afluente (min)	Tiempo de Concent. de Diseño (min)	Intensidad (mm/Hora)	Caudal de Diseño (L/s)		
P044-P045	P044	P045	8.21	8.21	5	0.30	2.46	2.46	0.30	912.68	0.15	28.33	0.02	28.35	0.00	28.35	75.46	516.92		
P045-P046	P045	P046	0.46	8.67	5	0.75	0.34	2.81	0.32	50.71	0.05	5.00	0.08	28.43	0.00	28.43	75.29	587.41		
P046-P047	P046	P047	0.00	8.67	5	0.75	0.00	2.81	0.32	0.00	0.02	0.00	0.07	28.50	0.00	28.50	75.14	587.41		
P047-P048	P047	P048	0.10	8.77	5	0.75	0.08	2.88	0.33	11.27	0.02	5.00	0.23	28.73	0.00	28.73	74.70	598.63		
P048-P049	P048	P049	0.33	9.10	5	0.75	0.25	3.13	0.34	36.47	0.02	5.25	0.50	29.22	0.00	29.22	73.75	641.47		
P049-P050	P049	P050	0.59	10.12	10	0.75	0.44	3.89	0.38	65.27	0.00	15.73	0.46	29.68	10.00	29.68	79.99	865.17		
P050-P051	P050	P051	0.57	10.69	10	0.75	0.43	4.32	0.40	63.63	0.01	11.02	0.45	30.13	0.00	30.13	79.10	949.90		
P051-P052	P051	P052	0.16	10.85	10	0.75	0.12	4.44	0.41	18.19	0.07	5.00	0.20	30.34	0.00	30.34	78.70	972.00		
P052-DP3	P052	DP3	0.12	11.39	10	0.75	0.09	4.84	0.43	13.06	0.09	5.00	0.14	30.48	10.13	30.48	78.43	1056.11		
P053-P049	P053	P049	0.43	0.43	3	0.75	0.32	0.32	0.75	47.56	0.02	5.95	0.37	10.00	0.00	10.00	152.06	135.72		
23P-24P	23P	24P	0.24	0.24	3	0.75	0.18	0.18	0.75	27.15	0.01	6.27	0.39	10.00	0.00	10.00	152.06	77.48		
24P-25P	24P	25P	0.17	0.42	3	0.75	0.13	0.31	0.75	19.21	0.09	5.00	0.11	10.11	0.00	10.11	150.76	131.18		
25P-P052	25P	P052	0.00	0.42	3	0.75	0.00	0.31	0.75	0.00	0.31	0.00	0.01	10.13	0.00	10.13	150.60	131.18		
P054-P055	P054	P055	2.79	2.79	5	0.75	2.09	2.09	0.75	309.47	0.07	10.76	0.05	10.80	0.00	10.80	155.57	903.41		
P055-26P	P055	26P	0.14	2.92	5	0.75	0.10	2.19	0.75	15.42	0.05	5.00	0.28	11.08	0.00	11.08	152.61	930.35		
26P-27P	26P	27P	0.88	3.80	5	0.75	0.66	2.85	0.75	97.32	0.05	6.43	0.19	11.27	0.00	11.27	150.72	1194.11		
27P-28P	27P	28P	0.40	6.01	5	0.75	0.30	4.51	0.75	44.36	0.04	5.00	0.09	11.36	10.60	11.36	149.79	1877.35		
28P-DP4	28P	DP4	0.00	6.01	5	0.75	0.00	4.51	0.75	0.00	0.20	0.00	0.03	11.39	0.00	11.39	149.52	1877.35		
P056-P057	P056	P057	0.74	0.74	3	0.75	0.55	0.55	0.75	81.70	0.04	6.53	0.16	10.00	0.00	10.00	152.06	233.12		
P057-P058	P057	P058	0.24	0.98	3	0.75	0.18	0.73	0.75	26.73	0.04	5.00	0.09	10.09	0.00	10.09	151.03	307.31		
P058-P059	P058	P059	0.48	1.46	3	0.75	0.36	1.09	0.75	53.57	0.03	5.75	0.34	10.43	0.00	10.43	147.35	447.94		
P059-27P	P059	27P	0.35	1.81	3	0.75	0.27	1.36	0.75	39.33	0.04	5.00	0.17	10.60	0.00	10.60	145.60	550.05		
P060-P061	P060	P061	0.35	0.35	3	0.75	0.26	0.26	0.75	39.06	0.00	15.26	0.54	15.80	0.00	15.80	107.88	79.06		
P061-P062	P061	P062	0.16	0.52	3	0.75	0.12	0.39	0.75	18.31	0.01	5.00	0.49	16.29	0.00	16.29	105.45	113.52		
P062-P063	P062	P063	0.21	0.72	3	0.75	0.16	0.54	0.75	23.03	0.03	5.00	0.17	16.46	0.00	16.46	104.61	157.84		
P063-P064	P063	P064	0.00	0.72	3	0.75	0.00	0.54	0.75	0.00	0.18	0.00	0.20	16.66	0.00	16.66	103.68	157.84		
P064-P065	P064	P065	0.39	1.11	3	0.75	0.29	0.83	0.75	43.23	0.10	5.00	0.09	16.75	0.00	16.75	103.27	239.58		
P065-P066	P065	P066	0.06	1.17	3	0.75	0.05	0.88	0.75	6.71	0.03	5.00	0.26	17.02	0.00	17.02	102.06	249.63		
P066-P067	P066	P067	0.24	1.42	3	0.75	0.18	1.06	0.75	27.14	0.12	5.00	0.13	17.15	0.00	17.15	101.47	299.86		
P067-DP2	P067	DP2	0.00	1.42	3	0.75	0.00	1.06	0.75	0.00	0.48	0.00	0.05	17.20	0.00	17.20	101.23	299.86		
P068-P069	P068	P069	0.31	0.31	3	0.75	0.24	0.24	0.75	34.88	0.01	6.93	0.22	10.00	0.00	10.00	152.06	99.52		
P069-P070	P069	P070	0.27	0.59	3	0.75	0.21	0.44	0.75	30.55	0.01	6.90	0.27	10.27	0.00	10.27	149.10	183.05		
P070-P071	P070	P071	0.29	0.88	3	0.75	0.22	0.66	0.75	32.09	0.01	7.08	0.24	10.51	0.00	10.51	146.53	268.14		
P071-P072	P071	P072	0.30	1.17	3	0.75	0.22	0.88	0.75	32.78	0.02	5.43	0.19	10.69	0.00	10.69	144.60	353.55		
P072-P073	P072	P073	0.29	1.47	3	0.75	0.22	1.10	0.75	32.68	0.00	9.67	0.17	10.86	0.00	10.86	142.91	437.06		
P073-P074	P073	P074	0.31	1.77	3	0.75	0.23	1.33	0.75	33.91	0.01	6.50	0.21	11.07	0.00	11.07	140.89	520.54		
P074-P075	P074	P075	0.30	2.08	5	0.75	0.23	1.56	0.75	33.88	0.02	5.34	0.16	11.23	0.00	11.23	151.12	654.39		
P075-P076	P075	P076	0.39	2.47	5	0.75	0.29	1.85	0.75	43.27	0.01	6.91	0.27	11.49	0.00	11.49	148.49	763.58		
P076-P077	P076	P077	0.32	2.98	5	0.75	0.24	2.24	0.75	35.67	0.00	8.78	0.14	11.63	10.00	11.63	147.15	914.39		





CONSORCIO PROSPERIDAD 2015			CONSTRUCCIÓN Y OPTIMIZACIÓN DEL SISTEMA DE ALCANTARILLADO SANITARIO Y PLUVIAL Y SISTEMA DE TRATAMIENTO DE AGUAS RESIDUALES DEL MUNICIPIO DE CHARALÁ, DEPARTAMENTO DE SANTANDER - ETAPA I														<div>Findeter</div> <div>Financiera del Desarrollo</div>	
			CONTRATO PAF-ATF-O-137-2015															
			CONSULTOR CONSORCIO PROSPERIDAD 2015 - MUNICIPIO DE CHARALÁ															
			ANÁLISIS DE CAUDALES SANITARIOS EN LA RED DE ALCANTARILLADO PLUVIAL PROYECTADA															
Tramo	Pozo Inicial	Pozo Final	Área Propia (Ha)	Área Acum (Ha)	Periodo de Retorno (Años)	Coefficiente de Escorrenfía Propio	C*A	C*A Acum.	Coefficiente de Escorrenfía Ponderado	Longitud de Entrada Media (m)	Pendiente de Entrada Media (%)	Tiempo de Entrada (min)	Tiempo de Recorrido Real (min)	Tiempo de Concent. Propio (min)	Tiempo de Concent. Afluente (min)	Tiempo de Concent. de Diseño (min)	Intensidad (mm/Hora)	Caudal de Diseño (L/s)
P077-P078	P077	P078	0.00	2.98	5	0.75	0.00	2.24	0.75	0.00	0.02	0.00	0.48	12.11	0.00	12.11	142.76	914.39
P078-32P	P078	32P	0.33	3.63	5	0.75	0.25	2.72	0.75	36.86	0.00	10.19	0.36	12.48	10.00	12.48	139.64	1057.01
32P-DP5	32P	DP5	0.38	5.28	5	0.75	0.28	3.96	0.75	41.68	0.06	5.00	0.26	12.73	10.32	12.73	137.51	1514.15
P079-P076	P079	P076	0.19	0.19	3	0.75	0.14	0.14	0.75	21.44	0.02	5.00	0.25	10.00	0.00	10.00	152.06	61.19
P080-P078	P080	P078	0.32	0.32	3	0.75	0.24	0.24	0.75	35.36	0.01	7.49	0.67	10.00	0.00	10.00	152.06	100.90
P081-30P	P081	30P	0.68	0.68	3	0.75	0.51	0.51	0.75	75.47	0.02	7.88	0.38	10.00	0.00	10.00	152.06	215.34
30P-31P	30P	31P	0.37	1.05	3	0.75	0.28	0.79	0.75	41.41	0.03	5.43	0.03	10.03	0.00	10.03	151.69	332.70
31P-32P	31P	32P	0.00	1.05	3	0.75	0.00	0.79	0.75	0.00	0.00	0.00	0.29	10.32	0.00	10.32	148.51	332.70
P082-32P	P082	32P	0.22	0.22	3	0.75	0.17	0.17	0.75	24.86	0.02	5.00	0.59	10.00	0.00	10.00	152.06	70.94
P083-P084	P083	P084	0.62	0.62	3	0.75	0.47	0.47	0.75	69.17	0.13	5.00	0.17	10.00	0.00	10.00	152.06	197.36
P084-P085	P084	P085	0.74	1.36	3	0.75	0.55	1.02	0.75	82.16	0.02	7.76	0.02	10.02	0.00	10.02	151.80	431.05
P085-P086	P085	P086	0.00	1.36	3	0.75	0.00	1.02	0.75	0.00	0.01	0.00	0.25	10.27	0.00	10.27	149.06	431.05
P086-P087	P086	P087	0.28	1.64	3	0.75	0.21	1.23	0.75	30.74	0.01	7.42	0.12	10.39	0.00	10.39	147.78	504.89
P087-DP6	P087	DP6	0.00	1.64	3	0.75	0.00	1.23	0.75	0.00	0.02	0.00	0.03	10.42	0.00	10.42	147.45	504.89
P088-P089	P088	P089	0.98	0.98	3	0.75	0.74	0.74	0.75	109.17	0.05	6.86	0.07	10.00	0.00	10.00	152.06	311.50
P089-DP7	P089	DP7	0.00	0.98	3	0.75	0.00	0.74	0.75	0.00	0.29	0.00	0.02	10.02	0.00	10.02	151.88	311.50
P090-P091	P090	P091	0.26	0.26	3	0.75	0.20	0.20	0.75	29.19	0.00	8.09	0.49	10.00	0.00	10.00	152.06	83.29
P091-P092	P091	P092	0.60	0.87	3	0.75	0.45	0.65	0.75	67.14	0.02	7.86	0.41	10.41	0.00	10.41	147.50	266.64
P092-P093	P092	P093	0.48	1.35	3	0.75	0.36	1.01	0.75	53.58	0.04	5.12	0.25	10.66	0.00	10.66	144.90	407.61
P093-P094	P093	P094	0.62	1.97	3	0.75	0.46	1.48	0.75	68.86	0.03	6.92	0.41	11.08	0.00	11.08	140.81	578.07
P094-DP8	P094	DP8	0.00	1.97	3	0.75	0.00	1.48	0.75	0.00	0.19	0.00	0.10	11.18	0.00	11.18	139.86	578.07
P095-P096	P095	P096	0.19	0.19	3	0.75	0.15	0.15	0.75	21.56	0.03	5.00	0.32	10.00	0.00	10.00	152.06	61.53
P096-P097	P096	P097	0.39	0.59	3	0.75	0.30	0.44	0.75	43.88	0.02	6.09	0.38	10.38	0.00	10.38	147.86	181.59
P097-P098	P097	P098	0.84	1.83	3	0.75	0.63	1.37	0.75	93.09	0.03	7.65	0.36	10.74	10.00	10.74	144.14	549.57
P098-P099	P098	P099	0.75	2.58	5	0.75	0.56	1.94	0.75	83.68	0.12	5.00	0.10	10.84	0.00	10.84	155.22	835.52
P099-DP9	P099	DP9	0.00	2.58	5	0.75	0.00	1.94	0.75	0.00	0.33	0.00	0.03	10.86	0.00	10.86	154.90	835.52
P100-P097	P100	P097	0.40	0.40	3	0.75	0.30	0.30	0.75	44.65	0.04	5.00	0.42	10.00	0.00	10.00	152.06	127.41
P101-P102	P101	P102	0.44	0.44	3	0.75	0.33	0.33	0.75	49.01	0.09	5.00	0.20	10.00	0.00	10.00	152.06	139.84


