



RSK ENVIRONMENT LIMITED

UBB, London

TW Sewer Assessment

(PLt A RES-Sm) + PLt B&C (DEMO+WALL+EXC-S)+New Load ST

Stage: Name	Specific Utility: Name	Sub-utility Iteration	Distance	x	y	z	Δx (n)	Δy (n)	Δz (n)	ΔH/(n)	Δi perp. (n)	Δx (n-Lp)	Δy (n-Lp)
Δx (n-Lp)	ΔH/(n-Lp)	Δi perp. (n-Lp)	Utility: Ref.	Δx (n+1p)	Δy (n+1p)	Δz (n+1p)	ΔH/(n+1p)	Δi perp. (n+1p)					
9.38183	5.87555		9.38183590 TW Fresh Water (d) - St Pancras 10.09366 3.19660 7.95752 4.95411 -0.49491 1										
8.59338	5.39087	-0.53446	8.59338100 9.24539 1.22843 6.92250 4.17494 -1.83525										
7.81797	4.85605	-0.58920	7.81797100 8.36269 -0.75160 5.54159 2.89546 -3.03909										
6.67837	3.97329	-2.10557	6.67837100 6.38992 -1.45574 4.02587 1.55489 -3.03101										
5.32113	2.67123	-3.13774	5.32113100 4.40442 -1.02986 2.13540 0.47588 -1.84091										
3.71464	1.34238	-2.89849	3.71464100 2.74160 -0.19591 0.40081 -0.30202 -0.34789										
1.83466	0.33240	-1.59245	1.83466100 1.27839 0.00000 -0.00000 -0.83393 0.00000										
0.20482	-0.42385	-0.17778	0.20482100 0.14272 0.00000 0.00000 -0.78258 0.00000										
8.98464	5.64016	-0.55879	8.98464100 9.66633 2.47197 7.53002 4.65347 -0.96864										
8.20806	5.12993	-0.51049	8.20806100 8.83083 0.09234 6.15957 3.53353 -2.53850										
7.34572	4.51329	-1.22509	7.34572100 7.54165 -1.26368 4.85444 2.22226 -3.20994										
5.92560	3.31169	-2.73063	5.92560100 5.26396 -1.36461 3.07571 0.96001 -2.54409										
4.58785	1.99250	-3.18797	4.58785100 3.57042 -0.63029 1.28949 0.08451 -1.11925										
2.75068	0.78167	-2.32643	2.75068100 1.94542 -0.02061 0.04216 -0.63799 -0.03659										
0.99438	-0.04606	-0.86310	0.99438100 0.69288 0.00000 0.00000 -0.82628 0.00000										
0.42213	5.98979	-0.34257	0.42213100 Assumed FW400 connection to TW2_1 1 0.29865 0.00000 0.00000 -2.04543 0.00000										

Specific Utility Damage Results - Pullouts & Rotations

Stage: Name	Specific Utility: Name	Sub-utility Iteration	Distance	x	y	z	Pullout: Vertical	Pullout: Left	Pullout: Right	Pullout: Left	Pullout: Right	Pullout: Left	Pullout: Right	Pullout: Left	Pullout: Right	Pullout: Left	Pullout: Right
Ref.	Ref.	Name	from start of utility	Check: Rotation	Check: Rotation	Check: Rotation	Check: Rotation	Check: Rotation	Check: Rotation	Check: Rotation	Check: Rotation	Check: Rotation	Check: Rotation	Check: Rotation	Check: Rotation	Check: Rotation	Check: Rotation
Right	Total:	Total:	Total:	Total:	Total:	Total:	Total:	Total:	Total:	Total:	Total:	Total:	Total:	Total:	Total:	Total:	Total:
Seg.:	Ax.:	Ax.:	Flex.:	Flex.:	Flex.:	Flex.:	Flex.:	Flex.:	Flex.:	Flex.:	Flex.:	Flex.:	Flex.:	Flex.:	Flex.:	Flex.:	Flex.:
Unfactored Factored Unfactored Factored Unfactored Factored Unfactored Factored Unfactored Factored Unfactored Factored Unfactored Factored Unfactored Factored Unfactored Factored																	
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
0	Base Model	1	TWS (1)_1	2	TWS (2)_1	3	TWS (2)_2	4	TWS (2)_3	5	TWS (2)_4	6	TW Fresh Water (a) - St Pancras	1	1	1	1
0.00009	0.00000	0.00000	0.00019	0.00019	0.00019	0.00019	-	OK	3.95632	22.55421	2.82127	20.65500	0.00000	0.00000	0.00009	0.00009	0.00009
0.00007	0.00000	0.00000	0.00013	0.00013	0.00013	0.00013	-	OK	7.91263	-28.59823	2.87302	20.65500	0.00000	0.00000	0.00007	0.00007	0.00007
0.00001	0.00000	0.00000	0.00001	0.00001	0.00001	0.00001	-	OK	11.86895	-24.64226	2.92477	20.65500	0.00000	0.00000	0.00001	0.00001	0.00001
0.00010	0.00000	0.00000	0.00019	0.00019	0.00019	0.00019	-	OK	15.82526	-20.68628	2.97652	20.65500	0.00000	0.00000	0.00010	0.00010	0.00010
0.00027	0.00000	0.00000	0.00054	0.00054	0.00054	0.00054	-	OK	19.78158	-16.73030	3.02827	20.65500	0.00000	0.00000	0.00027	0.00027	0.00027
0.00054	0.00000	0.00000	0.00108	0.00108	0.00108	0.00108	-	OK	23.73730	-12.77432	3.08002	20.65500	0.00000	0.00000	0.00054	0.00054	0.00054
0.00093	0.00000	0.00000	0.00187	0.00187	0.00187	0.00187	-	OK	27.69421	-8.81834	3.13177	20.65500	0.00000	0.00000	0.00093	0.00093	0.00093
0.00533	0.00900	0.00900	0.01065	0.01065	0.01065	0.01065	-	OK	31.65053	-4.86237	3.18352	20.65500	0.00000	0.00000	0.00533	0.00533	0.00533
0.00597	0.05989	0.05989	0.01194	0.01194	0.01194	0.01194	-	OK	35.60684	-0.90639	3.23527	20.65500	0.01097	0.01097	0.00597	0.00597	0.00597
0.00212	0.01606	0.01606	0.00424	0.00424	0.00424	0.00424	-	OK	39.56316	3.04959	3.28701	20.65500	0.08012	0.08012	0.00212	0.00212	0.00212
0.00451	-0.04693	-0.04693	0.00902	0.00902	0.00902	0.00902	-	OK	43.51948	0.00555	3.33876	20.65500	0.09017	0.09017	0.00451	0.00451	0.00451
0.00164	-0.00902	-0.00902	0.00327	0.00327	0.00327	0.00327	-	OK	47.47579	10.96154	3.39051	20.65500	0.04063	0.04063	0.00164	0.00164	0.00164
0.00204	0.00461	0.00461	0.00407	0.00407	0.00407	0.00407	-	OK	51.43211	14.91752	3.44226	20.65500	0.03213	0.03213	0.00204	0.00204	0.00204
0.00214	0.00247	0.00247	0.00428	0.00428	0.00428	0.00428	-	OK	55.38843	18.87350	3.49401	20.65500	0.03712	0.03712	0.00214	0.00214	0.00214
0.00094	0.00127	0.00127	0.00188	0.00188	0.00188	0.00188	-	OK	59.34474	22.82948	3.54576	20.65500	0.03971	0.03971	0.00094	0.00094	0.00094
0.00079	0.00127	0.00127	0.00158	0.00158	0.00158	0.00158	-	OK	63.30106	26.78545	3.59751	20.65500	0.04111	0.04111	0.00079	0.00079	0.00079
0.00095	0.00127	0.00127	0.00190	0.00190	0.00190	0.00190	-	OK	67.25737	30.74143	3.64926	20.65500	0.04251	0.04251	0.00095	0.00095	0.00095
0.00141	0.00127	0.00127	0.00283	0.00283	0.00283	0.00283	-	OK	71.21369	34.69741	3.70101	20.65500	0.04391	0.04391	0.00141	0.00141	0.00141
0.03747	0.00754	0.00754	0.07494	0.07494	0.07494	0.07494	-	OK	75.17001	38.65339	3.75276	20.65500	0.04531	0.04531	0.03747	0.03747	0.03747
0.05177	0.00679	0.00679	0.10355	0.10355	0.10355	0.10355	-	OK	79.12632	42.60936	3.80451	20.65500	0.05435	0.05435	0.05177	0.05177	0.05177
0.00008	0.00000	0.00000	0.00017	0.00017	0.00017	0.00017	-	OK	83.08447	46.57622	3.85701	20.65500	0.05579	0.05579	0.00008	0.00008	0.00008
0.00004	0.00000	0.00000	0.00008	0.00008	0.00008	0.00008	-	OK	86.99079	50.54313	3.90951	20.65500	0.05723	0.05723	0.00004	0.00004	0.00004
0.00004	0.00000	0.00000	0.00008	0.00008	0.00008	0.00008	-	OK	90.90797	54.51004	3.96201	20.65500	0.05867	0.05867	0.00004	0.00004	0.00004
0.00017	0.00000	0.00000	0.00034	0.00034	0.00034	0.00034	-	OK	94.82526	58.47695	4.01451	20.65500	0.06011	0.06011	0.00017	0.00017	0.00017
0.00039	0.00000	0.00000	0.00078	0.00078	0.00078	0.00078	-	OK	98.74257	62.44386	4.06701	20.65500	0.06155	0.06155	0.00039	0.00039	0.00039
0.00072	0.00000	0.00000	0.00144	0.00144	0.00144	0.00144	-	OK	102.65995	66.41077	4.11951	20.65500	0.06300	0.06300	0.00072	0.00072	0.00072
0.00156	0.00000	0.00000	0.00313	0.00313	0.00313	0.00313	-	OK	106.57723	70.37768	4.17201	20.65500	0.06444	0.06444	0.00156	0.00156	0.00156
0.00893	0.04201	0.04201	0.01786	0.01786	0.01786	0.01786	-	OK	110.49451	74.34459	4.22451	20.65500	0.06588	0.06588	0.00893	0.00893	0.00893
0.00305	0.05511	0.05511	0.00611	0.00611	0.00611	0.00611	-	OK	114.41179	78.31150	4.27701	20.65500	0.06732	0.06732	0.00305	0.00305	0.00305
0.00267	-0.03529	-0.03529	0.00535	0.00535	0.00535	0.00535	-	OK	118.32907	82.27841	4.32951	20.65500	0.06876	0.06876	0.00267	0.00267	0.00267
0.00298	-0.03541	-0.03541	0.00596	0.00596	0.00596	0.00596	-	OK	122.24635	86.24532	4.38201	20.65500	0.07020	0.07020	0.00298	0.00298	0.00298
0.00178	0.00524	0.00524	0.00356	0.00356	0.00356	0.00356	-	OK	126.16363	90.21223	4.43451	20.65500	0.07164	0.07164	0.00178	0.00178	0.00178
0.00290	0.00358	0.00358	0.00579	0.00579	0.00579	0.00579	-	OK	130.08091	94.17914	4.48701	20.65500	0.07308	0.07308	0.00290	0.00290	0.00290
0.00118	0.00149	0.00149	0.00237	0.00237	0.00237	0.00237	-	OK	134.00000	98.14605	4.53951	20.65500	0.07452	0.07452	0.00118	0.00118	0.00118
0.00083	0.00127	0.00127	0.00166	0.00166	0.00166	0.00166	-	OK	137.91729	102.11296	4.59201	20.65500	0.07596	0.07596	0.00083	0.00083	0.00083
0.00083	0.00127	0.00127	0.00165	0.00165	0.00165	0.00165	-	OK	141.83457	106.07987	4.64451	20.65500	0.07740	0.07740	0.00083	0.00083	0.00083
0.00115	0.00127	0.00127	0.00230	0.00230	0.00230	0.00230	-	OK	145.75185	110.04678	4.69701	20.65500	0.07884	0.07884	0.00115	0.00115	0.00115
0.00167	0.00127	0.00127	0.00335	0.00335	0.00335	0.00335	-	OK	149.66913	114.01369	4.74951	20.65500	0.08028	0.08028	0.00167	0.00167	0.00167
0.04435	0.00813	0.00813	0.08869	0.08869	0.08869	0.08869	-	OK	153.58641	117.98060	4.80201	20.65500	0.08172	0.08172	0.04435	0.04435	0.04435
0.04608	0.00217	0.00217	0.09217	0.09217	0.09217	0.09217	-	OK	157.50369	121.94751	4.85451	20.65500	0.08316	0.08316	0.04608	0.04608	0.04608
0.01134	0.32971	0.32971	0.02268	0.02268	0.02268	0.02268	-	OK	161.42097	125.91442	4.90701	20.65500	0.08460	0.08460	0.01134	0.01134	0.01134
0.02131	0.26347	0.26347	0.04263	0.04263	0.04263	0.04263	-	OK	165.33825	129.88133	4.95951	20.65500	0.08604	0.08604	0.02131	0.02131	0.02131
0.01218	0.12238	0.12238	0.02435	0.02435	0.02435	0.02435	-	OK	169.25553	133.84824	5.01201	20.65500	0.08748	0.08748	0.01218	0.01218	0.01218
							-	OK	173.17281	137.81515	5.06451	20.65500	0.08892	0.08892	0.00000	0.00000	0.00000



RSK ENVIRONMENT LIMITED

UBB, London

TW Sewer Assessment

(PLt A RES-Sm) + PLt B&C (DEMO+WALL+EXC-S)+New Load ST

Job No.	Sheet No.	Rev.
371654		
Drg. Ref.		
Made by MK	Date 09-Dec-2020	Checked Date

Stage: Ref.	Stage: Name	Specific Utility: Name	Sub-utility Name	Iteration	Distance	x	y	z	Pullout: Left	Pullout: Vertical	Pullout: Left	Pullout: Left	Pullout: Left	Pullout: Right	Pullout: Right	Pullout: Right
Right	Total:	Total:	Total:	Total:	Total:	Total:	Total:	Total:	Total:	Total:	Total:	Total:	Total:	Total:	Total:	Total:
0.00092	-0.00000	-0.00000	0.00184	0.00184	0.00184	0.00184	-	OK	0.00096	0.00096	-	OK	0.00000	0.00000	0.00000	0.00000
0.00067	0.00000	0.00000	0.00134	0.00134	0.00134	0.00134	-	OK	0.00070	0.00070	-	OK	0.00000	0.00000	0.00064	0.00064
0.00064	0.00198	0.00198	0.00128	0.00128	0.00326	0.00326	-	OK	23.98838	71.74354	-2.21642	20.34000	0.00000	0.00000	0.00198	0.00198
0.00149	0.00156	0.00156	0.00298	0.00298	0.01455	0.01455	-	OK	27.98644	75.61025	-3.23285	20.34000	0.00247	0.00247	0.01404	0.01404
0.00645	0.04561	0.04561	0.01290	0.01290	0.05851	0.05851	-	OK	31.98450	79.47695	-4.24927	20.34000	0.01610	0.01610	0.06171	0.06171
0.00459	0.09136	0.09136	0.00919	0.00919	0.10055	0.10055	-	OK	35.98257	83.34365	-5.26570	20.34000	0.06976	0.06976	0.00459	0.00459
0.00994	0.14721	0.14721	0.01989	0.01989	0.16710	0.16710	-	OK	39.98063	87.21035	-6.28213	20.34000	0.17331	0.17331	0.00994	0.00994
0.01199	0.30407	0.30407	0.02398	0.02398	0.32805	0.32805	-	OK	43.97909	91.01249	-7.35750	20.34000	0.25207	0.25207	0.01199	0.01199
0.02068	0.20686	0.20686	0.04137	0.04137	0.24822	0.24822	-	OK	47.99516	94.81160	-8.47153	20.34000	0.32052	0.32052	0.02068	0.02068
0.00574	0.03621	0.03621	0.01148	0.01148	0.04769	0.04769	-	OK	51.99322	98.54615	-9.51512	20.34000	0.40078	0.40078	0.00574	0.00574
0.00078	0.00000	0.00000	0.00155	0.00155	0.00155	0.00155	-	OK	55.99128	102.28070	-10.54828	20.34000	0.00000	0.00000	0.00078	0.00078
0.00058	0.00000	0.00000	0.00116	0.00116	0.00116	0.00116	-	OK	59.98935	106.01525	-11.58935	20.34000	0.00000	0.00000	0.00058	0.00058
0.00120	0.00556	0.00556	0.00241	0.00241	0.00797	0.00797	-	OK	63.98741	109.74354	-12.64354	20.34000	0.00120	0.00120	0.00556	0.00556
0.00370	0.02683	0.02683	0.00740	0.00740	0.03423	0.03423	-	OK	67.98547	113.48435	-13.69747	20.34000	0.00370	0.00370	0.02683	0.02683
0.00520	0.06775	0.06775	0.01040	0.01040	0.07816	0.07816	-	OK	71.98353	117.21890	-14.75153	20.34000	0.00520	0.00520	0.06775	0.06775
0.00649	0.11447	0.11447	0.01298	0.01298	0.12746	0.12746	-	OK	75.98159	120.95345	-15.80159	20.34000	0.00649	0.00649	0.11447	0.11447
0.00828	0.03099	0.03099	0.01656	0.01656	0.04755	0.04755	-	OK	79.97965	124.68800	-16.85159	20.34000	0.00828	0.00828	0.03099	0.03099
0.02411	0.01361	0.01361	0.04823	0.04823	0.06184	0.06184	-	OK	83.97771	128.42255	-17.90159	20.34000	0.02411	0.02411	0.01361	0.01361
0.00095	0.00673	0.00673	0.00189	0.00189	0.00862	0.00862	-	OK	87.97577	132.15710	-18.95159	20.34000	0.00095	0.00095	0.00673	0.00673
0.00084	0.00681	0.00681	0.00167	0.00167	0.00848	0.00848	-	OK	91.97383	135.89165	-19.99959	20.34000	0.00084	0.00084	0.00681	0.00681
0.00061	0.00689	0.00689	0.00121	0.00121	0.00810	0.00810	-	OK	95.97189	139.62619	-21.04959	20.34000	0.00061	0.00061	0.00689	0.00689
0.00044	0.00697	0.00697	0.00089	0.00089	0.00786	0.00786	-	OK	99.96995	143.36074	-22.09959	20.34000	0.00044	0.00044	0.00697	0.00697
0.00117	0.00627	0.00627	0.00235	0.00235	0.00862	0.00862	-	OK	103.96801	147.09529	-23.14959	20.34000	0.00117	0.00117	0.00627	0.00627
0.00314	0.00323	0.00323	0.00627	0.00627	0.00951	0.00951	-	OK	107.96607	150.82984	-24.19959	20.34000	0.00314	0.00314	0.00323	0.00323
0.00066	0.00131	0.00131	0.00133	0.00133	0.00264	0.00264	-	OK	111.96413	154.56439	-25.24959	20.34000	0.00066	0.00066	0.00131	0.00131
0.00077	0.00132	0.00132	0.00154	0.00154	0.00286	0.00286	-	OK	115.96219	158.29894	-26.29959	20.34000	0.00077	0.00077	0.00132	0.00132
0.00041	0.00132	0.00132	0.00081	0.00081	0.00213	0.00213	-	OK	119.96025	162.03349	-27.34959	20.34000	0.00041	0.00041	0.00132	0.00132
0.00020	0.00132	0.00132	0.00040	0.00040	0.00172	0.00172	-	OK	123.95831	165.76804	-28.39959	20.34000	0.00020	0.00020	0.00132	0.00132
0.00045	0.00132	0.00132	0.00089	0.00089	0.00221	0.00221	-	OK	127.95637	169.50259	-29.44959	20.34000	0.00045	0.00045	0.00132	0.00132
0.00040	0.00132	0.00132	0.00080	0.00080	0.00212	0.00212	-	OK	131.95443	173.23714	-30.49959	20.34000	0.00040	0.00040	0.00132	0.00132
0.00043	0.00132	0.00132	0.00086	0.00086	0.00219	0.00219	-	OK	135.95249	176.97169	-31.54959	20.34000	0.00043	0.00043	0.00132	0.00132
0.04258	0.02252	0.02252	0.08515	0.08515	0.10767	0.10767	-	OK	139.95055	180.70624	-32.59959	20.34000	0.04258	0.04258	0.02252	0.02252
0.00087	0.00668	0.00668	0.00173	0.00173	0.00842	0.00842	-	OK	143.94861	184.44079	-33.64959	20.34000	0.00087	0.00087	0.00668	0.00668
0.00092	0.00677	0.00677	0.00185	0.00185	0.00861	0.00861	-	OK	147.94667	188.17534	-34.69959	20.34000	0.00092	0.00092	0.00677	0.00677
0.00072	0.00685	0.00685	0.00145	0.00145	0.00829	0.00829	-	OK	151.94473	191.90989	-35.74959	20.34000	0.00072	0.00072	0.00685	0.00685
0.00051	0.00693	0.00693	0.00102	0.00102	0.00795	0.00795	-	OK	155.94279	195.64444	-36.79959	20.34000	0.00051	0.00051	0.00693	0.00693
0.00041	0.00701	0.00701	0.00082	0.00082	0.00784	0.00784	-	OK	159.94085	199.37899	-37.84959	20.34000	0.00041	0.00041	0.00701	0.00701
0.00369	0.00482	0.00482	0.00738	0.00738	0.01221	0.01221	-	OK	163.93891	203.11354	-38.89959	20.34000	0.00369	0.00369	0.00482	0.00482
0.00083	0.00182	0.00182	0.00165	0.00165	0.00348	0.00348	-	OK	167.93697	206.84809	-39.94959	20.34000	0.00083	0.00083	0.00182	0.00182
0.00076	0.00131	0.00131	0.00151	0.00151	0.00283	0.00283	-	OK	171.93503	210.58264	-40.99959	20.34000	0.00076	0.00076	0.00131	0.00131
0.00066	0.00132	0.00132	0.00131	0.00131	0.00263	0.00263	-	OK	175.93309	214.31719	-42.04959	20.34000	0.00066	0.00066	0.00132	0.00132
0.00009	0.00132	0.00132	0.00017	0.00017	0.00149	0.00149	-	OK	179.93115	218.05174	-43.09959	20.34000	0.00009	0.00009	0.00132	0.00132
0.00038	0.00132	0.00132	0.00076	0.00076	0.00208	0.00208	-	OK	183.92921	221.78629	-44.14959	20.34000	0.00038	0.00038	0.00132	0.00132
0.00043	0.00132	0.00132	0.00087	0.00087	0.00219	0.00219	-	OK	187.92727	225.52084	-45.19959	20.34000	0.00043	0.00043	0.00132	0.00132
0.00039	0.00132	0.00132	0.00077	0.00077	0.00209	0.00209	-	OK	191.92533	229.25539	-46.24959	20.34000	0.00039	0.00039	0.00132	0.00132
0.00185	0.00043	0.00043	0.00371	0.00371	0.00414	0.00414	-	OK	195.92339	232.98994	-47.29959	20.34000	0.00185	0.00185	0.00043	0.00043
0.00071	0.04429	0.04429	0.00142	0.00142	0.04571	0.04571	-	OK	199.92145	236.72449	-48.34959	20.34000	0.00071	0.00071	0.04429	0.04429
0.01502	-0.65040	-0.65040	0.03004	0.03004	0.03004	0.03004	-	OK	203.91951	240.45904	-49.39959	20.34000	0.01502	0.01502	-0.65040	-0.65040
0.00674	-1.22494	-1.22494	0.01348	0.01348	0.01348	0.01348	-	OK	207.91757	244.19359	-50.44959	20.34000	0.00674	0.00674	-1.22494	-1.22494
0.00493	-0.46272	-0.46272	0.00986	0.00986	0.00986	0.00986	-	OK	211.91563	247.92814	-51.49959	20.34000	0.00493	0.00493	-0.46272	-0.46272
0.00454	0.64842	0.64842	0.00907	0.00907	0.65749	0.65749	-	OK	215.91369	251.66269	-52.54959	20.34000	0.00454	0.00454	0.64842	0.64842
0.00556	1.27530	1.27530	0.01112	0.01112	1.28642	1.28642	-	OK	219.91175	255.39724	-53.59959	20.34000	0.00556	0.00556	1.27530	1.27530
0.01472	0.79623	0.79623	0.02944	0.02944	0.82566	0.82566	-	OK	223.90981	259.13179	-54.64959	20.34000	0.01472	0.01472	0.79623	0.79623
0.00823	0.08889	0.08889	0.01645	0.01645	0.10535	0.10535	-	OK	227.90787	262.86634	-55.69959	20.34000	0.00823	0.00823	0.08889	0.08889
0.00420	-0.20492	-0.20492	0.00841	0.00841	0.00841	0.00841	-	OK	231.90593	266.60089	-56.74959	20.34000	0.00420	0.00420	-0.20492	-0.20492
0.01777	-1.01400	-1.01400	0.03553	0.03553	0.03553	0.03553	-	OK	235.90399	270.33544	-57.79959	20.34000	0.01777	0.01777	-1.01400	-1.01400
0.00890	-0.99242	-0.99242	0.01780	0.01780	0.01780	0.01780	-	OK	239.90205	274.07000	-58.84959	20.34000	0.00890	0.00890	-0.99242	-0.99242
0.00111	0.09327	0.09327	0.00223	0.00223	0.09550	0.09550	-	OK	243.89999	277.80455	-59.89959	20.34000	0.00111	0.00111	0.09327	0.09327
0.00755	1.03436	1.03436	0.01511	0.01511	1.04947	1.04947	-	OK	247.89805	281.53910	-60.94959	20.34000	0.00755	0.00755	1.03436	1.0



RSK ENVIRONMENT LIMITED

UBB, London

TW Sewer Assessment

(PLt A RES-Sm) + PLt B&C (DEMO+WALL+EXC-S)+New Load ST

Job No.	Sheet No.	Rev.
371654		
Drg. Ref.		
Made by MK	Date 09-Dec-2020	Checked Date

Stage: Tension: Ref.	Name: Check:	Specific Compn.: Utility: Total:	Utility: Check:	Name: Compn.: Curv. Rad. of	Sub-utility Check:	Distance from Peak Flex. x	y	z	Ax. Strain:	Ax. Strain:	Flexural: Tension:	Flexural: Tension:	Flexural: Compn.:	Flexural: Compn.:	Tension: Total:					
0	Base Model	1	TWS(1)_1	-22.32995	-22.32995	OK	5.6740E+4	-	-	2.00040	48.04000	58.00000	14.64700	115.39	115.39	22.330	44.660	-22.330	-22.330	137.72064
160.05059	OK	-	-	-	-	-	-	-	-	4.00080	48.08000	56.00000	14.64700	81.892	81.892	61.646	123.29	-61.646	-61.646	143.53817
205.18392	OK	-61.64575	-61.64575	OK	2.0553E+4	-	-	-	-	6.00120	48.12000	54.00000	14.64700	10.002	10.002	104.73	209.45	-104.73	-104.73	114.72846
219.45512	OK	-104.72666	-104.72666	OK	1.2098E+4	-	-	-	-	8.00160	48.16000	52.00000	14.64700	-25.790	-25.790	58.334	116.67	-58.334	-58.334	58.33384
116.66767	OK	-84.12409	-84.12409	OK	2.1720E+4	-	-	-	-	10.00200	48.20000	50.00000	14.64700	-37.874	-37.874	53.278	106.56	-53.278	-53.278	53.27809
106.55618	OK	-91.15203	-91.15203	OK	2.3781E+4	-	-	-	-	12.00240	48.24000	48.00000	14.64700	-51.177	-51.177	156.62	313.24	-156.62	-156.62	156.62056
313.24113	OK	-207.79772	-207.79772	OK	8.0896E+3	-	-	-	-	14.00280	48.28000	46.00000	14.64700	-62.350	-62.350	143.67	287.34	-143.67	-143.67	143.67076
287.34152	OK	-206.02113	-206.02113	OK	8.8188E+3	-	-	-	-	16.00320	48.32000	44.00000	14.64700	-45.898	-45.898	183.58	367.16	-183.58	-183.58	183.57962
367.15924	OK	-229.47774	-229.47774	OK	6.9016E+3	-	-	-	-	18.00360	48.36000	42.00000	14.64700	-22.132	-22.132	82.166	164.33	-82.166	-82.166	82.16574
164.33147	OK	-104.29763	-104.29763	OK	1.5420E+4	-	-	-	-	20.00400	48.40000	40.00000	14.64700	-8.5418	-8.5418	180.83	361.66	-180.83	-180.83	180.82829
361.65658	OK	-189.37009	-189.37009	OK	7.0066E+3	-	-	-	-	22.00440	48.44000	38.00000	14.64700	-2.4107	-2.4107	97.459	194.92	-97.459	-97.459	97.45855
194.91709	OK	-99.86928	-99.86928	OK	1.3000E+4	-	-	-	-	24.00480	48.48000	36.00000	14.64700	0.037196	0.037196	89.278	178.56	-89.278	-89.278	89.31473
178.59225	OK	-89.27753	-89.27753	OK	1.4192E+4	-	-	-	-	26.00520	48.52000	34.00000	14.64700	0.017741	0.017741	17.616	35.231	-17.616	-17.616	17.63348
35.24922	OK	-17.61574	-17.61574	OK	7.1924E+4	-	-	-	-	28.00560	48.56000	32.00000	14.64700	0.0039202	0.0039202	108.83	217.66	-108.83	-108.83	108.83435
217.66479	OK	-108.83043	-108.83043	OK	1.1642E+4	-	-	-	-	30.00600	48.60000	30.00000	14.64700	0.012932	0.012932	207.06	414.12	-207.06	-207.06	207.07113
414.12933	OK	-207.05820	-207.05820	OK	6.1191E+3	-	-	-	-	32.00640	48.64000	28.00000	14.64700	0.086040	0.086040	114.70	229.40	-114.70	-114.70	114.78374
229.48144	OK	-114.69770	-114.69770	OK	1.1046E+4	-	-	-	-	34.00680	48.68000	26.00000	14.64700	-4.8504	-4.8504	80.485	160.97	-80.485	-80.485	80.48456
160.96913	OK	-85.33495	-85.33495	OK	1.5742E+4	-	-	-	-	36.00720	48.72000	24.00000	14.64700	-24.826	-24.826	123.89	247.77	-123.89	-123.89	123.88737
247.77473	OK	-148.71302	-148.71302	OK	1.0227E+4	-	-	-	-	38.00760	48.76000	22.00000	14.64700	-57.212	-57.212	12.125	24.250	-12.125	-12.125	12.12478
24.24955	OK	-69.33650	-69.33650	OK	1.0450E+5	-	-	-	-	40.00800	48.80000	20.00000	14.64700	-74.451	-74.451	162.26	324.52	-162.26	-162.26	162.26097
324.52194	OK	-236.71237	-236.71237	OK	7.8084E+3	-	-	-	-	42.00840	48.84000	18.00000	14.64700	-68.056	-68.056	137.96	275.92	-137.96	-137.96	137.96046
275.92092	OK	-206.01645	-206.01645	OK	9.1838E+3	-	-	-	-	44.00880	48.88000	16.00000	14.64700	-42.865	-42.865	12.848	25.696	-12.848	-12.848	12.84800
25.69600	OK	-55.71346	-55.71346	OK	9.8615E+4	-	-	-	-	46.00920	48.92000	14.00000	14.64700	0.14160	0.14160	123.27	246.53	-123.27	-123.27	123.40798
246.67435	OK	-123.26638	-123.26638	OK	1.0279E+4	-	-	-	-	48.00960	48.96000	12.00000	14.64700	43.122	43.122	134.18	268.37	-134.18	-134.18	177.30636
311.49120	OK	-134.18484	-134.18484	OK	9.4422E+3	-	-	-	-	50.01000	49.00000	10.00000	14.64700	60.705	60.705	166.43	332.87	-166.43	-166.43	227.13887
393.57237	OK	-166.43349	-166.43349	OK	7.6127E+3	-	-	-	-	52.01040	49.04000	8.00000	14.64700	65.374	65.374	12.523	25.047	-12.523	-12.523	77.89703
90.42045	OK	-12.52342	-12.52342	OK	1.0117E+5	-	-	-	-	54.01080	49.08000	6.00000	14.64700	57.229	57.229	14.274	28.548	-14.274	-14.274	71.50316
85.77706	OK	-14.27390	-14.27390	OK	8.8763E+4	-	-	-	-	56.01120	49.12000	4.00000	14.64700	28.994	28.994	12.544	25.087	-12.544	-12.544	41.53729
54.08099	OK	-12.54370	-12.54370	OK	1.0101E+5	-	-	-	-	58.01160	49.16000	2.00000	14.64700	12.448	12.448	23.915	47.831	-23.915	-23.915	36.36324
60.27865	OK	-23.91540	-23.91540	OK	5.2978E+4	-	-	-	-	60.01200	49.20000	0.00000	14.64700	4.9987	4.9987	24.470	48.940	-24.470	-24.470	29.46861
53.93853	OK	-24.46992	-24.46992	OK	5.1778E+4	-	-	-	-	62.01240	49.24000	-2.00000	14.64700	6.4202E-6	6.4202E-6	17.870	35.741	-17.870	-17.870	17.87033
35.74065	OK	-17.87032	-17.87032	OK	7.0900E+4	-	-	-	-	64.01280	49.28000	-4.00000	14.64700	239.05E-6	239.05E-6	14.367	28.734	-14.367	-14.367	14.36732
28.73441	OK	-14.36709	-14.36709	OK	8.8188E+4	-	-	-	-	66.01320	49.32000	-6.00000	14.64700	557.05E-6	557.05E-6	0.21626	0.43252	-0.21626	-0.21626	0.21682
0.43308	OK	-0.21626	-0.21626	OK	5.8587E+6	-	-	-	-	68.01360	49.36000	-8.00000	14.64700	542.63E-6	542.63E-6	0.76708	1.5342	-0.76708	-0.76708	0.76763
1.53471	OK	-0.76708	-0.76708	OK	1.6517E+6	-	-	-	-	70.01400	49.40000	-10.00000	14.64700	487.71E-6	487.71E-6	1.4008	2.8015	-1.4008	-1.4008	1.40125
2.80201	OK	-1.40076	-1.40076	OK	9.0451E+5	-	-	-	-	72.01440	49.44000	-12.00000	14.64700	412.38E-6	412.38E-6	1.7831	3.5661	-1.7831	-1.7831	1.78346
3.56651	OK	-1.78305	-1.78305	OK	7.1058E+5	-	-	-	-	74.01480	49.48000	-14.00000	14.64700	331.34E-6	331.34E-6	1.9865	3.9730	-1.9865	-1.9865	1.98684
3.97334	OK	-1.98651	-1.98651	OK	6.3780E+5	-	-	-	-	76.01520	49.52000	-16.00000	14.64700	254.14E-6	254.14E-6	2.0642	4.1284	-2.0642	-2.0642	2.06448
4.12870	OK	-2.06422	-2.06422	OK	6.1379E+5	-	-	-	-	78.01560	49.56000	-18.00000	14.64700	186.11E-6	186.11E-6	2.0550	4.1099	-2.0550	-2.0550	2.05515
4.11011	OK	-2.05496	-2.05496	OK	6.1656E+5	-	-	-	-	80.01600	49.60000	-20.00000	14.64700	129.64E-6	129.64E-6	1.9870	3.9740	-1.9870	-1.9870	1.98714
3.97414	OK	-1.98701	-1.98701	OK	6.3764E+5	-	-	-	-	82.01640	49.64000	-22.00000	14.64700	85.137E-6	85.137E-6	1.8810	3.7619	-1.8810	-1.8810	1.88104
3.76199	OK	-1.88095	-1.88095	OK	6.7359E+5	-	-	-	-	84.01680	49.68000	-24.00000	14.64700	51.828E-6	51.828E-6	1.7517	3.5035	-1.7517	-1.7517	1.75179
3.50353	OK	-1.75174	-1.75174	OK	7.2328E+5	-	-	-	-	86.01720	49.72000	-26.00000	14.64700	28.329E-6	28.329E-6	1.6101	3.2203	-1.6101	-1.6101	1.61017
3.22030	OK	-1.61014	-1.61014	OK	7															