CONSORCIO PROSPERIDAD 2015			CONSTRUCCIÓN Y OPTIMIZACIÓN DEL SISTEMA DE ALCANTARILLADO SANITARIO Y PLUVIAL Y SISTEMA DE TRATAMIENTO DE AGUAS RESIDUALES DEL MUNICIPIO DE CHARALÁ, DEPARTAMENTO DE SANTANDER - ETAPA I														 Financiera del Desarrollo	
			CONTRATO PAF-ATF-O-137-2015															
			CONSULTOR CONSORCIO PROSPERIDAD 2015 - MUNICIPIO DE CHARALÁ															
			ANÁLISIS DE CAUDALES SANITARIOS EN LA RED DE ALCANTARILLADO PLUVIAL PROYECTADA															
			Tramo	Pozo Inicial	Pozo Final	Área Propia (Ha)	Área Acum (Ha)	Periodo de Retorno (Años)	Coefficiente de Escorrentía Propio	C*A	C*A Acum.	Coefficiente de Escorrentía Ponderado	Longitud de Entrada Media (m)	Pendiente de Entrada Media (%)	Tiempo de Entrada (min)	Tiempo de Recorrido Real (min)		
P102-P103	P102	P103	0.00	0.44	3	0.75	0.00	0.33	0.75	0.00	0.17	0.00	0.11	10.11	0.00	10.11	150.78	139.84
P103-P104	P103	P104	0.80	1.24	3	0.75	0.60	0.93	0.75	88.47	0.12	5.00	0.05	10.16	0.00	10.16	150.21	387.53
P104-P105	P104	P105	0.00	1.24	3	0.75	0.00	0.93	0.75	0.00	0.09	0.00	0.06	10.22	0.00	10.22	149.55	387.53
P105-P106	P105	P106	0.00	1.24	3	0.75	0.00	0.93	0.75	0.00	0.14	0.00	0.05	10.27	0.00	10.27	149.00	387.53
P106-P107	P106	P107	0.00	1.24	3	0.75	0.00	0.93	0.75	0.00	0.52	0.00	0.02	10.30	0.00	10.30	148.78	387.53
P107-P108	P107	P108	0.00	1.24	3	0.75	0.00	0.93	0.75	0.00	0.55	0.00	0.02	10.31	0.00	10.31	148.57	387.53
P108-P109	P108	P109	0.00	1.24	3	0.75	0.00	0.93	0.75	0.00	0.41	0.00	0.03	10.35	0.00	10.35	148.23	387.53
P109-DP10	P109	DP10	0.00	1.24	3	0.75	0.00	0.93	0.75	0.00	0.20	0.00	0.03	10.38	0.00	10.38	147.90	387.53
P117-P118	P117	P118	0.42	0.42	3	0.75	0.31	0.31	0.75	46.58	0.01	8.94	0.37	10.00	0.00	10.00	152.06	132.91
P118-P119	P118	P119	0.08	0.50	3	0.75	0.06	0.38	0.75	9.11	0.01	5.00	0.63	10.63	0.00	10.63	145.22	151.75
P119-P120	P119	P120	0.54	1.04	3	0.75	0.41	0.78	0.75	60.09	0.06	5.00	0.30	10.93	0.00	10.93	142.20	308.95
P120-P121	P120	P121	0.54	1.58	3	0.75	0.40	1.18	0.75	59.50	0.05	5.07	0.14	11.07	0.00	11.07	140.85	463.28
P121-P122	P121	P122	0.12	1.70	3	0.75	0.09	1.27	0.75	13.49	0.02	5.00	0.24	11.31	0.00	11.31	138.62	491.01
P122-P123	P122	P123	0.51	2.21	5	0.75	0.38	1.65	0.75	56.31	0.05	5.00	0.24	11.55	0.00	11.55	147.96	680.46
P123-P124	P123	P124	0.29	2.50	5	0.75	0.22	1.87	0.75	32.52	0.30	5.00	0.04	11.59	0.00	11.59	147.62	768.96
P124-DP11	P124	DP11	0.00	2.50	5	0.75	0.00	1.87	0.75	0.00	0.50	0.00	0.03	11.61	0.00	11.61	147.36	768.96
P125-P126	P125	P126	0.21	0.21	3	0.75	0.16	0.16	0.75	23.62	0.03	5.00	0.44	10.00	0.00	10.00	152.06	67.39
P126-P127	P126	P127	0.26	0.47	3	0.75	0.19	0.35	0.75	28.68	0.05	5.00	0.16	10.16	0.00	10.16	150.29	147.48
P127-P128	P127	P128	0.15	0.62	3	0.75	0.11	0.47	0.75	16.89	0.08	5.00	0.10	10.26	0.00	10.26	149.18	193.67
P128-P129	P128	P129	0.18	0.81	3	0.75	0.14	0.61	0.75	20.47	0.08	5.00	0.08	10.34	0.00	10.34	148.33	249.55
P129-P130	P129	P130	0.06	0.86	3	0.75	0.04	0.65	0.75	6.23	0.05	5.00	0.38	10.72	0.00	10.72	144.38	259.78
P130-P131	P130	P131	0.38	2.10	5	0.75	0.28	1.57	0.75	41.84	0.10	5.00	0.05	10.77	10.96	11.01	153.35	669.93
P131-P132	P131	P132	0.00	2.10	5	0.75	0.00	1.57	0.75	0.00	0.08	0.00	0.06	10.83	0.00	11.08	152.68	669.93
P132-P133	P132	P133	0.00	2.10	5	0.75	0.00	1.57	0.75	0.00	0.07	0.00	0.15	10.98	0.00	11.22	151.16	669.93
P133-P134	P133	P134	0.29	2.38	5	0.75	0.22	1.79	0.75	31.95	0.09	5.00	0.20	11.19	0.00	11.43	149.14	740.91
P134-P135	P134	P135	0.00	2.38	5	0.75	0.00	1.79	0.75	0.00	0.06	0.00	0.18	11.37	0.00	11.61	147.36	740.91
P135-P136	P135	P136	0.00	2.38	5	0.75	0.00	1.79	0.75	0.00	0.09	0.00	0.05	11.42	0.00	11.66	146.89	740.91
P136-P137	P136	P137	0.00	3.31	5	0.75	0.00	2.48	0.75	0.00	0.05	0.00	0.21	11.63	10.03	11.87	144.95	1001.04
P137-P146	P137	P146	0.00	3.31	5	0.75	0.00	2.48	0.75	0.00	0.25	0.00	0.03	11.66	0.00	11.90	144.69	1001.04
P146-DP12	P146	DP12	0.00	3.31	5	0.75	0.00	2.48	0.75	0.00	0.69	0.00	0.01	11.67	0.00	11.91	144.57	1001.04
P138-P139	P138	P139	0.10	0.10	3	0.75	0.08	0.08	0.75	11.43	0.05	5.00	0.17	10.00	0.00	10.00	152.06	32.62
P139-P140	P139	P140	0.13	0.23	3	0.75	0.10	0.17	0.75	14.29	0.02	5.00	0.66	10.66	0.00	10.66	144.94	69.97
P140-P130	P140	P130	0.31	0.86	3	0.75	0.23	0.64	0.75	34.78	0.04	5.00	0.30	10.96	10.00	10.96	141.99	253.32
P141-P140	P141	P140	0.31	0.31	3	0.75	0.23	0.23	0.75	34.57	0.05	5.00	0.16	10.00	0.00	10.00	152.06	98.63
P142-P143	P142	P143	0.46	0.46	3	0.75	0.35	0.35	0.75	51.23	0.06	5.00	0.15	10.00	0.00	10.00	152.06	146.18
P143-P145	P143	P145	0.33	0.93	3	0.75	0.25	0.70	0.75	37.08	1.46	5.00	0.01	10.01	10.00	10.01	151.98	294.56
P145-P147	P145	P147	0.00	0.93	3	0.75	0.00	0.70	0.75	0.00	2.02	0.00	0.01	10.01	0.00	10.01	151.91	294.56
P147-P136	P147	P136	0.00	0.93	3	0.75	0.00	0.70	0.75	0.00	0.86	0.00	0.01	10.03	0.00	10.03	151.75	294.56
P144-P143	P144	P143	0.13	0.13	3	0.75	0.10	0.10	0.75	14.97	0.01	5.54	0.38	10.00	0.00	10.00	152.06	42.72


CONSORCIO PROSPERIDAD 2015			CONSTRUCCIÓN Y OPTIMIZACIÓN DEL SISTEMA DE ALCANTARILLADO SANITARIO Y PLUVIAL Y SISTEMA DE TRATAMIENTO DE AGUAS RESIDUALES DEL MUNICIPIO DE CHARALÁ, DEPARTAMENTO DE SANTANDER - ETAPA I															 Financiera del Desarrollo			
			CONTRATO PAF-ATF-O-137-2015																		
			CONSULTOR CONSORCIO PROSPERIDAD 2015 - MUNICIPIO DE CHARALÁ																		
			RESULTADOS HIDRÁULICOS DE LA RED DE ALCANTARILLADO PLUVIAL PROYECTADA																		
Tramo	Pozo Inicial	Pozo Final	Diámetro Interno (m)	Pend. (%)	n Manning	Caudal de Diseño (L/s)	Flujo Uniforme						Flujo Gradualmente Variado (SWMM 5.1)								
							Prof. Hidr. Y (m)	Veloc. Media V (m/s)	Fuerza Tractiva T (kg/m²)	Q/Q <sub>0</sub>	Y/D	Número de Froude	Tipo de Flujo	Prof. Hidr. Y (m)	Veloc. Media V (m/s)	Fuerza Tractiva T (kg/m²)	Q/Q <sub>0</sub>	Y/D	Número de Froude	Tipo de Flujo	
1P-2P	1P	2P	0.90	1.21%	0.013	368.33	0.26	2.38	1.82	0.18	0.29	1.75	Supercrítico	0.28	2.15	1.91	0.18	0.31	1.53	Supercrítico	
2P-3P	2P	3P	0.90	0.89%	0.013	368.33	0.28	2.13	1.43	0.22	0.31	1.50	Supercrítico	0.31	1.96	1.52	0.22	0.34	1.32	Supercrítico	
3P-4P	3P	4P	0.90	1.37%	0.013	376.77	0.26	2.50	2.03	0.18	0.29	1.86	Supercrítico	0.27	2.32	2.11	0.18	0.30	1.68	Supercrítico	
4P-5P	4P	5P	0.90	1.38%	0.013	384.13	0.26	2.52	2.05	0.18	0.29	1.87	Supercrítico	0.29	2.19	2.24	0.18	0.32	1.53	Supercrítico	
5P-6P	5P	6P	0.90	1.36%	0.013	394.51	0.26	2.53	2.05	0.19	0.29	1.85	Supercrítico	0.31	2.06	2.32	0.19	0.34	1.39	Supercrítico	
6P-7P	6P	7P	0.90	1.65%	0.013	488.11	0.28	2.88	2.62	0.21	0.31	2.04	Supercrítico	0.39	1.84	3.36	0.23	0.43	1.08	Crítico	
7P-8P	7P	8P	0.80	2.00%	0.013	724.43	0.35	3.46	3.62	0.39	0.43	2.16	Supercrítico	0.41	2.81	4.04	0.39	0.51	1.58	Supercrítico	
8P-9P	8P	9P	0.80	2.01%	0.013	815.59	0.37	3.58	3.82	0.43	0.46	2.15	Supercrítico	0.38	3.42	3.92	0.43	0.48	2.00	Supercrítico	
9P-10P	9P	10P	0.90	2.50%	0.013	944.08	0.36	4.01	4.78	0.33	0.40	2.48	Supercrítico	0.38	3.69	4.99	0.33	0.42	2.21	Supercrítico	
10P-11P	10P	11P	0.90	13.45%	0.013	944.08	0.23	7.34	18.04	0.14	0.25	5.81	Supercrítico	0.24	6.72	18.95	0.14	0.27	5.15	Supercrítico	
11P-P001	11P	P001	0.90	5.06%	0.013	944.08	0.29	5.18	8.36	0.23	0.33	3.57	Supercrítico	0.41	3.29	10.77	0.23	0.46	1.86	Supercrítico	
P001-12P	P001	12P	0.90	5.06%	0.013	1106.08	0.32	5.41	8.93	0.27	0.36	3.56	Supercrítico	0.39	4.21	10.28	0.27	0.43	2.48	Supercrítico	
12P-13P	12P	13P	0.90	4.34%	0.013	1106.08	0.33	5.12	7.90	0.29	0.37	3.29	Supercrítico	0.40	4.11	8.96	0.29	0.44	2.39	Supercrítico	
13P-P002	13P	P002	0.90	4.56%	0.013	1129.07	0.33	5.24	8.30	0.29	0.37	3.37	Supercrítico	0.39	4.27	9.27	0.29	0.43	2.52	Supercrítico	
P002-14P	P002	14P	1.20	0.89%	0.011	4127.43	0.93	4.36	3.24	0.95	0.78	1.43	Supercrítico	1.18	3.56	2.92	0.93	0.98	0.62	Subcrítico	
14P-15P	14P	15P	1.20	0.89%	0.011	4127.43	0.93	4.36	3.24	0.95	0.78	1.43	Supercrítico	1.03	3.87	3.23	0.92	0.86	1.11	Supercrítico	
15P-P003	15P	P003	1.20	3.87%	0.011	4127.43	0.57	7.79	11.21	0.46	0.47	3.75	Supercrítico	0.64	6.60	12.04	0.44	0.53	2.96	Supercrítico	
P003-15PA	P003	15PA	1.20	3.15%	0.011	4519.49	0.64	7.38	9.81	0.55	0.53	3.30	Supercrítico	0.76	5.82	10.74	0.54	0.63	2.31	Supercrítico	
15PA-15PB	15PA	15PB	1.20	1.71%	0.011	4519.49	0.78	5.83	5.90	0.75	0.65	2.27	Supercrítico	0.88	4.94	6.15	0.73	0.73	1.73	Supercrítico	
15PB-DP1	15PB	DP1	1.20	4.05%	0.011	5134.59	0.64	8.37	12.62	0.55	0.53	3.74	Supercrítico	0.80	6.23	14.18	0.54	0.67	2.35	Supercrítico	
P004-P005	P004	P005	0.31	1.06%	0.011	121.43	0.24	1.92	1.00	0.95	0.77	1.25	Supercrítico	0.31	1.61	0.82	0.94	1.00	0.00	Subcrítico	
P005-6P	P005	6P	0.38	0.78%	0.011	179.36	0.29	1.89	0.90	0.95	0.78	1.11	Supercrítico	0.34	1.66	0.88	0.98	0.90	0.77	Subcrítico	
P006-P007	P006	P007	0.46	3.43%	0.011	455.74	0.28	4.26	4.42	0.69	0.61	2.80	Supercrítico	0.38	3.14	4.80	0.69	0.82	1.56	Supercrítico	
P007-7P	P007	7P	0.46	1.82%	0.011	455.74	0.36	3.28	2.54	0.95	0.77	1.75	Supercrítico	0.41	2.91	2.51	0.96	0.89	1.26	Supercrítico	
P008-P001	P008	P001	0.31	5.68%	0.011	278.91	0.24	4.44	5.33	0.94	0.77	2.90	Supercrítico	0.27	3.95	5.29	0.94	0.88	2.13	Supercrítico	
P009-P010	P009	P010	0.38	1.37%	0.011	201.66	0.26	2.44	1.53	0.80	0.68	1.63	Supercrítico	0.38	1.78	1.30	0.80	1.00	0.00	Subcrítico	
P010-P011	P010	P011	0.46	0.98%	0.011	334.86	0.36	2.41	1.37	0.95	0.78	1.28	Supercrítico	0.46	2.01	1.13	0.94	1.00	0.00	Subcrítico	
P011-P012	P011	P012	0.61	0.60%	0.011	516.52	0.44	2.25	1.10	0.88	0.73	1.11	Supercrítico	0.61	1.77	0.92	0.88	1.00	0.00	Subcrítico	
P012-P013	P012	P013	0.61	0.60%	0.011	516.52	0.44	2.25	1.10	0.88	0.73	1.11	Supercrítico	0.61	1.77	0.92	0.84	1.00	0.00	Subcrítico	
P013-P013A	P013	P013A	0.61	0.63%	0.011	558.17	0.47	2.32	1.15	0.93	0.76	1.09	Crítico	0.61	1.91	0.95	0.90	1.00	0.00	Subcrítico	
P013A-17P	P013A	17P	0.61	0.63%	0.011	558.17	0.47	2.32	1.15	0.93	0.76	1.09	Crítico	0.61	1.91	0.95	0.93	1.00	0.00	Subcrítico	
17P-18P	17P	18P	0.77	0.50%	0.011	802.14	0.52	2.37	1.13	0.80	0.68	1.11	Supercrítico	0.77	1.48	0.96	0.70	1.00	0.00	Subcrítico	
18P-18PA	18P	18PA	0.77	0.53%	0.011	879.31	0.55	2.46	1.21	0.86	0.71	1.10	Crítico	0.77	1.65	1.01	0.72	1.00	0.00	Subcrítico	
18PA-P112	18PA	P112	0.77	0.53%	0.011	879.31	0.55	2.46	1.21	0.86	0.71	1.10	Crítico	0.77	1.65	1.01	0.76	1.00	0.00	Subcrítico	
P112-21P	P112	21P	0.90	0.63%	0.011	1609.80	0.70	3.02	1.72	0.95	0.78	1.15	Supercrítico	0.90	2.35	1.42	0.88	1.00	0.00	Subcrítico	
21P-22P	21P	22P	0.90	0.71%	0.011	1706.01	0.70	3.21	1.94	0.95	0.78	1.22	Supercrítico	0.90	2.50	1.60	0.87	1.00	0.00	Subcrítico	
22P-P014	22P	P014	0.90	0.72%	0.011	1722.12	0.70	3.23	1.97	0.95	0.78	1.23	Supercrítico	0.90	2.53	1.62	0.89	1.00	0.00	Subcrítico	
P014-P111	P014	P111	1.00	0.74%	0.011	2304.62	0.77	3.52	2.24	0.95	0.77	1.27	Supercrítico	1.00	2.79	1.85	0.90	1.00	0.00	Subcrítico	
P111-P015	P111	P015	1.05	0.61%	0.011	2393.55	0.82	3.30	1.94	0.95	0.78	1.16	Supercrítico	1.05	2.63	1.60	0.91	1.00	0.00	Subcrítico	
P015-P016	P015	P016	1.05	0.64%	0.011	2436.62	0.81	3.38	2.04	0.94	0.77	1.19	Supercrítico	1.05	2.68	1.68	0.90	1.00	0.00	Subcrítico	
P016-P110	P016	P110	1.05	1.08%	0.011	3183.33	0.82	4.39	3.44	0.95	0.78	1.54	Supercrítico	1.05	3.54	2.84	0.91	1.00	0.00	Subcrítico	
P110-P002	P110	P002	1.05	1.13%	0.011	3248.75	0.81	4.49	3.60	0.95	0.78	1.58	Supercrítico	1.05	3.62	2.97	0.91	1.00	0.00	Subcrítico	

CONSORCIO PROSPERIDAD 2015			CONSTRUCCIÓN Y OPTIMIZACIÓN DEL SISTEMA DE ALCANTARILLADO SANITARIO Y PLUVIAL Y SISTEMA DE TRATAMIENTO DE AGUAS RESIDUALES DEL MUNICIPIO DE CHARALÁ, DEPARTAMENTO DE SANTANDER - ETAPA I																	 Financiera del Desarrollo	
			CONTRATO PAF-ATF-O-137-2015																		
			CONSULTOR CONSORCIO PROSPERIDAD 2015 - MUNICIPIO DE CHARALÁ																		
RESULTADOS HIDRÁULICOS DE LA RED DE ALCANTARILLADO PLUVIAL PROYECTADA																					
Tramo	Pozo Inicial	Pozo Final	Diámetro Interno (m)	Pend. (%)	n Manning	Caudal de Diseño (L/s)	Flujo Uniforme						Flujo Gradualmente Variado (SWMM 5.1)								
							Prof. Hidr. Y (m)	Veloc. Media V (m/s)	Fuerza Tractiva T (kg/m²)	Q/Q <sub>0</sub>	Y/D	Número de Froude	Tipo de Flujo	Prof. Hidr. Y (m)	Veloc. Media V (m/s)	Fuerza Tractiva T (kg/m²)	Q/Q <sub>0</sub>	Y/D	Número de Froude	Tipo de Flujo	
P017-P013	P017	P013	0.25	2.97%	0.011	59.65	0.12	2.44	1.85	0.49	0.50	2.50	Supercrítico	0.20	1.46	2.26	0.49	0.78	1.05	Crítico	
P018-P019	P018	P019	0.25	15.40%	0.011	79.94	0.09	4.82	7.76	0.29	0.37	5.89	Supercrítico	0.09	4.81	7.78	0.29	0.37	5.87	Supercrítico	
P019-P020	P019	P020	0.31	10.08%	0.011	270.66	0.19	5.60	8.72	0.68	0.61	4.50	Supercrítico	0.28	3.79	9.31	0.68	0.90	1.95	Supercrítico	
P020-P021	P020	P021	0.38	4.27%	0.011	421.26	0.30	4.42	4.92	0.95	0.78	2.58	Supercrítico	0.38	3.53	4.06	0.90	1.00	0.00	Subcrítico	
P021-17P	P021	17P	0.38	4.27%	0.011	421.26	0.30	4.42	4.92	0.95	0.78	2.58	Supercrítico	0.38	2.72	4.06	0.70	1.00	0.00	Subcrítico	
P022-17P	P022	17P	0.25	1.76%	0.011	69.36	0.16	2.06	1.26	0.74	0.64	1.77	Supercrítico	0.24	1.44	1.26	0.75	0.95	0.69	Subcrítico	
P023-P024	P023	P024	0.38	1.88%	0.011	197.81	0.23	2.76	1.98	0.67	0.60	2.02	Supercrítico	0.23	2.71	2.00	0.67	0.61	1.96	Supercrítico	
P024-P025	P024	P025	0.46	1.70%	0.011	276.83	0.26	2.90	2.08	0.59	0.55	2.04	Supercrítico	0.26	2.80	2.11	0.59	0.57	1.93	Supercrítico	
P025-P112	P025	P112	0.46	3.79%	0.011	332.61	0.22	4.11	4.29	0.48	0.49	3.14	Supercrítico	0.23	4.03	4.36	0.48	0.50	3.03	Supercrítico	
P026-P027	P026	P027	0.31	3.86%	0.011	109.67	0.15	3.13	2.87	0.45	0.47	2.98	Supercrítico	0.15	3.11	2.87	0.45	0.47	2.96	Supercrítico	
P027-P112	P027	P112	0.46	2.39%	0.011	374.38	0.28	3.55	3.06	0.68	0.60	2.35	Supercrítico	0.40	2.46	3.33	0.68	0.86	1.14	Supercrítico	
19P-20P	19P	20P	0.90	0.59%	0.013	3.17	0.03	0.44	0.12	0.00	0.04	0.97	Crítico	0.41	0.01	1.24	0.00	0.45	0.01	Subcrítico	
20P-21P	20P	21P	0.90	2.49%	0.013	43.22	0.08	1.62	1.23	0.02	0.09	2.26	Supercrítico	0.74	0.08	6.82	0.02	0.82	0.03	Subcrítico	
22PA-22PB	22PA	22PB	0.60	3.59%	0.013	3.17	0.02	0.88	0.54	0.00	0.04	2.25	Supercrítico	0.31	0.02	5.52	0.00	0.52	0.01	Subcrítico	
22PB-22P	22PB	22P	0.60	1.68%	0.013	48.75	0.10	1.54	1.04	0.06	0.17	1.86	Supercrítico	0.60	0.17	2.52	0.06	1.00	0.00	Subcrítico	
P028-P029	P028	P029	0.38	13.00%	0.011	442.54	0.21	7.00	12.97	0.57	0.54	5.49	Supercrítico	0.21	6.71	13.22	0.57	0.56	5.15	Supercrítico	
P029-P030	P029	P030	0.38	7.66%	0.011	442.54	0.24	5.70	8.35	0.74	0.64	3.95	Supercrítico	0.27	5.04	8.70	0.74	0.72	3.18	Supercrítico	
P030-P031	P030	P031	0.46	4.60%	0.011	698.52	0.34	5.19	6.38	0.91	0.75	2.86	Supercrítico	0.36	4.98	6.43	0.91	0.79	2.59	Supercrítico	
P031-P014	P031	P014	0.61	3.09%	0.011	969.46	0.39	4.95	5.37	0.73	0.63	2.74	Supercrítico	0.40	4.73	5.47	0.73	0.66	2.54	Supercrítico	
P032-P033	P032	P033	0.38	0.90%	0.011	192.87	0.29	2.03	1.04	0.95	0.78	1.19	Supercrítico	0.34	1.81	1.02	0.95	0.89	0.86	Subcrítico	
P033-P113	P033	P113	0.38	16.07%	0.011	438.88	0.19	7.57	15.38	0.51	0.51	6.21	Supercrítico	0.22	6.60	16.50	0.51	0.57	5.00	Supercrítico	
P113-P034	P113	P034	0.38	21.66%	0.011	438.88	0.18	8.46	19.59	0.44	0.46	7.32	Supercrítico	0.19	7.91	20.31	0.43	0.49	6.62	Supercrítico	
P034-P035	P034	P035	0.61	1.80%	0.011	564.43	0.32	3.55	2.85	0.55	0.53	2.22	Supercrítico	0.34	3.44	2.91	0.55	0.55	2.11	Supercrítico	
P035-P036	P035	P036	0.61	1.94%	0.011	834.28	0.41	3.98	3.45	0.79	0.67	2.11	Supercrítico	0.43	3.81	3.51	0.79	0.70	1.95	Supercrítico	
P036-P037	P036	P037	0.61	9.05%	0.011	1084.51	0.30	7.66	13.54	0.48	0.49	5.09	Supercrítico	0.47	4.51	16.73	0.47	0.77	2.10	Supercrítico	
P037-P038	P037	P038	0.61	3.76%	0.011	1228.20	0.43	5.60	6.79	0.84	0.70	2.86	Supercrítico	0.61	4.20	5.73	0.84	1.00	0.00	Subcrítico	
P038-P016	P038	P016	0.77	1.00%	0.011	1335.16	0.60	3.43	2.34	0.95	0.78	1.41	Supercrítico	0.77	2.86	1.93	0.94	1.00	0.00	Subcrítico	
P039-P040	P039	P040	0.38	0.79%	0.011	179.27	0.29	1.90	0.91	0.94	0.77	1.12	Supercrítico	0.30	1.85	0.91	0.94	0.80	1.04	Crítico	
P040-P041	P040	P041	0.38	2.09%	0.011	291.89	0.29	3.09	2.41	0.94	0.77	1.82	Supercrítico	0.31	2.92	2.42	0.94	0.82	1.60	Supercrítico	
P041-P042	P041	P042	0.38	11.73%	0.011	291.89	0.17	6.06	10.20	0.40	0.44	5.44	Supercrítico	0.17	5.85	10.39	0.40	0.45	5.16	Supercrítico	
P042-P003	P042	P003	0.38	3.44%	0.011	373.82	0.29	3.96	3.96	0.94	0.77	2.34	Supercrítico	0.34	3.52	3.91	0.94	0.89	1.68	Supercrítico	
P043-P114	P043	P114	0.31	2.50%	0.011	125.10	0.18	2.74	2.11	0.63	0.58	2.28	Supercrítico	0.18	2.71	2.13	0.63	0.59	2.22	Supercrítico	
P114-P115	P114	P115	0.38	3.10%	0.011	326.03	0.27	3.72	3.51	0.86	0.72	2.36	Supercrítico	0.28	3.63	3.54	0.86	0.74	2.23	Supercrítico	
P115-P116	P115	P116	0.46	4.51%	0.011	718.84	0.36	5.16	6.29	0.95	0.78	2.74	Supercrítico	0.38	4.88	6.31	0.95	0.83	2.39	Supercrítico	
P116-15PB	P116	15PB	0.61	7.25%	0.011	1024.06	0.31	6.95	11.07	0.50	0.50	4.53	Supercrítico	0.32	6.66	11.33	0.50	0.52	4.24	Supercrítico	


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Tramo	Pozo Inicial	Pozo Final	Diámetro Interno (m)	Pend. (%)	n Manning	Caudal de Diseño (L/s)	Flujo Uniforme						Flujo Gradualmente Variado (SWMM 5.1)								
							Prof. Hidr. Y (m)	Veloc. Media V (m/s)	Fuerza Tractiva T (kg/m²)	Q/Q <sub>0</sub>	Y/D	Número de Froude	Tipo de Flujo	Prof. Hidr. Y (m)	Veloc. Media V (m/s)	Fuerza Tractiva T (kg/m²)	Q/Q <sub>0</sub>	Y/D	Número de Froude	Tipo de Flujo	
P044-P045	P044	P045	0.38	11.06%	0.011	516.92	0.24	6.81	11.95	0.72	0.63	4.80	Supercrítico	0.38	4.56	10.51	0.72	1.00	0.00	Subcrítico	
P045-P046	P045	P046	0.46	4.52%	0.011	587.41	0.30	5.01	6.03	0.77	0.66	3.10	Supercrítico	0.46	3.53	5.20	0.77	1.00	0.00	Subcrítico	
P046-P047	P046	P047	0.46	4.82%	0.011	587.41	0.30	5.14	6.37	0.75	0.65	3.23	Supercrítico	0.46	3.53	5.54	0.75	1.00	0.00	Subcrítico	
P047-P048	P047	P048	0.46	3.12%	0.011	598.63	0.36	4.29	4.35	0.95	0.78	2.28	Supercrítico	0.46	3.60	3.59	0.95	1.00	0.00	Subcrítico	
P048-P049	P048	P049	0.61	0.80%	0.011	641.47	0.47	2.63	1.48	0.95	0.77	1.21	Supercrítico	0.50	2.50	1.48	0.94	0.82	1.08	Crítico	
P049-P050	P049	P050	0.61	1.45%	0.011	865.17	0.47	3.54	2.68	0.95	0.78	1.63	Supercrítico	0.61	2.96	2.21	0.95	1.00	0.00	Subcrítico	
P050-P051	P050	P051	0.77	0.57%	0.011	949.90	0.57	2.57	1.32	0.89	0.74	1.12	Supercrítico	0.77	2.04	1.10	0.89	1.00	0.00	Subcrítico	
P051-P052	P051	P052	0.77	0.58%	0.011	972.00	0.57	2.60	1.35	0.90	0.74	1.12	Supercrítico	0.68	2.25	1.34	0.91	0.88	0.77	Subcrítico	
P052-DP3	P052	DP3	0.77	2.08%	0.011	1056.11	0.39	4.39	4.06	0.52	0.51	2.51	Supercrítico	0.45	3.74	4.37	0.52	0.58	1.97	Supercrítico	
P053-P049	P053	P049	0.31	2.36%	0.011	135.72	0.19	2.73	2.07	0.71	0.62	2.15	Supercrítico	0.20	2.63	2.11	0.71	0.65	2.00	Supercrítico	
23P-24P	23P	24P	0.28	0.81%	0.011	77.48	0.21	1.56	0.68	0.91	0.75	1.11	Supercrítico	0.22	1.49	0.69	0.90	0.79	0.99	Crítico	
24P-25P	24P	25P	0.31	5.70%	0.011	131.18	0.14	3.79	4.21	0.44	0.46	3.63	Supercrítico	0.23	2.21	5.30	0.44	0.73	1.52	Supercrítico	
25P-P052	25P	P052	0.31	1.23%	0.011	131.18	0.24	2.07	1.16	0.95	0.78	1.34	Supercrítico	0.28	1.82	1.13	0.99	0.91	0.91	Crítico	
P054-P055	P054	P055	0.46	7.16%	0.011	903.41	0.36	6.50	9.99	0.94	0.77	3.46	Supercrítico	0.41	5.80	9.86	0.94	0.89	2.51	Supercrítico	
P055-26P	P055	26P	0.61	4.07%	0.011	930.35	0.34	5.46	6.66	0.61	0.56	3.29	Supercrítico	0.36	5.23	6.83	0.61	0.59	3.05	Supercrítico	
26P-27P	26P	27P	0.60	5.64%	0.013	1194.11	0.41	5.72	9.97	0.82	0.69	2.99	Supercrítico	0.44	5.38	10.14	0.82	0.73	2.67	Supercrítico	
27P-28P	27P	28P	0.77	3.23%	0.011	1877.35	0.49	5.93	7.12	0.74	0.64	2.90	Supercrítico	0.77	4.03	6.22	0.74	1.00	0.00	Subcrítico	
28P-DP4	28P	DP4	0.77	3.27%	0.011	1877.35	0.49	5.96	7.19	0.74	0.64	2.93	Supercrítico	0.63	4.61	7.66	0.73	0.82	1.77	Supercrítico	
P056-P057	P056	P057	0.31	4.02%	0.011	233.12	0.24	3.73	3.77	0.93	0.76	2.46	Supercrítico	0.25	3.51	3.79	0.93	0.82	2.13	Supercrítico	
P057-P058	P057	P058	0.38	3.88%	0.011	307.31	0.24	4.04	4.20	0.73	0.63	2.84	Supercrítico	0.27	3.53	4.40	0.73	0.72	2.23	Supercrítico	
P058-P059	P058	P059	0.46	3.13%	0.011	447.94	0.29	4.10	4.07	0.71	0.62	2.65	Supercrítico	0.30	3.94	4.15	0.71	0.65	2.46	Supercrítico	
P059-27P	P059	27P	0.46	3.73%	0.011	550.05	0.31	4.58	5.02	0.80	0.67	2.78	Supercrítico	0.36	3.90	5.22	0.80	0.79	2.03	Supercrítico	
P060-P061	P060	P061	0.31	0.67%	0.011	79.06	0.20	1.48	0.60	0.77	0.66	1.11	Supercrítico	0.21	1.44	0.61	0.78	0.68	1.06	Crítico	
P061-P062	P061	P062	0.31	0.92%	0.011	113.52	0.24	1.79	0.87	0.95	0.78	1.16	Supercrítico	0.25	1.73	0.87	0.95	0.81	1.06	Crítico	
P062-P063	P062	P063	0.31	1.89%	0.011	157.84	0.23	2.56	1.77	0.92	0.76	1.70	Supercrítico	0.25	2.37	1.78	0.92	0.82	1.43	Supercrítico	
P063-P064	P063	P064	0.31	16.45%	0.011	157.84	0.12	5.87	10.59	0.31	0.38	6.30	Supercrítico	0.15	4.44	12.42	0.31	0.48	4.17	Supercrítico	
P064-P065	P064	P065	0.31	10.13%	0.011	239.58	0.17	5.46	8.40	0.60	0.56	4.63	Supercrítico	0.22	4.15	9.34	0.60	0.71	2.94	Supercrítico	
P065-P066	P065	P066	0.31	4.47%	0.011	249.63	0.24	3.94	4.20	0.95	0.78	2.56	Supercrítico	0.25	3.78	4.22	0.95	0.82	2.29	Supercrítico	
P066-P067	P066	P067	0.31	8.29%	0.011	299.86	0.22	5.28	7.61	0.83	0.70	3.79	Supercrítico	0.23	5.04	7.71	0.83	0.73	3.47	Supercrítico	
P067-DP2	P067	DP2	0.31	34.70%	0.011	299.86	0.14	9.16	24.87	0.41	0.44	9.01	Supercrítico	0.15	8.69	25.83	0.40	0.47	8.27	Supercrítico	
P068-P069	P068	P069	0.25	2.23%	0.011	99.52	0.19	2.41	1.69	0.95	0.78	1.74	Supercrítico	0.25	2.03	1.39	0.95	1.00	0.00	Subcrítico	
P069-P070	P069	P070	0.38	0.90%	0.011	183.05	0.28	2.02	1.03	0.90	0.74	1.24	Supercrítico	0.30	1.91	1.04	0.90	0.79	1.09	Crítico	
P070-P071	P070	P071	0.46	0.88%	0.011	268.14	0.31	2.23	1.19	0.80	0.68	1.35	Supercrítico	0.33	2.09	1.21	0.80	0.72	1.20	Supercrítico	
P071-P072	P071	P072	0.46	1.32%	0.011	353.55	0.33	2.76	1.81	0.86	0.72	1.59	Supercrítico	0.41	2.25	1.81	0.86	0.90	0.95	Crítico	
P072-P073	P072	P073	0.46	1.69%	0.011	437.06	0.35	3.16	2.36	0.94	0.77	1.69	Supercrítico	0.46	2.63	1.94	0.94	1.00	0.00	Subcrítico	
P073-P074	P073	P074	0.61	0.82%	0.011	520.54	0.40	2.57	1.44	0.76	0.65	1.39	Supercrítico	0.43	2.37	1.48	0.76	0.70	1.21	Supercrítico	
P074-P075	P074	P075	0.61	1.56%	0.011	654.39	0.37	3.48	2.67	0.69	0.61	1.98	Supercrítico	0.58	2.28	2.73	0.69	0.95	0.70	Subcrítico	
P075-P076	P075	P076	0.61	1.13%	0.011	763.58	0.47	3.12	2.09	0.95	0.78	1.44	Supercrítico	0.54	2.78	2.06	0.95	0.89	1.05	Crítico	
P076-P077	P076	P077	0.61	1.62%	0.011	914.39	0.47	3.74	3.00	0.95	0.78	1.72	Supercrítico	0.61	3.13	2.47	0.95	1.00	0.00	Subcrítico	