RSK ENVIRONMENT LIMITED

UBB, London

TW Sewer Assessment

(PLt A RES-Sm) + PLt B&C (DEMO+WALL+EXC-S)+New Load ST

Job No.	Sheet No.	Rev.
371654		
Drg. Ref.		
Made by MK	Date 09-Dec-2020	Checked Date

Stage: Tension: Ref.	Name	Specific Compn.: Total:	Utility: Total:	Name	Compn.: Total:	Check: Rad. of	Sub-utility: Name	Distance: x	y	z	Ax.	Ax.	Flexural: Tension:	Flexural: Tension:	Flexural: Compn.:	Flexural: Compn.:	Tension:																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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RSK ENVIRONMENT LIMITED

UBB, London

TW Sewer Assessment

(PLt A RES-Sm) + PLt B&C (DEMO+WALL+EXC-S)+New Load ST

Job No.	Sheet No.	Rev.
371654		
Drg. Ref.		
Made by MK	Date 09-Dec-2020	Checked Date

Stage:	Stage:	Name	Specific	Specific	Utility:	Name	Sub-utility	Distance	x	y	z	Ax.	Ax.	Flexural:	Flexural:	Flexural:	Flexural:	Tension:
Tension:	Check:	Compn.:	Compn.:	Check:	Rad. of	Check:	Check:	from	Peak	Flex.		Strain:	Strain:	Tension:	Tension:	Compn.:	Compn.:	Total:
Ref.	Total:	Tension	Total:	Total:	Compn.	Curv.	Rad. of	Name	Strain									
390.26215	OK	-632.77330	-632.77330	OK	3.8256E+3	-	-	76.30482	161.52232	-32.32085	16.23650	-437.64	-437.64	195.13	390.26	-195.13	-195.13	195.13108
107.69794	OK	-816.75789	-816.75789	OK	1.3863E+4	-	-	78.31284	163.37762	-33.08898	16.23650	-762.91	-762.91	53.849	107.70	-53.849	-53.849	53.84897
221.52307	OK	-719.79328	-719.79328	OK	6.7397E+3	-	-	80.32086	165.23291	-33.85711	16.23650	-609.03	-609.03	110.76	221.52	-110.76	-110.76	110.76153
76.72318	OK	-429.22697	-429.22697	OK	1.9460E+4	-	-	82.32888	167.08821	-34.62523	16.23650	-390.87	-390.87	38.362	76.723	-38.362	-38.362	38.36159
32.16743	OK	-125.80178	-125.80178	OK	4.6413E+4	-	-	84.33690	168.94351	-35.39336	16.23650	-109.72	-109.72	16.084	32.167	-16.084	-16.084	16.08372
279.93620	OK	-49.41134	-49.41134	OK	1.5108E+4	-	-	86.34492	170.79881	-36.16149	16.23650	181.11	181.11	49.411	98.823	-49.411	-49.411	230.52486
430.52056	OK	-30.55721	-30.55721	OK	2.4430E+4	-	-	88.35295	172.65411	-36.92962	16.23650	369.41	369.41	30.557	61.114	-30.557	-30.557	399.96335
478.80240	OK	-32.52312	-32.52312	OK	2.2953E+4	-	-	90.36097	174.50940	-37.69774	16.23650	413.76	413.76	32.523	65.046	-32.523	-32.523	446.27928
0.02549	OK	-0.02543	-0.02543	OK	2.1626E+6	-	-	93.95632	-32.55421	2.82127	20.65500	290.75E-6	58.150E-6	0.025432	0.025432	-0.025432	-0.025432	0.02572
0.02238	OK	-0.02231	-0.02231	OK	2.4648E+6	-	-	5.93447	-30.57622	2.84714	20.65500	311.82E-6	62.365E-6	0.022314	0.022314	-0.022314	-0.022314	0.02263
0.01780	OK	-0.01773	-0.01773	OK	3.1014E+6	-	-	7.91263	-28.59823	2.87302	20.65500	330.07E-6	66.013E-6	0.017734	0.017734	-0.017734	-0.017734	0.01806
0.01136	OK	-0.01129	-0.01129	OK	4.8697E+6	-	-	9.89079	-26.62024	2.89889	20.65500	343.62E-6	68.723E-6	0.011294	0.011294	-0.011294	-0.011294	0.01164
0.00258	OK	-0.00251	-0.00251	OK	2.1940E+7	-	-	11.86895	-24.64226	2.92477	20.65500	350.15E-6	70.031E-6	0.0025069	0.0025069	-0.0025069	-0.0025069	0.00286
0.00929	OK	-0.00922	-0.00922	OK	5.9630E+6	-	-	13.84711	-22.66427	2.95064	20.65500	346.96E-6	69.393E-6	0.0092235	0.0092235	-0.0092235	-0.0092235	0.00957
0.02468	OK	-0.02461	-0.02461	OK	2.2346E+6	-	-	15.82526	-20.68628	2.97652	20.65500	331.12E-6	66.224E-6	0.024613	0.024613	-0.024613	-0.024613	0.02494
0.04457	OK	-0.04451	-0.04451	OK	1.2356E+6	-	-	17.80342	-18.70829	3.00239	20.65500	299.90E-6	59.981E-6	0.044512	0.044512	-0.044512	-0.044512	0.04481
0.06995	OK	-0.06990	-0.06990	OK	7.8683E+5	-	-	19.78158	-16.73030	3.02827	20.65500	251.63E-6	50.326E-6	0.069900	0.069900	-0.069900	-0.069900	0.07015
0.10189	OK	-0.10186	-0.10186	OK	5.3997E+5	-	-	21.75974	-14.75231	3.05414	20.65500	187.11E-6	37.421E-6	0.10186	0.10186	-0.10186	-0.10186	0.10204
0.14149	OK	-0.14147	-0.14147	OK	3.8878E+5	-	-	23.73790	-12.77432	3.08002	20.65500	112.03E-6	22.407E-6	0.14147	0.14147	-0.14147	-0.14147	0.14158
0.18961	OK	-0.18960	-0.18960	OK	2.9008E+5	-	-	25.71605	-10.79633	3.10589	20.65500	40.637E-6	8.1274E-6	0.18960	0.18960	-0.18960	-0.18960	0.18964
0.24645	OK	-0.24645	-0.24645	OK	2.2317E+5	-	-	27.69421	-8.81834	3.13177	20.65500	688.64E-9	137.73E-9	0.24645	0.24645	-0.24645	-0.24645	0.24645
0.31065	OK	-0.31064	-0.31064	OK	1.7706E+5	-	-	29.67237	-6.84036	3.15764	20.65500	39.113E-6	7.8226E-6	0.31064	0.31064	-0.31064	-0.31064	0.31068
0.82008	OK	-0.82000	-0.82000	OK	6.7073E+4	-	-	31.65053	-4.86237	3.18352	20.65500	425.65E-6	85.130E-6	0.82000	0.82000	-0.82000	-0.82000	0.82042
4.96573	OK	-3.85522	-3.85522	OK	1.4266E+4	-	-	33.62869	-2.88438	3.20939	20.65500	5.5526	1.1105	3.8552	3.8552	-3.8552	-3.8552	9.40779
6.92386	OK	-1.98358	-1.98358	OK	2.7728E+4	-	-	35.60684	-0.90639	3.23527	20.65500	24.701	4.9403	1.9836	1.9836	-1.9836	-1.9836	26.68501
5.61797	OK	-0.42140	-0.42140	OK	1.3052E+5	-	-	37.58500	-1.07160	3.26114	20.65500	25.983	5.1966	0.42140	0.42140	-0.42140	-0.42140	26.40425
1.35922	OK	-0.63654	-0.63654	OK	8.6404E+4	-	-	39.56316	3.04959	3.28701	20.65500	3.6134	0.72268	0.63654	0.63654	-0.63654	-0.63654	4.24995
0.76391	OK	-17.59355	-4.12984	OK	7.1998E+4	-	-	41.54132	5.02758	3.31289	20.65500	-16.830	-3.3659	0.76391	0.76391	-0.76391	-0.76391	0.76391
1.89196	OK	-23.52770	-6.21911	OK	2.9070E+4	-	-	43.51948	7.00557	3.33876	20.65500	-21.636	-4.3271	1.8920	1.8920	-1.8920	-1.8920	1.89196
0.54751	OK	-7.86798	-2.01161	OK	1.0045E+5	-	-	45.49764	8.98355	3.36464	20.65500	-7.3205	-1.4641	0.54751	0.54751	-0.54751	-0.54751	0.54751
0.72082	OK	-0.43492	-0.43492	OK	1.2646E+5	-	-	47.47579	10.96154	3.39051	20.65500	1.4295	0.28590	0.43492	0.43492	-0.43492	-0.43492	1.86442
0.78442	OK	-0.49232	-0.49232	OK	1.1172E+5	-	-	49.45395	12.93953	3.41639	20.65500	1.4605	0.29210	0.49232	0.49232	-0.49232	-0.49232	1.95281
0.76891	OK	-0.47057	-0.47057	OK	1.1688E+5	-	-	51.43211	14.91752	3.44226	20.65500	1.4917	0.29834	0.47057	0.47057	-0.47057	-0.47057	1.96228
1.34959	OK	-1.13701	-1.13701	OK	4.8372E+4	-	-	53.41027	16.89551	3.46814	20.65500	1.0629	0.21258	1.1370	1.1370	-1.1370	-1.1370	2.19900
0.59413	OK	-0.49695	-0.49695	OK	1.1067E+5	-	-	55.38843	18.87350	3.49401	20.65500	0.48589	0.097178	0.49695	0.49695	-0.49695	-0.49695	0.98284
0.36262	OK	-0.29200	-0.29200	OK	1.8836E+5	-	-	57.36658	20.85149	3.51989	20.65500	0.35311	0.070622	0.29200	0.29200	-0.29200	-0.29200	0.64511
0.31671	OK	-0.24607	-0.24607	OK	2.2351E+5	-	-	59.34474	22.82948	3.54576	20.65500	0.35320	0.070640	0.24607	0.24607	-0.24607	-0.24607	0.59927
0.28710	OK	-0.21643	-0.21643	OK	2.5413E+5	-	-	61.32290	24.80747	3.57164	20.65500	0.35338	0.070675	0.21643	0.21643	-0.21643	-0.21643	0.56981
0.27587	OK	-0.20515	-0.20515	OK	2.6810E+5	-	-	63.30106	26.78545	3.59751	20.65500	0.35361	0.070723	0.20515	0.20515	-0.20515	-0.20515	0.55876
0.28541	OK	-0.21462	-0.21462	OK	2.5626E+5	-	-	65.27922	28.76344	3.62339	20.65500	0.35392	0.070783	0.21462	0.21462	-0.21462	-0.21462	0.56854
0.31768	OK	-0.24682	-0.24682	OK	2.2283E+5	-	-	67.25737	30.74143	3.64926	20.65500	0.35430	0.070861	0.24682	0.24682	-0.24682	-0.24682	0.60112
0.37285	OK	-0.30188	-0.30188	OK	1.8219E+5	-	-	69.23553	32.71942	3.67514	20.65500	0.35483	0.070967	0.30188	0.30188	-0.30188	-0.30188	0.65671
0.44631	OK	-0.37519	-0.37519	OK	1.4659E+5	-	-	71.21369	34.69741	3.70101	20.65500	0.35559	0.071119	0.37519	0.37519	-0.37519	-0.37519	0.73079
0.52312	OK	-0.45178	-0.45178	OK	1.2174E+5	-	-	73.19185	36.67540	3.72689	20.65500	0.35669	0.071339	0.45178	0.45178	-0.45178	-0.45178	0.80847
0.57061	OK	-0.49897	-0.4															



RSK ENVIRONMENT LIMITED

UBB, London

TW Sewer Assessment

(PLt A RES-Sm) + PLt B&C (DEMO+WALL+EXC-S)+New Load ST

Job No.	Sheet No.	Rev.
371654		
Drg. Ref.		
Made by MK	Date 09-Dec-2020	Checked Date

Stage:	Stage:	Name	Specific	Specific	Utility:	Name	Sub-utility	Distance	x	y	z	Ax.	Ax.	Flexural:	Flexural:	Flexural:	Flexural:	Tension:
Tension:	Check:	Check:	Compn.:	Compn.:	Check:	Rad. of	Check:	from	Peak	Flex.								
Ref.	Tension	Disp.	Disp.	Disp.	Ref.	Curv.	Rad. of	Rad. of	Tens.	Strain		Strain:	Strain:	Tension:	Tension:	Compn.:	Compn.:	Total:
0.61114	OK	-0.23885	-0.23885	OK	2.3027E+5	-	-	-	-3.89609	-	-	1.8732	0.37464	0.25719	0.25719	-0.25719	-0.25719	2.13037
0.63182	OK	-0.25719	-0.25719	OK	2.1385E+5	-	-	-	-3.61818	-	-	1.8850	0.37701	0.24810	0.24810	-0.24810	-0.24810	2.13313
0.62511	OK	-0.24810	-0.24810	OK	2.2168E+5	-	-	-	-3.71225	-	-	1.8969	0.37938	0.22327	0.22327	-0.22327	-0.22327	2.12019
0.60265	OK	-0.22327	-0.22327	OK	2.4634E+5	-	-	-	-4.16943	-	-	1.9088	0.38177	0.19148	0.19148	-0.19148	-0.19148	2.10031
0.57325	OK	-0.19148	-0.19148	OK	2.8723E+5	-	-	-	-4.86348	-	-	1.9207	0.38414	0.15961	0.15961	-0.15961	-0.15961	2.08033
0.54375	OK	-0.15961	-0.15961	OK	3.4460E+5	-	-	-	-5.83947	-	-	1.9326	0.38652	0.13311	0.13311	-0.13311	-0.13311	2.06569
0.51963	OK	-0.13311	-0.13311	OK	4.1318E+5	-	-	-	-7.00634	-	-	1.9444	0.38888	0.11534	0.11534	-0.11534	-0.11534	2.05975
0.50422	OK	-0.11534	-0.11534	OK	4.7686E+5	-	-	-	-8.09340	-	-	1.9562	0.39125	0.10706	0.10706	-0.10706	-0.10706	2.06329
0.49831	OK	-0.10706	-0.10706	OK	5.1372E+5	-	-	-	-8.72465	-	-	1.9680	0.39361	0.10754	0.10754	-0.10754	-0.10754	2.07559
0.50115	OK	-0.10754	-0.10754	OK	5.1144E+5	-	-	-	-8.68625	-	-	1.4893	0.29786	1.4505	1.4505	-1.4505	-1.4505	2.93981
1.74836	OK	-1.45050	-1.45050	OK	3.7918E+4	-	-	-	-10.97025	-	-	0.68577	0.13715	0.94433	0.94433	-0.94433	-0.94433	1.63010
1.08149	OK	-0.94433	-0.94433	OK	5.8242E+4	-	-	-	-10.07644	-	-	0.36671	0.073343	0.14367	0.14367	-0.14367	-0.14367	0.51039
0.21702	OK	-0.14367	-0.14367	OK	3.8281E+5	-	-	-	-10.09532	-	-	0.36723	0.073446	0.17651	0.17651	-0.17651	-0.17651	0.54374
0.24996	OK	-0.17651	-0.17651	OK	3.1159E+5	-	-	-	-10.07803	-	-	0.36786	0.073573	0.20522	0.20522	-0.20522	-0.20522	0.57308
0.27879	OK	-0.20522	-0.20522	OK	2.6801E+5	-	-	-	-10.06748	-	-	0.36860	0.073719	0.21311	0.21311	-0.21311	-0.21311	0.58170
0.28683	OK	-0.21311	-0.21311	OK	2.5808E+5	-	-	-	-10.06531	-	-	0.36935	0.073871	0.18335	0.18335	-0.18335	-0.18335	0.55270
0.25722	OK	-0.18335	-0.18335	OK	2.9998E+5	-	-	-	-10.07636	-	-	0.37000	0.073999	0.11249	0.11249	-0.11249	-0.11249	0.48248
0.18648	OK	-0.11249	-0.11249	OK	4.8895E+5	-	-	-	-10.12123	-	-	0.37039	0.074078	0.020270	0.020270	-0.020270	-0.020270	0.39066
0.09435	OK	-0.02027	-0.02027	OK	2.7134E+6	-	-	-	-10.69770	-	-	0.37050	0.074100	0.060701	0.060701	-0.060701	-0.060701	0.43120
0.13480	OK	-0.06070	-0.06070	OK	9.0609E+5	-	-	-	-18.023442	-	-	0.37040	0.074079	0.10865	0.10865	-0.10865	-0.10865	0.47905
0.18273	OK	-0.10865	-0.10865	OK	5.0621E+5	-	-	-	-18.013158	-	-	0.37021	0.074042	0.12304	0.12304	-0.12304	-0.12304	0.49325
0.19708	OK	-0.12304	-0.12304	OK	4.4701E+5	-	-	-	-18.011681	-	-	0.37003	0.074005	0.11648	0.11648	-0.11648	-0.11648	0.48650
0.19048	OK	-0.11648	-0.11648	OK	4.7220E+5	-	-	-	-18.04008	-	-	0.36989	0.073978	0.10394	0.10394	-0.10394	-0.10394	0.47383
0.17791	OK	-0.10394	-0.10394	OK	5.2917E+5	-	-	-	-18.013972	-	-	0.36980	0.073960	0.098085	0.098085	-0.098085	-0.098085	0.46788
0.17204	OK	-0.09808	-0.09808	OK	5.6074E+5	-	-	-	-18.014889	-	-	0.36971	0.073943	0.10890	0.10890	-0.10890	-0.10890	0.47861
0.18284	OK	-0.10890	-0.10890	OK	5.0505E+5	-	-	-	-18.013474	-	-	0.36959	0.073918	0.14335	0.14335	-0.14335	-0.14335	0.51294
0.21726	OK	-0.14335	-0.14335	OK	3.8369E+5	-	-	-	-18.010289	-	-	12.522	2.5043	0.22072	0.22072	-0.22072	-0.22072	12.74238
2.72505	OK	-0.22072	-0.22072	OK	2.4919E+5	-	-	-	-20.264771	-	-	12.334	2.4668	0.20015	0.20015	-0.20015	-0.20015	12.53439
2.66700	OK	-0.20015	-0.20015	OK	2.7480E+5	-	-	-	-206.93759	-	-	12.147	2.4293	0.13712	0.13712	-0.13712	-0.13712	12.28382
2.56646	OK	-0.13712	-0.13712	OK	4.0112E+5	-	-	-	-221.37738	-	-	-140.30	-28.061	4.9320	4.9320	-4.9320	-4.9320	4.93200
4.93200	OK	-145.23556	-32.99271	OK	1.1152E+4	-	-	-	-78.7180	-	-	-381.61	-76.321	6.2872	6.2872	-6.2872	-6.2872	6.28717
6.28717	OK	-387.89274	-82.60828	OK	8.7480E+3	-	-	-	-96.71852	-	-	-402.16	-80.432	2.2390	2.2390	-2.2390	-2.2390	2.23896
2.23896	OK	-404.39833	-82.67084	OK	2.4565E+4	-	-	-	-167.62986	-	-	324.11	64.823	2.5125	2.5125	-2.5125	-2.5125	326.62713
4.50324	OK	-290.30966	-61.66453	OK	1.2213E+4	-	-	-	-13.77566	-	-	-285.81	-57.161	4.5032	4.5032	-4.5032	-4.5032	4.50324
0.82465	OK	-147.51798	-30.16332	OK	6.6695E+4	-	-	-	-83.52975	-	-	-146.69	-29.339	0.82465	0.82465	-0.82465	-0.82465	0.82465
6.81989	OK	-0.25087	-0.25087	OK	2.1924E+5	-	-	-	-15.74361	-	-	32.845	6.5690	0.25087	0.25087	-0.25087	-0.25087	33.09600
40.68268	OK	-1.20297	-1.20297	OK	4.5720E+4	-	-	-	-211.12210	-	-	197.40	39.480	1.2030	1.2030	-1.2030	-1.2030	198.60150
76.33540	OK	-2.51247	-2.51247	OK	2.1891E+4	-	-	-	-12.38574	-	-	324.11	64.823	2.5125	2.5125	-2.5125	-2.5125	326.62713
75.96844	OK	-1.98702	-1.98702	OK	2.7680E+4	-	-	-	-48.90720	-	-	369.91	73.981	1.9870	1.9870	-1.9870	-1.9870	371.89410
77.01840	OK	-0.74785	-0.74785	OK	7.3545E+4	-	-	-	-51.07121	-	-	381.35	76.271	0.74785	0.74785	-0.74785	-0.74785	382.10060
57.18679	OK	-6.53668	-6.53668	OK	8.4141E+3	-	-	-	-25.58336	-	-	253.25	50.650	6.5367	6.5367	-6.5367	-6.5367	259.78727
14.19163	OK	-3.29665	-3.29665	OK	1.6684E+4	-	-	-	-77.55131	-	-	54.475	10.895	3.2967	3.2967	-3.2967	-3.2967	57.77152
3.03101	OK	-3.03091	-3.03091	OK	1.8146E+4	-	-	-	-82.07107	-	-	-47.84708	-	-	-	-	-	-
41.18567	OK	-32.92678	-32.92678	OK	6.2259E+3	-	-	-	-31.48721	-	-	505.18E-6	101.04E-6	3.0309	3.0309	-3.0309	-3.0309	3.03142
Note: Tensile strains are +ve, compressive strains are -ve.																		
Note: The peak flexural tensile strain orientation angle is measured with respect to the global z-axis by looking at the end point of the utility from the start point. Anti-clockwise is positive.																		

Specific Utility Damage Results - Maximum Values

Stage:	Stage:	Name	Specific	Specific	Utility:	Name	Jointed	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.
Max.	Max.	Max.	Max.	Max.	Utility:	Max.												
Disp.	Disp.	Disp.	Disp.	Disp.	Ref.	Curv.	Rad. of	Rad. of	Tens.	Strain:	Strain:	Strain:	Strain:	Rad. of	Rad. of	Curv.	Value	Value
Horiz.	Horiz.	Horiz.	Horiz.	Horiz.	Ref.	Curv.	Rad. of	Rad. of	Tens.	Strain:	Strain:	Strain:	Strain:	Rad. of	Rad. of	Curv.	Value	Value
x:	x:	Value	y:	y:														
Location	Location	Value	Location	Value														
[m]	[mm]	[m]	[mm]	[m]	[mm]	[m]	[mm]	[m]	[Deg]	[m]	[µE]	[m]	[µE]	[m]	[m]	[m]	[m]	[mm]
0	Base Model	1	TWS(1)_1	No	-	-	-	-	-	30.00600	414.12933	40.00800	-236.71237	30.006	6.1191E+3	30.006	-6.6456	
46.009	-0.56982	46.009	0.18923	No	-	-	-	-	-	28.04466	124.60250	40.06380	-63.06207	28.045	1.2995E+4	56.089	4.0403	
36.057	0.16611	70.111	0.87229	No	-	-	-	-	-	22.07428	360.55689	22.07428	-173.54730	22.074	4.6644E+3	0.0	3.4144	
30.101	0.14240	0.0	0.86770	No	-	-	-	-	-	21.42576	100.81059	7.79119	-32.81256	7.7912	2.4670E+4	25.321	1.2993	
25.321	0.66357	25.321	5.0134	No	-	-	-	-	-	90.36097	478.80240	78.31284	-816.75789	8.0321	3.3279E+3	66.265	8.1666	
84.337	-4.8033	34.136	12.478	No	-	-	-	-	-	79.126	0.11034	79.126	0.05393	79.126	1.2204E+3	79.126	1.7941	
39.563	0.12465	79.126	4.5443	No	-	-	-	-	-	3.9981	0.35240	7.9961	0.02220	9.99516	23.73343	9.99516	-9.56419	
0.0	-1.0239	0.0	3.8951	No	-	-	-	-	-	5.9913	0.10767	5.9913	0.04435	5.99128	28.85646	5.99128	-27.58609	
63.907	0.19932	63.907	10.258	No	-	-	-	-	-	23.615	1.2864	9.8398	0.01851	25.58336	77.01840	11.80771	-82.67084	
17.712	-3.2286	0.0	10.167	No	-	-	-	-	-	3.6209	0.64098	3.6209	0.06564	3.62091	41.18567	3.62091	-32.92678	
0.0	-0.34484	0.0	0.30062	No	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Note: * symbol indicates that the value has exceeded one of (or both) the limiting criteria



RSK ENVIRONMENT LIMITED

UBB, London

TW Sewer Assessment

FULL DEVELOPMENT LONG TERM

Job No.	Sheet No.	Rev.
371654		
Drg. Ref.		
Made by MK	Date 09-Dec-2020	Checked Date

Titles

Job No.: 371654
Job Title: UBB, London
Sub-title: TW Sewer Assessment
Calculation Heading: FULL DEVELOPMENT LONG TERM
Initials: MK
Checker:
Date Saved: 09-Dec-2020
Date Checked:
Notes:
File Name: FULL DEVELOPMENT LONG TERM (1).xdd
File Path: G:\Geoconsult\Projects\371600 - 371699\371654 Ugly Brown Building (UBB)\GMA\REV 02_OCTNOV 2020_TW Only\2 TW\MODELS\9 Full Development LT

History

Date	Time	By	Notes
19-Jun-2017	11:17	tyler_a	
19-Jun-2017	11:21	tyler_a	
19-Jun-2017	11:24	tyler_a	
19-Jun-2017	11:37	tyler_a	
30-Jun-2017	11:50	tyler_a	
07-Jul-2017	16:50	MKentish	
07-Jul-2017	17:21	MKentish	
10-Jul-2017	09:37	MKentish	
10-Jul-2017	13:57	MKentish	
10-Jul-2017	14:31	MKentish	
10-Jul-2017	16:58	MKentish	
12-Jul-2017	11:37	tyler_a	
13-Jul-2017	17:41	MKentish	
19-Jul-2017	16:52	MKentish	
17-Aug-2017	15:45	MKentish	
17-Aug-2017	15:51	MKentish	
17-Aug-2017	16:49	MKentish	
21-Aug-2017	12:26	TYLER_A	
19-Oct-2017	16:52	MKentish	
19-Oct-2017	17:05	MKentish	
20-Oct-2017	16:16	MKentish	
23-Oct-2017	13:06	MKentish	
05-May-2020	19:22	MKentish	
06-May-2020	17:45	MKentish	
07-May-2020	18:26	MKentish	
11-May-2020	17:18	MKentish	
14-May-2020	11:09	MKentish	
29-Jul-2020	17:55	MKentish	
30-Jul-2020	11:40	MKentish	
30-Jul-2020	15:51	MKentish	
30-Jul-2020	20:18	MKentish	
30-Jul-2020	22:06	MKentish	
31-Jul-2020	10:14	MKentish	
31-Jul-2020	13:16	MKentish	
03-Aug-2020	17:53	MKentish	
07-Aug-2020	14:54	MKentish	
11-Aug-2020	00:42	MKentish	
12-Aug-2020	14:42	MKentish	
29-Oct-2020	17:18	MKentish	
02-Nov-2020	17:52	MKentish	
04-Nov-2020	15:38	MKentish	
05-Nov-2020	12:45	MKentish	
10-Nov-2020	18:01	MKentish	
11-Nov-2020	12:03	MKentish	
11-Nov-2020	15:33	MKentish	
12-Nov-2020	11:57	MKentish	
16-Nov-2020	11:43	MKentish	
16-Nov-2020	13:57	MKentish	
16-Nov-2020	17:37	MKentish	
03-Dec-2020	14:30	MKentish	
04-Dec-2020	18:08	MKentish	
07-Dec-2020	09:40	MKentish	
09-Dec-2020	09:18	MKentish	

Displacement Lines

Ref.	Name	x1	y1	z1	x2	y2	z2	Intervals	Surface type for tunnels	Interpolate imported displacements	Calculate
		[m]	[m]	[m]	[m]	[m]	[m]	[No.]			
1	TWS(1)_1	48.00000	60.00000	14.64700	50.00000	-40.00000	14.64700	50	Surface	Yes	Yes
2	TWS(2)_1	-33.43100	6.49300	17.09950	36.67900	6.97300	17.09950	35	Surface	Yes	Yes
3	TWS(2)_2	36.67900	6.97300	17.09950	66.57600	3.47200	17.09950	15	Surface	Yes	Yes
4	TWS(2)_3	66.57600	3.47200	17.09950	91.02100	-3.13200	17.09950	13	Surface	Yes	Yes
5	TWS(2)_4	91.02100	-3.13200	16.23650	178.22000	-39.23400	16.23650	47	Surface	Yes	Yes
6	TW Fresh Water (a) - St Pancras	-36.51019	2.76952	20.65500	48.54333	3.88213	20.65500	43	Surface	Yes	Yes
7	TW Fresh Water (b) - St Pancras	48.54333	3.88213	20.34000	91.07705	-7.29855	20.34000	22	Surface	Yes	Yes
8	TW Fresh Water (c) - St Pancras	91.07705	-7.29855	19.73000	152.69712	-30.67206	19.73000	33	Surface	Yes	Yes
9	TW Fresh Water (d) - St Pancras	152.69712	-30.67206	19.20000	184.75043	-45.75126	19.20000	18	Surface	Yes	Yes
10	Assumed FW400 connection to TW2_1	52.86515	12.18589	16.51600	55.26286	5.35252	16.51600	4	Surface	Yes	Yes

Displacement Grids

Ref.	Name	Extrusion: Direction	Base line start: X	Base line start: Y	Base line start: Z (level)	Base line end: X	Base line end: Y	Base line end: Z (level)	Base line: Intervals	Extrusion: Distance	Extrusion: Intervals	Surface type for tunnels	Calculate
			[m]	[m]	[m]	[m]	[m]	[m]	[No.]	[m]	[No.]		
1	Grid 1	Global X	-20.00000	-70.00000	21.70000	-	100.00000	21.70000	100	250.00000	250	Surface	No