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			CONTRATO PAF-ATF-O-137-2015																	
			CONSULTOR CONSORCIO PROSPERIDAD 2015 - MUNICIPIO DE CHARALÁ																	
			RESULTADOS HIDRÁULICOS DE LA RED DE ALCANTARILLADO PLUVIAL PROYECTADA																	
Tramo	Pozo Inicial	Pozo Final	Diámetro Interno (m)	Pend. (%)	n Manning	Caudal de Diseño (L/s)	Flujo Uniforme						Flujo Gradualmente Variado (SWMM 5.1)							
							Prof. Hidr. Y (m)	Veloc. Media V (m/s)	Fuerza Tractiva T (kg/m²)	Q/Q <sub>0</sub>	Y/D	Número de Froude	Tipo de Flujo	Prof. Hidr. Y (m)	Veloc. Media V (m/s)	Fuerza Tractiva T (kg/m²)	Q/Q <sub>0</sub>	Y/D	Número de Froude	Tipo de Flujo
P077-P078	P077	P078	0.77	0.55%	0.011	914.39	0.56	2.52	1.27	0.87	0.72	1.11	Supercrítico	0.77	1.96	1.06	0.87	1.00	0.00	Subcrítico
P078-32P	P078	32P	0.90	0.28%	0.011	1057.01	0.69	2.01	0.76	0.93	0.77	0.78	Subcrítico	0.70	1.98	0.76	0.94	0.78	0.75	Subcrítico
32P-DP5	32P	DP5	0.90	0.58%	0.011	1514.15	0.69	2.90	1.58	0.93	0.76	1.12	Supercrítico	0.79	2.55	1.57	0.93	0.88	0.81	Subcrítico
P079-P076	P079	P076	0.25	2.79%	0.011	61.19	0.13	2.39	1.77	0.52	0.51	2.40	Supercrítico	0.20	1.50	2.12	0.52	0.78	1.08	Crítico
P080-P078	P080	P078	0.31	0.79%	0.011	100.90	0.23	1.65	0.74	0.91	0.75	1.11	Supercrítico	0.24	1.61	0.74	0.91	0.77	1.05	Crítico
P081-30P	P081	30P	0.31	3.31%	0.011	215.34	0.24	3.39	3.11	0.95	0.78	2.19	Supercrítico	0.31	2.85	2.57	0.95	1.00	0.00	Subcrítico
30P-31P	30P	31P	0.38	2.67%	0.011	332.70	0.30	3.49	3.08	0.95	0.78	2.04	Supercrítico	0.38	2.93	2.54	0.95	1.00	0.00	Subcrítico
31P-32P	31P	32P	0.46	0.97%	0.011	332.70	0.36	2.39	1.35	0.95	0.77	1.27	Supercrítico	0.41	2.13	1.34	0.95	0.89	0.92	Crítico
P082-32P	P082	32P	0.25	1.82%	0.011	70.94	0.16	2.10	1.31	0.75	0.64	1.79	Supercrítico	0.17	2.08	1.32	0.75	0.66	1.74	Supercrítico
P083-P084	P083	P084	0.25	12.64%	0.011	197.36	0.17	5.59	9.22	0.79	0.67	4.63	Supercrítico	0.21	4.48	9.60	0.79	0.84	2.92	Supercrítico
P084-P085	P084	P085	0.38	4.50%	0.011	431.05	0.29	4.54	5.19	0.95	0.78	2.65	Supercrítico	0.38	3.65	4.28	0.91	1.00	0.00	Subcrítico
P085-P086	P085	P086	0.46	1.62%	0.011	431.05	0.36	3.09	2.26	0.95	0.78	1.64	Supercrítico	0.46	2.49	1.86	0.91	1.00	0.00	Subcrítico
P086-P087	P086	P087	0.61	0.59%	0.011	504.89	0.44	2.23	1.07	0.87	0.72	1.11	Supercrítico	0.61	1.67	0.90	0.85	1.00	0.00	Subcrítico
P087-DP6	P087	DP6	0.61	0.59%	0.011	504.89	0.44	2.23	1.07	0.87	0.72	1.11	Supercrítico	0.53	1.80	1.09	0.93	0.87	0.71	Subcrítico
P088-P089	P088	P089	0.38	5.34%	0.011	311.50	0.22	4.59	5.51	0.63	0.57	3.46	Supercrítico	0.33	3.01	6.14	0.63	0.86	1.53	Supercrítico
P089-DP7	P089	DP7	0.38	4.91%	0.011	311.50	0.22	4.44	5.14	0.65	0.59	3.28	Supercrítico	0.30	3.22	5.68	0.66	0.80	1.82	Supercrítico
P090-P091	P090	P091	0.31	0.69%	0.011	83.29	0.21	1.51	0.63	0.80	0.68	1.11	Supercrítico	0.22	1.48	0.63	0.80	0.70	1.06	Crítico
P091-P092	P091	P092	0.46	0.68%	0.011	266.64	0.34	1.99	0.94	0.91	0.75	1.11	Supercrítico	0.46	1.60	0.78	0.90	1.00	0.00	Subcrítico
P092-P093	P092	P093	0.46	1.46%	0.011	407.61	0.36	2.94	2.04	0.94	0.77	1.57	Supercrítico	0.46	2.45	1.68	0.95	1.00	0.00	Subcrítico
P093-P094	P093	P094	0.61	0.66%	0.011	578.07	0.47	2.38	1.22	0.94	0.77	1.11	Supercrítico	0.61	1.98	1.01	0.94	1.00	0.00	Subcrítico
P094-DP8	P094	DP8	0.61	0.66%	0.011	578.07	0.47	2.38	1.22	0.94	0.77	1.11	Supercrítico	0.54	2.10	1.21	0.96	0.89	0.79	Subcrítico
P095-P096	P095	P096	0.25	2.59%	0.011	61.53	0.13	2.33	1.67	0.54	0.53	2.30	Supercrítico	0.18	1.65	1.93	0.54	0.71	1.30	Supercrítico
P096-P097	P096	P097	0.38	0.80%	0.011	181.59	0.29	1.91	0.92	0.95	0.77	1.12	Supercrítico	0.32	1.76	0.92	0.94	0.85	0.91	Crítico
P097-P098	P097	P098	0.46	2.67%	0.011	549.57	0.35	3.97	3.72	0.94	0.77	2.12	Supercrítico	0.41	3.53	3.68	0.94	0.89	1.53	Supercrítico
P098-P099	P098	P099	0.46	6.06%	0.011	835.52	0.36	5.98	8.46	0.95	0.78	3.17	Supercrítico	0.41	5.35	8.35	0.95	0.89	2.32	Supercrítico
P099-DP9	P099	DP9	0.46	12.24%	0.011	835.52	0.28	8.00	15.61	0.67	0.60	5.33	Supercrítico	0.35	6.12	17.06	0.67	0.77	3.28	Supercrítico
P100-P097	P100	P097	0.31	4.14%	0.011	127.41	0.16	3.34	3.21	0.50	0.50	3.05	Supercrítico	0.16	3.27	3.25	0.50	0.51	2.95	Supercrítico
P101-P102	P101	P102	0.25	9.35%	0.011	139.84	0.15	4.62	6.42	0.65	0.59	4.22	Supercrítico	0.15	4.54	6.49	0.65	0.60	4.09	Supercrítico


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			CONTRATO PAF-ATF-O-137-2015																		
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			RESULTADOS HIDRÁULICOS DE LA RED DE ALCANTARILLADO PLUVIAL PROYECTADA																		
Tramo	Pozo Inicial	Pozo Final	Diámetro Interno (m)	Pend. (%)	n Manning	Caudal de Diseño (L/s)	Flujo Uniforme						Flujo Gradualmente Variado (SWMM 5.1)								
							Prof. Hidr. Y (m)	Veloc. Media V (m/s)	Fuerza Tractiva T (kg/m²)	Q/Q <sub>0</sub>	Y/D	Número de Froude	Tipo de Flujo	Prof. Hidr. Y (m)	Veloc. Media V (m/s)	Fuerza Tractiva T (kg/m²)	Q/Q <sub>0</sub>	Y/D	Número de Froude	Tipo de Flujo	
P102-P103	P102	P103	0.25	14.95%	0.011	139.84	0.13	5.52	9.44	0.51	0.51	5.57	Supercrítico	0.19	3.52	11.28	0.51	0.75	2.63	Supercrítico	
P103-P104	P103	P104	0.31	11.69%	0.011	387.53	0.23	6.35	10.93	0.91	0.75	4.28	Supercrítico	0.31	5.08	9.06	0.90	1.00	0.00	Subcrítico	
P104-P105	P104	P105	0.31	10.70%	0.011	387.53	0.24	6.10	10.07	0.95	0.78	3.94	Supercrítico	0.31	5.08	8.29	0.94	1.00	0.00	Subcrítico	
P105-P106	P105	P106	0.31	11.40%	0.011	387.53	0.23	6.28	10.68	0.92	0.76	4.18	Supercrítico	0.27	5.49	10.66	0.91	0.87	3.03	Supercrítico	
P106-P107	P106	P107	0.38	32.54%	0.011	387.53	0.15	9.50	25.82	0.32	0.39	9.17	Supercrítico	0.16	8.57	27.45	0.30	0.42	7.88	Supercrítico	
P107-P108	P107	P108	0.38	32.54%	0.011	387.53	0.15	9.50	25.82	0.32	0.39	9.17	Supercrítico	0.16	8.52	27.45	0.30	0.42	7.84	Supercrítico	
P108-P109	P108	P109	0.38	32.54%	0.011	387.53	0.15	9.50	25.82	0.32	0.39	9.17	Supercrítico	0.21	6.15	32.41	0.30	0.54	4.83	Supercrítico	
P109-DP10	P109	DP10	0.38	12.25%	0.011	387.53	0.19	6.62	11.77	0.52	0.51	5.41	Supercrítico	0.23	5.45	12.92	0.51	0.60	3.98	Supercrítico	
P117-P118	P117	P118	0.38	0.63%	0.011	132.91	0.25	1.65	0.70	0.78	0.66	1.12	Supercrítico	0.27	1.54	0.71	0.79	0.71	0.98	Crítico	
P118-P119	P118	P119	0.38	1.21%	0.011	151.75	0.22	2.19	1.26	0.64	0.58	1.64	Supercrítico	0.23	2.15	1.28	0.64	0.60	1.57	Supercrítico	
P119-P120	P119	P120	0.38	3.89%	0.011	308.95	0.24	4.04	4.21	0.73	0.63	2.84	Supercrítico	0.25	3.94	4.26	0.73	0.65	2.71	Supercrítico	
P120-P121	P120	P121	0.46	5.85%	0.011	463.28	0.24	5.25	6.90	0.54	0.52	3.84	Supercrítico	0.33	3.63	8.04	0.54	0.72	2.08	Supercrítico	
P121-P122	P121	P122	0.46	2.11%	0.011	491.01	0.36	3.53	2.94	0.95	0.78	1.88	Supercrítico	0.39	3.29	2.95	0.94	0.84	1.58	Supercrítico	
P122-P123	P122	P123	0.46	4.05%	0.011	680.46	0.36	4.89	5.65	0.95	0.78	2.60	Supercrítico	0.39	4.53	5.65	0.95	0.85	2.14	Supercrítico	
P123-P124	P123	P124	0.46	20.20%	0.011	768.96	0.22	9.49	22.85	0.48	0.49	7.24	Supercrítico	0.24	8.59	24.08	0.47	0.53	6.21	Supercrítico	
P124-DP11	P124	DP11	0.46	20.20%	0.011	768.96	0.22	9.49	22.85	0.48	0.49	7.24	Supercrítico	0.26	7.81	25.11	0.47	0.57	5.38	Supercrítico	
P125-P126	P125	P126	0.25	2.71%	0.011	67.39	0.14	2.42	1.79	0.58	0.55	2.32	Supercrítico	0.14	2.39	1.81	0.58	0.56	2.26	Supercrítico	
P126-P127	P126	P127	0.25	4.90%	0.011	147.48	0.19	3.58	3.72	0.95	0.78	2.58	Supercrítico	0.21	3.37	3.72	0.95	0.84	2.20	Supercrítico	
P127-P128	P127	P128	0.31	6.47%	0.011	193.67	0.17	4.37	5.39	0.61	0.56	3.70	Supercrítico	0.19	4.07	5.57	0.61	0.60	3.29	Supercrítico	
P128-P129	P128	P129	0.31	6.90%	0.011	249.55	0.20	4.74	6.18	0.76	0.65	3.60	Supercrítico	0.24	3.93	6.49	0.76	0.78	2.53	Supercrítico	
P129-P130	P129	P130	0.31	4.82%	0.011	259.78	0.24	4.10	4.53	0.95	0.78	2.65	Supercrítico	0.25	3.99	4.55	0.95	0.81	2.45	Supercrítico	
P130-P131	P130	P131	0.46	5.71%	0.011	669.93	0.31	5.65	7.65	0.78	0.67	3.46	Supercrítico	0.38	4.53	7.99	0.78	0.83	2.21	Supercrítico	
P131-P132	P131	P132	0.46	6.36%	0.011	669.93	0.30	5.90	8.39	0.74	0.64	3.72	Supercrítico	0.35	4.91	8.87	0.74	0.77	2.63	Supercrítico	
P132-P133	P132	P133	0.46	6.39%	0.011	669.93	0.29	5.91	8.42	0.74	0.64	3.74	Supercrítico	0.32	5.47	8.67	0.74	0.69	3.26	Supercrítico	
P133-P134	P133	P134	0.46	8.21%	0.011	740.91	0.29	6.67	10.74	0.72	0.63	4.27	Supercrítico	0.33	5.77	11.28	0.72	0.72	3.31	Supercrítico	
P134-P135	P134	P135	0.46	6.00%	0.011	740.91	0.32	5.87	8.20	0.85	0.71	3.43	Supercrítico	0.35	5.56	8.33	0.85	0.75	3.06	Supercrítico	
P135-P136	P135	P136	0.46	7.40%	0.011	740.91	0.30	6.40	9.83	0.76	0.65	3.98	Supercrítico	0.35	5.54	10.27	0.76	0.75	3.05	Supercrítico	
P136-P137	P136	P137	0.61	4.55%	0.011	1001.04	0.35	5.79	7.50	0.62	0.57	3.47	Supercrítico	0.38	5.30	7.83	0.62	0.62	2.98	Supercrítico	
P137-P146	P137	P146	0.61	16.99%	0.011	1001.04	0.24	9.45	21.75	0.32	0.39	7.18	Supercrítico	0.26	8.22	23.40	0.32	0.43	5.88	Supercrítico	
P146-DP12	P146	DP12	0.61	16.99%	0.011	1001.04	0.24	9.45	21.75	0.32	0.39	7.18	Supercrítico	0.31	6.67	26.24	0.32	0.51	4.30	Supercrítico	
P138-P139	P138	P139	0.25	5.20%	0.011	32.62	0.08	2.54	2.26	0.20	0.31	3.44	Supercrítico	0.11	1.58	2.98	0.20	0.44	1.74	Supercrítico	
P139-P140	P139	P140	0.25	2.32%	0.011	69.97	0.15	2.30	1.60	0.65	0.59	2.10	Supercrítico	0.15	2.28	1.61	0.65	0.60	2.05	Supercrítico	
P140-P130	P140	P130	0.31	4.60%	0.011	253.32	0.24	4.00	4.33	0.95	0.78	2.59	Supercrítico	0.26	3.75	4.33	0.95	0.84	2.19	Supercrítico	
P141-P140	P141	P140	0.25	5.11%	0.011	98.63	0.14	3.38	3.45	0.62	0.57	3.16	Supercrítico	0.15	3.26	3.52	0.62	0.59	2.97	Supercrítico	
P142-P143	P142	P143	0.25	5.75%	0.011	146.18	0.18	3.83	4.29	0.87	0.72	2.98	Supercrítico	0.19	3.60	4.36	0.87	0.77	2.62	Supercrítico	
P143-P145	P143	P145	0.25	34.35%	0.011	294.56	0.16	9.04	24.33	0.72	0.63	7.90	Supercrítico	0.20	6.94	26.13	0.69	0.81	4.75	Supercrítico	
P145-P147	P145	P147	0.25	38.93%	0.011	294.56	0.15	9.50	27.02	0.67	0.60	8.56	Supercrítico	0.20	7.06	29.58	0.65	0.79	4.99	Supercrítico	
P147-P136	P147	P136	0.25	38.93%	0.011	294.56	0.15	9.50	27.02	0.67	0.60	8.56	Supercrítico	0.18	7.71	29.18	0.64	0.73	5.92	Supercrítico	
P144-P143	P144	P143	0.25	0.69%	0.011	42.72	0.16	1.29	0.49	0.73	0.64	1.11	Supercrítico	0.17	1.23	0.50	0.73	0.67	1.02	Crítico	