Imported Displacements

Set: Ref.	Set: Name	Result: Ref.	Coordinates: X [m]	Coordinates: Y [m]	Coordinates: Z [m]	Displacements: X [mm]	Displacements: Y [mm]	Displacements: Z [mm]
1	ID Set #	1	48.00000	60.00000	14.64700	0.00000	0.00000	-0.63099
		2	48.04000	58.00000	14.64700	0.02000	-0.20000	-0.07978
		3	48.08000	56.00000	14.64700	0.08000	-0.46000	0.61727
		4	48.12000	54.00000	14.64700	0.10897	-0.52581	1.26040
		5	48.16000	52.00000	14.64700	0.08000	-0.50000	1.79606
		6	48.20000	50.00000	14.64700	0.03000	-0.42418	2.48505
		7	48.24000	48.00000	14.64700	0.00100	-0.35000	3.29483
		8	48.28000	46.00000	14.64700	-0.00778	-0.22000	2.57724
		9	48.32000	44.00000	14.64700	0.00000	-0.10000	-1.02628
		10	48.36000	42.00000	14.64700	0.00000	-0.03500	-6.15463
		11	48.40000	40.00000	14.64700	0.00000	-0.01000	-10.10050
		12	48.44000	38.00000	14.64700	0.00000	0.00000	-12.20966
		13	48.48000	36.00000	14.64700	0.00000	0.00000	-13.35219
		14	48.52000	34.00000	14.64700	0.00000	0.00000	-14.24653
		15	48.56000	32.00000	14.64700	0.00000	0.00000	-15.04417
		16	48.60000	30.00000	14.64700	0.00000	0.00000	-14.85145
		17	48.64000	28.00000	14.64700	0.00000	0.00000	-12.88313
		18	48.68000	26.00000	14.64700	0.00000	0.00000	-9.88131
		19	48.72000	24.00000	14.64700	0.01000	0.02000	-7.27491
		20	48.76000	22.00000	14.64700	0.02500	0.10000	-6.23307



RSK ENVIRONMENT LIMITED

UBB, London

TW Sewer Assessment

FULL DEVELOPMENT LONG TERM

Job No.	Sheet No.	Rev.
371654		
Drg. Ref.		
Made by MK	Date 09-Dec-2020	Checked Date

Ref.	Set: Name	Result: Ref.	Coordinates: x [m]	Coordinates: y [m]	Coordinates: z [m]	Displacements: x [mm]	Displacements: y [mm]	Displacements: z [mm]
21			48.80000	20.00000	14.64700	0.06000	0.25000	-5.92154
22			48.84000	18.00000	14.64700	0.12000	0.40000	-4.53201
23			48.88000	16.00000	14.64700	0.16500	0.52500	-1.95422
24			48.92000	14.00000	14.64700	0.17780	0.57349	0.89026
25			48.96000	12.00000	14.64700	0.16500	0.52500	2.44523
26			49.00000	10.00000	14.64700	0.12000	0.40000	2.59933
27			49.04000	8.00000	14.64700	0.06000	0.28000	2.01310
28			49.08000	6.00000	14.64700	0.02500	0.13651	1.47967
29			49.12000	4.00000	14.64700	0.01000	0.05000	1.02938
30			49.16000	2.00000	14.64700	0.00000	0.02000	0.64368
31			49.20000	0.00000	14.64700	0.00000	0.00000	0.41057
32			49.24000	-2.00000	14.64700	0.00000	0.00000	0.31046
33			49.28000	-4.00000	14.64700	0.00000	0.00000	0.30576
34			49.32000	-6.00000	14.64700	0.00000	0.00000	0.37308
35			49.36000	-8.00000	14.64700	0.00000	0.00000	0.45878
36			49.40000	-10.00000	14.64700	0.00000	0.00000	0.55332
37			49.44000	-12.00000	14.64700	0.00000	0.00000	0.65011
38			49.48000	-14.00000	14.64700	0.00000	0.00000	0.74466
39			49.52000	-16.00000	14.64700	0.00000	0.00000	0.83402
40			49.56000	-18.00000	14.64700	0.00000	0.00000	0.91636
41			49.60000	-20.00000	14.64700	0.00000	0.00000	0.99073
42			49.64000	-22.00000	14.64700	0.00000	0.00000	1.05635
43			49.68000	-24.00000	14.64700	0.00000	0.00000	1.11343
44			49.72000	-26.00000	14.64700	0.00000	0.00000	1.16206
45			49.76000	-28.00000	14.64700	0.00000	0.00000	1.20262
46			49.80000	-30.00000	14.64700	0.00000	0.00000	1.23557
47			49.84000	-32.00000	14.64700	0.00000	0.00000	1.26148
48			49.88000	-34.00000	14.64700	0.00000	0.00000	1.28091
49			49.92000	-36.00000	14.64700	0.00000	0.00000	1.29446
50			49.96000	-38.00000	14.64700	0.00000	0.00000	1.30271
51			50.00000	-40.00000	14.64700	0.00000	0.00000	1.30621
52			-33.43100	6.49300	17.10000	0.00000	0.00000	-0.88723
53			-31.42786	6.50671	17.10000	0.00000	0.00000	-0.93795
54			-29.42471	6.52043	17.10000	0.00000	0.00000	-0.98934
55			-27.42157	6.53414	17.10000	0.00000	0.00000	-1.04053
56			-25.41843	6.54786	17.10000	0.00000	0.00000	-1.09035
57			-23.41529	6.56157	17.10000	0.00000	0.00000	-1.13718
58			-21.41214	6.57529	17.10000	0.00000	0.00000	-1.17886
59			-19.40900	6.58900	17.10000	0.00000	0.00000	-1.21247
60			-17.40586	6.60271	17.10000	0.00000	0.00000	-1.23416
61			-15.40271	6.61643	17.10000	0.00000	0.00000	-1.23881
62			-13.39957	6.63014	17.10000	0.00000	0.00000	-1.21964
63			-11.39643	6.64386	17.10000	0.00000	0.00000	-1.16773
64			-9.39329	6.65757	17.10000	0.00000	0.00000	-1.07130
65			-7.39014	6.67129	17.10000	0.00000	0.00000	-0.91498
66			-5.38700	6.68500	17.10000	0.00000	0.00000	-0.60012
67			-3.38386	6.69871	17.10000	0.00000	0.00000	0.07795
68			-1.38071	6.71243	17.10000	0.00000	0.00000	0.87163
69			0.62243	6.72614	17.10000	0.09639	0.10708	1.80325
70			2.62557	6.73986	17.10000	0.16426	0.27097	2.88086
71			4.62871	6.75357	17.10000	0.15947	0.46368	4.07466
72			6.63186	6.76729	17.10000	0.08180	0.65832	5.29233
73			8.63500	6.78100	17.10000	0.00925	0.75866	6.39442
74			10.63814	6.79471	17.10000	0.00935	0.76663	7.31349
75			12.64129	6.80843	17.10000	0.00944	0.77462	7.99527
76			14.64443	6.82214	17.10000	0.00954	0.78263	8.44772
77			16.64757	6.83586	17.10000	0.00964	0.79066	8.72126
78			18.65071	6.84957	17.10000	0.00974	0.79872	8.86737
79			20.65386	6.86329	17.10000	0.00984	0.80680	8.92342
80			22.65700	6.87700	17.10000	0.00993	0.81491	8.91365
81			24.66014	6.89071	17.10000	0.01003	0.82305	8.85373
82			26.66329	6.90443	17.10000	0.01013	0.83120	8.75323
83			28.66643	6.91814	17.10000	0.01023	0.83939	8.61573
84			30.66957	6.93186	17.10000	0.01033	0.84760	8.43773
85			32.67271	6.94557	17.10000	0.01043	0.85583	8.20710
86			34.67586	6.95929	17.10000	0.01053	0.86409	7.90101
87			36.67900	6.97300	17.10000	0.01064	0.87238	7.48344
88			38.68214	6.98671	17.10000	0.01009	0.87226	6.41375
89			40.68527	6.50620	17.10000	0.00954	0.78290	5.22298
90			42.68840	6.62880	17.10000	0.00877	0.71898	3.89835
91			44.69153	6.63940	17.10000	0.00637	0.52225	2.34301
92			46.69467	5.80600	17.10000	0.00387	0.31751	0.93471
93			48.69780	5.57260	17.10000	0.00167	0.13707	-0.20855
94			50.69993	5.33920	17.10000	0.00000	0.00000	-1.09197
95			52.70207	5.10580	17.10000	0.00000	0.00000	-1.79140
96			54.70420	4.87240	17.10000	0.00000	0.00000	-2.30712
97			56.70633	4.63900	17.10000	0.00000	0.00000	-2.60619
98			58.70847	4.40560	17.10000	0.00000	0.00000	-2.80535
99			60.71060	4.17220	17.10000	0.07469	0.17400	-2.16090
100			62.71273	3.93880	17.10000	0.11492	0.26772	-2.28574
101			64.71487	3.70540	17.10000	0.15568	0.36268	-2.39375
102			66.71700	3.47200	17.10000	0.19716	0.45931	-2.49532
103			68.71914	2.96400	17.10000	0.21742	0.50650	-2.69058
104			70.72127	2.45600	17.10000	0.23790	0.55422	-2.87087
105			72.72340	1.94800	17.10000	0.25864	0.60253	-3.03343
106			74.72553	1.44000	17.10000	0.30146	0.70228	-3.16209
107			75.72767	0.93200	17.10000	0.40409	0.94137	-3.25786
108			77.72980	0.42400	17.10000	0.50703	1.18119	-3.35344
109			79.73193	-0.08400	17.10000	0.63083	1.47288	-3.44395
110			81.73407	-0.59200	17.10000	0.77704	1.82029	-3.53933
111			83.73620	-1.10000	17.10000	0.94679	2.22623	-3.63727
112			85.73798	-1.60800	17.10000	1.14697	2.70786	-3.73312
113			87.74026	-2.11600	17.10000	1.38701	3.28867	-3.82625
114			89.74262	-2.62400	17.10000	1.66459	3.96529	-3.92675
115			91.74473	-3.13200	17.10000	1.94819	4.66697	-4.06367
116			93.74687	-3.64000	16.23650	1.28838	3.12987	-4.36380
117			95.74760	-4.14800	16.23651	1.79883	4.11536	-4.52689
118			97.74916	-4.65600	16.23652	2.40589	5.64955	-4.31573
119			99.75089	-5.16380	16.23653	3.15956	7.63552	-4.01736
120			101.75262	-5.67160	16.23654	3.65630	8.94973	-3.99486
121			103.75435	-6.17940	16.23655	3.79391	9.34335	-4.61497
122			105.75607	-6.70770	16.23656	3.90140	9.63668	-5.21759
123			107.75780	-7.23600	16.23657	4.00734	9.89790	-5.73376
124			109.75953	-7.76430	16.23659	4.07979	10.12243	-6.13562
125			111.76126	-8.29260	16.23660	4.15201	10.33588	-6.42574
126			113.76300	-8.82090	16.23661	4.22400	10.51507	-6.51047
127			115.76473	-9.34920	16.23662	4.29575	10.69369	-6.40113
128			117.76647	-9.87750	16.23663	4.36726	10.87172	-6.15565
129			119.76820	-10.40580	16.23664	4.43854	11.04916	-5.84308
130			121.76993	-10.93410	16.23665	4.50959	11.22602	-5.52092
131			123.77167	-11.46240	16.23666	4.58040	11.40229	-5.22665
132			125.77340	-11.99070	16.23667	4.65097	11.57798	-4.97087
133			127.77514	-12.51900	16.23668	4.72163	11.75960	-4.83310
134			129.77687	-13.04730	16.23669	4.79248	11.94184	-4.65476
135			131.77860	-13.57560	16.23670	4.86343	12.12408	-4.40005
136			133.78033	-14.10390	16.23671	4.93438	12.30632	-4.08983
137			135.78207	-14.63220	16.23672	5.00533		



RSK ENVIRONMENT LIMITED

UBB, London

TW Sewer Assessment

FULL DEVELOPMENT LONG TERM

Job No.	Sheet No.	Rev.
371654		
Drg. Ref.		
Made by MK	Date 09-Dec-2020	Checked Date

Set: Ref.	Set: Name	Result: Ref.	Coordinates: x [m]	Coordinates: y [m]	Coordinates: z [m]	Displacements: x [mm]	Displacements: y [mm]	Displacements: z [mm]
162	176.36470	-38.46587	16.23699	-1.41549	2.89590	-0.11454		
163	178.22000	-39.23400	16.23700	-0.95525	1.95431	-0.33496		
164	-36.51019	2.76952	20.65500	0.00000	0.00000	-0.77489		
165	-34.53220	2.79539	20.65500	0.00000	0.00000	-0.82029		
166	-32.55421	2.82127	20.65500	0.00000	0.00000	-0.86725		
167	-30.57622	2.84714	20.65500	0.00000	0.00000	-0.91541		
168	-28.59823	2.87302	20.65500	0.00000	0.00000	-0.96426		
169	-26.62024	2.89889	20.65500	0.00000	0.00000	-1.01311		
170	-24.64226	2.92477	20.65500	0.00000	0.00000	-1.06099		
171	-22.66427	2.95064	20.65500	0.00000	0.00000	-1.10666		
172	-20.68628	2.97652	20.65500	0.00000	0.00000	-1.14846		
173	-18.70829	3.00239	20.65500	0.00000	0.00000	-1.18422		
174	-16.73030	3.02827	20.65500	0.00000	0.00000	-1.21118		
175	-14.75231	3.05414	20.65500	0.00000	0.00000	-1.22581		
176	-12.77432	3.08002	20.65500	0.00000	0.00000	-1.22368		
177	-10.79343	3.10589	20.65500	0.00000	0.00000	-1.19927		
178	-8.81834	3.13177	20.65500	0.00000	0.00000	-1.14584		
179	-6.84036	3.15764	20.65500	0.00000	0.00000	-1.05544		
180	-4.86237	3.18352	20.65500	0.00000	0.00000	-0.91905		
181	-2.88438	3.20939	20.65500	0.00000	0.00000	-0.69586		
182	-0.90639	3.23527	20.65500	0.02152	0.02228	-0.16797		
183	1.07160	3.26114	20.65500	0.09498	0.20524	0.41172		
184	3.04959	3.28701	20.65500	0.11936	0.40508	1.01035		
185	5.02758	3.31289	20.65500	0.10342	0.64559	1.61113		
186	7.00857	3.33876	20.65500	0.04624	0.89794	2.16281		
187	8.98355	3.36464	20.65504	0.01264	1.03714	2.62458		
188	10.96154	3.39051	20.65500	0.01399	1.14732	3.02434		
189	12.93953	3.41639	20.65500	0.01536	1.26004	3.34577		
190	14.91752	3.44226	20.65500	0.01677	1.37528	3.58357		
191	16.89551	3.46814	20.65500	0.01820	1.49305	3.74504		
192	18.87350	3.49401	20.65500	0.01879	1.54719	3.83037		
193	20.85149	3.51989	20.65500	0.01913	1.56906	3.86057		
194	22.82948	3.54576	20.65500	0.01947	1.59669	3.84975		
195	24.80747	3.57164	20.65500	0.01980	1.62434	3.80541		
196	26.78545	3.59751	20.65500	0.02014	1.65199	3.73185		
197	28.76344	3.62339	20.65500	0.02048	1.67966	3.63011		
198	30.74143	3.64926	20.65500	0.02082	1.70734	3.49767		
199	32.71942	3.67514	20.65500	0.02115	1.73502	3.32824		
200	34.69741	3.70101	20.65500	0.02149	1.76273	3.11171		
201	36.67540	3.72689	20.65500	0.02183	1.79044	2.83500		
202	38.65339	3.75276	20.65500	0.02217	1.81817	2.48472		
203	40.63138	3.77864	20.65500	0.02251	1.84591	2.05306		
204	42.60936	3.80451	20.65500	0.00317	4.54478	3.03759		
205	44.58735	3.83038	20.65500	0.00243	4.50967	2.32362		
206	46.56534	3.85626	20.65500	0.00123	4.43764	0.87764		
207	48.54333	3.88213	20.65500	0.00000	4.02741	0.73331		
208	48.54333	3.88213	20.34000	0.00000	4.02741	0.73331		
209	50.47668	3.37392	20.34000	0.00000	3.06246	-0.60744		
210	52.41003	2.86571	20.34000	-0.00209	2.23214	-1.70644		
211	54.34338	2.35750	20.34000	-0.05267	1.55462	-2.55555		
212	56.27674	1.84928	20.34000	-0.06284	0.87470	-3.23971		
213	58.21009	1.34107	20.34000	-0.02832	0.24795	-3.50062		
214	60.14344	0.83286	20.34000	0.00000	0.00000	-3.16499		
215	62.07679	0.32464	20.34000	0.00000	0.00000	-3.30085		
216	64.01014	-0.18357	20.34000	0.00000	0.00000	-4.41780		
217	65.94349	-0.69178	20.34000	0.00000	0.00000	-3.52111		
218	67.87684	-1.20000	20.34000	0.00000	0.00000	-3.61403		
219	69.81019	-1.70821	20.34000	0.00000	0.00000	-3.69851		
220	71.74354	-2.21642	20.34000	0.00000	0.00000	-3.77619		
221	73.67689	-2.72463	20.34000	0.00000	0.00000	-3.84930		
222	75.61025	-3.23285	20.34000	0.01320	0.03074	-3.92117		
223	77.54360	-3.74106	20.34000	0.03375	0.07862	-3.99654		
224	79.47695	-4.24927	20.34000	0.07037	0.16649	-4.07232		
225	81.41030	-4.75749	20.34000	0.17587	0.42582	-4.14802		
226	83.34365	-5.26570	20.34000	0.30729	0.74966	-4.24448		
227	85.27700	-5.77391	20.34000	0.46968	1.15056	-4.34356		
228	87.21035	-6.28213	20.34000	0.66846	1.64206	-4.42967		
229	89.14370	-6.79034	20.34000	0.92983	2.28932	-4.47774		
230	91.07705	-7.29855	20.34000	1.28111	3.16036	-4.45615		
231	93.01070	-7.80676	19.73000	1.28111	3.16036	-4.45514		
232	94.94433	-8.31497	19.73000	1.66555	4.11639	-4.39019		
233	96.87160	-8.82318	19.73000	2.07402	5.13223	-4.32999		
234	98.80488	-9.33139	19.73000	2.68882	6.68848	-4.39263		
235	98.85415	-10.13170	19.73000	2.75730	6.86394	-4.37889		
236	100.41343	-10.83999	19.73000	2.82823	7.04049	-4.35072		
237	102.28070	-11.54828	19.73000	2.89959	7.21814	-4.46307		
238	104.14798	-12.25657	19.73000	2.97139	7.39687	-4.71368		
239	106.01525	-12.96486	19.73000	3.04363	7.57670	-4.89037		
240	107.88252	-13.67314	19.73000	3.11631	7.75763	-4.98383		
241	109.74980	-14.38143	19.73000	3.18942	7.93964	-4.99334		
242	111.61707	-15.08972	19.73000	3.26298	8.12275	-4.92964		
243	113.48435	-15.79801	19.73000	3.33697	8.30695	-4.81162		
244	115.35162	-16.50630	19.73000	3.41141	8.49224	-4.65995		
245	117.21890	-17.21459	19.73000	3.48628	8.67863	-4.49093		
246	119.08617	-17.92287	19.73000	3.56159	8.86611	-4.31180		
247	120.95345	-18.63116	19.73000	3.59999	8.96168	-4.16156		
248	122.82072	-19.33945	19.73000	3.61396	8.99648	-4.00976		
249	124.68800	-20.04774	19.73000	3.62795	9.03130	-3.80652		
250	126.55527	-20.75603	19.73000	3.64194	9.06612	-3.53610		
251	128.42255	-21.46431	19.73000	3.65594	9.10097	-3.19622		
252	130.28982	-22.17260	19.73000	3.66994	9.13584	-2.79922		
253	132.15710	-22.88089	19.73000	3.68396	9.17071	-2.36870		
254	134.02437	-23.58918	19.73000	3.69797	9.20561	-1.93343		
255	135.89165	-24.29747	19.73000	3.71200	9.24052	-1.51810		
256	137.75892	-25.00575	19.73000	3.72603	9.27545	-1.13333		
257	139.62619	-25.71404	19.73000	3.74007	9.31040	-0.77135		
258	141.49347	-26.42233	19.73000	3.75411	9.34536	-0.41240		
259	143.36074	-27.13062	19.73000	3.76817	9.38034	-0.03830		
260	145.22802	-27.83891	19.73000	3.78222	9.41534	0.35777		
261	147.09529	-28.54720	19.73000	3.79629	9.45035	0.77153		
262	148.96257	-29.25548	19.73000	3.81036	9.48539	1.19288		
263	150.82984	-29.96377	19.73000	3.82444	9.52044	1.61013		
264	152.69712	-30.67206	19.73000	3.79607	9.44980	1.95781		
265	154.56440	-31.38035	19.20000	3.79607	9.44980	1.95205		
266	154.47786	-31.50979	19.20000	3.63610	9.05160	2.06168		
267	156.34513	-32.21808	19.20000	3.47853	8.65933	2.13789		
268	158.09374	-33.18526	19.20000	3.32333	8.27299	2.18454		
269	159.82008	-34.02299	19.20000	3.17052	7.89259	2.21160		
270	161.60081	-34.86073	19.20000	2.92819	7.45540	2.19071		
271	163.38155	-35.69846	19.20000	1.00208	6.81282	1.95927		
272	165.16229	-36.53619	19.20000	-0.09490	6.02512	1.56889		
273	166.94303	-37.37393	19.20000	-0.88676	5.44208	1.20602		
274	168.72377	-38.21166	19.20000	-1.34125	4.73349	0.78083		
275	170.50451	-39.04939	19.20000	-1.47930	3.88022	0.35625		
276	172.28525	-39.88713	19.20000	-3.41013	2.91013	-0.00406		
277	174.06599	-40.72486	19.20000	-0.96582	1.97594	-0.26935		
278	175.84673	-41.56260	19.20000	-0.56124	1.14821	-0.46851		
279	177.62747	-42.40033	19.20000	-0.12072	0.24698	-0.70135		
280	179.40821	-43.23806	19.20000	0.00000	0.00000	-0.89107		
281	181.18895	-44.07580	19.20000	0.00000	0.00000	-0.94394		
282	182.96969	-44.91353	19.20000	0.00000	0.00000	-0.80065		
283	184.75043	-45.75126	19.20000	0.00000	0.00000	-0.67333		
284	186.53117	-12.18589	16.51600	0.16949	0.42492	12.80100		
285	188.31191	-10.47755	16.51600	0.07350	0.18316	3.59928		
286	190.09265	-8.76921	16.51600	0.00000	0.00000	0.79494		
287	191.87339	-7.06086	16.51600	0.00000	0.00000	-0.92578		
288	1935.							

Polygonal Excavations

Ref.	1										
Excavation Name:	PLOT A - 17.2mAOD Basement Wall Install										
Surface level [m]:	21.700										
Contribution:	Positive										
Surface movement curves which are selected are applied between surface and [m]:	13.450										
Corner	x	y	Base	Arc	Stiffened	Prev.	Prev.	Prev.	Next	Next	Next



RSK ENVIRONMENT LIMITED

UBB, London

TW Sewer Assessment

FULL DEVELOPMENT LONG TERM

Job No.	Sheet No.	Rev.
371654		
Drg. Ref.		
Made by MK	Date 09-Dec-2020	Checked Date

Level Enabled					Side:		Side:		Side:		Side:		Side:	
	[m]		[m]			d	p1	p2*	d	p1	p2*	d	p1	p2*
						[m]	[%]	[%]	[m]	[%]	[%]	[m]	[%]	[%]
	1	42.430	45.000	13.450	Yes	No	-	-	-	-	-	-	-	-
	2	18.390	46.290	13.450	No	No	-	-	-	-	-	-	-	-
	3	7.3100	46.290	13.450	Yes	No	-	-	-	-	-	-	-	-
	4	7.9800	14.740	13.700	Yes	No	-	-	-	-	-	-	-	-
	5	42.430	14.320	13.700	Yes	No	-	-	-	-	-	-	-	-
Side	x1	y1	x2	y2	G.M. Curve: Vertical			G.M. Curve: Horizontal						
	[m]	[m]	[m]	[m]										
	1	42.430	45.000	18.390	46.290	No	vertical	ground movement	No horizontal ground movement					
	2	18.390	46.290	7.3100	46.290	No	vertical	ground movement	No horizontal ground movement					
	3	7.3100	46.290	7.9800	14.740	No	vertical	ground movement	No horizontal ground movement					
	4	7.9800	14.740	42.430	14.320	No	vertical	ground movement	No horizontal ground movement					
	5	42.430	14.320	42.430	45.000	No	vertical	ground movement	No horizontal ground movement					
Ref.						2								
Excavation Name:						PLOT A - 17.2m AOD Excavation (+ve)								
Surface level [m]:						18.000								
Contribution:						Positive								
Surface movement curves which are selected are applied between surface and [m]:						17.200								
Corner	x	y	Base Level	Arc Enabled	Stiffened	Prev. Side:	Prev. Side:	Prev. Side:	Next Side:	Next Side:	Next Side:			
	[m]	[m]	[m]			d	p1	p2*	d	p1	p2*			
	[m]	[m]	[m]			[m]	[%]	[%]	[m]	[%]	[%]			
	1	42.430	45.000	17.200	Yes	No	-	-	-	-	-			
	2	18.390	46.290	17.200	No	No	-	-	-	-	-			
	3	7.3100	46.290	17.200	Yes	Yes	9.5000	67.000	25.000	9.5000	67.000	25.000		
	4	7.9800	14.740	17.200	Yes	Yes	9.5000	67.000	25.000	9.5000	67.000	25.000		
	5	42.430	14.320	17.200	Yes	No	-	-	-	-	-			
Side	x1	y1	x2	y2	G.M. Curve: Vertical			G.M. Curve: Horizontal						
	[m]	[m]	[m]	[m]										
	1	42.430	45.000	18.390	46.290	No	vertical	ground movement	No horizontal ground movement					
	2	18.390	46.290	7.3100	46.290	No	vertical	ground movement	No horizontal ground movement					
	3	7.3100	46.290	7.9800	14.740	No	vertical	ground movement	No horizontal ground movement					
	4	7.9800	14.740	42.430	14.320	No	vertical	ground movement	No horizontal ground movement					
	5	42.430	14.320	42.430	45.000	No	vertical	ground movement	No horizontal ground movement					
Ref.						3								
Excavation Name:						Proposed Contig Wall south_2								
Surface level [m]:						21.700								
Contribution:						Positive								
Surface movement curves which are selected are applied between surface and [m]:						13.575								
Corner	x	y	Base Level	Arc Enabled	Stiffened	Prev. Side:	Prev. Side:	Prev. Side:	Next Side:	Next Side:	Next Side:			
	[m]	[m]	[m]			d	p1	p2*	d	p1	p2*			
	[m]	[m]	[m]			[m]	[%]	[%]	[m]	[%]	[%]			
	1	51.335	44.430	13.575	No	No	-	-	-	-	-			
	2	52.345	22.880	13.575	No	No	-	-	-	-	-			
	3	52.350	22.880	13.575	Yes	No	-	-	-	-	-			
	4	51.340	44.430	13.575	Yes	No	-	-	-	-	-			
Side	x1	y1	x2	y2	G.M. Curve: Vertical			G.M. Curve: Horizontal						
	[m]	[m]	[m]	[m]										
	1	51.335	44.430	52.345	22.880	No	vertical	ground movement	No horizontal ground movement					
	2	52.345	22.880	52.350	22.880	No	vertical	ground movement	No horizontal ground movement					
	3	52.350	22.880	51.340	44.430	No	vertical	ground movement	No horizontal ground movement					
	4	51.340	44.430	51.335	44.430	No	vertical	ground movement	No horizontal ground movement					
Ref.						4								
Excavation Name:						PLOT B NEW WALL 1								
Surface level [m]:						21.700								
Contribution:						Positive								
Surface movement curves which are selected are applied between surface and [m]:						13.700								
Corner	x	y	Base Level	Arc Enabled	Stiffened	Prev. Side:	Prev. Side:	Prev. Side:	Next Side:	Next Side:	Next Side:			
	[m]	[m]	[m]			d	p1	p2*	d	p1	p2*			
	[m]	[m]	[m]			[m]	[%]	[%]	[m]	[%]	[%]			
	1	51.340	44.430	13.700	No	No	-	-	-	-	-			
	2	101.00	63.000	13.700	No	No	-	-	-	-	-			
	3	101.00	46.000	13.700	No	No	-	-	-	-	-			
	4	65.520	17.230	13.700	No	No	-	-	-	-	-			
	5	52.350	22.880	13.700	No	No	-	-	-	-	-			
Side	x1	y1	x2	y2	G.M. Curve: Vertical			G.M. Curve: Horizontal						
	[m]	[m]	[m]	[m]										
	1	51.340	44.430	101.00	63.000	No	vertical	ground movement	No horizontal ground movement					
	2	101.00	63.000	101.00	46.000	No	vertical	ground movement	No horizontal ground movement					
	3	101.00	46.000	65.520	17.230	No	vertical	ground movement	No horizontal ground movement					
	4	65.520	17.230	52.350	22.880	No	vertical	ground movement	No horizontal ground movement					
	5	52.350	22.880	51.340	44.430	No	vertical	ground movement	No horizontal ground movement					
Ref.						5								
Excavation Name:						PLOT B & C ALL EXC - 19.10mAOD (+ve)								
Surface level [m]:						21.700								
Contribution:						Positive								
Surface movement curves which are selected are applied between surface and [m]:						19.100								
Corner	x	y	Base Level	Arc Enabled	Stiffened	Prev. Side:	Prev. Side:	Prev. Side:	Next Side:	Next Side:	Next Side:			
	[m]	[m]	[m]			d	p1	p2*	d	p1	p2*			
	[m]	[m]	[m]			[m]	[%]	[%]	[m]	[%]	[%]			
	1	51.340	44.430	19.100	No	Yes	25.000	9.5000	25.000	25.000	67.000	25.000		
	2	101.00	63.000	19.100	Yes	No	-	-	-	-	-			
	3	167.21	84.375	19.100	Yes	Yes	9.5000	67.000	25.000	9.5000	67.000	25.000		
	4	176.07	61.064	19.100	Yes	No	-	-	-	-	-			
	5	175.87	-18.327	19.100	Yes	Yes	9.5000	67.000	25.000	9.5000	67.000	25.000		
	6	164.92	-23.678	19.100	Yes	Yes	9.5000	67.000	25.000	9.5000	67.000	25.000		
	7	101.00	2.0000	19.100	No	No	-	-	-	-	-			
	8	52.350	22.880	19.100	No	No	-	-	-	-	-			
Side	x1	y1	x2	y2	G.M. Curve: Vertical			G.M. Curve: Horizontal						
	[m]	[m]	[m]	[m]										
	1	51.340	44.430	101.00	63.000	No	vertical	ground movement	No horizontal ground movement					
	2	101.00	63.000	167.21	84.375	No	vertical	ground movement	No horizontal ground movement					
	3	167.21	84.375	176.07	61.064	No	vertical	ground movement	No horizontal ground movement					
	4	176.07	61.064	175.87	-18.327	No	vertical	ground movement	No horizontal ground movement					
	5	175.87	-18.327	164.92	-23.678	No	vertical	ground movement	No horizontal ground movement					
	6	164.92	-23.678	101.00	2.0000	No	vertical	ground movement	No horizontal ground movement					
	7	101.00	2.0000	52.350	22.880	No	vertical	ground movement	No horizontal ground movement					
	8	52.350	22.880	51.340	44.430	No	vertical	ground movement	No horizontal ground movement					



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Made by MK	Date 09-Dec-2020	Checked Date

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Side	x1 [m]	y1 [m]	x2 [m]	y2 [m]	G.M. Curve: Vertical				G.M. Curve: Horizontal				
Ref.					6	PLOT B WALL INST - 2							
Excavation Name:					21.700								
Surface level [m]:					Positive								
Contribution:					11.700								
Surface movement curves which are selected are applied between surface and [m]:													
Corner	x	y	Base Level	Arc Enabled	Stiffened	Prev. Side: d	Prev. Side: p1	Prev. Side: p2*	Next Side: d	Next Side: p1	Next Side: p2*		
	[m]	[m]	[m]			[m]	[%]	[%]	[m]	[%]	[%]		
1	101.00	2.0000	11.700	No	No	-	-	-	-	-	-		
2	101.00	46.000	11.700	No	No	-	-	-	-	-	-		
3	65.520	17.230	11.700	No	No	-	-	-	-	-	-		
Side	x1 [m]	y1 [m]	x2 [m]	y2 [m]	G.M. Curve: Vertical				G.M. Curve: Horizontal				
1	101.00	2.0000	101.00	46.000	No	vertical	ground	movement	No	horizontal	ground	movement	
2	101.00	46.000	65.520	17.230	No	vertical	ground	movement	No	horizontal	ground	movement	
3	65.520	17.230	101.00	2.0000	No	vertical	ground	movement	No	horizontal	ground	movement	
Ref.					7	PLOT B EXC - 16.3mAOD (+ve)							
Excavation Name:					19.100								
Surface level [m]:					Positive								
Contribution:					16.300								
Surface movement curves which are selected are applied between surface and [m]:													
Corner	x	y	Base Level	Arc Enabled	Stiffened	Prev. Side: d	Prev. Side: p1	Prev. Side: p2*	Next Side: d	Next Side: p1	Next Side: p2*		
	[m]	[m]	[m]			[m]	[%]	[%]	[m]	[%]	[%]		
1	101.00	2.0000	16.300	No	Yes	9.5000	67.000	25.000	9.5000	67.000	25.000		
2	101.00	46.000	16.300	No	No	-	-	-	-	-	-		
3	65.520	17.230	16.300	Yes	No	-	-	-	-	-	-		
Side	x1 [m]	y1 [m]	x2 [m]	y2 [m]	G.M. Curve: Vertical				G.M. Curve: Horizontal				
1	101.00	2.0000	101.00	46.000	No	vertical	ground	movement	No	horizontal	ground	movement	
2	101.00	46.000	65.520	17.230	No	vertical	ground	movement	No	horizontal	ground	movement	
3	65.520	17.230	101.00	2.0000	No	vertical	ground	movement	No	horizontal	ground	movement	
Ref.					8	PLOT C - WALL INST							
Excavation Name:					21.700								
Surface level [m]:					Positive								
Contribution:					9.2000								
Surface movement curves which are selected are applied between surface and [m]:													
Corner	x	y	Base Level	Arc Enabled	Stiffened	Prev. Side: d	Prev. Side: p1	Prev. Side: p2*	Next Side: d	Next Side: p1	Next Side: p2*		
	[m]	[m]	[m]			[m]	[%]	[%]	[m]	[%]	[%]		
1	167.21	84.375	9.2000	Yes	No	-	-	-	-	-	-		
2	101.00	63.000	9.2000	No	No	-	-	-	-	-	-		
3	101.00	2.0000	9.2000	No	No	-	-	-	-	-	-		
4	164.92	-23.678	9.2000	Yes	No	-	-	-	-	-	-		
5	175.87	-18.327	9.2000	Yes	No	-	-	-	-	-	-		
6	176.07	61.064	9.2000	Yes	No	-	-	-	-	-	-		
Side	x1 [m]	y1 [m]	x2 [m]	y2 [m]	G.M. Curve: Vertical				G.M. Curve: Horizontal				
1	167.21	84.375	101.00	63.000	No	vertical	ground	movement	No	horizontal	ground	movement	
2	101.00	63.000	101.00	2.0000	No	vertical	ground	movement	No	horizontal	ground	movement	
3	101.00	2.0000	164.92	-23.678	No	vertical	ground	movement	No	horizontal	ground	movement	
4	164.92	-23.678	175.87	-18.327	No	vertical	ground	movement	No	horizontal	ground	movement	
5	175.87	-18.327	176.07	61.064	No	vertical	ground	movement	No	horizontal	ground	movement	
6	176.07	61.064	167.21	84.375	No	vertical	ground	movement	No	horizontal	ground	movement	
Ref.					9	PLOT C - EXC (+ve)							
Excavation Name:					19.100								
Surface level [m]:					Positive								
Contribution:					13.400								
Surface movement curves which are selected are applied between surface and [m]:													
Corner	x	y	Base Level	Arc Enabled	Stiffened	Prev. Side: d	Prev. Side: p1	Prev. Side: p2*	Next Side: d	Next Side: p1	Next Side: p2*		
	[m]	[m]	[m]			[m]	[%]	[%]	[m]	[%]	[%]		
1	167.21	84.375	13.400	Yes	Yes	9.5000	67.000	25.000	9.5000	67.000	25.000		
2	101.00	63.000	13.400	Yes	Yes	25.000	9.5000	25.000	25.000	67.000	25.000		
3	101.00	2.0000	13.400	Yes	Yes	25.000	9.5000	25.000	25.000	67.000	25.000		
4	164.92	-23.678	13.400	Yes	Yes	9.4300	67.000	25.000	9.4300	67.000	25.000		
5	175.87	-18.327	13.400	Yes	Yes	9.4300	67.000	25.000	9.4300	67.000	25.000		
6	176.07	61.064	13.400	Yes	No	-	-	-	-	-	-		
Side	x1 [m]	y1 [m]	x2 [m]	y2 [m]	G.M. Curve: Vertical				G.M. Curve: Horizontal				
1	167.21	84.375	101.00	63.000	No	vertical	ground	movement	No	horizontal	ground	movement	
2	101.00	63.000	101.00	2.0000	No	vertical	ground	movement	No	horizontal	ground	movement	
3	101.00	2.0000	164.92	-23.678	No	vertical	ground	movement	No	horizontal	ground	movement	
4	164.92	-23.678	175.87	-18.327	No	vertical	ground	movement	No	horizontal	ground	movement	
5	175.87	-18.327	176.07	61.064	No	vertical	ground	movement	No	horizontal	ground	movement	
6	176.07	61.064	167.21	84.375	No	vertical	ground	movement	No	horizontal	ground	movement	
Ref.					10	PLOT A - 18.00mAD - EXC (+ve)							
Excavation Name:					21.700								
Surface level [m]:					Positive								
Contribution:					18.000								
Surface movement curves which are selected are applied between surface and [m]:													
Corner	x	y	Base Level	Arc Enabled	Stiffened	Prev. Side: d	Prev. Side: p1	Prev. Side: p2*	Next Side: d	Next Side: p1	Next Side: p2*		
	[m]	[m]	[m]			[m]	[%]	[%]	[m]	[%]	[%]		
1	7.3100	46.290	18.000	Yes	Yes	9.5000	67.000	25.000	9.5000	67.000	25.000		
2	18.390	46.290	18.000	Yes	No	-	-	-	-	-	-		
3	42.430	45.000	18.000	Yes	No	-	-	-	-	-	-		
4	51.340	44.430	18.000	No	Yes	9.5000	67.000	25.000	9.5000	67.000	25.000		
5	52.350	22.880	18.000	No	No	-	-	-	-	-	-		
6	52.350	14.320	18.000	Yes	Yes	9.5000	67.000	25.000	9.5000	67.000	25.000		
7	42.430	14.320	18.000	No	No	-	-	-	-	-	-		
8	7.9800	14.740	18.000	Yes	Yes	9.5000	67.000	25.000	9.5000	67.000	25.000		
Side	x1 [m]	y1 [m]	x2 [m]	y2 [m]	G.M. Curve: Vertical				G.M. Curve: Horizontal				



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1	7.3100	46.290	18.390	46.290	No vertical ground movement	No horizontal ground movement
2	18.390	46.290	42.430	45.000	No vertical ground movement	No horizontal ground movement
3	42.430	45.000	51.340	44.430	No vertical ground movement	No horizontal ground movement
4	51.340	44.430	52.350	22.880	No vertical ground movement	No horizontal ground movement
5	52.350	22.880	52.350	14.320	No vertical ground movement	No horizontal ground movement
6	52.350	14.320	42.430	14.320	No vertical ground movement	No horizontal ground movement
7	42.430	14.320	7.9800	14.740	No vertical ground movement	No horizontal ground movement
8	7.9800	14.740	7.3100	46.290	No vertical ground movement	No horizontal ground movement

Ref. 11
Excavation Name: Proposed Contig Wall South 1
Surface level [m]: 21.700
Contribution: Positive
Surface movement curves which are selected are applied between surface and [m]: 13.575

Corner	x	y	Base Level	Arc Enabled	Stiffened	Prev. Side: d	Prev. Side: p1	Prev. Side: p2*	Next Side: d	Next Side: p1	Next Side: p2*
	[m]	[m]	[m]			[m]	[%]	[%]	[m]	[%]	[%]
1	52.345	22.880	13.575	No	No	-	-	-	-	-	-
2	52.345	14.320	13.575	No	No	-	-	-	-	-	-
3	52.350	14.320	13.575	Yes	No	-	-	-	-	-	-
4	52.350	22.880	13.575	Yes	No	-	-	-	-	-	-

Side	x1 [m]	y1 [m]	x2 [m]	y2 [m]	G.M. Curve: Vertical	G.M. Curve: Horizontal
1	52.345	22.880	52.345	14.320	No vertical ground movement	No horizontal ground movement
2	52.345	14.320	52.350	14.320	No vertical ground movement	No horizontal ground movement
3	52.350	14.320	52.350	22.880	No vertical ground movement	No horizontal ground movement
4	52.350	22.880	52.345	22.880	No vertical ground movement	No horizontal ground movement

Circular Excavations

Vertical Ground Movement Curves

Curve Name: No vertical ground movement
Coordinates: [Distance from wall / wall depth or max. excavation depth (x), Depth / wall depth or max. excavation depth (y), Settlement / wall depth or max. excavation depth (z) (%)]
[0.000,0.000,0.000][1.000,0.000,0.000][0.000,1.000,0.000][1.000,1.000,0.000]
Curve Fitting Method: Polynomial
x Order: 1
y Order: 0
Polynomial: z = 0.0x + 0.0
Coeff. of Determination:

Horizontal Ground Movement Curves

Curve Name: No horizontal ground movement
Coordinates: [Distance from wall / wall depth or max. excavation depth (x), Depth / wall depth or max. excavation depth (y), Horizontal movement / wall depth or max. excavation depth (z) (%)]
[0.000,0.000,0.000][1.000,0.000,0.000][0.000,1.000,0.000][1.000,1.000,0.000]
Curve Fitting Method: Polynomial
x Order: 0
y Order: 0
Polynomial: z = 0.0
Coeff. of Determination:

Utility Dimensions

Ref.	Name	Internal Diameter [mm]	Wall Thickness [mm]
1	TWS(1)_1_2134mm Dia	2134.0	200.00
2	TWS(2)_1_1219mm Dia	1219.0	200.00
3	TWS(2)_2_1219mm Dia	1219.0	200.00
4	TWS(2)_3_1219mm Dia	1219.0	200.00
5	TWS(2)_4_1093mm Dia	1093.0	200.00
6	TW Fresh Water (a) - St Pancras	100.00	5.0000
7	TW Fresh Water (b) - St Pancras	100.00	5.0000
8	TW Fresh Water (c) - St Pancras	100.00	5.0000
9	TW Fresh Water (d) - St Pancras	100.00	5.0000
10	Assumed FW400 connection to TW2_1	400.00	5.0000

Acceptance Criteria/Parameters

Ref.	Name	Criteria: Factors:	Criteria: Factors:	Criteria: Factors:	Criteria: Factors:	Criteria: Factors:	Criteria: Factors:	Criteria: Factors:	Criteria: Factors:	Criteria: Factors:	Criteria: Factors:	Criteria: Factors:	Criteria: Factors:	Criteria: Factors:	Criteria: Factors:	Criteria: Factors:	Criteria: Factors:	Criteria: Factors:
Pullout:	Rotn.	Ax.	Threshold	Strain:	Limit	Value	Value	Value	Value	Tension	Tension:	Compn.	Compn.:	Threshold	Threshold:	Limit	Limit:	Ax.
Flex.	Strain:	Strain:	Strain:	Strain:	Strain:	Strain:	Strain:	Strain:	Strain:	Strain:	Strain:	Strain:	Strain:	Strain:	Strain:	Strain:	Strain:	Strain:
Tension	Compn.	Tension	Compn.	Tension	Compn.	Tension	Compn.	Tension	Compn.	Tension	Compn.	Tension	Compn.	Tension	Compn.	Tension	Compn.	Tension
1	Brick	No	-	No	-	No	-	No	-	Yes	500.00	Yes	1000.0	No	-	No	-	1.0000
1.0000	1.0000	1.0000	1.0000	2.0000	1.0000	3.0000	No	-	Yes	0.10000	Yes	100.00	Yes	1200.0	No	-	No	1.0000
2	Cast Iron	No	-	Yes	3.0000	No	-	Yes	0.10000	Yes	100.00	Yes	1200.0	No	-	No	-	1.0000
1.0000	1.0000	0.20000	0.20000	1.0000	1.0000	3.0000	No	-	Yes	0.50000	Yes	100.00	Yes	700.00	No	-	No	1.0000
3	Ductile Iron	No	-	Yes	3.0000	No	-	Yes	0.50000	Yes	100.00	Yes	700.00	No	-	No	-	1.0000
1.0000	1.0000	0.20000	0.20000	1.0000	1.0000													

Utility Strain Calculation Options

Neglect beneficial contribution of axial strains : Yes

Utilities

Ref.	Utility Name			Sub-Utility	Jointed	Dimension	Acceptance	Displacement	Displacement Line	Displacement	Line	Poly segs		
Poly segs	Start	End	Pipe	Name			Criteria/Parameters	Data Type		Polyline	Length	continuous		
continuous Distance Distance Segment														
: Strain	Along	Along	Length										: Pullout	
Line	Line													
[m]	[m]	[m]											[m]	
1	TWS(1)_1			1	No	TWS(1)_1_2134mm Dia	Brick	Line	TWS(1)_1	-	100.02	-		
2	TWS(2)_1	0.0	100.02	-	1	No	TWS(2)_1_1219mm Dia	Brick	Line	TWS(2)_1	-	70.112	-	
3	TWS(2)_2	0.0	70.111	-	1	No	TWS(2)_2_1219mm Dia	Brick	Line	TWS(2)_2	-	30.101	-	
4	TWS(2)_3	0.0	30.101	-	1	No	TWS(2)_3_1219mm Dia	Brick	Line	TWS(2)_3	-	25.321	-	
5	TWS(2)_4	0.0	25.321	-	1	No	TWS(2)_4_1093mm Dia	Brick	Line	TWS(2)_4	-	94.377	-	
-	-	0.0	94.377	-										



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Ref. Poly segs	Utility Name Start End Pipe	Sub-Utility Jointed Name	Dimension	Acceptance Criteria/Parameters	Displacement Data Type	Displacement Line	Displacement Polyline	Line Length continuous	Poly segs
continuous Distance Segment									
6	TW Fresh Water (a) - St Pancras	1	Yes	TW Fresh Water (a) - St Pancras	Cast Iron	Line	TW Fresh Water (a) - St Pancras	-	85.061
-	0.0 85.060 3.6000								-
7	TW Fresh Water (b) - St Pancras	1	Yes	TW Fresh Water (b) - St Pancras	Cast Iron	Line	TW Fresh Water (b) - St Pancras	-	43.979
-	0.0 43.978 3.6000								-
8	TW Fresh Water (c) - St Pancras	1	Yes	TW Fresh Water (c) - St Pancras	Cast Iron	Line	TW Fresh Water (c) - St Pancras	-	65.904
-	0.0 65.904 3.6000								-
9	TW Fresh Water (d) - St Pancras	1	Yes	TW Fresh Water (d) - St Pancras	Cast Iron	Line	TW Fresh Water (d) - St Pancras	-	35.423
-	0.0 35.423 3.6000								-
10	Assumed FW400 connection to TW2_1	1	Yes	Assumed FW400 connection to TW2_1	Ductile Iron	Line	Assumed FW400 connection to TW2_1	-	7.2418
-	0.0 7.2410 3.6000								-

Warnings

- Multiple excavations have been specified. Displacements resulting from each excavation are summed with no account taken of the interactions between excavations (e.g. overlapping zones of influence or 'shielding' of one excavation by another).
- Embedded Wall Excavation PE1 : PLOT A - 17.2mAOD Basement Wall Install intersects PE10 : PLOT A - 18.00mAD - EXC (+ve).
- Embedded Wall Excavation PE2 : PLOT A - 17.2m AOD Excavation (+ve) intersects PE10 : PLOT A - 18.00mAD - EXC (+ve).
- Embedded Wall Excavation PE3 : Proposed Contig Wall south_2 intersects PE4 : PLOT B NEW WALL 1, , PE5 : PLOT B & C ALL EXC - 19.10mAOD (+ve), , PE10 : PLOT A - 18.00mAD - EXC (+ve), and PE11 : Proposed Contig Wall South 1.
- Embedded Wall Excavation PE4 : PLOT B NEW WALL 1 intersects PE3 : Proposed Contig Wall south_2, , PE5 : PLOT B & C ALL EXC - 19.10mAOD (+ve), , PE6 : PLOT B WALL INST - 2, , PE7 : PLOT B EXC - 16.3mAOD (+ve), , PE8 : PLOT C - WALL INST, , PE9 : PLOT C - EXC (+ve), and PE10 : PLOT A - 18.00mAD - EXC (+ve).
- Embedded Wall Excavation PE5 : PLOT B & C ALL EXC - 19.10mAOD (+ve) intersects PE3 : Proposed Contig Wall south_2, , PE4 : PLOT B NEW WALL 1, , PE8 : PLOT C - WALL INST, , PE9 : PLOT C - EXC (+ve).
- Embedded Wall Excavation PE6 : PLOT B WALL INST - 2 intersects PE4 : PLOT B NEW WALL 1, , PE8 : PLOT C - WALL INST, and PE9 : PLOT C - EXC (+ve).
- Embedded Wall Excavation PE7 : PLOT B EXC - 16.3mAOD (+ve) intersects PE4 : PLOT B NEW WALL 1, , PE8 : PLOT C - WALL INST, and PE9 : PLOT C - EXC (+ve).
- Embedded Wall Excavation PE8 : PLOT C - WALL INST intersects PE4 : PLOT B NEW WALL 1, , PE5 : PLOT B & C ALL EXC - 19.10mAOD (+ve), , PE6 : PLOT B WALL INST - 2, and PE7 : PLOT B EXC - 16.3mAOD (+ve).
- Embedded Wall Excavation PE9 : PLOT C - EXC (+ve) intersects PE4 : PLOT B NEW WALL 1, , PE5 : PLOT B & C ALL EXC - 19.10mAOD (+ve), , PE6 : PLOT B WALL INST - 2, and PE7 : PLOT B EXC - 16.3mAOD (+ve).
- Embedded Wall Excavation PE10 : PLOT A - 18.00mAD - EXC (+ve) intersects PE1 : PLOT A - 17.2mAOD Basement Wall Install, , PE2 : PLOT A - 17.2m AOD Excavation (+ve), , PE3 : Proposed Contig Wall south_2, , PE4 : PLOT B NEW WALL 1, , PE5 : PLOT B & C ALL EXC - 19.10mAOD (+ve), and PE11 : Proposed Contig Wall South 1.
- Embedded Wall Excavation PE11 : Proposed Contig Wall South 1 intersects PE3 : Proposed Contig Wall south_2, and PE10 : PLOT A - 18.00mAD - EXC (+ve).
- If an embedded wall excavation is assigned a 'sub-surface' ground movement curve then displacements induced by it can only be calculated for those points that are level with or below the embedded wall excavation's 'surface level'. Others are ignored. An example of such a combination, for which displacements will not be calculated is Excavation XP2/Side 1/Line 6/Vertical. This is an example only. There are 111 others.

Errors

None

Displacement Results - Displacement Lines

Stage: Ref.	Stage: Name	Disp. Line: Ref.	Disp. Line: Name	Chainage	x	y	z	Δx	Δy	Δz	Δs//	ΔHperp.	Angle	
				[m]	[m]	[m]	[m]	[mm]	[mm]	[mm]	[mm]	[mm]	[°]	
0	Base Model 1	TWS(1)_1		0.0	48.00000	60.00000	14.64700	0.0	0.0	-0.63099	0.0	0.0	271.15	*
				2.0004	48.04000	58.00000	14.64700	0.020000	-0.20000	-0.079783	0.20036	0.015997	271.15	*
				4.0008	48.08000	56.00000	14.64700	0.080000	-0.46000	0.61727	0.46151	0.070786	271.15	*
				6.0012	48.12000	54.00000	14.64700	0.10897	-0.52581	1.2604	0.52788	0.098432	271.15	*
				8.0016	48.16000	52.00000	14.64700	0.080000	-0.50000	1.7961	0.50150	0.069986	271.15	*
				10.002	48.20000	50.00000	14.64700	0.030000	-0.45000	2.4851	0.44870	0.021512	271.15	*
				12.002	48.24000	48.00000	14.64700	0.0010000	-0.35000	3.2948	0.34995	-0.0059988	271.15	*
				14.003	48.28000	46.00000	14.64700	-0.0077840	-0.22000	2.5772	0.21980	-0.012182	271.15	*
				16.003	48.32000	44.00000	14.64700	0.0	-0.10000	-1.0263	0.099980	-0.0019996	271.15	*
				18.004	48.36000	42.00000	14.64700	0.0	-0.035000	-6.1546	0.034993	-699.86E-6	271.15	*
				20.004	48.40000	40.00000	14.64700	0.0	-0.010000	-10.101	0.009980	-199.56E-6	271.15	*
				22.004	48.44000	38.00000	14.64700	0.0	0.0	-12.201	0.0	0.0	271.15	*
				24.005	48.48000	36.00000	14.64700	0.0	0.0	-13.352	0.0	0.0	271.15	*
				26.005	48.52000	34.00000	14.64700	0.0	0.0	-14.247	0.0	0.0	271.15	*
				28.006	48.56000	32.00000	14.64700	0.0	0.0	-15.044	0.0	0.0	271.15	*
				30.006	48.60000	30.00000	14.64700	0.0	0.0	-14.851	0.0	0.0	271.15	*
				32.006	48.64000	28.00000	14.64700	0.0	0.0	-12.883	0.0	0.0	271.15	*
				34.007	48.68000	26.00000	14.64700	0.0	0.0	-9.8813	0.0	0.0	271.15	*
				36.007	48.72000	24.00000	14.64700	0.010000	0.020000	-7.2749	-0.019796	0.010398	271.15	*
				38.008	48.76000	22.00000	14.64700	0.025000	0.10000	-6.2331	-0.099480	0.026995	271.15	*
				40.008	48.80000	20.00000	14.64700	0.060000	0.25000	-5.9215	-0.24875	0.064987	271.15	*
				42.008	48.84000	18.00000	14.64700	0.12000	0.40000	-4.5320	-0.39752	0.12797	271.15	*
				44.009	48.88000	16.00000	14.64700	0.16500	0.52500	-1.9542	-0.52160	0.17546	271.15	*
				46.009	48.92000	14.00000	14.64700	0.17780	0.57349	0.89026	-0.56982	0.18923	271.15	*
				48.010	48.96000	12.00000	14.64700	0.16500	0.52500	2.4452	-0.52160	0.17546	271.15	*
				50.010	49.00000	10.00000	14.64700	0.12000	0.40000	-3.9752	-0.39752	0.12797	271.15	*
				52.010	49.04000	8.00000	14.64700	0.060000	0.28000	2.0131	-0.27874	0.065587	271.15	*
				54.011	49.08000	6.00000	14.64700	0.025000	0.13651	1.4797	-0.13598	0.027725	271.15	*
				56.011	49.12000	4.00000	14.64700	0.010000	0.050000	1.0294	-0.049790	0.010998	271.15	*
				58.012	49.16000	2.00000	14.64700	0.0	0.020000	0.64368	-0.019996	399.92E-6	271.15	*
				60.012	49.20000	0.00000	14.64700	0.0	0.0	0.41057	0.0	0.0	271.15	*
				62.012	49.24000	-2.00000	14.64700	0.0	0.0	0.31046	0.0	0.0	271.15	*
				64.013	49.28000	-4.00000	14.64700	0.0	0.0	0.30576	0.0	0.0	271.15	*
				66.013	49.32000	-6.00000	14.64700	0.0	0.0	0.37308	0.0	0.0	271.15	*
				68.014	49.36000	-8.00000	14.64700	0.0	0.0	0.45878	0.0	0.0	271.15	*
				70.014	49.40000	-10.00000	14.64700	0.0	0.0	0.55332	0.0	0.0	271.15	*
				72.014	49.44000	-12.00000	14.64700	0.0	0.0	0.65011	0.0	0.0	271.15	*
				74.015	49.48000	-14.00000	14.64700	0.0	0.0	0.74466	0.0	0.0	271.15	*
				76.015	49.52000	-16.00000	14.64700	0.0	0.0	0.83402	0.0	0.0	271.15	*
				78.016	49.56000	-18.00000	14.64700	0.0	0.0	0.91636	0.0	0.0	271.15	*
				80.016	49.60000	-20.00000	14.64700	0.0	0.0	0.99063	0.0	0.0	271.15	*
				82.016	49.64000	-22.00000	14.64700	0.0	0.0	1.0563	0.0	0.0	271.15	*
				84.017	49.68000	-24.00000	14.64700	0.0	0.0	1.1134	0.0	0.0	271.15	*
				86.017	49.72000	-26.00000	14.64700	0.0	0.0	1.1621	0.0	0.0	271.15	*
				88.018	49.76000	-28.00000	14.64700	0.0	0.0	1.2026	0.0	0.0	271.15	*
				90.018	49.80000	-30.00000	14.64700	0.0	0.0	1.2389	0.0	0.0	271.15	*
				92.018	49.84000	-32.00000	14.64700	0.0	0.0	1.2615	0.0	0.0	271.15	*
				94.019	49.88000	-34.00000	14.64700	0.0	0.0	1.2809	0.0	0.0	271.15	*
				96.019	49.92000	-36.00000	14.64700	0.0	0.0	1.2945	0.0	0.0	271.15	*
				98.020	49.96000	-38.00000	14.64700	0.0	0.0	1.3027	0.0	0.0	271.15	*
				100.02	50.00000	-40.00000	14.64700	0.0	0.0	1.3062	0.0	0.0	271.15	*
2	TWS(2)_1			0.0	-33.43100	6.49300	17.09950	0.0	0.0	-0.88723	0.0	0.0	0.39226	*
				2.0032	-31.42786	6.50671	17.09950	0.0	0.0	-0.93795	0.0	0.0	0.39226	*
				4.0064	-29.42471	6.52043	17.09950	0.0	0.0	-0.98934	0.0	0.0	0.39226	*
				6.0096	-27.42157	6.53414	17.09950	0.0	0.0	-1.0405	0.0	0.0	0.39226	*
				8.0128	-25.41843	6.54786	17.09950	0.0	0.0	-1.0903	0.0	0.0	0.39226	*
				10.016	-23.41529	6.56157	17.09950	0.0	0.0	-1.1372	0.0	0.0	0.39226	*
				12.019	-21.41214	6.57529	17.09950	0.0	0.0	-1.1789	0.0	0.0	0.39226	*
				14.022	-19.40900	6.58900	17.09950	0.0	0.0	-1.2125	0.0	0.0	0.39226	*
				16.026	-17.40586	6.60271	17.09950	0.0	0.0	-1.2342	0.0	0.0	0.39226	*
				18.029	-15.40271	6.61643	17.09950	0.0	0.0	-1.2389	0.0	0.0	0.39226	*
				20.032	-13.39957	6.63014	17.09950	0.0	0.0	-1.2196	0.0	0.0	0.39226	*
				22.035	-11.39643	6.64386	17.09950	0.0	0.0	-1.1677	0.0	0.0	0.39226	*
				24.038	-9.39329	6.65757	17.09950	0.0	0.0	-1.0713	0.0	0.0	0.39226	*
				26.041	-7.39014	6.67129	17.09950	0.0	0.0	-0.91498	0.0	0.0	0.39226	*
				28.045	-5.38700	6.68500	17.09950	0.0	0.0	-0.60012	0.0	0.0	0.39226	*
				30.048	-3.38386	6.69871	17.09950	0.0	0.0	0.077955	0.0	0.0	0.39226	*
				32.051	-1.38071	6.71243	17.09950	0.0	0.0	0.87163	0.0	0.0	0.39226	*
				34.054	0.62243	6.72614	17.09950	0.096394	0.10708	1.8033	0.097125	0.10642	0.39226	*
				36.057	2.62557	6.73986	17.09950	0.16426	0.27097	2.8809	0.16611	0.26984	0.39226	*
				38.061	4.62871	6.75357	17.09950	0.15947	0.46368	4.0747	0.16264	0.46258	0.39226	*
				40.064	6.63186	6.76729	17.09950	0.081803	0.65832	5.2923	0.086308	0.65774	0.39226	*



RSK ENVIRONMENT LIMITED

UBB, London

TW Sewer Assessment

FULL DEVELOPMENT LONG TERM

Oasys													Job No.	Sheet No.	Rev.	
RSK ENVIRONMENT LIMITED													371654			
UBB, London													Drg. Ref.			
TW Sewer Assessment													Made by	Date	Checked	Date
FULL DEVELOPMENT LONG TERM													MK	09-Dec-2020		
Stage: Ref.	Stage: Name	Disp. Line: Ref.	Disp. Line: Name	Chainage	x	y	z	δx	δy	δz	δH//	δH Perp.	Angle			
				[m]	[m]	[m]	[m]	[mm]	[mm]	[mm]	[mm]	[mm]	[°]			
				42.067	8.63500	6.78100	17.09950	0.0092490	0.75866	6.3944	0.014443	0.75858	0.39226			
				44.070	10.63814	6.79471	17.09950	0.0093460	0.76663	7.3135	0.014594	0.76655	0.39226			
				46.073	12.64129	6.80843	17.09950	0.0094440	0.77462	7.9953	0.014747	0.77453	0.39226			
				48.077	14.64443	6.82214	17.09950	0.0095410	0.78263	8.4477	0.014899	0.78254	0.39226			
				50.080	16.64757	6.83586	17.09950	0.0096390	0.79066	8.7213	0.015052	0.79058	0.39226			
				52.083	18.65071	6.84957	17.09950	0.0097380	0.79872	8.8674	0.015206	0.79863	0.39226			
				54.086	20.65386	6.86329	17.09950	0.0098360	0.80680	8.9234	0.015359	0.80672	0.39226			
				56.089	22.65700	6.87700	17.09950	0.0099350	0.81491	8.9136	0.015514	0.81482	0.39226			
				58.093	24.66014	6.89071	17.09950	0.010034	0.82305	8.8537	0.015669	0.82296	0.39226			
				60.096	26.66329	6.90443	17.09950	0.010134	0.83120	8.7532	0.015824	0.83112	0.39226			
				62.099	28.66643	6.91814	17.09950	0.010233	0.83939	8.6157	0.015979	0.83930	0.39226			
				64.102	30.66957	6.93186	17.09950	0.010334	0.84760	8.4377	0.016137	0.84751	0.39226			
				66.105	32.67271	6.94557	17.09950	0.010434	0.85583	8.2071	0.016293	0.85574	0.39226			
				68.108	34.67586	6.95929	17.09950	0.010535	0.86409	7.9010	0.016451	0.86400	0.39226			
				70.112	36.67900	6.97300	17.09950	0.010636	0.87238	7.4834	0.016608	0.87229	0.39226			
				0.0	36.67900	6.97300	17.09950	0.010636	0.87238	7.4834	-0.090900	0.86770	353.32			
				2.0068	38.67213	6.73960	17.09950	0.010086	0.82726	6.4137	-0.086199	0.82282	353.32			
				4.0135	40.66527	6.50620	17.09950	0.0095450	0.78290	5.2230	-0.081577	0.77869	353.32			
				6.0203	42.65840	6.27280	17.09950	0.0087650	0.71898	3.8993	-0.071491	0.71519	353.32			
				8.0270	44.65153	6.03940	17.09950	0.0063670	0.52225	2.3430	-0.054417	0.51944	353.32			
				10.034	46.64467	5.80600	17.09950	0.0038710	0.31751	0.93471	-0.033084	0.31580	353.32			
				12.041	48.63780	5.57260	17.09950	0.0016710	0.13707	-0.20855	-0.014282	0.13633	353.32			
				14.047	50.63093	5.33920	17.09950	-2.7568E-12	-226.13E-12	-1.0920	23.563E-12	-224.92E-12	353.32			
				16.054	52.62407	5.10580	17.09950	0.0	0.0	0.0	0.0	0.0	353.32			
				18.061	54.61720	4.87240	17.09950	0.0	0.0	-2.3071	0.0	0.0	353.32			
				20.068	56.61033	4.63900	17.09950	0.0	0.0	-2.6062	0.0	0.0	353.32			
				22.074	58.60347	4.40560	17.09950	0.0	0.0	-2.8053	0.0	0.0	353.32			
				24.081	60.59660	4.17220	17.09950	0.074691	0.17400	-2.1609	0.053947	0.18151	353.32			
				26.088	62.58973	3.93880	17.09950	0.0	0.0	-2.1492	-0.28517	0.24263	353.32			
				28.095	64.58287	3.70540	17.09950	0.15568	0.36268	-2.3937	0.11244	0.37832	353.32			
				30.101	66.57600	3.47200	17.09950	0.19716	0.45931	-2.4953	0.14240	0.47912	353.32			
				0.0	66.57600	3.47200	17.09950	0.19716	0.45931	-2.4953	0.070546	0.49483	344.88			
				1.9478	68.45638	2.96400	17.09950	0.21742	0.50650	-2.6906	0.077794	0.54567	344.88			
				3.8956	70.33671	2.45600	17.09950	0.23700	0.55289	-2.8709	0.085122	0.59703	344.88			
				5.8434	72.21715	1.94800	17.09950	0.25864	0.60253	-3.0334	0.092545	0.64913	344.88			
				7.7912	74.09754	1.44000	17.09950	0.30146	0.70228	-3.1621	0.10786	0.75660	344.88			
				9.7390	75.97792	0.93200	17.09950	0.40409	0.94137	-3.2579	0.14459	1.0142	344.88			
				11.687	77.85831	0.42400	17.09950	0.50703	1.1812	-3.3534	0.18142	1.2725	344.88			
				13.635	79.73869	-0.08400	17.09950	0.61093	1.4729	-3.4449	0.22489	1.5864	344.88			
				15.582	81.61908	-0.59200	17.09950	0.77704	1.8203	-3.5393	0.27540	1.9599	344.88			
				17.530	83.49946	-1.10000	17.09950	0.94679	2.2262	-3.6373	0.33340	2.3961	344.88			
				19.478	85.37985	-1.60800	17.09950	1.1470	2.7079	-3.7331	0.40104	2.9133	344.88			
				21.426	87.26023	-2.11600	17.09950	1.3870	3.2887	-3.8262	0.48129	3.5366	344.88			
				23.374	89.14062	-2.62400	17.09950	1.6646	3.9635	-3.9261	0.57289	4.1727	344.88			
				25.321	91.02100	-3.13200	17.09950	1.9482	4.6670	-4.0637	0.66359	5.0136	344.88			
				0.0	91.02100	-3.13200	16.23650	1.2884	3.1299	-4.3638	-0.0068741	3.3847	337.51			
				2.0080	92.87360	-3.90013	16.23650	1.7988	4.1154	-4.5269	0.087766	4.4905	337.51			
				4.0160	94.73160	-4.66828	16.23650	2.4059	5.6496	-4.3157	0.061780	6.1402	337.51			
				6.0241	96.58689	-5.43638	16.23650	3.1596	7.6355	-4.0174	-0.0015331	8.2547	337.51			
				8.0321	98.44219	-6.20451	16.23650	3.6563	8.9497	-3.9949	-0.045324	9.6677	337.51			
				10.040	100.29749	-6.97264	16.23650	3.7939	9.3434	-4.6150	-0.068753	10.084	337.51			
				12.048	102.15279	-7.74077	16.23650	3.9014	9.6367	-5.2176	-0.081645	10.396	337.51			
				14.056	104.00809	-8.50839	16.23650	4.0073	9.8797	-5.7338	-0.076727	10.661	337.51			
				16.064	105.86338	-9.27702	16.23650	4.0798	10.1222	-6.1359	-0.102632	10.913	337.51			
				18.072	107.71868	-10.04515	16.23650	4.1520	10.336	-6.4257	-0.11756	11.138	337.51			
				20.080	109.57398	-10.81328	16.23650	4.2240	10.515	-6.5105	-0.11959	11.331	337.51			
				22.088	111.42928	-11.58140	16.23650	4.2957	10.694	-6.4041	-0.12163	11.524	337.51			
				24.096	113.28457	-12.34953	16.23650	4.3673	10.872	-6.1557	-0.12365	11.705	337.51			
				26.104	115.13987	-13.11766	16.23650	4.4385	11.049	-5.8431	-0.12567	11.887	337.51			
				28.112	116.99517	-13.88579	16.23650	4.5096	11.226	-5.5209	-0.12768	12.097	337.51			
				30.120	118.85047	-14.65391	16.23650	4.5804	11.402	-5.2267	-0.12968	12.287	337.51			
				32.128	120.70577	-15.42204	16.23650	4.6510	11.578	-4.9709	-0.13168	12.477	337.51			
				34.136	122.56106	-16.19017	16.23650	4.6516	11.580	-4.4831	-0.13170	12.478	337.51			
				36.144	124.41633	-16.95930	16.23650	4.6437	11.582	-4.4584	-0.13148	12.457	337.51			
				38.152	126.27166	-17.72643	16.23650	4.6357	11.540	-4.3521	-0.13125	12.436	337.51			
				40.160	128.12696	-18.49455	16.23650	4.6278	11.520	-3.8956	-0.13103	12.414	337.51			
				42.168	129.98226	-19.26268	16.23650	4.6199	11.501	-3.3033	-0.13080	12.393	337.51			
				44.176	131.83755	-20.03081	16.2365									