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			CONTRATO PAF-ATF-O-137-2015																		
			CONSULTOR CONSORCIO PROSPERIDAD 2015 - MUNICIPIO DE CHARALÁ																		
ANÁLISIS DE EMPATES EN LA RED DE ALCANTARILLADO PLUVIAL PROYECTADA																					
Tramo	Pozo Inicial	Pozo Final	Yc (m)	Diametro Pozo Final (m)	Tipo de Flujo	Análisis Subcrítico				Análisis Supercrítico				Caída al Final del Tramo (m)	Línea de Energía Inicial	Línea de Energía Final	Δ Línea de Energía (m)	Línea de Energía Afluente Mínimo (m)	Δ Línea de Energía Afluente (m)	Caída Afluente Mínima Batea (m)	Tipo de Empate
						R <sub>c</sub> /Øs	ΔH <sub>c</sub> (m)	K <sub>k</sub>	ΔH <sub>e</sub> (m)	Y <sub>c</sub> /D	Tipo de Entrada	He (m)	Hw (m)								
1P-2P	1P	2P	0.35	1.20	Supercrítico	4.11	---	---	---	0.39	No Sumergida	0.00	0.68	0.08	1287.65	1287.44	0.11				Existente
2P-3P	2P	3P	0.35	1.20	Supercrítico	2.04	---	---	---	0.39	No Sumergida	0.00	0.68	0.05	1287.33	1287.09	-0.01				Existente
3P-4P	3P	4P	0.36	1.20	Supercrítico	24.99	---	---	---	0.39	No Sumergida	0.00	0.69	0.08	1287.10	1286.81	0.07				Existente
4P-5P	4P	5P	0.36	1.20	Supercrítico	1.71	---	---	---	0.40	No Sumergida	0.00	0.69	0.00	1286.73	1286.21	-0.01				Existente
5P-6P	5P	6P	0.36	1.20	Supercrítico	1.98	---	---	---	0.40	No Sumergida	0.00	0.71	0.04	1286.22	1285.56	-0.07				Existente
6P-7P	6P	7P	0.41	1.20	Supercrítico	2.30	---	---	---	0.45	No Sumergida	0.01	0.80	-0.09	1285.63	1285.14	-0.34	1285.73	0.09	0.32	Existente
7P-8P	7P	8P	0.52	1.20	Supercrítico	3951.43	---	---	---	0.65	No Sumergida	0.02	1.07	0.00	1285.49	1284.78	-0.07	1285.90	0.42	0.47	Existente
8P-9P	8P	9P	0.55	1.20	Supercrítico	51.34	---	---	---	0.69	No Sumergida	0.02	1.15	0.75	1284.84	1283.60	0.60				Existente
9P-10P	9P	10P	0.57	1.20	Supercrítico	50.81	---	---	---	0.64	No Sumergida	0.03	1.20	0.16	1283.01	1282.22	-1.64				Existente
10P-11P	10P	11P	0.57	1.20	Supercrítico	86.34	---	---	---	0.64	No Sumergida	0.03	1.20	1.25	1283.86	1281.16	2.57				Existente
11P-P001	11P	P001	0.57	1.20	Supercrítico	381971.86	---	---	---	0.64	No Sumergida	0.03	1.20	0.00	1278.59	1278.16	-0.15				Existente
P001-12P	P001	12P	0.62	1.20	Supercrítico	477.31	---	---	---	0.69	No Sumergida	0.05	1.34	0.00	1278.31	1277.32	0.14	1278.38	0.07	0.64	Existente
12P-13P	12P	13P	0.62	1.20	Supercrítico	45.78	---	---	---	0.69	No Sumergida	0.05	1.34	0.01	1277.18	1274.98	-0.06				Existente
13P-P002	13P	P002	0.63	1.20	Supercrítico	229183.12	---	---	---	0.70	No Sumergida	0.02	1.41	3.95	1275.04	1274.67	3.78				Existente
P002-14P	P002	14P	1.08	1.20	Supercrítico	13.99	---	---	---	0.90	Sumergida	0.71	###	0.00	1270.88	1270.74	0.00	1270.88	0.00	0.06	Energía
14P-15P	14P	15P	1.08	1.20	Supercrítico	67.68	---	---	---	0.90	Sumergida	0.71	###	1.76	1270.74	1270.35	0.00				Energía
15P-P003	15P	P003	1.08	1.20	Supercrítico	1145915.59	---	---	---	0.90	Sumergida	0.71	###	2.58	1270.35	1268.91	2.83				Energía
P003-15PA	P003	15PA	1.11	1.20	Supercrítico	114591.56	---	---	---	0.93	Sumergida	0.91	###	0.74	1266.08	1264.65	1.65	1266.08	0.00	2.32	Energía
15PA-15PB	15PA	15PB	1.11	1.20	Supercrítico	2.86	---	---	---	0.93	Sumergida	0.91	###	1.71	1263.01	1262.13	0.00				Energía
15PB-DP1	15PB	DP1	1.14	Descarga	Supercrítico		---	---	---	0.95	---	---	---	0.00	1262.12	1260.81		1262.40	0.27	1.72	Energía
P004-P005	P004	P005	0.27	1.20	Supercrítico	3.03	---	---	---	0.86	No Sumergida	0.00	0.51	0.05	1286.13	1285.79	0.00				Energía
P005-6P	P005	6P	0.31	1.20	Supercrítico	1.04	---	---	---	0.81	---	---	---	0.00	1285.79	1285.73					Energía
P006-P007	P006	P007	0.44	1.20	Supercrítico	6.49	---	---	---	0.95	Sumergida	0.04	0.60	0.00	1289.15	1286.32	0.30				Energía
P007-7P	P007	7P	0.44	1.20	Supercrítico	3.62	---	---	---	0.95	---	---	---	0.00	1286.01	1285.90					Energía
P008-P001	P008	P001	0.31	1.20	Supercrítico	1.59	---	---	---	0.99	---	---	---	0.00	1278.98	1278.38					Energía
P009-P010	P009	P010	0.33	1.20	Supercrítico	2989345.02	---	---	---	0.86	No Sumergida	0.00	0.63	0.09	1279.18	1278.18	0.00				Energía
P010-P011	P010	P011	0.40	1.20	Supercrítico	707.77	---	---	---	0.87	No Sumergida	0.01	0.84	0.70	1278.18	1277.98	0.65				Energía
P011-P012	P011	P012	0.47	1.20	Supercrítico	751420.06	---	---	---	0.77	No Sumergida	0.02	0.94	1.27	1277.33	1276.78	1.27				Energía
P012-P013	P012	P013	0.47	1.20	Supercrítico	1.87	---	---	---	0.77	No Sumergida	0.02	0.94	0.03	1275.51	1275.48	-0.01				Batea
P013-P013A	P013	P013A	0.49	1.20	Crítico	751420.06	---	---	---	0.80	---	---	---	0.00	1275.49	1275.44	0.00	1277.43	1.94	2.25	Energía
P013A-17P	P013A	17P	0.49	1.20	Crítico	1.43	---	---	---	0.80	---	---	---	0.26	1275.44	1274.93	0.19				Energía
17P-18P	17P	18P	0.55	1.20	Supercrítico	89.16	---	---	---	0.72	No Sumergida	0.03	1.18	0.05	1274.74	1274.54	0.00	1275.71	0.97	0.49	Energía
18P-18PA	18P	18PA	0.58	1.20	Crítico	12066.50	---	---	---	0.75	---	---	---	0.00	1274.54	1274.50	0.00				Energía
18PA-P112	18PA	P112	0.58	1.20	Crítico	1.25	---	---	---	0.75	---	---	---	0.36	1274.50	1274.29	0.05				Energía
P112-21P	P112	21P	0.75	1.20	Supercrítico	84.94	---	---	---	0.83	Sumergida	0.14	###	0.06	1274.23	1273.87	0.00	1275.85	1.61	1.86	Energía
21P-22P	21P	22P	0.76	1.20	Supercrítico	18.73	---	---	---	0.85	Sumergida	0.16	###	0.01	1273.87	1273.80	0.00	1274.53	0.66	1.67	Energía
22P-P014	22P	P014	0.77	1.20	Supercrítico	1.12	---	---	---	0.85	No Sumergida	0.12	2.01	0.17	1273.80	1273.50	0.00	1274.20	0.40	1.41	Energía
P014-P111	P014	P111	0.86	1.20	Supercrítico	79.96	---	---	---	0.86	Sumergida	0.22	###	0.00	1273.50	1273.00	0.03	1277.32	3.82	3.59	Energía
P111-P015	P111	P015	0.87	1.20	Supercrítico	1.16	---	---	---	0.83	Sumergida	0.25	###	0.02	1272.97	1272.64	0.00				Energía
P015-P016	P015	P016	0.88	1.20	Supercrítico	49.33	---	---	---	0.84	Sumergida	0.26	###	0.41	1272.64	1272.07	0.00				Energía
P016-P110	P016	P110	0.97	1.20	Supercrítico	235.37	---	---	---	0.92	Sumergida	0.53	###	0.06	1272.07	1271.34	0.02	1272.51	0.44	1.04	Energía
P110-P002	P110	P002	0.97	1.20	Supercrítico	1.05	---	---	---	0.93	---	---	---	0.00	1271.32	1270.88					Energía





CONSORCIO PROSPERIDAD 2015			CONSTRUCCIÓN Y OPTIMIZACIÓN DEL SISTEMA DE ALCANTARILLADO SANITARIO Y PLUVIAL Y SISTEMA DE TRATAMIENTO DE AGUAS RESIDUALES DEL MUNICIPIO DE CHARALÁ, DEPARTAMENTO DE SANTANDER - ETAPA I																 Findeter Financiera del Desarrollo			
			CONTRATO PAF-ATF-O-137-2015																			
			CONSULTOR CONSORCIO PROSPERIDAD 2015 - MUNICIPIO DE CHARALÁ																			
			ANÁLISIS DE EMPATES EN LA RED DE ALCANTARILLADO PLUVIAL PROYECTADA																			
			Tramo	Pozo Inicial	Pozo Final	Yc (m)	Diametro Pozo Final (m)	Tipo de Flujo	Análisis Subcrítico				Análisis Supercrítico				Caída al Final del Tramo (m)	Línea de Energía Inicial			Línea de Energía Final	Δ Línea de Energía (m)
R <sub>c</sub> /Øs	ΔH <sub>c</sub> (m)	K <sub>k</sub>	ΔH <sub>e</sub> (m)	Y <sub>c</sub> /D	Tipo de Entrada	He (m)	Hw (m)	Línea de Energía Inicial	Línea de Energía Final	Δ Línea de Energía (m)	Línea de Energía Afluente Mínimo (m)	Δ Línea de Energía Afluente (m)	Caída Afluente Mínima Batea (m)	Tipo de Empate								
P017-P013	P017	P013	0.20	1.20	Supercrítico	2.07	---	---	---	0.80	---	---	---	0.00	1278.48	1277.43					Energía	
P018-P019	P018	P019	0.22	1.20	Supercrítico	5821.26	---	---	---	0.90	No Sumergida	0.00	0.45	0.51	1293.12	1283.62	0.00				Energía	
P019-P020	P019	P020	0.31	1.20	Supercrítico	146.43	---	---	---	0.99	Sumergida	0.02	0.39	0.07	1283.63	1280.88	0.57				Energía	
P020-P021	P020	P021	0.38	1.20	Supercrítico	3618680.81	---	---	---	0.99	Sumergida	0.05	0.39	0.61	1280.31	1276.52	0.61				Energía	
P021-17P	P021	17P	0.38	1.20	Supercrítico	342.38	---	---	---	0.99	---	---	---	0.00	1275.91	1275.71					Energía	
P022-17P	P022	17P	0.21	1.20	Supercrítico	1.66	---	---	---	0.85	---	---	---	0.00	1277.43	1276.42					Energía	
P023-P024	P023	P024	0.32	1.20	Supercrítico	716.52	---	---	---	0.85	No Sumergida	0.00	0.62	0.07	1284.14	1282.46	0.00				Energía	
P024-P025	P024	P025	0.37	1.20	Supercrítico	2.73	---	---	---	0.80	No Sumergida	0.01	0.68	0.51	1282.45	1280.72	0.11				Energía	
P025-P112	P025	P112	0.40	1.20	Supercrítico	314.90	---	---	---	0.86	---	---	---	0.00	1280.61	1277.17					Energía	
P026-P027	P026	P027	0.25	1.20	Supercrítico	125.47	---	---	---	0.82	No Sumergida	0.00	0.47	0.28	1282.13	1278.43	0.01				Energía	
P027-P112	P027	P112	0.41	1.20	Supercrítico	1.43	---	---	---	0.90	---	---	---	0.00	1278.43	1275.85					Energía	
19P-20P	19P	20P	0.03	1.20	Crítico	1.88	---	---	---	0.03	---	---	---	0.03	1275.40	1275.11	-0.14				Existente	
20P-21P	20P	21P	0.12	1.20	Supercrítico	1.33	---	---	---	0.13	---	---	---	0.00	1275.25	1274.53					Existente	
22PA-22PB	22PA	22PB	0.03	1.20	Supercrítico	8.52	---	---	---	0.06	No Sumergida	0.00	0.06	0.18	1276.66	1274.70	0.02				Existente	
22PB-22P	22PB	22P	0.14	1.20	Supercrítico	2.10	---	---	---	0.23	---	---	---	0.00	1274.68	1274.20					Existente	
P028-P029	P028	P029	0.38	1.20	Supercrítico	49.32	---	---	---	0.99	Sumergida	0.06	0.39	0.19	1295.52	1289.91	0.99				Energía	
P029-P030	P029	P030	0.38	1.20	Supercrítico	178.24	---	---	---	0.99	Sumergida	0.03	0.60	0.09	1288.92	1285.28	0.27				Energía	
P030-P031	P030	P031	0.46	1.20	Supercrítico	3738.41	---	---	---	0.99	Sumergida	0.05	1.81	0.86	1285.01	1281.11	0.95				Energía	
P031-P014	P031	P014	0.58	1.20	Supercrítico	30.17	---	---	---	0.96	---	---	---	0.00	1280.16	1277.32					Energía	
P032-P033	P032	P033	0.32	1.20	Supercrítico	3.32	---	---	---	0.84	Sumergida	0.01	0.39	2.61	1296.62	1296.35	0.00				Energía	
P033-P113	P033	P113	0.38	1.20	Supercrítico	1206226.94	---	---	---	0.99	Sumergida	0.06	0.39	0.71	1296.35	1294.48	0.00				Energía	
P113-P034	P113	P034	0.38	1.20	Supercrítico	27.48	---	---	---	0.99	No Sumergida	0.01	1.50	1.44	1294.48	1289.44	4.29				Energía	
P034-P035	P034	P035	0.49	1.20	Supercrítico	23.79	---	---	---	0.80	Sumergida	0.03	1.81	0.25	1285.15	1283.15	0.00				Energía	
P035-P036	P035	P036	0.57	1.20	Supercrítico	88.60	---	---	---	0.93	Sumergida	0.08	1.81	2.07	1283.15	1281.38	0.00				Energía	
P036-P037	P036	P037	0.59	1.20	Supercrítico	4847.87	---	---	---	0.97	Sumergida	0.15	1.81	0.00	1281.38	1276.68	1.26				Energía	
P037-P038	P037	P038	0.60	1.20	Supercrítico	329.00	---	---	---	0.98	Sumergida	0.11	6.22	0.16	1275.41	1273.81	0.99				Energía	
P038-P016	P038	P016	0.69	1.20	Supercrítico	1.10	---	---	---	0.90	---	---	---	0.00	1272.83	1272.51					Energía	
P039-P040	P039	P040	0.31	1.20	Supercrítico	842.73	---	---	---	0.82	Sumergida	0.01	0.39	0.96	1275.40	1274.70	0.66				Energía	
P040-P041	P040	P041	0.36	1.20	Supercrítico	676.76	---	---	---	0.95	Sumergida	0.02	0.39	1.27	1274.04	1273.03	0.01				Energía	
P041-P042	P041	P042	0.36	1.20	Supercrítico	723736.16	---	---	---	0.95	Sumergida	0.02	0.39	1.15	1273.02	1268.61	2.10				Energía	
P042-P003	P042	P003	0.37	1.20	Supercrítico	0.95	---	---	---	0.98	---	---	---	0.00	1266.51	1266.08					Energía	
P043-P114	P043	P114	0.27	1.20	Supercrítico	176.04	---	---	---	0.87	No Sumergida	0.00	0.52	0.42	1277.85	1275.70	0.00				Energía	
P114-P115	P114	P115	0.37	1.20	Supercrítico	213.32	---	---	---	0.97	Sumergida	0.01	0.60	0.74	1275.70	1272.89	0.00				Energía	
P115-P116	P115	P116	0.46	1.20	Supercrítico	246.74	---	---	---	0.99	Sumergida	0.05	1.81	1.05	1272.88	1269.60	0.00				Energía	
P116-15PB	P116	15PB	0.59	1.20	Supercrítico	2.03	---	---	---	0.96	---	---	---	0.00	1269.61	1262.40					Energía	


CONSORCIO PROSPERIDAD 2015			CONSTRUCCIÓN Y OPTIMIZACIÓN DEL SISTEMA DE ALCANTARILLADO SANITARIO Y PLUVIAL Y SISTEMA DE TRATAMIENTO DE AGUAS RESIDUALES DEL MUNICIPIO DE CHARALÁ, DEPARTAMENTO DE SANTANDER - ETAPA I																	 Findeter Financiera del Desarrollo	
			CONTRATO PAF-ATF-O-137-2015																		
			CONSULTOR CONSORCIO PROSPERIDAD 2015 - MUNICIPIO DE CHARALÁ																		
			ANÁLISIS DE EMPATES EN LA RED DE ALCANTARILLADO PLUVIAL PROYECTADA																		
			Tramo	Pozo Inicial	Pozo Final	Yc (m)	Diametro Pozo Final (m)	Tipo de Flujo	Análisis Subcrítico				Análisis Supercrítico				Caída al Final del Tramo (m)	Línea de Energía Inicial	Línea de Energía Final		
R <sub>c</sub> /Øs	ΔH <sub>c</sub> (m)	K <sub>k</sub>	ΔH <sub>e</sub> (m)	Y <sub>c</sub> /D	Tipo de Entrada	He (m)	Hw (m)	Tipo de Entrada	He (m)	Hw (m)											
P044-P045	P044	P045	0.38	1.20	Supercrítico	2.45	---	---	---	1.00	Sumergida	0.05	0.60	0.08	1293.97	1293.12	1.10				Energía
P045-P046	P045	P046	0.45	1.20	Supercrítico	27.38	---	---	---	0.98	Sumergida	0.07	0.60	0.06	1292.02	1290.87	0.00				Energía
P046-P047	P046	P047	0.45	1.20	Supercrítico	32.99	---	---	---	0.98	Sumergida	0.07	0.60	0.00	1290.88	1289.79	0.35				Energía
P047-P048	P047	P048	0.45	1.20	Supercrítico	2.11	---	---	---	0.98	Sumergida	0.03	1.81	0.00	1289.44	1287.63	0.47				Energía
P048-P049	P048	P049	0.52	1.20	Supercrítico	102.99	---	---	---	0.85	Sumergida	0.04	1.81	0.99	1287.15	1286.52	0.70				Energía
P049-P050	P049	P050	0.57	1.20	Supercrítico	1.19	---	---	---	0.94	No Sumergida	0.04	1.52	0.00	1285.82	1284.41	0.21	1286.71	0.89	1.43	Energía
P050-P051	P050	P051	0.60	1.20	Supercrítico	87.40	---	---	---	0.78	No Sumergida	0.05	1.34	0.01	1284.20	1283.80	0.00				Energía
P051-P052	P051	P052	0.61	1.20	Supercrítico	1.24	---	---	---	0.79	No Sumergida	0.06	1.36	0.46	1283.81	1283.63	0.00				Energía
P052-DP3	P052	DP3	0.63	Descarga	Supercrítico		---	---	---	0.82	---	---	---	0.00	1283.62	1282.85		1284.13	0.50	1.42	Energía
P053-P049	P053	P049	0.28	1.20	Supercrítico	2.19	---	---	---	0.89	---	---	---	0.00	1288.16	1286.71					Energía
23P-24P	23P	24P	0.22	1.20	Supercrítico	5.45	---	---	---	0.79	No Sumergida	0.00	0.40	0.54	1286.34	1286.04	0.00				Existente
24P-25P	24P	25P	0.27	1.20	Supercrítico	45.84	---	---	---	0.88	Sumergida	0.00	0.28	0.00	1286.05	1284.57	0.42				Energía
25P-P052	25P	P052	0.27	1.20	Supercrítico	148820.21	---	---	---	0.88	---	---	---	0.00	1284.15	1284.13					Energía
P054-P055	P054	P055	0.46	1.20	Supercrítico	9.62	---	---	---	1.00	Sumergida	0.09	1.81	0.05	1296.15	1294.85	0.70				Energía
P055-26P	P055	26P	0.58	1.20	Supercrítico	19.94	---	---	---	0.95	Sumergida	0.11	1.68	0.66	1294.15	1290.41	0.44				Energía
26P-27P	26P	27P	0.59	1.20	Supercrítico	142.36	---	---	---	0.98	Sumergida	0.10	6.22	0.84	1289.97	1286.39	0.63				Existente
27P-28P	27P	28P	0.75	1.20	Supercrítico	2.34	---	---	---	0.97	Sumergida	0.33	6.22	0.02	1285.76	1284.69	0.00	1285.76	0.00	0.91	Energía
28P-DP4	28P	DP4	0.75	Descarga	Supercrítico		---	---	---	0.97	---	---	---	0.00	1284.68	1284.35					Energía
P056-P057	P056	P057	0.31	1.20	Supercrítico	3618680.81	---	---	---	0.98	Sumergida	0.01	0.39	0.12	1292.34	1290.94	0.00				Energía
P057-P058	P057	P058	0.37	1.20	Supercrítico	2.85	---	---	---	0.96	Sumergida	0.01	0.60	0.08	1290.94	1290.09	0.01				Energía
P058-P059	P058	P059	0.43	1.20	Supercrítico	7.08	---	---	---	0.94	Sumergida	0.03	0.60	0.24	1290.08	1287.48	0.00				Energía
P059-27P	P059	27P	0.45	1.20	Supercrítico	1.28	---	---	---	0.97	---	---	---	0.00	1287.48	1285.76					Energía
P060-P061	P060	P061	0.22	1.20	Supercrítico	5280.72	---	---	---	0.70	No Sumergida	0.00	0.38	0.09	1286.41	1286.09	0.00				Energía
P061-P062	P061	P062	0.26	1.20	Supercrítico	99.53	---	---	---	0.83	Sumergida	0.00	0.28	0.16	1286.08	1285.60	0.00				Energía
P062-P063	P062	P063	0.29	1.20	Supercrítico	50.33	---	---	---	0.93	Sumergida	0.01	0.28	1.31	1285.61	1285.11	0.00				Energía
P063-P064	P063	P064	0.29	1.20	Supercrítico	234.16	---	---	---	0.93	Sumergida	0.01	0.28	0.00	1285.10	1273.66	0.18				Energía
P064-P065	P064	P065	0.31	1.20	Supercrítico	10714.50	---	---	---	0.99	Sumergida	0.02	0.28	0.00	1273.48	1270.53	0.66				Energía
P065-P066	P065	P066	0.31	1.20	Supercrítico	19.08	---	---	---	0.99	Sumergida	0.02	0.28	0.61	1269.87	1267.07	0.00				Energía
P066-P067	P066	P067	0.31	1.20	Supercrítico	34.44	---	---	---	0.99	Sumergida	0.04	0.28	2.78	1267.07	1263.58	0.00				Energía
P067-DP2	P067	DP2	0.31	Descarga	Supercrítico		---	---	---	0.99	---	---	---	0.00	1263.57	1253.35					Energía
P068-P069	P068	P069	0.24	1.20	Supercrítico	194.90	---	---	---	0.95	No Sumergida	0.00	0.55	0.00	1299.99	1299.28	0.00				Energía
P069-P070	P069	P070	0.31	1.20	Supercrítico	652.41	---	---	---	0.82	No Sumergida	0.00	0.58	0.08	1299.28	1298.99	0.01				Energía
P070-P071	P070	P071	0.36	1.20	Supercrítico	842.54	---	---	---	0.79	No Sumergida	0.01	0.67	0.15	1298.98	1298.70	0.00				Energía
P071-P072	P071	P072	0.41	1.20	Supercrítico	709.55	---	---	---	0.88	Sumergida	0.02	0.60	0.15	1298.71	1298.30	0.00				Energía
P072-P073	P072	P073	0.43	1.20	Supercrítico	2997.69	---	---	---	0.94	No Sumergida	0.01	1.06	0.00	1298.29	1297.75	0.13				Energía
P073-P074	P073	P074	0.47	1.20	Supercrítico	2096.99	---	---	---	0.77	No Sumergida	0.02	0.95	0.25	1297.62	1297.36	-0.01				Batea
P074-P075	P074	P075	0.52	1.20	Supercrítico	38.04	---	---	---	0.85	Sumergida	0.04	1.81	0.00	1297.37	1296.85	0.02				Energía
P075-P076	P075	P076	0.55	1.20	Supercrítico	1.78	---	---	---	0.90	Sumergida	0.06	1.81	0.91	1296.83	1296.27	0.69				Energía
P076-P077	P076	P077	0.58	1.20	Supercrítico	1.29	---	---	---	0.95	No Sumergida	0.05	1.60	0.00	1295.57	1295.06	0.30	1295.58	0.01	0.77	Energía

CONSORCIO PROSPERIDAD 2015			CONSTRUCCIÓN Y OPTIMIZACIÓN DEL SISTEMA DE ALCANTARILLADO SANITARIO Y PLUVIAL Y SISTEMA DE TRATAMIENTO DE AGUAS RESIDUALES DEL MUNICIPIO DE CHARALÁ, DEPARTAMENTO DE SANTANDER - ETAPA I																	 Financiera del Desarrollo		
			CONTRATO PAF-ATF-O-137-2015																			
			CONSULTOR CONSORCIO PROSPERIDAD 2015 - MUNICIPIO DE CHARALÁ																			
			ANÁLISIS DE EMPATES EN LA RED DE ALCANTARILLADO PLUVIAL PROYECTADA																			
			Tramo	Pozo Inicial	Pozo Final	Yc (m)	Diámetro Pozo Final (m)	Tipo de Flujo	Análisis Subcrítico				Análisis Supercrítico				Caída al Final del Tramo (m)	Línea de Energía Inicial	Línea de Energía Final			Δ Línea de Energía (m)
R <sub>c</sub> /Øs	ΔHc (m)	K <sub>k</sub>	ΔHe (m)	Yc/D	Tipo de Entrada	He (m)	Hw (m)	Línea de Energía Inicial	Línea de Energía Final	Δ Línea de Energía (m)	Línea de Energía Afluente Mínimo (m)	Δ Línea de Energía Afluente (m)	Caída Afluente Mínima Batea (m)	Tipo de Empate								
P077-P078	P077	P078	0.59	1.20	Supercrítico	1.33	---	---	---	0.76	No Sumergida	0.03	1.28	0.02	1294.76	1294.36	0.01					Energía
P078-32P	P078	32P	0.61	1.20	Subcrítico	1.15	0.13	##	0.37	0.68	---	---	---	0.56	1294.36	1294.24	0.34	1295.89	1.54	2.06		Energía
32P-DP5	32P	DP5	0.73	Descarga	Supercrítico		---	---	---	0.81	---	---	---	0.00	1293.89	1293.63		1294.98	1.08	1.55		Energía
P079-P076	P079	P076	0.20	1.20	Supercrítico	78.40	---	---	---	0.80	---	---	---	0.00	1296.57	1295.58						Energía
P080-P078	P080	P078	0.25	1.20	Supercrítico	162.76	---	---	---	0.79	---	---	---	0.00	1296.41	1295.89						Energía
P081-30P	P081	30P	0.30	1.20	Supercrítico	7.97	---	---	---	0.98	Sumergida	0.01	0.39	0.09	1298.37	1295.83	0.00					Energía
30P-31P	30P	31P	0.37	1.20	Supercrítico	6.10	---	---	---	0.97	Sumergida	0.02	0.60	0.00	1295.83	1295.65	0.27					Energía
31P-32P	31P	32P	0.40	1.20	Supercrítico	1.55	---	---	---	0.86	---	---	---	0.00	1295.38	1294.98						Energía
P082-32P	P082	32P	0.21	1.20	Supercrítico	19.29	---	---	---	0.86	---	---	---	0.00	1297.69	1296.33						Energía
P083-P084	P083	P084	0.25	1.20	Supercrítico	11.71	---	---	---	1.00	Sumergida	0.01	0.39	0.00	1288.43	1281.33	0.42					Energía
P084-P085	P084	P085	0.38	1.20	Supercrítico	7.01	---	---	---	0.99	Sumergida	0.03	0.60	0.22	1280.91	1280.63	0.72					Energía
P085-P086	P085	P086	0.43	1.20	Supercrítico	2400.70	---	---	---	0.94	No Sumergida	0.01	1.05	0.00	1279.91	1279.17	0.15					Energía
P086-P087	P086	P087	0.46	1.20	Supercrítico	4.75	---	---	---	0.76	No Sumergida	0.02	0.93	0.00	1279.02	1278.93	0.00					Energía
P087-DP6	P087	DP6	0.46	Descarga	Supercrítico		---	---	---	0.76	---	---	---	0.00	1278.93	1278.91						Energía
P088-P089	P088	P089	0.37	1.20	Supercrítico	7.62	---	---	---	0.96	Sumergida	0.02	0.39	0.00	1280.16	1279.11	0.06					Energía
P089-DP7	P089	DP7	0.37	Descarga	Supercrítico		---	---	---	0.96	---	---	---	0.00	1279.05	1278.85						Energía
P090-P091	P090	P091	0.22	1.20	Supercrítico	130.59	---	---	---	0.72	No Sumergida	0.00	0.39	0.98	1276.97	1276.66	0.76					Energía
P091-P092	P091	P092	0.36	1.20	Supercrítico	713.79	---	---	---	0.78	No Sumergida	0.01	0.67	0.28	1275.90	1275.56	0.03					Energía
P092-P093	P092	P093	0.43	1.20	Supercrítico	1.97	---	---	---	0.92	No Sumergida	0.01	0.99	0.02	1275.53	1274.89	0.06					Energía
P093-P094	P093	P094	0.49	1.20	Supercrítico	4.75	---	---	---	0.81	Sumergida	0.03	1.81	0.00	1274.83	1274.44	0.00					Energía
P094-DP8	P094	DP8	0.49	Descarga	Supercrítico		---	---	---	0.81	---	---	---	0.00	1274.44	1274.35						Energía
P095-P096	P095	P096	0.20	1.20	Supercrítico	768.95	---	---	---	0.81	No Sumergida	0.00	0.37	0.13	1282.81	1281.66	0.06					Energía
P096-P097	P096	P097	0.31	1.20	Supercrítico	2.41	---	---	---	0.82	No Sumergida	0.00	0.58	0.68	1281.60	1281.25	0.00					Energía
P097-P098	P097	P098	0.45	1.20	Supercrítico	182.58	---	---	---	0.97	Sumergida	0.06	0.60	1.02	1281.25	1278.97	0.00	1282.76	1.52	1.95		Energía
P098-P099	P098	P099	0.46	1.20	Supercrítico	7.95	---	---	---	1.00	Sumergida	0.18	0.60	1.36	1278.97	1276.88	0.00					Energía
P099-DP9	P099	DP9	0.46	Descarga	Supercrítico		---	---	---	1.00	---	---	---	0.00	1276.88	1275.16						Energía
P100-P097	P100	P097	0.27	1.20	Supercrítico	2.82	---	---	---	0.87	---	---	---	0.00	1286.26	1282.76						Energía
P101-P102	P101	P102	0.25	1.20	Supercrítico	156.58	---	---	---	0.99	Sumergida	0.01	0.22	0.45	1286.28	1281.18	0.00					Energía