RSK ENVIRONMENT LIMITED

UBB, London

TW Sewer Assessment

FULL DEVELOPMENT LONG TERM

Oasys														Job No.		Sheet No.		Rev.	
RSK ENVIRONMENT LIMITED														371654					
UBB, London														Drg. Ref.					
TW Sewer Assessment														Date		Checked		Date	
FULL DEVELOPMENT LONG TERM														MK		09-Dec-2020			
Stage Ref.	Stage Name	Disp. Line: Ref.	Disp. Line: Name	Chainage	x	y	z	Δx	Δy	Δz	ΔH//	ΔSperp.	Angle						
				[m]	[m]	[m]	[m]	[mm]	[mm]	[mm]	[mm]	[mm]	[°]						
				7.9961	56.27674	1.84928	20.34000	-0.062836	0.87469	-3.2397	-0.28314	0.82998	345.27	*					
				9.9952	58.21009	1.34107	20.34000	-0.028322	0.24795	-3.5006	-0.090428	0.23260	345.27	*					
				11.994	60.14344	0.83286	20.34000	38.352E-12	-335.76E-12	-3.1650	122.45E-12	-314.98E-12	345.27	*					
				13.993	62.07679	0.32464	20.34000	0.0	0.0	-3.3009	0.0	0.0	345.27	*					
				15.992	64.01014	-0.18357	20.34000	0.0	0.0	-3.4178	0.0	0.0	345.27	*					
				17.991	65.94349	-0.69178	20.34000	0.0	0.0	-3.5211	0.0	0.0	345.27	*					
				19.990	67.87684	-1.20000	20.34000	0.0	0.0	-3.6140	0.0	0.0	345.27	*					
				21.989	69.81019	-1.70821	20.34000	0.0	0.0	-3.6985	0.0	0.0	345.27	*					
				23.988	71.74354	-2.21642	20.34000	0.0	0.0	-3.7762	0.0	0.0	345.27	*					
				25.987	73.67689	-2.72463	20.34000	0.0	0.0	-3.8493	0.0	0.0	345.27	*					
				27.986	75.61025	-3.23285	20.34000	0.013196	0.030742	-3.9212	0.0049469	0.033087	345.27	*					
				29.985	77.54360	-3.74106	20.34000	0.033747	0.078617	-3.9965	0.012651	0.084613	345.27	*					
				31.985	79.47695	-4.24927	20.34000	0.070367	0.16649	-4.0723	0.025729	0.17891	345.27	*					
				33.984	81.41030	-4.75749	20.34000	0.17587	0.42582	-4.1480	0.061834	0.45654	345.27	*					
				35.983	83.34365	-5.26570	20.34000	0.30729	0.74966	-4.2445	0.10661	0.80315	345.27	*					
				37.982	85.27700	-5.77391	20.34000	0.46968	1.1506	-4.3436	0.16174	1.2322	345.27	*					
				39.981	87.21035	-6.28213	20.34000	0.66846	1.6421	-4.4297	0.22904	1.7581	345.27	*					
				41.980	89.14370	-6.79034	20.34000	0.92983	2.2893	-4.4777	0.31727	2.4505	345.27	*					
				43.979	91.07705	-7.29855	20.34000	1.2811	3.1604	-4.4561	0.43556	3.3822	345.27	*					
8			TW Fresh Water (c) - St Pancras	0.0	91.07705	-7.29855	19.73000	1.2811	3.1604	-4.4551	0.76978	3.4093	339.23	*					
				1.9971	92.94433	-8.00684	19.73000	1.6655	4.1164	-4.3902	0.097368	4.4395	339.23	*					
				3.9942	94.81160	-8.71513	19.73000	2.0740	5.1322	-4.3300	0.11901	5.5342	339.23	*					
				5.9913	96.67888	-9.42342	19.73000	2.6868	6.6885	-3.3926	0.14003	7.2066	339.23	*					
				7.9884	98.54615	-10.13170	19.73000	2.7573	6.8639	-3.7890	0.14371	7.3957	339.23	*					
				9.9855	100.41343	-10.83999	19.73000	2.8282	7.0405	-4.1507	0.14740	7.5859	339.23	*					
				11.983	102.28070	-11.54828	19.73000	2.8996	7.2161	-4.4631	0.15112	7.7773	339.23	*					
				13.980	104.14798	-12.25657	19.73000	2.9714	7.3969	-4.7137	0.15486	7.9699	339.23	*					
				15.977	106.01525	-12.96486	19.73000	3.0436	7.5767	-4.8904	0.15863	8.1636	339.23	*					
				17.974	107.88253	-13.67314	19.73000	3.1163	7.7576	-4.9838	0.16242	8.3586	339.23	*					
				19.971	109.74980	-14.38143	19.73000	3.1894	7.9396	-4.9933	0.16623	8.5547	339.23	*					
				21.968	111.61707	-15.08972	19.73000	3.2630	8.1227	-4.9296	0.17006	8.7520	339.23	*					
				23.965	113.48435	-15.79801	19.73000	3.3370	8.3070	-4.8116	0.17392	8.9505	339.23	*					
				25.962	115.35162	-16.50630	19.73000	3.4114	8.4922	-4.6599	0.17780	9.1501	339.23	*					
				27.959	117.21890	-17.21459	19.73000	3.4863	8.6786	-4.4909	0.18170	9.3509	339.23	*					
				29.956	119.08617	-17.92287	19.73000	3.5616	8.8661	-4.3118	0.18563	9.5529	339.23	*					
				31.954	120.95345	-18.63116	19.73000	3.6000	8.9617	-4.1616	0.18763	9.6559	339.23	*					
				33.951	122.82072	-19.33945	19.73000	3.6140	8.9965	-4.0098	0.18836	9.6934	339.23	*					
				35.948	124.68800	-20.04774	19.73000	3.6279	9.0313	-3.8065	0.18908	9.7309	339.23	*					
				37.945	126.55527	-20.75603	19.73000	3.6419	9.0661	-3.5361	0.18981	9.7684	339.23	*					
				39.942	128.42255	-21.46431	19.73000	3.6559	9.1010	-3.1962	0.19054	9.8060	339.23	*					
				41.939	130.28982	-22.17260	19.73000	3.6699	9.1358	-2.7992	0.19127	9.8435	339.23	*					
				43.936	132.15710	-22.88089	19.73000	3.6840	9.1707	-2.3687	0.19200	9.8811	339.23	*					
				45.933	134.02437	-23.58918	19.73000	3.6980	9.2056	-1.9334	0.19273	9.9187	339.23	*					
				47.930	135.89165	-24.29747	19.73000	3.7120	9.2405	-1.5181	0.19346	9.9563	339.23	*					
				49.927	137.75892	-25.00575	19.73000	3.7260	9.2755	-1.1333	0.19420	9.9940	339.23	*					
				51.924	139.62619	-25.71404	19.73000	3.7401	9.3104	-0.77135	0.19493	10.032	339.23	*					
				53.922	141.49347	-26.42233	19.73000	3.7541	9.3454	-0.41240	0.19566	10.069	339.23	*					
				55.919	143.36074	-27.13062	19.73000	3.7682	9.3803	-0.038305	0.19639	10.107	339.23	*					
				57.916	145.22802	-27.83891	19.73000	3.7822	9.4153	0.35777	0.19712	10.145	339.23	*					
				59.913	147.09529	-28.54720	19.73000	3.7963	9.4504	0.77153	0.19786	10.182	339.23	*					
				61.910	148.96257	-29.25548	19.73000	3.8104	9.4854	1.1929	0.19859	10.220	339.23	*					
				63.907	150.82984	-29.96377	19.73000	3.8244	9.5204	1.6101	0.19932	10.258	339.23	*					
				65.904	152.69712	-30.67206	19.73000	3.7961	9.4498	1.9578	0.19785	10.182	339.23	*					
9			TW Fresh Water (d) - St Pancras	0.0	152.69712	-30.67206	19.20000	3.7961	9.4498	1.9521	-0.58772	10.167	334.81	*					
				1.9680	154.47786	-31.50979	19.20000	3.6361	9.0516	2.0617	-0.56296	9.7384	334.81	*					
				3.9359	156.25860	-32.34753	19.20000	3.4785	8.6593	2.1379	-0.53856	9.3163	334.81	*					
				5.9039	158.03934	-33.18526	19.20000	3.3233	8.2730	2.1845	-0.51453	8.9007	334.81	*					
				7.8718	159.82008	-34.02299	19.20000	3.1705	7.8926	2.2116	-0.49087	8.4914	334.81	*					
				9.8398	161.60081	-34.86073	19.20000	2.3282	7.4554	2.1907	-1.0670	7.7373	334.81	*					
				11.808	163.38155	-35.69846	19.20000	1.0021	6.8128	1.9593	-1.9934	6.5913	334.81	*					
				13.776	165.16229	-36.53619	19.20000	-0.094898	6.0251	1.5689	-2.6507	5.4116	334.81	*					
				15.744	166.94303	-37.37393	19.20000	-0.88676	5.4421	1.2060	-3.1190	4.5469	334.81	*					
				17.712	168.72377	-38.21166	19.20000	-1.3413	4.7335	0.78083	-3.2286	3.7122	334.81	*					
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RSK ENVIRONMENT LIMITED

UBB, London

TW Sewer Assessment

FULL DEVELOPMENT LONG TERM

Oasys RISK ENVIRONMENT LIMITED											Job No.			Sheet No.					Rev.	
											371654									
UBB, London TW Sewer Assessment FULL DEVELOPMENT LONG TERM											Drg. Ref.									
											Made by MK		Date 09-Dec-2020		Checked		Date			
Stage: Sta (n-Lp) Ref.	Stage: Sta (n-Lp) Ref.	Name Sta (n-Lp) Ref.	Specific Utility: Sta (n-Lp) Ref.	Specific Utility: Sta (n-Lp) Ref.	Utility: Sta (n-Lp) Ref.	Name Sta (n-Lp) Ref.	Sub-utility Iteration Sta (n-Lp) Ref.	Distance Sta (n-Lp) Ref.	x	y	z	Sta (n) Sta (n-Lp) Ref.	Sta (n) Sta (n-Lp) Ref.	Sta (n) Sta (n-Lp) Ref.	Sta (n) Sta (n-Lp) Ref.	Sta (n) Sta (n-Lp) Ref.	Sta (n) Sta (n-Lp) Ref.	Sta (n) Sta (n-Lp) Ref.		
1.76772	3.06187	0.04467	1.76728	0.00666	4.05864	2.86025	0.05974	1.81772	79.12632	42.60936	3.80451	20.65500	0.00317	4.54478	3.03759	0.06262	4.54435	0.02223		
1.82316	2.40697	0.04607	1.82272	0.00145	4.45040	1.71201	0.05966	4.54435	5.93447	-30.57622	2.84714	20.65500	0.00000	0.00000	-0.91541	0.00000	0.00000	0.00000		
0.00000	-0.82875	0.00000	0.00000	0.00000	0.00000	-1.00431	0.00000	0.00000	9.89079	-26.62024	2.89889	20.65500	0.00000	0.00000	-1.01311	0.00000	0.00000	0.00000		
0.00000	-0.92421	0.00000	0.00000	0.00000	0.00000	-1.09844	0.00000	0.00000	13.84711	-22.66427	2.95064	20.65500	0.00000	0.00000	-1.10666	0.00000	0.00000	0.00000		
0.00000	-1.02173	0.00000	0.00000	0.00000	0.00000	-1.17778	0.00000	0.00000	17.80342	-18.70829	3.00239	20.65500	0.00000	0.00000	-1.18422	0.00000	0.00000	0.00000		
0.00000	-1.11419	0.00000	0.00000	0.00000	0.00000	-1.22318	0.00000	0.00000	21.75974	-14.75231	3.05414	20.65500	0.00000	0.00000	-1.22581	0.00000	0.00000	0.00000		
0.00000	-1.18907	0.00000	0.00000	0.00000	0.00000	-1.20367	0.00000	0.00000	25.71605	-10.79633	3.10589	20.65500	0.00000	0.00000	-1.19927	0.00000	0.00000	0.00000		
0.00000	-1.22543	0.00000	0.00000	0.00000	0.00000	-1.07172	0.00000	0.00000	29.67237	-6.84036	3.15764	20.65500	0.00000	0.00000	-1.05544	0.00000	0.00000	0.00000		
0.00000	-1.18965	0.00000	0.00000	0.00000	0.00000	-0.73606	0.00000	0.00000	33.62869	-2.88438	3.20939	20.65500	0.00000	0.00000	-0.69586	0.00000	0.00000	0.00000		
0.00000	-1.03087	0.00000	0.00000	0.08175	0.17408	0.30730	0.08402	0.00000	37.58500	1.07160	3.26114	20.65500	0.09498	0.20524	0.41172	0.09765	0.20398	0.00388		
0.00581	-0.60078	0.00395	0.00576	0.10630	0.60227	1.50292	0.11416	0.20398	41.54132	5.02758	3.31289	20.65500	0.10342	0.64559	1.61113	0.11186	0.64419	0.09937		
0.24123	0.51955	0.10252	0.23991	0.01870	1.01206	2.54140	0.03193	0.64419	45.49764	8.98355	3.36464	20.65500	0.01264	1.03714	2.62458	0.02621	1.03688	0.09312		
0.69105	1.71051	0.10216	0.68977	0.01511	1.23974	3.28787	0.03133	1.03688	49.45395	12.93953	3.41639	20.65500	0.01536	1.26004	3.34577	0.03184	1.25973	0.01289		
1.05698	2.69658	0.02671	1.05673	0.01794	1.47183	3.71595	0.03719	1.25973	53.41027	16.89551	3.46814	20.65500	0.01820	1.49305	3.74504	0.03773	1.49268	0.01562		
1.28080	3.38861	0.03237	1.28048	0.01907	1.56408	3.85513	0.03953	1.49268	57.36658	20.85149	3.51989	20.65500	0.01913	1.56906	3.86057	0.03965	1.56867	0.01831		
1.50176	3.76041	0.03795	1.50139	0.01974	1.61936	3.81340	0.04092	1.56867	61.32290	24.80747	3.57164	20.65500	0.01980	1.62434	3.80541	0.04105	1.62394	0.01919		
1.57403	3.85862	0.03978	1.57365	0.02042	1.67467	3.64843	0.04232	1.62394	65.27922	28.76344	3.62339	20.65500	0.02048	1.67966	3.63011	0.04245	1.67925	0.01986		
1.62932	3.79216	0.04117	1.62892	0.02109	1.73004	3.35876	0.04372	1.67925	69.23553	32.71942	3.67514	20.65500	0.02115	1.73502	3.32824	0.04385	1.73460	0.02054		
1.68464	3.60625	0.04257	1.68423	0.02177	1.78545	2.88484	0.04512	1.73460	73.19185	36.67540	3.72689	20.65500	0.02183	1.79044	2.83500	0.04525	1.79000	0.02121		
1.74001	3.28924	0.04397	1.73959	0.02244	1.84091	2.13081	0.04652	1.79000	77.14816	40.63138	3.77864	20.65500	0.02251	1.84591	2.05306	0.04665	1.84545	0.02189		
1.79543	2.77190	0.04537	1.79499	0.00256	4.51599	2.45222	0.06163	1.84545	81.10448	44.58735	3.83038	20.65500	0.00243	4.50966	2.32362	0.06142	4.50925	0.01902		
2.33204	2.23040	0.04952	2.33159	0.00022	4.10126	0.88539	0.05387	4.50925	85.99806	52.41003	2.86571	20.34000	-0.00209	2.23214	-1.70644	-0.56950	2.15827	0.00000		
3.83526	0.46633	-0.97504	3.70925	-0.06081	1.01009	-3.10347	-0.31561	2.15827	89.79613	56.27674	1.84928	20.34000	-0.06284	0.87469	-3.23971	-0.28314	0.82998	-0.01217		
2.09723	-1.87552	-0.54494	2.02523	-0.00564	0.04937	-3.23182	-0.01801	0.82998	11.99419	60.14344	0.83286	20.34000	0.00000	-0.00000	-3.16499	0.00000	-0.00000	-0.05596		
0.74989	-3.29166	-0.24477	0.71103	0.00000	0.00000	-3.39451	0.00000	-0.00000	15.99225	64.01014	-0.18357	20.34000	0.00000	0.00000	-3.41780	0.00000	0.00000	0.00000		
0.00000	-3.19204	0.00000	-0.00000	0.00000	0.00000	-3.59553	0.00000	0.00000	19.99031	67.87684	-1.20000	20.34000	0.00000	0.00000	-3.61403	0.00000	0.00000	0.00000		
0.00000	-3.43837	0.00000	0.00000	0.00000	0.00000	-3.76072	0.00000	0.00000	23.98838	71.74354	-2.21642	20.34000	0.00000	0.00000	-3.77619	0.00000	0.00000	0.00000		
0.00000	-3.63085	0.00000	0.00000	0.01057	0.02462	-3.90686	0.00396	0.00000	27.98644	75.61025	-3.23285	20.34000	0.01320	0.03074	-3.92117	0.00495	0.03309	0.00000		
0.00000	-3.79075	0.00000	0.00000	0.06307	0.14899	-4.05723	0.02312	0.03309	31.98450	79.47695	-4.24927	20.34000	0.07037	0.16649	-4.07232	0.02573	0.17891	0.01729		
0.04028	-3.93618	0.00648	0.04335	0.28112	0.68518	-4.22528	0.09769	0.17891	35.98257	83.34365	-5.26570	20.34000	0.30729	0.74966	-4.24449	0.10661	0.80315	0.09138		
0.21813	-4.08740	0.03292	0.23419	0.62888	1.54419	-4.41252	0.21564	0.80315	39.98063	87.21035	-6.28213	20.34000	0.66846	1.64206	-4.42967	0.22904	1.75805	0.33963		
0.82949	-4.26422	0.11759	0.88858	1.21116	2.98691	-4.46045	0.41200	1.75805	5.99709	54.34338	2.35750	20.34000	-0.05267	1.55462	-2.55555	-0.44618	1.49015	-0.00042		
2.89712	-0.82628	-0.73694	2.80183	-0.03519	3.37275	-3.44867	-0.12880	1.49015	9.99516	58.21009	1.34107	20.34000	-0.02832	0.24795	-3.50062	-0.09043	0.23260	-0.05470		
1.41923	-2.69178	-0.41371	1.35869	0.00000	-0.00000	-3.27380	0.00000	0.23260	13.99322	62.07679	0.32464	20.34000	0.00000	0.00000	-3.30085	0.00000	0.00000	-0.02268		
0.19858	-3.43379	-0.07242	0.18629	0.00000	0.00000	-3.50054	0.00000	0.00000	17.99128	65.94349	-0.69178	20.34000	0.00000	0.00000	-3.52111	0.00000	0.00000	0.00000		
0.00000	-3.32414	0.00000	0.00000	0.00000	0.00000	-3.68169	0.00000	0.00000	21.98935	69.81019	-1.70821	20.34000	0.00000	0.00000	-3.69851	0.00000	0.00000	0.00000		
0.00000	-3.53961	0.00000	0.00000	0.00000	0.00000	-3.83474	0.00000	0.00000	25.98741	73.67689	-2.72463	20.34000	0.00000	0.00000	-3.84930	0.00000	0.00000	0.00000		
0.00000	-3.71398	0.00000	0.00000	0.02965	0.06908	-3.98153	0.01112	0.00000	29.98547	77.54360	-3.74106	20.34000	0.03375	0.07862	-3.99654	0.01265	0.08461	0.00263		
0.00612	-3.86361	0.00099	0.00659	0.15486	0.37418	-4.13295	0.05464	0.08461	33.98353	81.41030	-4.75749	20.34000	0.17587	0.42582	-4.14802	0.06183	0.45654			

UBB, London

TW Sewer Assessment

FULL DEVELOPMENT LONG TERM

Stage	Stage: Name	Specific Utility: Name	Sub-utility Iteration	Distance	x	y	z	δx (n)	δy (n)	δz (n)	$\delta R/(n)$	$\delta \text{Perp.}$ (n)	δx (n-Lp)	δy (n-Lp)							
δz (n-Lp)	$\delta R/(n-Lp)$	$\delta \text{Perp.}$ (n-Lp)	Utility: Ref.	δx (n+Lp)	δy (n+Lp)	δz (n+Lp)	$\delta R/(n+Lp)$	$\delta \text{Perp.}$ (n+Lp)	Name	from start of utility											
9.38183	1.97077		9 -0.58350	TW Fresh Water (d)	10.09366	3.19660	7.95752	2.20698	-0.49491	1	1	3.93590	156.25860	-32.34753	19.20000	3.47853	8.65933	2.13789	-0.53856	9.31633	3.76876
8.59338	2.14586	-0.53446		9.24539	1.22843	6.92250	1.99878	-1.83525		8.49142	8.49142	16.00771	163.38155	-35.69846	19.20000	1.00208	6.81282	1.95927	-1.99338	6.59129	3.02675
7.81797	2.20803	-0.58920		8.36270	-0.75160	5.54159	2.16796	-3.03909		6.59129	6.59129	15.74361	166.94303	-37.37393	19.20000	-0.88676	5.44208	1.20602	-3.11903	4.54689	0.81485
6.67837	1.89264	-2.10557		6.38992	-1.45574	4.02587	0.42872	-3.03101		4.54689	4.54689	19.67951	170.50451	-39.04940	19.20000	-1.47930	3.88023	0.35625	-2.99034	2.88138	-0.96434
5.32113	1.13344	-3.13774		4.40442	-1.02986	2.13540	-0.22407	-1.84091		2.88138	2.88138	33.61541	174.06599	-40.72486	19.20000	-0.96582	1.97594	-0.26935	-1.71508	1.37683	-1.45569
3.71464	0.29475	-2.89849		2.74160	-0.19591	0.40081	-0.66160	-0.34789		1.37683	1.37683	27.55131	177.62747	-42.40033	19.20000	-0.12072	0.24698	-0.70135	-0.21437	0.17209	-0.89677
1.83466	-0.30334	-1.59245		1.27839	0.00000	-0.00000	-0.93491	0.00000		0.17209	0.17209	49.8721	181.18895	-44.07580	19.20000	0.00000	0.00000	-0.94394	0.00000	0.00000	-0.10012
0.20482	-0.73373	-0.17778		0.14272	0.00000	0.00000	-0.69507	0.00000		0.00000	0.00000	5.90385	158.03934	-33.18526	19.20000	3.32333	8.72299	2.18454	-0.51453	8.90069	3.60921
8.98464	2.07469	-0.55879		9.66633	2.47197	7.53002	2.19428	-0.96864		8.90069	8.90069	9.83975	161.60081	-34.86073	19.20000	2.32819	7.45540	2.19071	-1.06697	7.73725	3.29725
8.20806	2.18916	-0.51049		8.83083	0.49234	6.15957	1.63552	-2.53850		7.73725	7.73725	33.77566	165.16229	-36.53619	19.20000	-0.09490	6.02512	1.56889	-2.65069	5.41155	2.10184
7.34572	2.15121	-1.22509		7.54165	-1.26368	4.85444	0.85340	-3.20994		5.41155	5.41155	17.71156	168.72377	-38.21166	19.20000	-1.34125	4.73349	0.78083	-3.22865	3.71224	-0.23006
5.92560	1.50695	-2.73063		5.26396	-1.36461	3.07571	0.05744	-2.54409		3.71224	3.71224	21.64746	172.28525	-39.88713	19.20000	-1.34101	2.91013	-0.00406	-2.45225	2.06244	-1.36481
4.58785	0.70836	-3.18797		3.57042	-0.63029	1.28949	-0.43452	-1.11925		2.06244	2.06244	25.58336	175.84673	-41.56260	19.20000	-0.56123	1.14821	-0.46851	-0.99662	0.80007	-1.27697
2.75068	-0.04934	-2.32643		1.94542	-0.02061	0.04216	-0.85868	-0.03659		0.80007	0.80007	29.51926	179.40821	-43.23806	19.20000	0.00000	-0.00000	-0.89107	0.00000	-0.00000	-0.48605
0.99438	-0.50825	-0.86310		0.69288	0.00000	0.00000	-0.82511	0.00000		-0.00000	-0.00000	33.72091	54.06400	8.76921	16.51600	0.00000	0.00000	0.79494	0.00000	0.00000	0.16838
0.42213	12.69473	-0.34257	Assumed TW40 connection	0.29865	0.00000	0.00000	-2.14175	0.00000		0.00000	0.00000										

Specific Utility Damage Results - Pullouts & Rotations

Stage: Name		Specific Utility: Name		Sub-utility: Iteration		Distance		x		y		z		Pullout: Pullout:		Pullout: Pullout:		Pullout: Pullout:		Pullout: Pullout:		Pullout: Pullout:	
Ref.	Pullout:	Pullout:	Utility:	Pullout:	Pullout:	Pullout:	Pullout:	Check:	Check:	Rotation:	Rotation:	Check:	Check:	Vertical:	Pullout:	Pullout:	Pullout:	Pullout:	Pullout:	Pullout:	Pullout:	Pullout:	
Right	Total:	Total:	Utility:	Total:	Total:	Total:	Total:	Name	Name	from	to	from	to	Left	Left	Left	Left	Right	Right	Right	Right		
Seg.:	Ax.:	Ax.:	Ref.:	Flex.:	Flex.:	Total:	Total:	Threshold	Limit	start of	end of	Threshold	Limit	Ax.:	vs	Seg.:	Flex.:	Seg.:	Seg.:	Ax.:	Seg.:	Seg.:	
Flex.:		Unfactored	Factored	Unfactored	Factored	Unfactored	Factored	utility						Unfactored	Ax.:	Unfactored	Factored	Unfactored	Ax.:	Unfactored	Factored	Unfactored	
Factored														Factored									
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	
0	Base Model	1	TWS(1)_1																				
		2	TWS(2)_1																				
		3	TWS(2)_2																				
		4	TWS(2)_3																				
		5	TWS(2)_4																				
		6	TW Fresh Water (a) - St Pancras																				
0.00006	0.00000	0.00000	0.00012	0.00012	0.00012	0.00012	1	1	OK	3.95632	-32.55421	2.82127	20.65500	0.00000	0.00000	0.00006	0.00006	0.00000	0.00000	0.00000	0.00000	0.00006	
0.00000	0.00000	0.00000	0.00001	0.00001	0.00001	0.00001	1	OK	OK	7.91263	-28.59823	2.87302	20.65500	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	
0.00012	0.00000	0.00000	0.00024	0.00024	0.00024	0.00024	1	OK	OK	11.86895	-24.64226	2.92477	20.65500	0.00000	0.00000	0.00012	0.00012	0.00000	0.00000	0.00000	0.00012	0.00012	
0.00033	0.00000	0.00000	0.00065	0.00065	0.00065	0.00065	1	OK	OK	15.82526	-20.66288	2.97652	20.65500	0.00000	0.00000	0.00033	0.00033	0.00000	0.00000	0.00000	0.00033	0.00033	
0.00066	0.00000	0.00000	0.00133	0.00133	0.00133	0.00133	1	OK	OK	19.78158	-16.73030	3.02827	20.65500	0.00000	0.00000	0.00066	0.00066	0.00000	0.00000	0.00000	0.00066	0.00066	
0.00119	0.00000	0.00000	0.00239	0.00239	0.00239	0.00239	1	OK	OK	23.73790	-12.77432	3.08002	20.65500	0.00000	0.00000	0.00119	0.00119	0.00000	0.00000	0.00000	0.00119	0.00119	
0.00197	0.00000	0.00000	0.00394	0.00394	0.00394	0.00394	1	OK	OK	27.69421	-8.81834	3.13177	20.65500	0.00000	0.00000	0.00197	0.00197	0.00000	0.00000	0.00000	0.00197	0.00197	
0.00682	0.00900	0.00900	0.01364	0.01364	0.02263	0.02263	1	OK	OK	31.65053	-4.86237	3.18352	20.65500	0.00000	0.00000	0.00682	0.00682	0.00900	0.00900	0.00900	0.00682	0.00682	
0.00719	0.05989	0.05989	0.01438	0.01438	0.07427	0.07427	1	OK	OK	35.60684	-9.90639	2.23527	20.65500	0.00000	0.01097	0.00719	0.00719	0.07087	0.07087	0.07087	0.00719	0.00719	
0.00168	0.01605	0.01605	0.00335	0.00335	0.01941	0.01941	1	OK	OK	39.56316	3.04959	3.28701	20.65500	0.00000	0.08012	0.00168	0.00168	0.09617	0.09617	0.09617	0.00168	0.00168	
0.00515	-0.04693	-0.04693	0.01029	0.01029	0.01029	0.01029	1	OK	OK	43.51948	7.00557	3.33876	20.65500	0.00000	0.09017	0.00515	0.00515	0.04324	0.04324	0.04324	0.00515	0.00515	
0.00401	-0.00902	-0.00902	0.00802	0.00802	0.00802	0.00802	1	OK	OK	47.47579	10.96154	3.39051	20.65500	0.00000	0.04063	0.00401	0.00401	0.03161	0.03161	0.03161	0.00401	0.00401	
0.00419	0.00461	0.00461	0.00839	0.00839	0.01300	0.01300	1	OK	OK	51.43211	14.91752	3.44226	20.65500	0.00000	0.03213	0.00419	0.00419	0.03674	0.03674	0.03674	0.00419	0.00419	
0.00333	0.00247	0.00247	0.00666	0.00666	0.00913	0.00913	1	OK	OK	55.33843	18.87850	3.49401	20.65500	0.00000	0.03712	0.00333	0.00333	0.03959	0.03959	0.03959	0.00333	0.00333	
0.00181	0.00127	0.00127	0.00362	0.00362	0.00490	0.00490	1	OK	OK	59.34474	22.82948	3.54576	20.65500	0.00000	0.03971	0.00181	0.00181	0.04099	0.04099	0.04099	0.00181	0.00181	
0.00153	0.00127	0.00127	0.00307	0.00307	0.00434	0.00434	1	OK	OK	63.30106	26.78545	3.59751	20.65500	0.00000	0.04111	0.00153	0.00153	0.04238	0.04238	0.04238	0.00153	0.00153	
0.00200	0.00127	0.00127	0.00401	0.00401	0.00528	0.00528	1	OK	OK	67.25737	30.74143	3.64926	20.65500	0.00000	0.04251	0.00200	0.00200	0.04378	0.04378	0.04378	0.00200	0.00200	
0.00318	0.00127	0.00127	0.00637	0.00637	0.00764	0.00764	1	OK	OK	71.21369	34.69741	3.70101	20.65500	0.00000	0.04391	0.00318	0.00318	0.04518	0.04518	0.04518	0.00318	0.00318	
0.03649	0.00754	0.00754	0.02798	0.02798	0.08051	0.08051	1	OK	OK	75.17001	38.65339	3.75276	20.65500	0.00000	0.04531	0.03649	0.03649	0.05284	0.05284	0.05284	0.03649	0.03649	
0.05238	0.00679	0.00679	0.01047	0.01047	0.01156	0.01156	1	OK	OK	79.12632	42.60936	3.80451	20.65500	0.00000	0.05435	0.05238	0.05238	0.06114	0.06114	0.06114	0.05238	0.05238	
0.00003	0.00000	0.00000	0.00007	0.00007	0.00007	0.00007	1	OK	OK	83.05457	46.55457	2.84714	20.65500	0.00000	0.00000	0.00003	0.00003	0.00000	0.00000	0.00000	0.00003	0.00003	
0.00005	0.00000	0.00000	0.00011	0.00011	0.00011	0.00011	1	OK	OK	86.98079	50.62024	2.89889	20.65500	0.00000	0.00000	0.00005	0.00005	0.00000	0.00000	0.00000	0.00005	0.00005	
0.00021	0.00000	0.00000	0.00042	0.00042	0.00042	0.00042	1	OK	OK	90.91006	54.68006	2.95064	20.65500	0.00000	0.00000	0.00021	0.00021	0.00000	0.00000	0.00000	0.00021	0.00021	
0.00047	0.00000	0.00000	0.00095	0.00095	0.00095	0.00095	1	OK	OK	94.84032	58.70829	3.00239	20.65500	0.00000	0.00000	0.00047	0.00047	0.00000	0.00000	0.00000	0.00047	0.00047	
0.00090	0.00000	0.00000	0.00180	0.00180	0.00180	0.00180	1	OK	OK	98.76959	62.73652	3.05414	20.65500	0.00000	0.00000	0.00090	0.00090	0.00000	0.00000	0.00000	0.00090	0.00090	
0.00155	0.00000	0.00000	0.00310	0.00310	0.00310	0.00310	1	OK	OK	102.69885	66.76475	3.10589	20.65500	0.00000	0.00000	0.00155	0.00155	0.00000	0.00000	0.00000	0.00155	0.00155	
0.00283	0.00000	0.00000	0.00566	0.00566	0.00566	0.00566	1	OK	OK	106.62811	70.79298	3.15764	20.65500	0.00000	0.00000	0.00283	0.00283	0.00000	0.00000	0.00000	0.00283	0.00283	
0.01054	0.04201	0.04201	0.02109	0.02109	0.06310	0.06310	1	OK	OK	110.55737	74.82121	3.20939	20.65500	0.00000	0.00000	0.01054	0.01054	0.04201	0.04201	0.04201	0.01054	0.01054	
0.00326	0.05511	0.05511	0.00653	0.00653	0.06163	0.06163	1	OK	OK	114.48659	78.84944	3.26114	20.65500	0.00000	0.05080	0.00326	0.00326	0.10591	0.10591	0.10591	0.00326	0.00326	
0.00253	-0.03529	-0.03529	0.00506	0.00506	0.00506	0.00506	1	OK	OK	118.41585	82.87767	3.31289	20.65500	0.00000	0.10719	0.00253	0.00253	0.07190	0.07190	0.07190	0.00253	0.00253	
0.00442	-0.03541	-0.03541	0.00884	0.00884	0.00884	0.00884	1	OK	OK	122.34511	86.90590	3.36464	20.65500	0.00000	0.06418	0.00442	0.00442	0.02877	0.02877	0.02877	0.00442	0.00442	
0.00426	0.00524	0.00524	0.00853	0.00853	0.01377	0.01377	1	OK	OK	126.27437	90.93413	3.41639	20.65500	0.00000	0.02928	0.00426	0.00426	0.03452	0.03452	0.03452	0.00426	0.00426	
0.00434	0.00358	0.00358	0.00868	0.00868	0.01225	0.01225	1	OK	OK	130.20363	94.96236	3.46814	20.65500	0.00000	0.03505	0.00434	0.00434	0.03863	0.03863	0.03863	0.00434	0.00434	
0.00227	0.00149	0.00149	0.00453	0.00453	0.00602	0.00602	1	OK	OK	134.13289	98.99059	3.51989	20.65500	0.00000	0.03880	0.00227	0.00227	0.04029	0.04029	0.04029	0.00227	0.00227	
0.00159	0.00127	0.00127	0.00317	0.00317	0.00444	0.00444	1	OK	OK	138.06215	103.01882	3.57164	20.65500	0.00000	0.04041	0.00159	0.00159	0.04168	0.04168	0.04168	0.00159	0.00159	
0.00167	0.00127	0.00127	0.00334	0.00334	0.00461	0.00461	1	OK	OK	141.99141	107.04705	3.62339	20.65500	0.00000	0.04181	0.00167	0.00167	0.04308	0.04308	0.04308	0.00167	0.00167	
0.00253	0.00127	0.00127	0.00505	0.00505	0.00633	0.00633	1	OK	OK	145.92067	111.07528	3.67514	20.65500	0.00000	0.04321	0.00253	0.00253	0.04448	0.04448	0.04448	0.00253	0.00253	
0.00382	0.00127	0.00127	0.00764	0.00764	0.00891	0.00891	1	OK	OK	149.84993	115.10351	3.72689	20.65500	0.00000	0.04461	0.00382	0.00382	0.04588	0.04588	0.04588	0.00382	0.00382	
0.04351	0.00813	0.00813	0.08703	0.08703	0.09516	0.09516	1	OK	OK	153.77919	119.13174	3.77864	20.65500	0.00000	0.04601	0.04351	0.04351	0.05414	0.05414	0.05414	0.04351	0.04351	
0.04592	0.00217	0.00217	0.09183	0.09183	0.09400	0.09400	1	OK	OK	157.70845	123.16000	3.83038	20.65500	0.00000	0.05547	0.04592	0.04592	0.05764	0.05764	0.05764	0.04592	0.04592	
0.01303	0.32971	0.32971	TW Fresh Water (b) - St Pancras	0.02606	0.02606	0.35577	0.35577	1	OK	3.99806	-41.00322	8.86571	20.34000	0.00000</									

UBB, London

TW Sewer Assessment

FULL DEVELOPMENT LONG TERM

Stage	Stage	Name	Specific	Specific Utility: Name			Sub-utility Iteration		Distance	x	y	z	Pullout:	Pullout:	Pullout:	Pullout:	Pullout:	Pullout:	Pullout:					
				Pullout:	Pullout:	Pullout:	Pullout:	Check:												Check:	Rotation:	Rotation:	Check:	Check:
Ref.	Right	Total:	Pullout:	Utility:	Total:	Total:	Total:	Name	Pullout:	Check:	Check:	Rotation:	Rotation:	Check:	Check:	Left	Seg:	Left	Left	Seg:	Left	Right	Right	Right
0.00073	-0.00000	-0.00000			0.00147	0.00147	0.00147	0.00147	-	OK		0.00076	0.00076	-	OK									
												19.39031	67.87684	-1.20000	20.34000	0.00000		0.00000	0.00000	0.00044	0.00044	0.00000	0.00000	0.00044
0.00044	0.00000	0.00000			0.00089	0.00089	0.00089	0.00089	-	OK		0.00046	0.00046	-	OK									
												23.98838	71.74354	-2.21642	20.34000	0.00000		0.00000	0.00000	0.00046	0.00046	0.00198	0.00198	0.00046
0.00046	0.00198	0.00198			0.00093	0.00093	0.00291	0.00291	-	OK		0.00048	0.00048	-	OK									
0.00144	0.00156	0.00156			0.00288	0.00288	0.01444	0.01444	-	OK		27.98644	75.61265	-3.23285	20.34000	0.00000		0.00247	0.00247	0.00144	0.00144	0.01404	0.01404	0.00144
												0.00150	0.00150	-	OK									
0.00642	0.04561	0.04561			0.01283	0.01283	0.05844	0.05844	-	OK		31.98450	79.47695	-4.24927	20.34000	0.01610		0.01610		0.00642	0.00642	0.06171	0.06171	0.00642
												0.00668	0.00668	-	OK									
0.00430	0.09136	0.09136			0.00860	0.00860	0.09996	0.09996	-	OK		35.98257	83.34365	-5.26570	20.34000	0.06976		0.06976		0.00430	0.00430	0.16112	0.16112	0.00430
												0.00448	0.00448	-	OK									
0.00894	0.14721	0.14721			0.01787	0.01787	0.16508	0.16508	-	OK		39.98063	87.21035	-6.28213	20.34000	0.17331		0.17331		0.00894	0.00894	0.32052	0.32052	0.00894
												0.00931	0.00931	-	OK									
0.01305	0.30407	0.30407			0.02609	0.02609	0.33016	0.33016	-	OK		5.99709	54.34338	2.35750	20.34000	-0.59156		-0.59156		0.01305	0.01305	-0.28749	-0.28749	0.01305
												0.01359	0.01359	-	OK									
0.02090	0.20686	0.20686			0.04179	0.04179	0.24865	0.24865	-	OK		9.99516	58.21219	1.34107	20.34000	-0.25107		-0.25207		0.02090	0.02090	-0.04521	-0.04521	0.02090
												0.02177	0.02177	-	OK									
0.00582	0.03621	0.03621			0.01165	0.01165	0.04786	0.04786	-	OK		13.99322	62.07679	0.32464	20.34000	-0.03621		-0.03621		0.00582	0.00582	0.00000	0.00000	0.00582
												0.00607	0.00607	-	OK									
0.00056	0.00000	0.00000			0.00111	0.00111	0.00111	0.00111	-	OK		17.91282	65.94349	-0.69178	20.34000	0.00000		0.00000		0.00056	0.00056	0.00000	0.00000	0.00056
												0.00058	0.00058	-	OK									
0.00035	0.00000	0.00000			0.00069	0.00069	0.00069	0.00069	-	OK		21.98395	69.81019	-1.70821	20.34000	0.00000		0.00000		0.00035	0.00035	0.00000	0.00000	0.00035
												0.00036	0.00036	-	OK									
0.00114	0.00556	0.00556			0.00227	0.00227	0.00783	0.00783	-	OK		25.98741	73.67689	-2.72463	20.34000	0.00000		0.00000		0.00114	0.00114	0.00556	0.00556	0.00114
												0.00118	0.00118	-	OK									
0.00365	0.02683	0.02683			0.00729	0.00729	0.03412	0.03412	-	OK		29.98547	77.54000	-2.74106	20.34000	0.00000		0.00682		0.00365	0.00365	0.03365	0.03365	0.00365
												0.00380	0.00380	-	OK									
0.00518	0.06775	0.06775			0.01037	0.01037	0.07812	0.07812	-	OK		33.98353	81.41030	-4.75749	20.34000	0.03854		0.03854		0.00518	0.00518	0.10630	0.10630	0.00518
												0.00540	0.00540	-	OK									
0.00577	0.11447	0.11447			0.01153	0.01153	0.12601	0.12601	-	OK		37.98160	85.27700	5.77391	20.34000	0.11624		0.11624		0.00577	0.00577	0.23072	0.23072	0.00577
												0.00675	0.00675	-	OK									
0.00789	0.03099	0.03099			0.01577	0.01577	0.04676	0.04676	-	OK		3.99419	94.81160	-8.71513	19.73000	0.10001		0.10001		0.00789	0.00789	0.13100	0.13100	0.00789
												0.00822	0.00822	-	OK									
0.02341	0.01361	0.01361			0.04682	0.04682	0.06044	0.06044	-	OK		7.98838	98.54616	-10.13170	19.73000	0.13343		0.13343		0.02341	0.02341	0.14705	0.14705	0.02341
												0.02439	0.02439	-	OK									
0.00321	0.00672	0.00672			0.00643	0.00643	0.01315	0.01315	-	OK		11.98257	102.28700	-2.54828	19.73000	0.14778		0.14778		0.00321	0.00321	0.15450	0.15450	0.00321
												0.00335	0.00335	-	OK									
0.00423	0.00681	0.00681			0.00846	0.00846	0.01526	0.01526	-	OK		15.97676	106.01525	-12.96486	19.73000	0.15525		0.15525		0.00423	0.00423	0.16205	0.16205	0.00423
												0.00440	0.00440	-	OK									
0.00371	0.00689	0.00689			0.00742	0.00742	0.01431	0.01431	-	OK		19.7095	109.74980	-14.38143	19.73000	0.16280		0.16280		0.00371	0.00371	0.16969	0.16969	0.00371
												0.00187	0.00187	-	OK									
0.00181	0.00697	0.00697			0.00361	0.00361	0.01059	0.01059	-	OK		23.96513	113.48435	-15.79801	19.73000	0.17045		0.17045		0.00181	0.00181	0.17742	0.17742	0.00181
												0.00188	0.00188	-	OK									
0.00118	0.00627	0.00627			0.00235	0.00235	0.00862	0.00862	-	OK		27.95932	117.21890	-17.21459	19.73000	0.17819		0.17819		0.00118	0.00118	0.18447	0.18447	0.00118
												0.00122	0.00122	-	OK									
0.00303	0.00323	0.00323			0.00607	0.00607	0.00930	0.00930	-	OK		31.95351	107.95345	-18.63116	19.73000	0.18505		0.18505		0.00303	0.00303	0.18828	0.18828	0.00303
												0.00316	0.00316	-	OK									
0.00333	0.00131	0.00131			0.00667	0.00667	0.00798	0.00798	-	OK		35.94770	124.68800	-20.04774	19.73000	0.18843		0.18843		0.00333	0.00333	0.18974	0.18974	0.00333
												0.00347	0.00347	-	OK									
0.00284	0.00132	0.00132			0.00567	0.00567	0.00699	0.00699	-	OK		39.94189	128.42255	-21.46431	19.73000	0.18989		0.18989		0.00284	0.00284	0.19120	0.19120	0.00284
												0.00195	0.00195	-	OK									
0.00030	0.00132	0.00132			0.00059	0.00059	0.00191	0.00191	-	OK		43.93608	132.15710	-22.88089	19.73000	0.19135		0.19135		0.00030	0.00030	0.19266	0.19266	0.00030
												0.00031	0.00031	-	OK									
0.00137	0.00132	0.00132			0.00273	0.00273	0.00405	0.00405	-	OK		47.93027	135.89165	-24.29747	19.73000	0.19281		0.19281		0.00137	0.00137	0.19412	0.19412	0.00137
												0.00142	0.00142	-	OK									
0.00018	0.00132	0.00132			0.00035	0.00035	0.00167	0.00167	-	OK		51.92446	139.62619	-25.71404	19.73000	0.19427		0.19427		0.00018	0.00018	0.19559	0.19559	0.00018
												0.00018	0.00018	-	OK									
0.00101	0.00132	0.00132			0.00202	0.00202	0.00334	0.00334	-	OK		55.91865	143.36074	-27.13062	19.73000	0.19573		0.19573		0.00101	0.00101	0.19705	0.19705	0.00101
												0.00105	0.00105	-	OK									
0.00038	0.00132	0.00132			0.00075	0.00075	0.00207	0.00207	-	OK		59.91284	147.09529	-28.54720	19.73000	0.19720		0.19720		0.00038	0.00038	0.19852	0.19852	0.00038
												0.00039	0.00039	-	OK									
0.04233	0.02252	0.02252			0.08467	0.08467	0.10718	0.10718	-	OK		5.99128	96.67688	-9.42342	19.73000	0.12084		0.12084		0.04233	0.04233	0.14335	0.14335	0.04233
												0.04410	0.04410	-	OK									
0.00254	0.00668																							

Specific Utility Damage Results - Strains

Stage: Name		Specific Utility: Name			Sub-utility Distance		x	y	z	Ax.	Ax.	Flexural:	Flexural:	Flexural:	Flexural:	Tension:
Tension:	Check:	Compn.:	Compn.:	Check:	Rad. of	Check:	Check:	Peak	Flex.							
Ref.	Utility:	Total:	Total:	Compn.	Curv.	Rad. of	Rad. of	Tens. Strain								
Total:	Tension	Ref.	Unfactored	Factored		Curv.:	Curv.:	start of	Unfactored	Factored	Unfactored	Factored	Unfactored	Factored	Unfactored	
Factored	Unfactored	Factored				Curv.:	Curv.:	Orientn. Angle	Unfactored	Factored	Unfactored	Factored	Unfactored	Factored	Unfactored	
Threshold	Limit	(w.r.t. Global														
Axis)																
[με]	[με]	[m]				[Deg]	[m]	[m]	[m]	[m]	[με]	[με]	[με]	[με]	[με]	[με]



RSK ENVIRONMENT LIMITED

UBB, London

TW Sewer Assessment

FULL DEVELOPMENT LONG TERM

Oasys RSK ENVIRONMENT LIMITED															Job No.		Sheet No.		Rev.	
															371654					
															Drg. Ref.					
Made by MK		Date 09-Dec-2020		Checked		Date														
Stage: Tension: Ref.	Stage: Check:	Name: Compn.: Utility: Total:	Specific Compn.: Total:	Utility: Check: Compn.: Total:	Name: Rad. of Curv.	Sub-utility Rad. of	Distance from	x y z	Peak Flex.	Strain:	Strain:	Flexural: Tension:	Flexural: Tension:	Flexural: Compn.:	Flexural: Compn.:	Tension: Total:				
0	Base Model	1	TWS(1)_1	OK	2.6515E+4	1	2.00040	48.04000	58.00000	14.64700	115.40	115.40	47.785	95.570	-47.785	-47.785	163.18760			
210.97252	OK	-47.78492	-47.78492	OK	2.6515E+4	-	4.00080	-14.89437	153.28138	56.00000	81.920	81.920	19.114	38.229	-19.114	-19.114	101.03483			
120.14925	OK	-19.11442	-19.11442	OK	6.6285E+4	-	6.00120	48.08000	152.43877	54.00000	10.039	10.039	38.384	76.768	-38.384	-38.384	48.42352			
86.80763	OK	-38.38411	-38.38411	OK	3.3008E+4	-	8.00160	48.16000	152.43877	52.00000	-25.744	-25.744	48.960	97.920	-48.960	-48.960	48.95976			
97.91953	OK	-74.70350	-74.70350	OK	2.5878E+4	-	10.00200	7.44186	48.20000	50.00000	-37.809	-37.809	38.816	77.632	-38.816	-38.816	38.81603			
77.63206	OK	-76.62553	-76.62553	OK	3.2641E+4	-	12.00240	48.20000	50.00000	14.64700	-37.809	-37.809	38.816	77.632	-38.816	-38.816	38.81603			
967.29478	Fails	-534.86128	-534.86128	OK	2.6197E+3	-	14.00280	48.24000	48.00000	14.64700	-51.214	-51.214	483.65	967.29	-483.65	-483.65	483.64739			
1827.53133	Fails	-975.66237	-975.66237	OK	1.3866E+3	-	16.00320	180.80002	46.00000	14.64700	-61.897	-61.897	913.77	1827.5	-913.77	-913.77	913.76566			
965.61059	Fails	-526.61607	-526.61607	OK	2.6242E+3	-	18.00360	180.32489	44.00000	14.64700	-43.811	-43.811	482.81	965.61	-482.81	-482.81	482.80530			
748.79881	Fails	-394.31821	-394.31821	OK	3.3841E+3	-	20.00400	179.66625	42.00000	14.64700	-19.919	-19.919	374.40	748.80	-374.40	-374.40	374.39941			
1168.79025	Fails	-591.99974	-591.99974	OK	2.1681E+3	-	22.00440	48.36000	40.00000	14.64700	-7.6046	-7.6046	584.40	1168.8	-584.40	-584.40	584.39513			
600.71905	Fails	-302.52824	-302.52824	OK	4.2183E+3	-	24.00480	0.03876	38.00000	14.64700	-2.1687	-2.1687	300.36	600.72	-300.36	-300.36	300.35953			
162.99855	OK	-81.43390	-81.43390	OK	1.5559E+4	-	26.00520	48.40000	36.00000	14.64700	0.13075	0.13075	81.434	162.87	-81.434	-81.434	81.56465			
61.31535	OK	-30.61296	-30.61296	OK	4.1388E+4	-	28.00560	48.48000	34.00000	14.64700	0.089427	0.089427	30.613	61.226	-30.613	-30.613	30.70239			
627.15938	Fails	-313.57397	-313.57397	OK	4.0405E+3	-	30.00600	0.00000	32.00000	14.64700	0.011431	0.011431	313.57	627.15	-313.57	-313.57	313.58540			
1124.54094	Fails	-562.19753	-562.19753	OK	2.2537E+3	-	32.00640	48.56000	30.00000	14.64700	0.14588	0.14588	562.20	1124.4	-562.20	-562.20	562.34341			
655.22540	Fails	-327.22688	-327.22688	OK	3.8719E+3	-	34.00680	0.00000	28.00000	14.64700	0.77164	0.77164	327.23	654.45	-327.23	-327.23	327.99852			
250.48072	OK	-129.20589	-129.20589	OK	1.0117E+4	-	36.00720	48.60000	26.00000	14.64700	-3.9655	-3.9655	125.24	250.48	-125.24	-125.24	125.24036			
990.76408	Fails	-519.83130	-519.83130	OK	2.5576E+3	-	38.00760	48.68000	24.00000	14.64700	-24.449	-24.449	495.38	990.76	-495.38	-495.38	495.38204			
462.66007	OK	-288.49983	-288.49983	OK	5.4770E+3	-	40.00800	180.22700	22.00000	14.64700	-57.170	-57.170	231.33	462.66	-231.33	-231.33	231.33004			
682.82265	Fails	-415.81581	-415.81581	OK	3.7111E+3	-	42.00840	181.67812	20.00000	14.64700	-74.404	-74.404	341.41	682.82	-341.41	-341.41	341.41132			
752.52624	Fails	-443.96876	-443.96876	OK	3.3673E+3	-	44.00880	-1.32825	18.00000	14.64700	-67.706	-67.706	376.26	752.53	-376.26	-376.26	376.26312			
170.22257	OK	-127.25973	-127.25973	OK	1.4886E+4	-	46.00920	0.74719	16.00000	14.64700	-42.148	-42.148	85.111	170.22	-85.111	-85.111	85.11129			
817.36787	Fails	-408.38163	-408.38163	OK	3.1025E+3	-	48.00960	7.20680	14.00000	14.64700	0.60461	0.60461	408.38	816.76	-408.38	-408.38	408.98624			
930.50831	Fails	-443.67497	-443.67497	OK	2.8557E+3	-	50.01000	48.96000	12.00000	14.64700	43.158	43.158	443.67	887.35	-443.67	-443.67	486.83334			
529.62043	Fails	-234.45675	-234.45675	OK	5.4040E+3	-	52.01040	178.62101	10.00000	14.64700	60.707	60.707	234.46	468.91	-234.46	-234.46	295.16368			
102.28581	OK	-18.43712	-18.43712	OK	6.8720E+4	-	54.01080	49.04000	8.00000	14.64700	65.412	65.412	18.437	36.874	-18.437	-18.437	83.84869			
111.57344	OK	-27.15801	-27.15801	OK	4.6653E+4	-	56.01120	-24.90882	6.00000	14.64700	57.257	57.257	27.158	54.316	-27.158	-27.158	84.41544			
70.09973	OK	-20.54386	-20.54386	OK	6.1673E+4	-	58.01160	49.08000	4.00000	14.64700	29.012	29.012	20.544	41.088	-20.544	-20.544	49.55587			
109.29554	OK	-48.41928	-48.41928	OK	2.6167E+4	-	60.01200	-5.42020	2.00000	14.64700	12.457	12.457	48.419	96.839	-48.419	-48.419	60.87626			
89.23258	OK	-42.11555	-42.11555	OK	3.0084E+4	-	62.01240	49.16000	0.00000	14.64700	5.0015	5.0015	42.116	84.231	-42.116	-42.116	47.11702			
60.41387	OK	-30.20677	-30.20677	OK	4.1944E+4	-	64.01280	-0.17226	-2.00000	14.64700	343.09E-6	343.09E-6	30.207	60.414	-30.207	-30.207	30.20711			
45.60188	OK	-22.80088	-22.80088	OK	5.5568E+4	-	66.01320	49.24000	-4.00000	14.64700	122.47E-6	122.47E-6	22.801	45.602	-22.801	-22.801	22.80100			
11.64330	OK	-5.82129	-5.82129	OK	2.1765E+5	-	68.01360	49.28000	-6.00000	14.64700	731.35E-6	731.35E-6	5.8213	11.643	-5.8213	-5.8213	5.82202			
5.60394	OK	-2.80146	-2.80146	OK	4.5226E+5	-	70.01400	49.36000	-8.00000	14.64700	0.0010149	0.0010149	2.8015	5.6029	-2.8015	-2.8015	2.80248			
1.42047	OK	-0.70967	-0.70967	OK	1.7853E+6	-	72.01440	0.00000	-10.00000	14.64700	0.0011436	0.0011436	0.70967	1.4193	-0.70967	-0.70967	0.71081			
1.41970	OK	-0.70928	-0.70928	OK	1.7863E+6	-	74.01480	49.40000	-12.00000	14.64700	0.0011436	0.0011436	0.70928	1.4186	-0.70928	-0.70928	0.71042			
3.28480	OK	-1.64187	-1.64187	OK	7.7168E+5	-	76.01520	49.48000	-14.00000	14.64700	0.0010565	0.0010565	1.6419	3.2837	-1.6419	-1.6419	1.64293			
4.44894	OK	-2.22401	-2.22401	OK	5.6969E+5	-	78.01560	180.00000	-16.00000	14.64700	920.92E-6	920.92E-6	2.2240	4.4480	-2.2240	-2.2240	2.22493			
5.11057	OK	-2.55490	-2.55490	OK	4.9591E+5	-	80.01600	49.56000	-18.00000	14.64700	766.13E-6	766.13E-6	2.5549	5.1098	-2.5549	-2.5549	2.55567			
5.41499	OK	-2.70719	-2.70719	OK	4.6801E+5	-	82.01640	180.00000	-20.00000	14.64700	612.15E-6	612.15E-6	2.7072	5.4144	-2.7072	-2.7072	2.70780			
5.46888	OK	-2.73421	-2.73421	OK	4.6339E+5	-	84.01680	49.64000	-22.00000	14.64700	471.07E-6	471.07E-6	2.7342	5.4684	-2.7342	-2.7342	2.73468			
5.35060	OK	-2.67512	-2.67512	OK	4.7362E+5	-	86.01720	180.00000	-24.00000	14.64700	349.12E-6	349.12E-6	2.6751	5.3502	-2.6751	-2.6751	2.67547			
5.11766	OK	-2.55870	-2.55870	OK	4.9517E+5	-	88.01760	49.68000	-26.00000	14.64700	248.48E-6	248.48E-6	2.5587	5.1174	-2.5587	-2.5587	2.55895			
4.81211	OK	-2.40597	-2.40597	OK	5.2661E+5	-	90.01800	180.00000	-28.00000	14.64700	168.79E-6	168.79E-6	2.4060	4.8119	-2.4060	-2.4060	2.40614			
4.46453	OK	-2.23221	-2.23221	OK	5.6760E+5	-	92.01840	49.76000	-30.00000	14.64700	108.22E-6	108.22E								



RSK ENVIRONMENT LIMITED

UBB, London

TW Sewer Assessment

FULL DEVELOPMENT LONG TERM

Job No.	Sheet No.	Rev.
371654		
Drg. Ref.		
Made by MK	Date 09-Dec-2020	Checked Date