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			CONSULTOR CONSORCIO PROSPERIDAD 2015 - MUNICIPIO DE CHARALÁ																			
			ANÁLISIS DE EMPATES EN LA RED DE ALCANTARILLADO PLUVIAL PROYECTADA																			
			Tramo	Pozo Inicial	Pozo Final	Yc (m)	Diametro Pozo Final (m)	Tipo de Flujo	Análisis Subcrítico				Análisis Supercrítico				Caída al Final del Tramo (m)	Línea de Energía Inicial	Línea de Energía Final			Δ Línea de Energía (m)
R <sub>c</sub> /Øs	ΔH <sub>c</sub> (m)	K <sub>k</sub>	ΔHe (m)	Y <sub>c</sub> /D	Tipo de Entrada	He (m)	Hw (m)	Línea de Energía Inicial	Línea de Energía Final	Δ Línea de Energía (m)	Línea de Energía Afluente Mínimo (m)	Δ Línea de Energía Afluente (m)	Caída Afluente Mínima Batea (m)	Tipo de Empate								
P102-P103	P102	P103	0.25	1.20	Supercrítico	44.78	---	---	---	0.99	Sumergida	0.00	0.28	0.60	1281.18	1275.60	0.00					Energía
P103-P104	P103	P104	0.31	1.20	Supercrítico	22.72	---	---	---	1.00	Sumergida	0.08	0.28	0.00	1275.61	1273.33	0.15					Energía
P104-P105	P104	P105	0.31	1.20	Supercrítico	71.80	---	---	---	1.00	Sumergida	0.08	0.28	0.11	1273.18	1270.83	0.00					Energía
P105-P106	P105	P106	0.31	1.20	Supercrítico	9.22	---	---	---	1.00	Sumergida	0.04	0.39	2.50	1270.83	1268.63	0.00					Energía
P106-P107	P106	P107	0.37	1.20	Supercrítico	723736.16	---	---	---	0.98	Sumergida	0.04	0.39	2.23	1268.62	1264.89	2.23					Energía
P107-P108	P107	P108	0.37	1.20	Supercrítico	603113.47	---	---	---	0.98	Sumergida	0.04	0.39	1.59	1262.66	1259.11	1.59					Energía
P108-P109	P108	P109	0.37	1.20	Supercrítico	904670.20	---	---	---	0.98	Sumergida	0.04	0.39	0.00	1257.52	1251.61	2.31					Energía
P109-DP10	P109	DP10	0.37	Descarga	Supercrítico		---	---	---	0.98	---	---	---	0.00	1249.30	1247.80						Energía
P117-P118	P117	P118	0.27	1.20	Supercrítico	3.73	---	---	---	0.71	No Sumergida	0.00	0.47	0.08	1275.09	1274.86	0.00					Energía
P118-P119	P118	P119	0.29	1.20	Supercrítico	883.89	---	---	---	0.75	No Sumergida	0.00	0.52	0.61	1274.86	1273.85	0.00					Energía
P119-P120	P119	P120	0.37	1.20	Supercrítico	131.18	---	---	---	0.96	Sumergida	0.01	0.60	0.57	1273.84	1270.99	0.00					Energía
P120-P121	P120	P121	0.44	1.20	Supercrítico	3887.31	---	---	---	0.95	Sumergida	0.04	0.60	0.00	1271.00	1268.42	0.65					Energía
P121-P122	P121	P122	0.44	1.20	Supercrítico	493.53	---	---	---	0.96	Sumergida	0.04	0.60	0.58	1267.76	1266.69	0.00					Energía
P122-P123	P122	P123	0.45	1.20	Supercrítico	10.75	---	---	---	0.99	Sumergida	0.10	0.60	3.24	1266.70	1263.90	0.00					Energía
P123-P124	P123	P124	0.46	1.20	Supercrítico	16071.75	---	---	---	0.99	Sumergida	0.14	0.60	2.29	1263.89	1259.74	2.29					Energía
P124-DP11	P124	DP11	0.46	Descarga	Supercrítico		---	---	---	0.99	---	---	---	0.00	1257.45	1254.35						Energía
P125-P126	P125	P126	0.21	1.20	Supercrítico	33.88	---	---	---	0.84	Sumergida	0.00	0.22	0.41	1284.39	1282.64	0.00					Energía
P126-P127	P126	P127	0.25	1.20	Supercrítico	32.63	---	---	---	0.99	Sumergida	0.01	0.28	0.30	1282.64	1280.99	0.00					Energía
P127-P128	P127	P128	0.30	1.20	Supercrítico	7.39	---	---	---	0.97	Sumergida	0.01	0.28	0.20	1280.99	1279.29	0.00					Energía
P128-P129	P128	P129	0.31	1.20	Supercrítico	163.45	---	---	---	0.99	Sumergida	0.02	0.28	0.00	1279.29	1277.74	0.25					Energía
P129-P130	P129	P130	0.31	1.20	Supercrítico	9.69	---	---	---	0.99	No Sumergida	0.01	1.10	1.74	1277.49	1273.01	0.90					Energía
P130-P131	P130	P131	0.45	1.20	Supercrítico	8.36	---	---	---	0.99	Sumergida	0.10	0.60	0.14	1272.10	1271.04	0.00	1272.11	0.00	0.88		Energía
P131-P132	P131	P132	0.45	1.20	Supercrítico	12.31	---	---	---	0.99	Sumergida	0.10	0.60	0.01	1271.04	1269.58	0.00					Energía
P132-P133	P132	P133	0.45	1.20	Supercrítico	4.16	---	---	---	0.99	Sumergida	0.10	0.60	0.50	1269.58	1266.22	0.02					Energía
P133-P134	P133	P134	0.46	1.20	Supercrítico	16.28	---	---	---	0.99	Sumergida	0.13	0.60	0.00	1266.20	1259.50	0.47					Energía
P134-P135	P134	P135	0.46	1.20	Supercrítico	18.47	---	---	---	0.99	Sumergida	0.13	0.60	0.31	1259.02	1255.12	0.00					Energía
P135-P136	P135	P136	0.46	1.20	Supercrítico	234.89	---	---	---	0.99	Sumergida	0.06	1.81	0.15	1255.12	1253.73	0.48					Energía
P136-P137	P136	P137	0.59	1.20	Supercrítico	11.14	---	---	---	0.96	Sumergida	0.12	1.81	2.76	1253.25	1249.95	0.03	1256.30	3.05	0.36		Energía
P137-P146	P137	P146	0.59	1.20	Supercrítico	2254260.18	---	---	---	0.96	Sumergida	0.12	1.81	1.29	1249.92	1247.20	1.29					Energía
P146-DP12	P146	DP12	0.59	Descarga	Supercrítico		---	---	---	0.96	---	---	---	0.00	1245.91	1244.68						Energía
P138-P139	P138	P139	0.15	1.20	Supercrítico	4.92	---	---	---	0.59	No Sumergida	0.00	0.25	0.01	1278.85	1277.50	0.00					Energía
P139-P140	P139	P140	0.21	1.20	Supercrítico	6.16	---	---	---	0.85	No Sumergida	0.00	0.41	0.64	1277.51	1275.39	0.00					Energía
P140-P130	P140	P130	0.31	1.20	Supercrítico	36.49	---	---	---	0.99	---	---	---	0.00	1275.39	1272.11		1275.57	0.19	0.52		Energía
P141-P140	P141	P140	0.24	1.20	Supercrítico	17.15	---	---	---	0.95	---	---	---	0.00	1277.22	1275.57						Energía
P142-P143	P142	P143	0.25	1.20	Supercrítico	6.99	---	---	---	0.99	Sumergida	0.01	0.22	4.13	1273.28	1271.33	0.74					Energía
P143-P145	P143	P145	0.25	1.20	Supercrítico	343774.68	---	---	---	1.00	Sumergida	0.07	0.22	4.25	1270.59	1269.32	3.83	1270.59	0.00	4.08		Energía
P145-P147	P145	P147	0.25	1.20	Supercrítico	500035.89	---	---	---	1.00	Sumergida	0.07	0.22	4.81	1265.50	1264.25	4.81					Energía
P147-P136	P147	P136	0.25	1.20	Supercrítico	2.14	---	---	---	1.00	---	---	---	0.00	1259.44	1256.30						Energía
P144-P143	P144	P143	0.17	1.20	Supercrítico	5.57	---	---	---	0.67	---	---	---	0.00	1270.79	1270.59						Energía

CONSORCIO PROSPERIDAD 2015		CONSTRUCCIÓN Y OPTIMIZACIÓN DEL SISTEMA DE ALCANTARILLADO SANITARIO Y PLUVIAL Y SISTEMA DE TRATAMIENTO DE AGUAS RESIDUALES DEL MUNICIPIO DE CHARALÁ, DEPARTAMENTO DE SANTANDER - ETAPA I					 Financiera del Desarrollo
		CONTRATO PAF-ATF-O-137-2015					
		CONSULTOR CONSORCIO PROSPERIDAD 2015 - MUNICIPIO DE CHARALÁ					
		TOPOLOGÍA DE ESTRUCTURAS DE LA RED DE ALCANTARILLADO PLUVIAL PROYECTADO					
Pozo	Coordenada Este (m)	Coordenada Norte (m)	Elevación (msnm)	Profundidad (m)	Cota Batea (msnm)	Diámetro Estructura (m)	Tipo de Estructura
1P	1,103,168.32	1,186,655.04	1,289.00	1.90	1,287.10	1.50	Existente
2P	1,103,155.56	1,186,666.78	1,289.20	2.39	1,286.81	1.50	Existente
3P	1,103,128.91	1,186,669.89	1,288.51	1.99	1,286.52	1.50	Existente
4P	1,103,122.70	1,186,690.08	1,288.25	2.10	1,286.15	1.50	Existente
5P	1,103,115.53	1,186,727.07	1,287.90	2.27	1,285.63	1.50	Existente
6P	1,103,067.11	1,186,729.79	1,286.57	1.64	1,284.93	1.50	Existente
7P	1,103,057.55	1,186,757.84	1,285.93	1.40	1,284.53	1.50	Existente
8P	1,103,022.12	1,186,760.94	1,285.66	1.84	1,283.82	1.50	Existente
9P	1,102,960.78	1,186,766.35	1,283.68	1.85	1,281.83	1.50	Existente
10P	1,102,929.19	1,186,767.49	1,283.52	2.64	1,280.88	1.50	Existente
11P	1,102,909.11	1,186,767.16	1,279.83	2.90	1,276.93	1.50	Existente
P001	1,102,900.67	1,186,767.28	1,278.45	1.95	1,276.50	1.50	Proyectado
12P	1,102,881.05	1,186,767.56	1,277.88	2.37	1,275.51	1.50	Existente
13P	1,102,830.32	1,186,768.01	1,274.91	1.61	1,273.30	1.50	Existente
P002	1,102,822.18	1,186,768.56	1,274.80	5.82	1,268.98	2.00	Proyectado
14P	1,102,806.27	1,186,769.62	1,274.50	5.66	1,268.84	2.00	Proyectado
15P	1,102,763.79	1,186,778.67	1,271.65	4.96	1,266.69	2.00	Proyectado
P003	1,102,727.11	1,186,785.35	1,267.45	4.78	1,262.67	2.00	Proyectado
15PA	1,102,682.35	1,186,793.50	1,263.44	2.94	1,260.50	2.00	Proyectado
15PB	1,102,631.91	1,186,802.69	1,262.45	4.54	1,257.91	2.00	Proyectado
DP1	1,102,603.38	1,186,787.37	1,257.80	1.20	1,256.60	Descarga	Existente
P004	1,103,062.68	1,186,697.53	1,286.75	1.05	1,285.70	1.20	Proyectado
P005	1,103,058.81	1,186,729.11	1,286.40	1.09	1,285.31	1.20	Proyectado
P006	1,103,144.67	1,186,756.39	1,289.40	1.46	1,287.94	1.20	Proyectado
P007	1,103,062.29	1,186,761.82	1,285.98	0.87	1,285.11	1.20	Proyectado
P008	1,102,902.39	1,186,756.85	1,279.05	1.31	1,277.74	1.20	Proyectado
P009	1,103,246.21	1,187,126.51	1,280.70	2.08	1,278.62	1.20	Proyectado
P010	1,103,173.36	1,187,130.76	1,279.00	1.47	1,277.53	1.20	Proyectado
P011	1,103,153.38	1,187,131.92	1,279.10	2.47	1,276.63	1.20	Proyectado
P012	1,103,062.58	1,187,136.70	1,278.30	3.49	1,274.81	1.20	Proyectado
P013	1,103,058.03	1,187,136.94	1,278.25	3.50	1,274.75	1.20	Proyectado
17P	1,103,058.02	1,187,047.56	1,277.00	3.07	1,273.93	1.50	Proyectado
18P	1,103,017.53	1,187,051.02	1,276.62	2.94	1,273.68	1.50	Proyectado
P112	1,102,969.91	1,187,053.41	1,277.55	4.48	1,273.07	1.50	Proyectado
21P	1,102,970.91	1,186,995.93	1,275.92	3.27	1,272.65	1.50	Proyectado
22P	1,102,971.38	1,186,986.37	1,275.83	3.26	1,272.57	1.50	Proyectado
P014	1,102,967.47	1,186,944.56	1,277.30	5.20	1,272.10	1.50	Proyectado
P111	1,102,901.09	1,186,955.64	1,274.72	3.12	1,271.60	1.50	Proyectado
P015	1,102,846.87	1,186,963.11	1,276.60	5.35	1,271.25	1.50	Proyectado
P016	1,102,833.52	1,186,874.49	1,274.30	4.03	1,270.27	1.50	Proyectado
P110	1,102,826.56	1,186,807.17	1,272.65	3.17	1,269.48	1.50	Proyectado
P017	1,103,022.77	1,187,138.76	1,279.30	1.25	1,278.05	1.20	Proyectado
P018	1,103,239.63	1,187,029.76	1,293.10	1.25	1,291.85	1.20	Proyectado
P019	1,103,178.38	1,187,037.19	1,283.60	1.76	1,281.84	1.20	Proyectado
P020	1,103,151.27	1,187,040.44	1,280.40	1.38	1,279.02	1.20	Proyectado
P021	1,103,062.81	1,187,047.19	1,277.00	2.38	1,274.62	1.20	Proyectado
P022	1,103,056.74	1,186,989.95	1,278.30	1.25	1,277.05	1.20	Proyectado
P023	1,102,778.40	1,187,150.35	1,284.90	1.38	1,283.52	1.20	Proyectado
P024	1,102,867.53	1,187,147.79	1,284.00	2.23	1,281.77	1.20	Proyectado
P025	1,102,969.10	1,187,144.13	1,283.45	3.92	1,279.53	1.20	Proyectado
P026	1,102,766.21	1,187,060.25	1,282.80	1.31	1,281.49	1.20	Proyectado
P027	1,102,862.12	1,187,059.14	1,279.10	1.59	1,277.51	1.20	Proyectado
19P	1,103,013.96	1,187,044.31	1,276.72	1.36	1,275.36	1.50	Existente
20P	1,102,999.78	1,186,997.24	1,276.26	1.22	1,275.04	1.50	Existente
22PA	1,103,052.48	1,186,989.81	1,278.20	1.60	1,276.60	1.20	Existente
22PB	1,102,998.31	1,186,996.07	1,276.32	1.86	1,274.46	1.20	Existente
P028	1,103,233.46	1,186,918.58	1,293.70	0.88	1,292.82	1.20	Proyectado
P029	1,103,191.04	1,186,926.55	1,288.40	1.38	1,287.02	1.20	Proyectado
P030	1,103,143.64	1,186,929.29	1,284.75	1.46	1,283.29	1.20	Proyectado
P031	1,103,059.15	1,186,936.66	1,280.85	2.32	1,278.53	1.20	Proyectado
P032	1,103,200.26	1,186,863.14	1,297.50	1.38	1,296.12	1.20	Proyectado
P033	1,103,193.96	1,186,833.56	1,299.00	5.76	1,293.24	1.20	Proyectado
P113	1,103,182.45	1,186,835.40	1,292.75	2.09	1,290.66	1.20	Proyectado
P034	1,103,159.49	1,186,839.07	1,287.00	2.82	1,284.18	1.20	Proyectado
P035	1,103,048.44	1,186,840.77	1,284.45	2.52	1,281.93	1.20	Proyectado
P036	1,102,958.90	1,186,857.09	1,282.70	4.61	1,278.09	1.20	Proyectado