Stage:	Stage:	Name	Specific	Utility:	Name	Sub-utility	Distance	x	y	z	Ax.	Ax.	Flexural:	Flexural:	Flexural:	Flexural:	Tension:
Tension:	Check:	Compn.:	Compn.:	Check:	Rad. of	Check:	from	Peak	Flex.		Strain:	Strain:	Tension:	Tension:	Compn.:	Compn.:	Total:
Ref.	Total:	Utility:	Total:	Curv.	Rad. of	Rad. of	Tens.	Strain									
92.64267	OK	-46.26329	-46.26329	OK	1.7498E+4	-	-	180.00600									
72.27960	OK	-36.09354	-36.09354	OK	2.2428E+4	-	48.07656	14.64443	6.82214	17.09950	0.092517	0.092517	36.094	72.187	-36.094	-36.094	36.18606
51.48988	OK	-25.70386	-25.70386	OK	3.1493E+4	-	50.07975	16.64757	6.83586	17.09950	0.082166	0.082166	25.704	51.408	-25.704	-25.704	25.78602
36.41957	OK	-18.17077	-18.17077	OK	4.4550E+4	-	52.08293	18.65071	6.84957	17.09950	0.078037	0.078037	18.171	36.342	-18.171	-18.171	18.24880
26.63113	OK	-13.27711	-13.27711	OK	6.0970E+4	-	54.08612	20.65386	6.86329	17.09950	0.076915	0.076915	13.277	26.554	-13.277	-13.277	13.35402
20.30978	OK	-10.11622	-10.11622	OK	8.0020E+4	-	56.08931	22.65700	6.87700	17.09950	0.077334	0.077334	10.116	20.232	-10.116	-10.116	10.19356
16.44873	OK	-8.18521	-8.18521	OK	9.8898E+4	-	58.09250	24.66014	6.89071	17.09950	0.078320	0.078320	8.1852	16.370	-8.1852	-8.1852	8.26353
15.00916	OK	-7.46490	-7.46490	OK	1.0844E+5	-	60.09569	26.66329	6.90443	17.09950	0.079368	0.079368	7.4649	14.930	-7.4649	-7.4649	7.54426
16.42357	OK	-8.17126	-8.17126	OK	9.9067E+4	-	62.09888	28.66643	6.91814	17.09950	0.081041	0.081041	8.1713	16.343	-8.1713	-8.1713	8.25231
21.31599	OK	-10.61625	-10.61625	OK	7.6251E+4	-	64.10207	30.66957	6.93186	17.09950	0.083479	0.083479	10.616	21.233	-10.616	-10.616	10.69973
30.53159	OK	-15.22213	-15.22213	OK	5.3179E+4	-	66.10526	32.67271	6.94557	17.09950	0.087341	0.087341	15.222	30.444	-15.222	-15.222	15.30947
51.16012	OK	-24.33907	-24.33907	OK	3.3259E+4	-	68.00250	34.67213	6.73960	17.09950	2.4820	2.4820	24.339	48.678	-24.339	-24.339	26.82106
57.39071	OK	-27.19148	-27.19148	OK	2.9770E+4	-	4.01351	40.66527	6.50620	17.09950	3.0078	3.0078	27.191	54.383	-27.191	-27.191	30.19923
113.90604	OK	-53.43978	-53.43978	OK	1.5148E+4	-	6.02026	42.65840	6.27280	17.09950	7.0265	7.0265	53.440	106.88	-53.440	-53.440	60.46626
69.90136	OK	-29.60036	-29.60036	OK	2.7348E+4	-	8.02701	44.65153	6.03940	17.09950	10.701	10.701	29.600	59.201	-29.600	-29.600	40.30099
117.20111	OK	-53.49723	-53.49723	OK	1.5132E+4	-	10.03376	46.64467	5.80600	17.09950	10.207	10.207	53.497	106.99	-53.497	-53.497	63.70388
114.27006	OK	-52.94816	-52.94816	OK	1.5289E+4	-	12.04052	48.63780	5.57260	17.09950	8.3737	8.3737	52.948	105.90	-52.948	-52.948	61.32189
95.69893	OK	-46.03102	-46.03102	OK	1.7586E+4	-	14.04727	50.63093	5.33920	17.09950	3.6369	3.6369	46.031	92.062	-46.031	-46.031	49.66791
73.90441	OK	-36.92929	-36.92929	OK	2.1920E+4	-	16.05402	52.62407	5.10580	17.09950	0.045833	0.045833	36.929	73.859	-36.929	-36.929	36.97512
87.11745	OK	-43.54842	-43.54842	OK	1.8589E+4	-	18.06077	54.61720	4.87240	17.09950	0.020607	0.020607	43.548	87.097	-43.548	-43.548	43.56903
40.17738	OK	-20.08484	-20.08484	OK	4.0304E+4	-	20.06753	56.61033	4.63900	17.09950	0.0077052	0.0077052	20.085	40.170	-20.085	-20.085	20.09254
360.36452	OK	-173.45804	-173.45804	OK	4.6668E+3	-	22.07428	58.60347	4.40560	17.09950	13.448	13.448	173.46	346.92	-173.46	-173.46	186.90649
331.79679	OK	-155.55253	-155.55253	OK	5.2040E+3	-	24.08103	60.59660	4.17220	17.09950	20.692	20.692	155.55	311.11	-155.55	-155.55	176.24426
21.36751	OK	-3.39485	-3.39485	OK	2.3845E+5	-	26.08778	62.58973	3.93880	17.09950	14.578	14.578	3.3948	6.7897	-3.3948	-3.3948	17.97267
11.35939	OK	-3.78434	-3.78434	OK	2.1391E+5	-	3.89559	64.73677	2.45600	17.09950	3.7907	3.7907	3.7843	7.5687	-3.7843	-3.7843	7.57505
33.56406	OK	-13.86152	-13.86152	OK	5.8399E+4	-	5.84339	66.72175	1.94800	17.09950	5.8410	5.8410	13.862	27.723	-13.862	-13.862	19.70254
78.94650	OK	-32.79067	-32.79067	OK	2.4687E+4	-	7.79119	68.09754	1.44000	17.09950	13.365	13.365	32.791	65.581	-32.791	-32.791	46.15584
19.23831	OK	-0.17307	-0.17307	OK	4.6773E+6	-	9.73898	70.79792	0.93200	17.09950	18.892	18.892	0.17307	0.34614	-0.17307	-0.17307	19.06524
44.40549	OK	-11.89316	-11.89316	OK	6.8064E+4	-	11.68678	72.85831	0.42400	17.09950	20.619	20.619	11.893	23.786	-11.893	-11.893	32.51234
49.67666	OK	-12.76719	-12.76719	OK	6.3405E+4	-	13.63457	74.73869	-0.08400	17.09950	24.142	24.142	12.767	25.534	-12.767	-12.767	36.90947
54.64298	OK	-13.37906	-13.37906	OK	6.0505E+4	-	15.58237	76.64676	-0.59200	17.09950	27.885	27.885	13.379	26.758	-13.379	-13.379	41.26392
66.85925	OK	-17.28902	-17.28902	OK	4.6822E+4	-	17.53017	78.49946	-1.10000	17.09950	32.281	32.281	17.289	34.578	-17.289	-17.289	49.57023
83.31516	OK	-22.65372	-22.65372	OK	3.5734E+4	-	19.47796	80.53795	-1.60800	17.09950	38.008	38.008	22.654	45.307	-22.654	-22.654	60.66144
87.91844	OK	-21.88232	-21.88232	OK	6.6993E+4	-	21.42576	82.62023	-2.11600	17.09950	44.154	44.154	21.882	43.765	-21.882	-21.882	66.03613
261.80071	OK	-122.23516	-122.23516	OK	6.1071E+3	-	2.00802	84.70537	-3.90013	16.23650	17.330	17.330	122.24	244.47	-122.24	-122.24	139.56555
178.27369	OK	-110.92816	-110.92816	OK	8.3748E+3	-	4.01604	86.73160	-4.66826	16.23650	-21.791	-21.791	89.137	178.27	-89.137	-89.137	89.13684
285.13042	OK	-168.84531	-168.84531	OK	5.2362E+3	-	6.02406	88.75689	-5.43638	16.23650	-26.280	-26.280	142.57	285.13	-142.57	-142.57	142.56521
436.39071	OK	-234.81441	-234.81441	OK	3.4212E+3	-	8.03209	90.44219	-6.20451	16.23650	-16.619	-16.619	218.20	436.39	-218.20	-218.20	218.19535
31.1798	OK	-28.54013	-28.54013	OK	8.167E+4	-	10.04011	100.29749	-6.97264	16.23650	-8.9811	-8.9811	19.559	39.118	-19.559	-19.559	19.55899
36.45043	OK	-20.16149	-20.16149	OK	4.0960E+4	-	12.04813	102.15279	-7.74077	16.23650	-1.9363	-1.9363	18.225	36.450	-18.225	-18.225	18.22522
42.59744	OK	-26.49060	-26.49060	OK	3.5049E+4	-	14.05615	104.00809	-8.50889	16.23650	-5.1919	-5.1919	21.299	42.597	-21.299	-21.299	21.29872
42.58238	OK	-31.43586	-31.43586	OK	3.5061E+4	-	16.06417	105.86338	-9.27702	16.23650	-10.145	-10.145	21.291	42.582	-21.291	-21.291	21.29119
76.94914	OK	-42.68785	-42.68785	OK	1.9402E+4	-	18.07219	107.71868	-10.04515	16.23650	-4.2133	-4.2133	38.475	76.949	-38.475	-38.475	38.47457
71.86236	OK	-36.93997	-36.93997	OK	2.0776E+4	-	20.08021	109.57398	-10.81328	16.23650	-1.0088	-1.0088	35.931	71.862	-35.931	-35.931	35.93118
50.40585	OK	-26.20455	-26.20455	OK	2.9620E+4	-	22.08824	111.42928	-11.58140	16.23650	-1.0016	-1.0016	25.203	50.406	-25.203	-25.203	25.20293
24.84533	OK	-13.41526	-13.41526	OK	6.0092E+4	-	24.09626	113.28457	-12.34953	16.23650	-0.99259	-0.99259	12.423	24.845	-12.423	-12.423	12.42267
3.56015	OK	-2.76641															



RSK ENVIRONMENT LIMITED

UBB, London

TW Sewer Assessment

FULL DEVELOPMENT LONG TERM

09-DEC-2020																		
MK																		
Stage:	Name	Specific	Specific	Sub-utility	Distance	x	y	z	Ax.	Ax.	Flexural:	Flexural:	Flexural:	Flexural:	Flexural:	Tension:		
Tension:	Check:	Compn.:	Compn.:	Check:	Check:	Peak			Strain:	Strain:	Tension:	Tension:	Compn.:	Compn.:				
Total:	Tension	Total:	Total:	Rad. of	Rad. of	Flex.									Total:			
389.92685	OK	-632.62782	-632.62782	OK	3.8289E+3	-	-	76.30482	161.52232	-32.32085	16.23650	-437.66	-437.66	194.96	389.93	-194.96	-194.96	194.96343
104.10594	OK	-815.00519	-815.00519	OK	1.4341E+4	-	-	78.31284	163.37762	-33.08898	16.23650	-762.95	-762.95	52.053	104.11	-52.053	-52.053	52.05297
222.03452	OK	-720.09925	-720.09925	OK	6.7242E+3	-	-	80.32086	165.23291	-33.85711	16.23650	-609.08	-609.08	111.02	222.03	-111.02	-111.02	111.01726
77.89295	OK	-429.86568	-429.86568	OK	1.9167E+4	-	-	82.32888	167.08821	-34.62523	16.23650	-390.92	-390.92	38.946	77.893	-38.946	-38.946	38.94647
37.06155	OK	-128.31384	-128.31384	OK	4.0284E+4	-	-	84.33690	168.94351	-35.39336	16.23650	-109.78	-109.78	18.531	37.062	-18.531	-18.531	18.53077
277.35596	OK	-48.15221	-48.15221	OK	1.5503E+4	-	-	86.34492	170.79881	-36.16149	16.23650	181.05	181.05	48.152	96.304	-48.152	-48.152	229.20374
420.72645	OK	-25.68456	-25.68456	OK	2.9064E+4	-	-	88.35295	172.65411	-36.92962	16.23650	369.36	369.36	25.685	51.369	-25.685	-25.685	395.04189
468.70360	OK	-27.49079	-27.49079	OK	2.7155E+4	-	-	90.36097	174.50940	-37.69774	16.23650	413.72	413.72	27.491	54.982	-27.491	-27.491	441.21281
0.01693	OK	-0.01688	-0.01688	OK	3.2589E+6	-	-	93.65322	-32.55421	2.82127	20.65500	289.02E-6	57.803E-6	0.016877	0.016877	-0.016877	-0.016877	0.01717
0.00981	OK	-0.00975	-0.00975	OK	5.6436E+6	-	-	95.93447	-30.57622	2.84714	20.65500	300.64E-6	60.128E-6	0.0097455	0.0097455	-0.0097455	-0.0097455	0.01005
0.00017	OK	-0.00011	-0.00011	OK	4.8757E+8	-	-	97.91263	-28.59823	2.87302	20.65500	304.90E-6	60.981E-6	0.01280E-6	0.01280E-6	-0.01280E-6	-0.01280E-6	0.00042
0.01351	OK	-0.01345	-0.01345	OK	4.0898E+6	-	-	99.89079	-26.62024	2.89889	20.65500	298.91E-6	59.782E-6	0.013448	0.013448	-0.013448	-0.013448	0.01375
0.03125	OK	-0.03119	-0.03119	OK	1.7633E+6	-	-	111.86895	-24.64226	2.92477	20.65500	279.61E-6	55.921E-6	0.031192	0.031192	-0.031192	-0.031192	0.03147
0.05454	OK	-0.05450	-0.05450	OK	1.0093E+6	-	-	113.84711	-22.66427	2.95064	20.65500	244.35E-6	48.871E-6	0.054495	0.054495	-0.054495	-0.054495	0.05474
0.08480	OK	-0.08476	-0.08476	OK	6.4887E+5	-	-	115.82526	-20.68628	2.97652	20.65500	192.13E-6	38.425E-6	0.084762	0.084762	-0.084762	-0.084762	0.08495
0.12371	OK	-0.12368	-0.12368	OK	4.4468E+5	-	-	117.80342	-18.70829	3.00239	20.65500	125.67E-6	25.134E-6	0.12368	0.12368	-0.12368	-0.12368	0.12381
0.17325	OK	-0.17324	-0.17324	OK	3.1748E+5	-	-	119.78158	-16.73030	3.02827	20.65500	55.274E-6	11.055E-6	0.17324	0.17324	-0.17324	-0.17324	0.17330
0.23566	OK	-0.23566	-0.23566	OK	2.3339E+5	-	-	121.75974	-14.75231	3.05414	20.65500	4.9955E-6	999.10E-9	0.23566	0.23566	-0.23566	-0.23566	0.23566
0.31321	OK	-0.31321	-0.31321	OK	1.7560E+5	-	-	123.73790	-12.77432	3.08002	20.65500	22.509E-6	4.5018E-6	0.31321	0.31321	-0.31321	-0.31321	0.31323
0.40780	OK	-0.40776	-0.40776	OK	1.3488E+5	-	-	125.71605	-10.79633	3.10589	20.65500	193.55E-6	38.710E-6	0.40776	0.40776	-0.40776	-0.40776	0.40795
0.51991	OK	-0.51977	-0.51977	OK	1.0582E+5	-	-	127.69421	-8.81834	3.13177	20.65500	660.84E-6	132.17E-6	0.51977	0.51977	-0.51977	-0.51977	0.52043
0.64665	OK	-0.64632	-0.64632	OK	8.5097E+4	-	-	129.67237	-6.84036	3.15764	20.65500	0.0016431	328.62E-6	0.64632	0.64632	-0.64632	-0.64632	0.64796
1.22074	OK	-1.21991	-1.21991	OK	4.5085E+4	-	-	131.65053	-4.86237	3.18352	20.65500	0.0041301	826.03E-6	1.2199	1.2199	-1.2199	-1.2199	1.22044
5.41923	OK	-4.30639	-4.30639	OK	1.2772E+4	-	-	133.62869	-2.88438	3.20939	20.65500	5.5642	1.1128	4.3064	4.3064	-4.3064	-4.3064	9.87061
7.04245	OK	-2.09782	-2.09782	OK	2.6218E+4	-	-	135.60684	-0.90639	3.23527	20.65500	24.723	4.9446	2.0978	2.0978	-2.0978	-2.0978	26.82099
5.67160	OK	-0.46970	-0.46970	OK	1.1710E+5	-	-	137.58500	-1.07160	3.26114	20.65500	26.010	5.2019	0.46970	0.46970	-0.46970	-0.46970	26.47920
1.30842	OK	-0.57978	-0.57978	OK	9.4863E+4	-	-	139.56316	-0.304959	3.28701	20.65500	3.6432	0.72864	0.57978	0.57978	-0.57978	-0.57978	4.22296
0.71170	OK	-17.51204	-4.07177	OK	7.7279E+4	-	-	141.54132	-5.50258	3.31289	20.65500	-16.800	-3.3601	0.71170	0.71170	-0.71170	-0.71170	0.71170
2.03452	OK	-23.64590	-6.35680	OK	2.7033E+4	-	-	143.51948	-7.00557	3.33876	20.65500	-21.611	-4.3223	2.0345	2.0345	-2.0345	-2.0345	2.03452
0.96484	OK	-8.26696	-2.42526	OK	5.7004E+4	-	-	145.49764	-8.98355	3.36464	20.65500	-7.3021	-1.4604	0.96484	0.96484	-0.96484	-0.96484	0.96484
1.38997	OK	-1.10156	-1.10156	OK	4.9929E+4	-	-	147.47579	-10.96154	3.39051	20.65500	1.4421	0.28842	1.1016	1.1016	-1.1016	-1.1016	2.54365
1.46956	OK	-1.17602	-1.17602	OK	4.6768E+4	-	-	149.45395	-12.93953	3.41639	20.65500	1.4677	0.29353	1.1760	1.1760	-1.1760	-1.1760	2.64369
1.37254	OK	-1.07350	-1.07350	OK	5.1234E+4	-	-	151.43211	-14.91752	3.44226	20.65500	1.4952	0.29905	1.0735	1.0735	-1.0735	-1.0735	2.56872
1.66050	OK	-1.44771	-1.44771	OK	3.7991E+4	-	-	153.41027	-16.89551	3.46814	20.65500	1.0639	0.21279	1.4477	1.4477	-1.4477	-1.4477	2.51166
0.92509	OK	-0.82790	-0.82790	OK	6.6433E+4	-	-	155.38843	-18.87350	3.49401	20.65500	0.48594	0.097188	0.82790	0.82790	-0.82790	-0.82790	1.31384
0.64705	OK	-0.57642	-0.57642	OK	9.5416E+4	-	-	157.36658	-20.85149	3.51989	20.65500	0.35316	0.070632	0.57642	0.57642	-0.57642	-0.57642	0.92958
0.54199	OK	-0.47133	-0.47133	OK	1.1669E+5	-	-	159.34474	-22.82948	3.54576	20.65500	0.35331	0.070662	0.47133	0.47133	-0.47133	-0.47133	0.82463
0.48139	OK	-0.41065	-0.41065	OK	1.3393E+5	-	-	161.32290	-24.80747	3.57164	20.65500	0.35372	0.070744	0.41065	0.41065	-0.41065	-0.41065	0.76437
0.46705	OK	-0.39613	-0.39613	OK	1.3884E+5	-	-	163.30106	-26.78545	3.59751	20.65500	0.35458	0.070916	0.39613	0.39613	-0.39613	-0.39613	0.75071
0.50245	OK	-0.43136	-0.43136	OK	1.2750E+5	-	-	165.27922	-28.76344	3.62339	20.65500	0.35542	0.071085	0.43136	0.43136	-0.43136	-0.43136	0.78679
0.59133	OK	-0.52000	-0.52000	OK	1.0577E+5	-	-	167.25737	-30.74143	3.64926	20.65500	0.35666	0.071332	0.52000	0.52000	-0.52000	-0.52000	0.87666
0.73372	OK	-0.66200	-0.66200	OK	8.3081E+4	-	-	169.23553	-32.71942	3.67514	20.65500	0.35858	0.071717	0.66200	0.66200	-0.66200	-0.66200	1.02059
0.91820	OK	-0.84587	-0.84587	OK	6.5022E+4	-	-	171.21369	-34.69741	3.70101	20.65500	0.36168	0.072336	0.84587	0.84587	-0.84587	-0.84587	1.20755
1.10733	OK	-1.03397	-1.03397	OK	5.3193E+4	-	-	173.19185	-36.67540	3.72689	20.65500	0.36680	0.073361	1.0340	1.0340	-1.0340	-1.0340	1.40077
1.21871	OK	-1.14389	-1.14389	OK	4.8082E+4	-	-	175.17001	-38.65339	3.75276	20.65500	0.37412	0.074823	1.1439	1.1439	-1.1439	-1.1439	1.51801
43.38655	OK	-42.49423	-42.49423	OK	1.2943E+3	-	-	177.14816	-40.63138	3.77864	20.65500	4.						



RSK ENVIRONMENT LIMITED

UBB, London

TW Sewer Assessment

FULL DEVELOPMENT LONG TERM

Job No.	Sheet No.	Rev.
371654		
Drg. Ref.		
Made by MK	Date 09-Dec-2020	Checked Date

Stage:	Stage:	Name	Specific	Utility:	Name	Sub-utility	Distance	x	y	z	Ax.	Ax.	Flexural:	Flexural:	Flexural:	Flexural:	Tension:	
Tension:	Check:	Compn.:	Compn.:	Check:	Rad. of	Check:	from	Peak			Strain:	Strain:	Tension:	Tension:	Compn.:	Compn.:	Total:	
Total:	Tension	Total:	Compn.:	Total:	Compn.:	Curv.	Rad. of	Flex.			Strain:	Strain:	Tension:	Tension:	Compn.:	Compn.:	Total:	
1.05637	OK	-0.68132	-0.68132	OK	8.0725E+4	-	-	-1.36540	11.98257	102.28070	-11.54828	1.8825	0.37650	0.85166	0.85166	-0.85166	-0.85166	2.73416
1.22816	OK	-0.85166	-0.85166	OK	6.4580E+4	-	-	-1.09206	13.97966	104.14798	-12.25657	1.8900	0.37799	1.0193	1.0193	-1.0193	-1.0193	2.90928
1.39732	OK	-1.01933	-1.01933	OK	5.3957E+4	-	-	-0.91188	15.97676	106.01525	-12.96486	1.8979	0.37957	1.1480	1.1480	-1.1480	-1.1480	3.04588
1.52760	OK	-1.14803	-1.14803	OK	4.7908E+4	-	-	-0.81052	17.97385	107.88253	-13.67314	1.9077	0.38154	1.1576	1.1576	-1.1576	-1.1576	3.06534
1.53918	OK	-1.15763	-1.15763	OK	4.7511E+4	-	-	-0.80339	19.97095	109.74980	-14.38143	1.9190	0.38381	1.0098	1.0098	-1.0098	-1.0098	2.92883
1.39359	OK	-1.00978	-1.00978	OK	5.4467E+4	-	-	-0.92123	21.96804	111.61707	-15.08972	1.9312	0.38625	0.74920	0.74920	-0.74920	-0.74920	2.68044
1.13545	OK	-0.74920	-0.74920	OK	7.3411E+4	-	-	-1.24204	23.96513	113.48435	-15.79801	1.9440	0.38879	0.46440	0.46440	-0.46440	-0.46440	2.40837
0.85319	OK	-0.46440	-0.46440	OK	1.1843E+5	-	-	-2.00399	25.96223	115.35162	-16.50630	1.9564	0.39128	0.23973	0.23973	-0.23973	-0.23973	2.19613
0.63101	OK	-0.23973	-0.23973	OK	2.2942E+5	-	-	-3.88430	27.95932	117.21890	-17.21459	1.9685	0.39371	0.14028	0.14028	-0.14028	-0.14028	2.10883
0.53399	OK	-0.14028	-0.14028	OK	3.9207E+5	-	-	-6.64248	29.95642	119.08617	-17.92287	1.4900	0.29800	1.4225	1.4225	-1.4225	-1.4225	2.91248
1.72048	OK	-1.42249	-1.42249	OK	3.8665E+4	-	-	-106.26105	31.95351	120.95345	-18.63116	0.68690	0.13738	0.90325	0.90325	-0.90325	-0.90325	1.59016
1.04063	OK	-0.90325	-0.90325	OK	6.0891E+4	-	-	-88.62656	33.95061	122.82072	-19.33945	0.36899	0.073797	0.70918	0.70918	-0.70918	-0.70918	1.07817
0.78298	OK	-0.70918	-0.70918	OK	7.7554E+4	-	-	-0.02008	35.94770	124.68800	-20.04774	0.37227	0.074454	0.92643	0.92643	-0.92643	-0.92643	1.29870
1.00899	OK	-0.92643	-0.92643	OK	5.9368E+4	-	-	-0.01408	37.94480	126.55527	-20.75603	0.37711	0.075423	0.95791	0.95791	-0.95791	-0.95791	1.33502
1.03333	OK	-0.95791	-0.95791	OK	5.7417E+4	-	-	-0.01487	39.94189	128.42255	-21.46431	0.38257	0.076514	0.78767	0.78767	-0.78767	-0.78767	1.17024
0.86418	OK	-0.78767	-0.78767	OK	6.9826E+4	-	-	-0.01749	41.93899	130.28982	-22.17260	0.38736	0.077472	0.46223	0.46223	-0.46223	-0.46223	0.84959
0.53970	OK	-0.46223	-0.46223	OK	1.1899E+5	-	-	-0.03142	43.93608	132.15710	-22.88089	0.38951	0.077901	0.065572	0.065572	-0.065572	-0.065572	0.45508
0.14347	OK	-0.06557	-0.06557	OK	8.3877E+5	-	-	-0.20590	45.93317	134.02437	-23.58918	0.38857	0.077714	0.27502	0.27502	-0.27502	-0.27502	0.66359
0.35274	OK	-0.27502	-0.27502	OK	1.9998E+5	-	-	-180.05177	47.93027	135.89165	-24.29747	0.38630	0.077261	0.42140	0.42140	-0.42140	-0.42140	0.80770
0.49866	OK	-0.42140	-0.42140	OK	1.3052E+5	-	-	-180.03337	49.92736	137.75892	-25.00575	0.38406	0.076813	0.31434	0.31434	-0.31434	-0.31434	0.69840
0.39115	OK	-0.31434	-0.31434	OK	1.7497E+5	-	-	-180.04530	51.92446	139.62619	-25.71404	0.38281	0.076562	0.041783	0.041783	-0.041783	-0.041783	0.42459
0.11835	OK	-0.04178	-0.04178	OK	1.3163E+6	-	-	-180.36517	53.92155	141.49347	-26.42233	0.38362	0.076724	0.20889	0.20889	-0.20889	-0.20889	0.59251
0.28561	OK	-0.20889	-0.20889	OK	2.6330E+5	-	-	-180.06583	55.91865	143.36074	-27.13062	0.38572	0.077144	0.30316	0.30316	-0.30316	-0.30316	0.68888
0.38030	OK	-0.30316	-0.30316	OK	1.8142E+5	-	-	-0.04789	57.91574	145.22802	-27.83891	0.38771	0.077541	0.24370	0.24370	-0.24370	-0.24370	0.63141
0.32124	OK	-0.24370	-0.24370	OK	2.2569E+5	-	-	-0.05844	59.91284	147.05329	-28.54720	0.38918	0.077836	0.10478	0.10478	-0.10478	-0.10478	0.49396
0.18262	OK	-0.10478	-0.10478	OK	5.2489E+5	-	-	-0.14830	61.90993	148.96257	-29.25548	0.38953	0.077907	0.056459	0.056459	-0.056459	-0.056459	0.44599
0.13437	OK	-0.05646	-0.05646	OK	9.7416E+5	-	-	-180.25220	1.96795	154.47786	-31.50979	12.515	2.5030	0.48315	0.48315	-0.48315	-0.48315	12.99831
2.98618	OK	-0.48315	-0.48315	OK	1.1384E+5	-	-	-190.82307	3.93590	156.25860	-32.34753	12.327	2.4653	0.42960	0.42960	-0.42960	-0.42960	12.75616
2.89491	OK	-0.42960	-0.42960	OK	1.2803E+5	-	-	-192.18316	5.90385	158.03934	-33.18526	12.138	2.4276	0.29253	0.29253	-0.29253	-0.29253	12.43066
2.72015	OK	-0.29253	-0.29253	OK	1.8802E+5	-	-	-198.05076	7.87180	159.82008	-34.02299	-140.31	-28.063	4.9452	4.9452	-4.9452	-4.9452	4.94524
4.94524	OK	-145.25950	-33.00809	OK	1.1122E+4	-	-	-97.91422	9.83975	161.60081	-34.86073	-381.63	-76.325	6.3167	6.3167	-6.3167	-6.3167	6.31668
6.31668	OK	-387.94199	-82.64174	OK	8.7071E+3	-	-	-118.25363	11.80771	163.38155	-35.69846	-402.19	-80.438	2.3076	2.3076	-2.3076	-2.3076	2.30760
2.30760	OK	-404.49972	-82.74602	OK	2.3834E+4	-	-	-168.00348	13.77566	165.16229	-36.53619	-285.84	-57.169	4.4916	4.4916	-4.4916	-4.4916	4.49158
4.49158	OK	-290.33427	-61.66012	OK	1.2245E+4	-	-	-85.01056	15.74361	166.94303	-37.37393	-146.73	-29.346	0.98228	0.98228	-0.98228	-0.98228	0.98228
0.98228	OK	-147.71120	-30.32807	OK	5.5992E+4	-	-	-205.71677	17.71156	168.72377	-38.21166	32.810	6.5620	0.054495	0.054495	-0.054495	-0.054495	32.86457
6.61651	OK	-0.05450	-0.05450	OK	1.0093E+6	-	-	-80.86778	19.67951	170.50451	-39.04940	197.37	39.474	0.92834	0.92834	-0.92834	-0.92834	198.29664
40.40200	OK	-0.92834	-0.92834	OK	5.9246E+4	-	-	-10.50682	21.64746	172.28525	-39.88713	324.09	64.818	2.3251	2.3251	-2.3251	-2.3251	326.41726
67.14357	OK	-2.32514	-2.32514	OK	2.3654E+4	-	-	-54.52470	23.61541	174.06599	-40.72486	369.89	73.978	1.8087	1.8087	-1.8087	-1.8087	371.69999
75.78694	OK	-1.80867	-1.80867	OK	3.0409E+4	-	-	-58.71965	25.58336	175.84673	-41.56260	381.34	76.268	0.87040	0.87040	-0.87040	-0.87040	382.21017
77.13835	OK	-0.87040	-0.87040	OK	6.3189E+4	-	-	-123.32495	27.55131	177.62747	-42.40033	253.24	50.648	6.5031	6.5031	-6.5031	-6.5031	259.74304
57.15106	OK	-6.50307	-6.50307	OK	8.4576E+3	-	-	-84.59749	29.51926	179.40821	-43.23806	54.469	10.894	3.1225	3.1225	-3.1225	-3.1225	57.59139
14.01630	OK	-3.12253	-3.12253	OK	1.7614E+4	-	-	-51.50823	31.48721	181.18895	-44.07580	262.96E-6	52.592E-6	2.7857	2.7857	-2.7857	-2.7857	2.78592
2.78571	OK	-2.78566	-2.78566	OK	1.9744E+4	-	-	-0.00000	3.62091	54.06400	8.76921	41.791	8.3583	68.259	68.259	-68.259	-68.259	110.05013
76.61706	OK	-68.25880	-68.25880	OK	3.0033E+3	-	-	-6.84104										

Summary: There is failure at one(or many) location(s). e.g. Stage 0, Specific Utility 1, location (49.000000|10.000000|14.647000)
Note: Tensile strains are +ve, compressive strains are -ve.
Note: The peak flexural tensile strain orientation angle is measured with respect to the global z-axis by looking at the end point of the utility from the start point. Anti-clockwise is positive.