CONSORCIO PROSPERIDAD 2015		CONSTRUCCIÓN Y OPTIMIZACIÓN DEL SISTEMA DE ALCANTARILLADO SANITARIO Y PLUVIAL Y SISTEMA DE TRATAMIENTO DE AGUAS RESIDUALES DEL MUNICIPIO DE CHARALÁ, DEPARTAMENTO DE SANTANDER - ETAPA I					 Financiera del Desarrollo
		CONTRATO PAF-ATF-O-137-2015					
		CONSULTOR CONSORCIO PROSPERIDAD 2015 - MUNICIPIO DE CHARALÁ					
TOPOLOGÍA DE ESTRUCTURAS DE LA RED DE ALCANTARILLADO PLUVIAL PROYECTADO							
Pozo	Coordenada Este (m)	Coordenada Norte (m)	Elevación (msnm)	Profundidad (m)	Cota Batea (msnm)	Diámetro Estructura (m)	Tipo de Estructura
P037	1,102,907.49	1,186,864.12	1,275.00	1.61	1,273.39	1.20	Proyectado
P038	1,102,865.30	1,186,869.86	1,273.40	1.77	1,271.63	1.50	Proyectado
P039	1,102,753.86	1,186,970.61	1,276.30	1.38	1,274.92	1.20	Proyectado
P040	1,102,740.62	1,186,882.88	1,276.05	2.79	1,273.26	1.20	Proyectado
P041	1,102,733.76	1,186,835.01	1,274.50	3.52	1,270.98	1.20	Proyectado
P042	1,102,728.78	1,186,797.76	1,267.95	2.53	1,265.42	1.20	Proyectado
P043	1,102,685.40	1,187,147.28	1,278.60	1.31	1,277.29	1.20	Proyectado
P044	1,103,146.95	1,186,518.73	1,292.75	1.38	1,291.37	1.20	Proyectado
P045	1,103,139.70	1,186,521.17	1,291.90	1.46	1,290.44	1.20	Proyectado
P046	1,103,149.29	1,186,544.67	1,290.75	1.52	1,289.23	1.20	Proyectado
P047	1,103,153.73	1,186,566.87	1,290.30	2.16	1,288.14	1.20	Proyectado
P048	1,103,156.03	1,186,624.78	1,289.25	2.92	1,286.33	1.20	Proyectado
P049	1,103,078.34	1,186,633.19	1,287.45	2.74	1,284.71	1.20	Proyectado
P050	1,102,981.07	1,186,639.97	1,287.25	3.95	1,283.30	1.50	Proyectado
P051	1,102,994.73	1,186,571.81	1,287.65	4.76	1,282.89	1.50	Proyectado
P052	1,102,999.83	1,186,540.65	1,285.55	3.30	1,282.25	1.50	Proyectado
DP3	1,102,963.06	1,186,543.01	1,282.26	0.78	1,281.48	Descarga	Existente
P053	1,103,080.72	1,186,571.79	1,288.90	1.31	1,287.59	1.20	Proyectado
23P	1,103,035.87	1,186,579.04	1,286.97	0.96	1,286.01	1.20	Existente
24P	1,103,027.47	1,186,543.25	1,287.29	2.12	1,285.17	1.20	Proyectado
25P	1,103,001.60	1,186,540.54	1,285.00	1.31	1,283.69	1.20	Proyectado
P054	1,103,145.24	1,186,447.56	1,295.10	1.46	1,293.64	1.20	Proyectado
P055	1,103,132.01	1,186,459.91	1,293.90	1.61	1,292.29	1.20	Proyectado
26P	1,103,045.63	1,186,491.18	1,289.49	1.60	1,287.89	1.20	Existente
27P	1,102,991.40	1,186,524.22	1,286.01	2.54	1,283.47	1.50	Proyectado
28P	1,102,962.67	1,186,540.88	1,284.82	2.44	1,282.38	1.50	Proyectado
DP4	1,102,954.75	1,186,534.84	1,282.83	0.78	1,282.05	Descarga	Existente
P056	1,103,015.86	1,186,400.66	1,292.70	1.31	1,291.39	1.20	Proyectado
P057	1,102,981.27	1,186,404.31	1,291.30	1.43	1,289.87	1.20	Proyectado
P058	1,102,959.48	1,186,406.61	1,290.40	1.46	1,288.94	1.20	Proyectado
P059	1,102,960.87	1,186,489.58	1,287.80	1.70	1,286.10	1.20	Proyectado
P060	1,102,903.02	1,186,647.60	1,287.40	1.31	1,286.09	1.20	Proyectado
P061	1,102,855.90	1,186,657.13	1,287.35	1.67	1,285.68	1.20	Proyectado
P062	1,102,804.58	1,186,667.43	1,286.60	1.56	1,285.04	1.20	Proyectado
P063	1,102,778.13	1,186,670.62	1,285.85	2.62	1,283.23	1.20	Proyectado
P064	1,102,711.18	1,186,689.42	1,273.10	1.31	1,271.79	1.20	Proyectado
P065	1,102,682.89	1,186,696.37	1,270.15	1.31	1,268.84	1.20	Proyectado
P066	1,102,622.05	1,186,711.25	1,268.10	2.67	1,265.43	1.20	Proyectado
P067	1,102,580.53	1,186,704.54	1,263.25	4.09	1,259.16	1.20	Proyectado
DP2	1,102,551.12	1,186,706.41	1,249.25	0.31	1,248.94	Descarga	Existente
P068	1,102,586.40	1,185,474.67	1,300.75	1.25	1,299.50	1.20	Proyectado
P069	1,102,599.10	1,185,504.10	1,300.45	1.66	1,298.79	1.20	Proyectado
P070	1,102,612.77	1,185,533.17	1,300.70	2.28	1,298.42	1.20	Proyectado
P071	1,102,626.70	1,185,562.17	1,300.45	2.46	1,297.99	1.20	Proyectado
P072	1,102,639.96	1,185,590.21	1,299.90	2.47	1,297.43	1.20	Proyectado
P073	1,102,653.82	1,185,618.98	1,299.80	2.91	1,296.89	1.20	Proyectado
P074	1,102,667.79	1,185,647.89	1,299.45	3.07	1,296.38	1.20	Proyectado
P075	1,102,682.23	1,185,677.63	1,298.80	2.94	1,295.86	1.20	Proyectado
P076	1,102,699.23	1,185,724.36	1,298.15	3.76	1,294.39	1.20	Proyectado
P077	1,102,727.57	1,185,710.81	1,298.00	4.12	1,293.88	1.50	Proyectado
P078	1,102,745.99	1,185,780.82	1,296.85	3.39	1,293.46	1.50	Proyectado
32P	1,102,788.31	1,185,769.68	1,296.99	4.21	1,292.78	1.50	Proyectado
DP5	1,102,793.43	1,185,814.37	1,294.50	1.98	1,292.52	Descarga	Existente
P079	1,102,667.96	1,185,741.30	1,297.40	1.25	1,296.15	1.20	Proyectado
P080	1,102,681.86	1,185,796.58	1,297.35	1.31	1,296.04	1.20	Proyectado
P081	1,102,812.17	1,185,678.76	1,298.85	1.31	1,297.54	1.20	Proyectado
30P	1,102,831.39	1,185,753.12	1,297.29	2.38	1,294.91	1.20	Proyectado
31P	1,102,828.15	1,185,759.04	1,297.12	2.39	1,294.73	1.20	Proyectado
P082	1,102,769.69	1,185,697.37	1,298.35	1.05	1,297.30	1.20	Proyectado
P083	1,103,332.34	1,187,059.55	1,287.92	1.25	1,286.67	1.20	Proyectado
P084	1,103,338.44	1,187,115.38	1,280.45	0.88	1,279.57	1.20	Proyectado
P085	1,103,335.92	1,187,121.05	1,280.30	1.23	1,279.07	1.20	Proyectado
P086	1,103,349.19	1,187,164.84	1,279.70	1.37	1,278.33	1.20	Proyectado
P087	1,103,353.80	1,187,179.96	1,279.60	1.36	1,278.24	1.20	Proyectado
DP6	1,103,357.49	1,187,181.93	1,279.50	1.28	1,278.22	Descarga	Existente
P088	1,103,358.51	1,187,208.76	1,280.25	1.38	1,278.87	1.20	Proyectado

CONSORCIO PROSPERIDAD 2015		CONSTRUCCIÓN Y OPTIMIZACIÓN DEL SISTEMA DE ALCANTARILLADO SANITARIO Y PLUVIAL Y SISTEMA DE TRATAMIENTO DE AGUAS RESIDUALES DEL MUNICIPIO DE CHARALÁ, DEPARTAMENTO DE SANTANDER - ETAPA I					 Findeter Financiera del Desarrollo
		CONTRATO PAF-ATF-O-137-2015					
		CONSULTOR CONSORCIO PROSPERIDAD 2015 - MUNICIPIO DE CHARALÁ					
		TOPOLOGÍA DE ESTRUCTURAS DE LA RED DE ALCANTARILLADO PLUVIAL PROYECTADO					
Pozo	Coordenada Este (m)	Coordenada Norte (m)	Elevación (msnm)	Profundidad (m)	Cota Batea (msnm)	Diámetro Estructura (m)	Tipo de Estructura
P089	1,103,338.98	1,187,210.03	1,279.20	1.38	1,277.82	1.20	Proyectado
DP7	1,103,335.87	1,187,207.31	1,278.00	0.38	1,277.62	Descarga	Existente
P090	1,103,291.59	1,187,212.94	1,277.95	1.31	1,276.64	1.20	Proyectado
P091	1,103,247.37	1,187,215.09	1,277.75	2.40	1,275.35	1.20	Proyectado
P092	1,103,198.04	1,187,219.47	1,276.90	2.17	1,274.73	1.20	Proyectado
P093	1,103,154.14	1,187,223.69	1,278.85	4.78	1,274.07	1.20	Proyectado
P094	1,103,159.69	1,187,282.69	1,277.30	3.62	1,273.68	1.20	Proyectado
DP8	1,103,150.51	1,187,293.77	1,274.50	0.91	1,273.59	Descarga	Existente
P095	1,103,061.70	1,187,234.52	1,283.65	1.25	1,282.40	1.20	Proyectado
P096	1,103,017.39	1,187,236.48	1,282.50	1.38	1,281.12	1.20	Proyectado
P097	1,102,973.81	1,187,238.04	1,283.35	3.26	1,280.09	1.20	Proyectado
P098	1,102,983.74	1,187,322.91	1,280.75	3.96	1,276.79	1.20	Proyectado
P099	1,102,986.77	1,187,357.31	1,276.75	3.41	1,273.34	1.20	Proyectado
DP9	1,102,996.04	1,187,367.83	1,272.08	0.46	1,271.62	Descarga	Existente
P100	1,102,889.36	1,187,241.32	1,286.85	1.31	1,285.54	1.20	Proyectado
P101	1,102,790.92	1,187,245.32	1,286.30	1.25	1,285.05	1.20	Proyectado
P102	1,102,804.28	1,187,298.23	1,281.20	1.70	1,279.50	1.20	Proyectado
P103	1,102,815.63	1,187,333.82	1,274.75	1.43	1,273.32	1.20	Proyectado
P104	1,102,824.66	1,187,351.11	1,272.35	1.31	1,271.04	1.20	Proyectado
P105	1,102,840.68	1,187,366.11	1,270.40	1.82	1,268.58	1.20	Proyectado
P106	1,102,856.07	1,187,377.68	1,267.69	3.81	1,263.88	1.20	Proyectado
P107	1,102,859.09	1,187,388.72	1,261.75	3.83	1,257.92	1.20	Proyectado
P108	1,102,861.96	1,187,399.24	1,255.75	2.97	1,252.78	1.20	Proyectado
P109	1,102,866.74	1,187,416.75	1,248.25	1.38	1,246.87	1.20	Proyectado
DP10	1,102,869.96	1,187,428.55	1,245.75	0.38	1,245.37	Descarga	Existente
P114	1,102,673.87	1,187,062.09	1,276.45	1.73	1,274.72	1.20	Proyectado
P115	1,102,658.51	1,186,972.81	1,274.00	2.83	1,271.17	1.20	Proyectado
P116	1,102,647.93	1,186,900.79	1,269.90	3.06	1,266.84	1.20	Proyectado
P117	1,102,616.77	1,187,057.86	1,275.80	1.10	1,274.70	1.20	Proyectado
P118	1,102,579.68	1,187,057.19	1,276.05	1.66	1,274.39	1.20	Proyectado
P119	1,102,567.50	1,186,974.78	1,275.45	2.68	1,272.77	1.20	Proyectado
P120	1,102,557.31	1,186,902.28	1,271.30	1.95	1,269.35	1.20	Proyectado
P121	1,102,549.45	1,186,858.94	1,268.95	2.18	1,266.77	1.20	Proyectado
P122	1,102,540.37	1,186,809.22	1,267.70	2.58	1,265.12	1.20	Proyectado
P123	1,102,528.64	1,186,740.96	1,264.00	4.92	1,259.08	1.20	Proyectado
DP11	1,102,539.46	1,186,706.72	1,250.00	0.46	1,249.54	Descarga	Existente
P124	1,102,534.83	1,186,721.36	1,257.75	5.11	1,252.64	1.20	Proyectado
P125	1,103,390.83	1,187,336.59	1,285.20	1.25	1,283.95	1.20	Proyectado
P126	1,103,412.54	1,187,397.49	1,283.45	1.66	1,281.79	1.20	Proyectado
P127	1,103,432.27	1,187,424.90	1,281.60	1.76	1,279.84	1.20	Proyectado
P128	1,103,452.20	1,187,442.06	1,279.45	1.51	1,277.94	1.20	Proyectado
P129	1,103,473.93	1,187,436.40	1,277.70	1.31	1,276.39	1.20	Proyectado
P130	1,103,562.72	1,187,408.74	1,273.33	3.16	1,270.17	1.20	Proyectado
P131	1,103,580.82	1,187,412.87	1,271.40	2.43	1,268.97	1.20	Proyectado
P132	1,103,596.31	1,187,429.78	1,269.50	2.00	1,267.50	1.20	Proyectado
P133	1,103,613.06	1,187,479.65	1,265.60	1.96	1,263.64	1.20	Proyectado
P134	1,103,554.77	1,187,536.69	1,258.40	1.46	1,256.94	1.20	Proyectado
P135	1,103,524.86	1,187,594.37	1,254.50	1.77	1,252.73	1.20	Proyectado
P136	1,103,511.92	1,187,608.02	1,252.80	1.61	1,251.19	1.20	Proyectado
P137	1,103,461.09	1,187,659.82	1,249.50	4.37	1,245.13	1.20	Proyectado
DP12	1,103,451.48	1,187,680.98	1,240.50	0.61	1,239.89	Descarga	Existente
P138	1,103,434.48	1,187,326.62	1,279.70	1.25	1,278.45	1.20	Proyectado
P139	1,103,459.00	1,187,317.86	1,278.35	1.26	1,277.09	1.20	Proyectado
P140	1,103,491.75	1,187,402.96	1,276.10	1.77	1,274.33	1.20	Proyectado
P141	1,103,461.57	1,187,414.41	1,277.75	1.25	1,276.50	1.20	Proyectado
P142	1,103,518.24	1,187,566.74	1,273.60	1.25	1,272.35	1.20	Proyectado
P143	1,103,502.14	1,187,596.65	1,271.65	5.38	1,266.27	1.20	Proyectado
P144	1,103,477.58	1,187,612.14	1,271.80	1.25	1,270.55	1.20	Proyectado
P145	1,103,504.56	1,187,599.46	1,266.25	5.50	1,260.75	1.20	Proyectado
P146	1,103,454.47	1,187,674.40	1,245.50	4.38	1,241.12	1.20	Proyectado
P147	1,103,506.66	1,187,601.90	1,259.75	5.06	1,254.69	1.20	Proyectado
P013A	1,103,058.03	1,187,129.39	1,278.10	3.40	1,274.70	1.20	Proyectado
18PA	1,103,010.57	1,187,051.37	1,276.90	3.26	1,273.64	1.50	Proyectado