Specific Utility Damage Results - Maximum Values

Stage:	Stage:	Name	Specific	Utility:	Name	Jointed	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.
Ref.	Max.	Max.	Utility:	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.
Disp:	Disp:	Disp:	Disp:	Disp:	Disp:	Disp:	Pullout:	Pullout:	Rotation:	Rotation:	Strain:	Strain:	Strain:	Strain:	Rad. of	Curv.:	Disp.:	Vert.:	Disp.:
Horiz.	Horiz.	Horiz.	Ref.	Horiz.	Horiz.	Horiz.	Factored:	Factored:	Factored:	Factored:	Tension:	Tension:	Compn.:	Compn.:	Curv.:	Value	Vert.:	Value	Value
x:	x:	y:	y:				Location	Value	Location	Value	Factored:	Factored:	Factored:	Factored:	Location		Location		
Location	Location	Value									Location	Value	Location	Value					
[m]	[mm]	[m]	[mm]				[m]	[mm]	[m]	[Deg]	[m]	[µε]	[m]	[µε]	[m]	[m]	[m]	[mm]	[mm]
0	Base Model	1	TWS(1)_1	No	-	-	-	-	-	-	14.00280	1827.53133*	14.00280	-975.66237	14.003	1.3866E+3	28.006	-15.044	
46.009	-0.56982	2	TWS(2)_1	No	-	-	-	-	-	-	28.04466	146.57721	28.04466	-73.27325	28.045	1.1048E+4	54.086	8.9234	
36.057	0.16611	3	TWS(2)_2	No	-	-	-	-	-	-	22.07428	360.36452	22.07428	-173.45804	22.074	4.6668E+3	0.0	7.4834	
30.101	0.14240	4	TWS(2)_3	No	-	-	-	-	-	-	21.42576	87.91844	7.79119	-32.79067	7.7912	2.4687E+4	25.321	-4.0636	
25.321	0.66357	5	TWS(2)_4	No	-	-	-	-	-	-	90.36097	468.70360	78.31284	-815.00519	8.0321	3.4212E+3	20.080	-6.5105	
84.337	-4.8033	6	TW Fresh Water (a) - St Pancras	Yes	79.126	0.11156	79.126	0.05457	79.12632	46.03132	79.12632	-45.23891	79.126	1.2158E+3	57.367	3.8606			
39.563	0.12465	7	TW Fresh Water (b) - St Pancras	Yes	3.9981	0.35577	7.9961	0.02280	9.99516	23.79225	9.99516	-9.62381	9.9952	5.7150E+3	41.980	-4.4777			
0.0	-1.0239	8	TW Fresh	Yes	5.9913	0.10718	5.9913	0.04410	5.99128	28.76820	5.99128	-27.50804	5.9913	1.9994E+3	19.971	-4.9933			
63.907	0.19932	9	TW Fresh Water (d) - St Pancras	Yes	23.615	1.2850	9.8398	0.01865	25.58336	77.13835	11.80771	-82.74602	27.551	8.4576E+3	7.8718	2.2116			
17.712	-3.2286	10	Assumed FW400 connection to TW2_1	Yes	3.6209	1.1926	3.6209	0.14273	3.62091	76.61706	3.62091	-68.25880	-	-	0.0	12.801			
0.0	-0.34484	0.0	30062																



RSK ENVIRONMENT LIMITED

UBB, London

TW Sewer Assessment

FULL DEVELOPMENT LONG TERM_Smoothed

Job No.	Sheet No.	Rev.
371654		
Drg. Ref.		
Made by MK	Date 09-Dec-2020	Checked Date

Titles

Job No.: 371654
Job Title: UBB, London
Sub-title: TW Sewer Assessment
Calculation Heading: FULL DEVELOPMENT LONG TERM_Smoothed
Initials: MK
Checker:
Date Saved: 09-Dec-2020
Date Checked:
Notes:
File Name: FULL DEVELOPMENT LONG TERM (1)_Smoothed rev11test1_USE.xdd
File Path: G:\Geoconsult\Projects\371600 - 371699\371654 Ugly Brown Building (UBB)\GMA\REV 02_OCTNOV 2020_TW Only\2 TW\Combinations CSVs for XDISP\CS Vs from XDISP_SMOOTHED

History

Date	Time	By	Notes
19-Jun-2017	11:17	tyler_a	
19-Jun-2017	11:21	tyler_a	
19-Jun-2017	11:24	tyler_a	
19-Jun-2017	11:37	tyler_a	
30-Jun-2017	11:50	tyler_a	
07-Jul-2017	16:50	MKentish	
07-Jul-2017	17:21	MKentish	
10-Jul-2017	09:37	MKentish	
10-Jul-2017	13:57	MKentish	
10-Jul-2017	14:31	MKentish	
10-Jul-2017	16:58	MKentish	
12-Jul-2017	11:37	tyler_a	
13-Jul-2017	17:41	MKentish	
19-Jul-2017	16:52	MKentish	
17-Aug-2017	15:45	MKentish	
17-Aug-2017	15:51	MKentish	
17-Aug-2017	16:49	MKentish	
21-Aug-2017	12:26	TYLER_A	
19-Oct-2017	16:52	MKentish	
19-Oct-2017	17:05	MKentish	
20-Oct-2017	16:16	MKentish	
23-Oct-2017	13:06	MKentish	
05-May-2020	19:22	MKentish	
06-May-2020	17:45	MKentish	
07-May-2020	18:26	MKentish	
11-May-2020	17:18	MKentish	
14-May-2020	11:09	MKentish	
29-Jul-2020	17:55	MKentish	
30-Jul-2020	11:40	MKentish	
30-Jul-2020	15:51	MKentish	
30-Jul-2020	20:18	MKentish	
30-Jul-2020	22:06	MKentish	
31-Jul-2020	10:14	MKentish	
31-Jul-2020	13:16	MKentish	
03-Aug-2020	17:53	MKentish	
07-Aug-2020	14:54	MKentish	
11-Aug-2020	00:42	MKentish	
12-Aug-2020	14:42	MKentish	
29-Oct-2020	17:18	MKentish	
02-Nov-2020	17:52	MKentish	
04-Nov-2020	15:38	MKentish	
05-Nov-2020	12:45	MKentish	
10-Nov-2020	18:01	MKentish	
11-Nov-2020	12:03	MKentish	
11-Nov-2020	15:33	MKentish	
12-Nov-2020	11:57	MKentish	
16-Nov-2020	11:43	MKentish	
16-Nov-2020	13:57	MKentish	
16-Nov-2020	17:37	MKentish	
03-Dec-2020	14:30	MKentish	
04-Dec-2020	18:08	MKentish	
07-Dec-2020	09:40	MKentish	
09-Dec-2020	11:38	MKentish	
09-Dec-2020	12:08	MKentish	

Displacement Lines

Ref.	Name	x1	y1	z1	x2	y2	z2	Intervals	Surface type for tunnels	Interpolate imported displacements	Calculate
		[m]	[m]	[m]	[m]	[m]	[m]	[No.]			
1	TWS(1)_1	48.00000	60.00000	14.64700	50.00000	-40.00000	14.64700	50	Surface	Yes	Yes
2	TWS(2)_1	-33.43100	6.49300	17.09950	36.67900	6.97300	17.09950	35	Surface	Yes	Yes
3	TWS(2)_2	36.67900	6.97300	17.09950	66.57600	3.47200	17.09950	15	Surface	Yes	Yes
4	TWS(2)_3	66.57600	3.47200	17.09950	91.02100	-3.13200	17.09950	13	Surface	Yes	Yes
6	TWS(2)_4	91.02100	-3.13200	16.23650	178.22000	-39.23400	16.23650	47	Surface	Yes	Yes
4	TW Fresh Water (a) - St Pancras	-36.51019	2.76952	20.65500	48.54333	3.88213	20.65500	43	Surface	Yes	Yes
7	TW Fresh Water (b) - St Pancras	48.54333	3.88213	20.34000	91.07705	-7.29855	20.34000	22	Surface	Yes	Yes
8	TW Fresh Water (c) - St Pancras	91.07705	-7.29855	19.73000	152.69712	-30.67206	19.73000	33	Surface	Yes	Yes
9	TW Fresh Water (d) - St Pancras	152.69712	-30.67206	19.20000	184.75043	-45.75126	19.20000	18	Surface	Yes	Yes
10	Assumed FW400 connection to TW2_1	52.86515	12.18589	16.51600	55.26286	5.35252	16.51600	4	Surface	Yes	Yes

Displacement Grids

Ref.	Name	Extrusion: Direction	Base line start: X	Base line start: Y	Base line start: Z (level)	Base line end: X	Base line end: Y	Base line end: Z (level)	Base line: Intervals	Extrusion: Distance	Extrusion: Intervals	Surface type for tunnels	Calculate
			[m]	[m]	[m]	[m]	[m]	[m]	[No.]	[m]	[No.]		
1	Grid 1	Global X	-20.00000	-70.00000	21.70000	-	100.00000	21.70000	100	250.00000	250	Surface	No

Imported Displacements

Set:	Set:	Result:	Coordinates:	Coordinates:	Coordinates:	Displacements:	Displacements:	Displacements:
Ref.	Name	Ref.	x [m]	y [m]	z [m]	x [mm]	y [mm]	z [mm]
1	ID Set #	1	48.00000	60.00000	14.64700	0.00000	0.00000	0.00000
		2	48.04000	58.00000	14.64700	0.02000	-0.20000	1.00000
		3	48.08000	56.00000	14.64700	0.08000	-0.46000	1.80000
		4	48.12000	54.00000	14.64700	0.10897	-0.52581	2.40000
		5	48.16000	52.00000	14.64700	0.08000	-0.50000	2.80000
		6	48.20000	50.00000	14.64700	0.03000	-0.42418	3.15000
		7	48.24000	48.00000	14.64700	0.00100	-0.35000	3.20000
		8	48.28000	46.00000	14.64700	-0.00778	-0.22000	2.00000
		9	48.32000	44.00000	14.64700	0.00000	-0.10000	-1.02628
		10	48.36000	42.00000	14.64700	0.00000	-0.03500	-6.15463
		11	48.40000	40.00000	14.64700	0.00000	-0.01000	-9.50000
		12	48.44000	38.00000	14.64700	0.00000	0.00000	-11.90000
		13	48.48000	36.00000	14.64700	0.00000	0.00000	-13.15000
		14	48.52000	34.00000	14.64700	0.00000	0.00000	-14.24653
		15	48.56000	32.00000	14.64700	0.00000	0.00000	-15.04417
		16	48.60000	30.00000	14.64700	0.00000	0.00000	-14.75000
		17	48.64000	28.00000	14.64700	0.00000	0.00000	-13.80000
		18	48.68000	26.00000	14.64700	0.00000	0.00000	-12.00000
		19	48.72000	24.00000	14.64700	0.01000	0.02000	-10.00000



RSK ENVIRONMENT LIMITED

UBB, London

TW Sewer Assessment

FULL DEVELOPMENT LONG TERM_Smoothed

Job No.	Sheet No.	Rev.
371654		
Drg. Ref.		
Made by MK	Date 09-Dec-2020	Checked Date

Ref.	Set: Name	Result: Ref.	Coordinates: x [m]	Coordinates: y [m]	Coordinates: z [m]	Displacements: x [mm]	Displacements: y [mm]	Displacements: z [mm]
20			48.760000	22.000000	14.647000	0.025000	0.100000	-8.000000
21			48.800000	20.000000	14.647000	0.060000	0.250000	-6.100000
22			48.840000	18.000000	14.647000	0.120000	0.400000	-4.200000
23			48.880000	16.000000	14.647000	0.165000	0.525000	-1.954222
24			48.920000	14.000000	14.647000	0.177800	0.573490	0.250000
25			48.960000	12.000000	14.647000	0.165000	0.525000	1.700000
26			49.000000	10.000000	14.647000	0.120000	0.400000	2.405000
27			49.040000	8.000000	14.647000	0.060000	0.280000	2.380000
28			49.080000	6.000000	14.647000	0.025000	0.136511	2.000000
29			49.120000	4.000000	14.647000	0.010000	0.050000	1.450000
30			49.160000	2.000000	14.647000	0.000000	0.020000	0.800000
31			49.200000	0.000000	14.647000	0.000000	0.000000	0.410571
32			49.240000	-2.000000	14.647000	0.000000	0.000000	0.310466
33			49.280000	-4.000000	14.647000	0.000000	0.000000	0.305766
34			49.320000	-6.000000	14.647000	0.000000	0.000000	0.373088
35			49.360000	-8.000000	14.647000	0.000000	0.000000	0.458778
36			49.400000	-10.000000	14.647000	0.000000	0.000000	0.553322
37			49.440000	-12.000000	14.647000	0.000000	0.000000	0.650111
38			49.480000	-14.000000	14.647000	0.000000	0.000000	0.744666
39			49.520000	-16.000000	14.647000	0.000000	0.000000	0.834022
40			49.560000	-18.000000	14.647000	0.000000	0.000000	0.916366
41			49.600000	-20.000000	14.647000	0.000000	0.000000	0.990633
42			49.640000	-22.000000	14.647000	0.000000	0.000000	1.056333
43			49.680000	-24.000000	14.647000	0.000000	0.000000	1.113433
44			49.720000	-26.000000	14.647000	0.000000	0.000000	1.162066
45			49.760000	-28.000000	14.647000	0.000000	0.000000	1.202622
46			49.800000	-30.000000	14.647000	0.000000	0.000000	1.235577
47			49.840000	-32.000000	14.647000	0.000000	0.000000	1.261488
48			49.880000	-34.000000	14.647000	0.000000	0.000000	1.280911
49			49.920000	-36.000000	14.647000	0.000000	0.000000	1.294466
50			49.960000	-38.000000	14.647000	0.000000	0.000000	1.302711
51			50.000000	-40.000000	14.647000	0.000000	0.000000	1.306211
52			-33.431000	6.493000	17.099500	0.000000	0.000000	-0.887233
53			-31.427866	6.506711	17.099500	0.000000	0.000000	-0.937795
54			-29.424711	6.520043	17.099500	0.000000	0.000000	-0.989334
55			-27.421577	6.534144	17.099500	0.000000	0.000000	-1.040533
56			-25.418433	6.547886	17.099500	0.000000	0.000000	-1.090355
57			-23.415299	6.561577	17.099500	0.000000	0.000000	-1.137188
58			-21.412144	6.575729	17.099500	0.000000	0.000000	-1.178866
59			-19.409000	6.589800	17.099500	0.000000	0.000000	-1.212477
60			-17.405866	6.602711	17.099500	0.000000	0.000000	-1.238416
61			-15.402711	6.616433	17.099500	0.000000	0.000000	-1.238811
62			-13.399577	6.630144	17.099500	0.000000	0.000000	-1.219644
63			-11.396433	6.643886	17.099500	0.000000	0.000000	-1.167777
64			-9.393299	6.657577	17.099500	0.000000	0.000000	-1.071130
65			-7.390144	6.671129	17.099500	0.000000	0.000000	-0.914988
66			-5.387000	6.685000	17.099500	0.000000	0.000000	-0.600122
67			-3.383866	6.698711	17.099500	0.000000	0.000000	0.077795
68			-1.380711	6.712433	17.099500	0.000000	0.000000	0.871633
69			0.622433	6.726144	17.099500	0.096339	0.107008	1.803255
70			2.625577	6.739886	17.099500	0.164226	0.270797	3.880886
71			4.628711	6.753577	17.099500	0.159477	0.463668	4.074666
72			6.631866	6.767299	17.099500	0.081800	0.658322	5.292333
73			8.635000	6.781000	17.099500	0.009225	0.758666	6.394444
74			10.638144	6.794711	17.099500	0.009335	0.766663	7.313488
75			12.641299	6.808433	17.099500	0.009444	0.774622	7.995277
76			14.644433	6.822144	17.099500	0.009544	0.782663	8.447722
77			16.647577	6.835886	17.099500	0.009644	0.790666	8.721266
78			18.650711	6.849577	17.099500	0.009744	0.798722	8.867377
79			20.653866	6.863299	17.099500	0.009844	0.806800	8.923444
80			22.657000	6.877000	17.099500	0.009933	0.814911	8.913666
81			24.660144	6.890711	17.099500	0.010033	0.823055	8.853733
82			26.663299	6.904433	17.099500	0.010133	0.831200	8.753233
83			28.666433	6.918144	17.099500	0.010233	0.839399	8.615777
84			30.669577	6.931886	17.099500	0.010333	0.847600	8.437733
85			32.672711	6.945577	17.099500	0.010433	0.855833	8.207100
86			34.675866	6.959299	17.099500	0.010533	0.864099	7.901011
87			36.679000	6.973000	17.099500	0.010644	0.872338	7.483444
88			38.682133	6.986711	17.099500	0.010700	0.882726	6.413775
89			40.685277	6.500954	17.099500	0.009544	0.782900	5.222299
90			42.688400	6.272800	17.099500	0.008777	0.718988	3.898335
91			44.651533	6.039400	17.099500	0.006377	0.522255	2.343011
92			46.644666	5.806000	17.099500	0.003877	0.317511	0.934711
93			48.637800	5.572600	17.099500	0.001677	0.137007	-0.208555
94			50.630933	5.339200	17.099500	-0.000000	-0.000000	-0.091977
95			52.624077	5.105800	17.099500	0.000000	0.000000	-1.791400
96			54.617200	4.872400	17.099500	0.000000	0.000000	-2.307122
97			56.610333	4.639000	17.099500	0.000000	0.000000	-2.606199
98			58.603477	4.405600	17.099500	0.000000	0.000000	-2.805335
99			60.596600	4.172200	17.099500	0.007469	0.174000	-1.160900
100			62.589733	3.938800	17.099500	0.114922	0.267722	-2.285744
101			64.582877	3.705400	17.099500	0.155688	0.362688	-2.393755
102			66.576000	3.472000	17.099500	0.197116	0.459311	-2.495322
103			68.569133	2.964000	17.099500	0.217422	0.506500	-2.690588
104			70.562277	2.456000	17.099500	0.237900	0.554222	-2.870877
105			72.555400	1.948000	17.099500	0.258644	0.602533	-3.033433
106			74.548533	1.440000	17.099500	0.301466	0.702228	-3.162099
107			75.977922	0.932000	17.099500	0.404099	0.941377	-3.257866
108			77.858311	0.424000	17.099500	0.507033	1.181199	-3.353444
109			79.739599	-0.084000	17.099500	0.630083	1.472808	-3.443955
110			81.619088	-0.592000	17.099500	0.777044	1.820229	-3.539333
111			83.499466	-1.100000	17.099500	0.946779	2.226233	-3.637277
112			85.379855	-1.608000	17.099500	1.146977	2.707877	-3.733122
113			87.260233	-2.116000	17.099500	1.387011	3.288677	-3.826225
114			89.140622	-2.624000	17.099500	1.664599	3.965299	-3.925775
115			91.021000	-3.132000	17.099500	1.948199	4.666977	-4.063677
116			91.021000	-3.132000	16.236500	1.288388	3.129877	-4.363800
117			92.876300	-3.900133	16.236500	1.798883	4.115366	-4.526899
118			94.731600	-4.668226	16.236500	2.405889	5.649555	-4.315733
119			96.586900	-5.436388	16.236500	3.159566	7.635522	-4.017366
120			98.442199	-6.204511	16.236500	3.656300	8.949733	-3.994866
121			100.297499	-6.972644	16.236500	3.793911	9.343355	-4.614977
122			102.152799	-7.740777	16.236500	3.901400	9.636688	-5.217599
123			104.008099	-8.508888	16.236500	4.007334	9.879700	-5.733766
124			105.863388	-9.277022	16.236500	4.079799	10.122433	-6.135662
125			107.718688	-10.045155	16.236500	4.152011	10.335888	-6.425744
126			109.573988	-10.813288	16.236500	4.224000	10.515077	-6.510477
127			111.429288	-11.581400	16.236500	4.295755	10.693699	-6.401133
128			113.284577	-12.349533	16.236500	4.367266	10.871722	-6.155655
129			115.139877	-13.117666	16.236500	4.438544	11.049166	-5.843084



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TW Sewer Assessment

FULL DEVELOPMENT LONG TERM_Smoothed

Job No.	Sheet No.	Rev.
371654		
Drg. Ref.		
Made by MK	Date 09-Dec-2020	Checked Date

Set: Ref.	Set: Name	Result: Ref.	Coordinates: x [m]	Coordinates: y [m]	Coordinates: z [m]	Displacements: x [mm]	Displacements: y [mm]	Displacements: z [mm]
161	174.50940	-37.69774	16.23650	-1.91965	3.92734	0.21526		
162	176.36470	-38.46587	16.23650	-1.41549	2.89590	-0.11454		
163	178.22000	-39.23400	16.23650	-0.95525	1.95431	-0.33496		
164	-36.51019	2.76952	20.65500	0.00000	0.00000	-0.77489		
165	-34.53220	2.79539	20.65500	0.00000	0.00000	-0.82029		
166	-32.55421	2.82127	20.65500	0.00000	0.00000	-0.86725		
167	-30.57622	2.84714	20.65500	0.00000	0.00000	-0.91541		
168	-28.59823	2.87302	20.65500	0.00000	0.00000	-0.96426		
169	-26.62024	2.89889	20.65500	0.00000	0.00000	-1.01311		
170	-24.64226	2.92477	20.65500	0.00000	0.00000	-1.06099		
171	-22.66427	2.95064	20.65500	0.00000	0.00000	-1.10666		
172	-20.68628	2.97652	20.65500	0.00000	0.00000	-1.14846		
173	-18.70829	3.00239	20.65500	0.00000	0.00000	-1.18422		
174	-16.73030	3.02827	20.65500	0.00000	0.00000	-1.21118		
175	-14.75231	3.05414	20.65500	0.00000	0.00000	-1.22581		
176	-12.77432	3.08002	20.65500	0.00000	0.00000	-1.22368		
177	-10.79633	3.10589	20.65500	0.00000	0.00000	-1.19927		
178	-8.81834	3.13177	20.65500	0.00000	0.00000	-1.14584		
179	-6.84036	3.15764	20.65500	0.00000	0.00000	-1.05544		
180	-4.86237	3.18352	20.65500	0.00000	0.00000	-0.91905		
181	-2.88438	3.20939	20.65500	0.00000	0.00000	-0.69586		
182	-0.90639	3.23527	20.65500	0.02152	0.03228	-0.16797		
183	1.07160	3.26114	20.65500	0.09498	0.20524	0.41172		
184	3.04959	3.28701	20.65500	0.11936	0.40508	1.01035		
185	5.02758	3.31289	20.65500	0.10342	0.64559	1.61113		
186	7.00557	3.33876	20.65500	0.04624	0.89794	2.16281		
187	8.98355	3.36464	20.65500	0.01264	1.03714	2.62458		
188	10.96154	3.39051	20.65500	0.01399	1.14732	3.02434		
189	12.93953	3.41639	20.65500	0.01536	1.26004	3.34577		
190	14.91752	3.44226	20.65500	0.01677	1.37528	3.58357		
191	16.89551	3.46814	20.65500	0.01820	1.49305	3.74504		
192	18.87350	3.49401	20.65500	0.01879	1.54143	3.83037		
193	20.85149	3.51989	20.65500	0.01913	1.56906	3.86057		
194	22.82948	3.54576	20.65500	0.01947	1.59669	3.84975		
195	24.80747	3.57164	20.65500	0.01980	1.62434	3.80541		
196	26.78545	3.59751	20.65500	0.02014	1.65199	3.73185		
197	28.76344	3.62339	20.65500	0.02048	1.67966	3.63011		
198	30.74143	3.64926	20.65500	0.02082	1.70734	3.49767		
199	32.71942	3.67514	20.65500	0.02115	1.73502	3.32824		
200	34.69741	3.70101	20.65500	0.02149	1.76273	3.11171		
201	36.67540	3.72689	20.65500	0.02183	1.79044	2.83500		
202	38.65339	3.75276	20.65500	0.02217	1.81817	2.48472		
203	40.63138	3.77864	20.65500	0.02251	1.84591	2.05306		
204	42.60936	3.80451	20.65500	0.00317	4.54478	3.03759		
205	44.58735	3.83038	20.65500	0.00243	4.50967	2.32362		
206	46.56534	3.85626	20.65500	0.00123	4.43738	1.57764		
207	48.54333	3.88213	20.65500	0.00000	4.02741	0.73331		
208	48.54333	3.88213	20.34000	0.00000	4.02741	0.73331		
209	50.47668	3.37392	20.34000	0.00000	3.06247	-0.60744		
210	52.40003	2.86571	20.34000	-0.00209	2.23214	-1.70644		
211	54.34338	2.35750	20.34000	-0.05267	1.55462	-2.55555		
212	56.27674	1.84928	20.34000	-0.06284	0.87469	-3.23971		
213	58.21009	1.34107	20.34000	-0.02832	0.24795	-3.50062		
214	60.14344	0.83286	20.34000	0.00000	-0.00000	-3.16499		
215	62.07679	0.32464	20.34000	0.00000	0.00000	-3.30085		
216	64.01014	-0.18357	20.34000	0.00000	0.00000	-3.41780		
217	65.94349	-0.69178	20.34000	0.00000	0.00000	-3.52111		
218	67.87684	-1.20000	20.34000	0.00000	0.00000	-3.61403		
219	69.81019	-1.70821	20.34000	0.00000	0.00000	-3.69851		
220	71.74354	-2.21642	20.34000	0.00000	0.00000	-3.77619		
221	73.67689	-2.72463	20.34000	0.00000	0.00000	-3.84930		
222	75.61025	-3.23285	20.34000	0.01320	0.03074	-3.92117		
223	77.54360	-3.74106	20.34000	0.03375	0.07862	-3.99654		
224	79.47695	-4.24927	20.34000	0.07037	0.16649	-4.07232		
225	81.41030	-4.75749	20.34000	0.11787	0.42582	-4.14802		
226	83.34365	-5.26570	20.34000	0.30729	0.74966	-4.24449		
227	85.27700	-5.77391	20.34000	0.46968	1.15056	-4.34356		
228	87.21035	-6.28213	20.34000	0.66846	1.64206	-4.42967		
229	89.14370	-6.79034	20.34000	0.92983	2.28932	-4.47774		
230	91.07705	-7.29855	20.34000	1.28111	3.16036	-4.45615		
231	91.07705	-7.29855	19.73000	1.28111	3.16036	-4.45514		
232	92.94433	-8.00684	19.73000	1.66555	4.11638	-4.39019		
233	94.81160	-8.71513	19.73000	2.07402	5.13223	-4.32999		
234	96.67888	-9.42342	19.73000	2.68682	6.68847	-3.99263		
235	98.54615	-10.13170	19.73000	3.46394	7.66394	-3.78898		
236	100.41343	-10.83999	19.73000	2.82823	7.04049	-4.15072		
237	102.28070	-11.54828	19.73000	2.89959	7.21814	-4.46307		
238	104.14798	-12.25657	19.73000	2.97139	7.39687	-4.71368		
239	106.01525	-12.96486	19.73000	3.04363	7.57670	-4.89037		
240	107.88253	-13.67314	19.73000	3.11631	7.75763	-4.98383		
241	109.74980	-14.38143	19.73000	3.18942	7.93964	-4.99334		
242	111.61707	-15.08972	19.73000	3.26298	8.12275	-4.82964		
243	113.48435	-15.79801	19.73000	3.33697	8.30695	-4.81162		
244	115.35162	-16.50630	19.73000	3.41141	8.49224	-4.65995		
245	117.21890	-17.21459	19.73000	3.48628	8.67863	-4.49093		
246	119.08617	-17.92287	19.73000	3.56159	8.86611	-4.31180		
247	120.95345	-18.63116	19.73000	3.59999	8.96168	-4.16156		
248	122.82072	-19.33945	19.73000	3.61396	8.99648	-4.00976		
249	124.68800	-20.04774	19.73000	3.62795	9.03129	-3.80652		
250	126.55527	-20.75603	19.73000	3.64194	9.06612	-3.53610		
251	128.42255	-21.46431	19.73000	3.65594	9.10097	-3.19622		
252	130.28982	-22.17260	19.73000	3.66994	9.13583	-2.79922		
253	132.15710	-22.88089	19.73000	3.68396	9.17071	-2.36870		
254	134.02437	-23.58918	19.73000	3.69797	9.20561	-1.93343		
255	135.89165	-24.29747	19.73000	3.71200	9.24052	-1.51810		
256	137.75892	-25.00575	19.73000	3.72603	9.27545	-1.13333		
257	139.62619	-25.71404	19.73000	3.74007	9.31040	-0.77135		
258	141.49347	-26.42233	19.73000	3.75411	9.34536	-0.41240		
259	143.36074	-27.13062	19.73000	3.76817	9.38034	-0.03830		
260	145.22802	-27.83891	19.73000	3.78222	9.41534	0.35777		
261	147.09529	-28.54720	19.73000	3.79629	9.45035	0.77153		
262	148.96257	-29.25548	19.73000	3.81036	9.48539	1.19288		
263	150.82984	-29.96377	19.73000	3.82444	9.52043	1.61013		
264	152.69712	-30.67206	19.73000	3.79607	9.44980	1.95781		
265	152.69712	-30.67206	19.20000	3.79607	9.44980	1.95205		
266	154.47786	-31.50979	19.20000	3.63610	9.05160	2.06168		
267	156.25860	-32.34753	19.20000	3.47853	8.65933	2.13789		
268	158.03934	-33.18526	19.20000	3.32333	8.27299	2.18454		
269	159.82008	-34.02299	19.20000	3.17052	7.89259	2.21160		
270	161.60081	-34.86073	19.20000	2.32819	7.45540	2.19071		
271	163.38155	-35.69846	19.20000	1.00208	6.81282	1.95927		
272	165.16229	-36.53619	19.20000	-0.09490	6.02512	1.56889		
273	166.94303	-37.37393	19.20000	-0.88676	5.44208	1.20602		
274	168.72377	-38.21166	19.20000	-1.34125	4.73349	0.78083		
275	170.50451	-39.04940	19.20000	-1.47930	3.88023	0.35625		
276	172.28525	-39.88713	19.20000	-1.34101	2.91013	-0.00406		
277	174.06599	-40.72486	19.20000	-0.96582	1.97594	-0.26935		
278	175.84673	-41.56260	19.20000	-0.56123	1.14821	-0.46851		
279	177.62747	-42.40033	19.20000	-0.12072	0.24698	-0.70135		
280	179.40821	-43.23806	19.20000	0.00000	-0.0.			

Polygonal Excavations

Ref.	1
Excavation Name:	PLOT A - 17.2mAOB Basement Wall Install
Surface level [m]:	21.700
Contribution:	Positive
Surface movement curves which are selected are applied between surface and [m]:	13.450



RSK ENVIRONMENT LIMITED

UBB, London

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FULL DEVELOPMENT LONG TERM_Smoothed

Job No.	Sheet No.	Rev.
371654		
Drg. Ref.		
Made by MK	Date 09-Dec-2020	Checked Date

Corner	x	y	Base Level	Arc Enabled	Stiffened	Prev. Side: d	Prev. Side: p1	Prev. Side: p2*	Next Side: d	Next Side: p1	Next Side: p2*
	[m]	[m]	[m]			[m]	[%]	[%]	[m]	[%]	[%]
1	42.430	45.000	13.450	Yes	No	-	-	-	-	-	-
2	18.390	46.290	13.450	No	No	-	-	-	-	-	-
3	7.3100	46.290	13.450	Yes	No	-	-	-	-	-	-
4	7.9800	14.740	13.700	Yes	No	-	-	-	-	-	-
5	42.430	14.320	13.700	Yes	No	-	-	-	-	-	-

Side	x1 [m]	y1 [m]	x2 [m]	y2 [m]	G.M. Curve: Vertical			G.M. Curve: Horizontal		
1	42.430	45.000	18.390	46.290	No	vertical	ground movement	No	horizontal	ground movement
2	18.390	46.290	7.3100	46.290	No	vertical	ground movement	No	horizontal	ground movement
3	7.3100	46.290	7.9800	14.740	No	vertical	ground movement	No	horizontal	ground movement
4	7.9800	14.740	42.430	14.320	No	vertical	ground movement	No	horizontal	ground movement
5	42.430	14.320	42.430	45.000	No	vertical	ground movement	No	horizontal	ground movement

Ref.
Excavation Name: 2
Surface level [m]: PLOT A - 17.2m AOD Excavation (+ve)
Contribution: 18.000
Surface movement curves which are
selected are applied between
surface and [m]: Positive
17.200

Corner	x	y	Base Level	Arc Enabled	Stiffened	Prev. Side: d	Prev. Side: p1	Prev. Side: p2*	Next Side: d	Next Side: p1	Next Side: p2*
	[m]	[m]	[m]			[m]	[%]	[%]	[m]	[%]	[%]
1	42.430	45.000	17.200	Yes	No	-	-	-	-	-	-
2	18.390	46.290	17.200	No	No	-	-	-	-	-	-
3	7.3100	46.290	17.200	Yes	Yes	9.5000	67.000	25.000	9.5000	67.000	25.000
4	7.9800	14.740	17.200	Yes	Yes	9.5000	67.000	25.000	9.5000	67.000	25.000
5	42.430	14.320	17.200	Yes	No	-	-	-	-	-	-

Side	x1 [m]	y1 [m]	x2 [m]	y2 [m]	G.M. Curve: Vertical			G.M. Curve: Horizontal		
1	42.430	45.000	18.390	46.290	No	vertical	ground movement	No	horizontal	ground movement
2	18.390	46.290	7.3100	46.290	No	vertical	ground movement	No	horizontal	ground movement
3	7.3100	46.290	7.9800	14.740	No	vertical	ground movement	No	horizontal	ground movement
4	7.9800	14.740	42.430	14.320	No	vertical	ground movement	No	horizontal	ground movement
5	42.430	14.320	42.430	45.000	No	vertical	ground movement	No	horizontal	ground movement

Ref.
Excavation Name: 3
Surface level [m]: Proposed Contig Wall south_2
Contribution: 21.700
Surface movement curves which are
selected are applied between
surface and [m]: Positive
13.575

Corner	x	y	Base Level	Arc Enabled	Stiffened	Prev. Side: d	Prev. Side: p1	Prev. Side: p2*	Next Side: d	Next Side: p1	Next Side: p2*
	[m]	[m]	[m]			[m]	[%]	[%]	[m]	[%]	[%]
1	51.335	44.430	13.575	No	No	-	-	-	-	-	-
2	52.345	22.880	13.575	No	No	-	-	-	-	-	-
3	52.350	22.880	13.575	Yes	No	-	-	-	-	-	-
4	51.340	44.430	13.575	Yes	No	-	-	-	-	-	-

Side	x1 [m]	y1 [m]	x2 [m]	y2 [m]	G.M. Curve: Vertical			G.M. Curve: Horizontal		
1	51.335	44.430	52.345	22.880	No	vertical	ground movement	No	horizontal	ground movement
2	52.345	22.880	52.350	22.880	No	vertical	ground movement	No	horizontal	ground movement
3	52.350	22.880	51.340	44.430	No	vertical	ground movement	No	horizontal	ground movement
4	51.340	44.430	51.335	44.430	No	vertical	ground movement	No	horizontal	ground movement

Ref.
Excavation Name: 4
Surface level [m]: PLOT B NEW WALL 1
Contribution: 21.700
Surface movement curves which are
selected are applied between
surface and [m]: Positive
13.700

Corner	x	y	Base Level	Arc Enabled	Stiffened	Prev. Side: d	Prev. Side: p1	Prev. Side: p2*	Next Side: d	Next Side: p1	Next Side: p2*
	[m]	[m]	[m]			[m]	[%]	[%]	[m]	[%]	[%]
1	51.340	44.430	13.700	No	No	-	-	-	-	-	-
2	101.00	63.000	13.700	No	No	-	-	-	-	-	-
3	101.00	46.000	13.700	No	No	-	-	-	-	-	-
4	65.520	17.230	13.700	No	No	-	-	-	-	-	-
5	52.350	22.880	13.700	No	No	-	-	-	-	-	-

Side	x1 [m]	y1 [m]	x2 [m]	y2 [m]	G.M. Curve: Vertical			G.M. Curve: Horizontal		
1	51.340	44.430	101.00	63.000	No	vertical	ground movement	No	horizontal	ground movement
2	101.00	63.000	101.00	46.000	No	vertical	ground movement	No	horizontal	ground movement
3	101.00	46.000	65.520	17.230	No	vertical	ground movement	No	horizontal	ground movement
4	65.520	17.230	52.350	22.880	No	vertical	ground movement	No	horizontal	ground movement
5	52.350	22.880	51.340	44.430	No	vertical	ground movement	No	horizontal	ground movement

Ref.
Excavation Name: 5
Surface level [m]: PLOT B & C ALL EXC - 19.10m AOD (+ve)
Contribution: 21.700
Surface movement curves which are
selected are applied between
surface and [m]: Positive
19.100

Corner	x	y	Base Level	Arc Enabled	Stiffened	Prev. Side: d	Prev. Side: p1	Prev. Side: p2*	Next Side: d	Next Side: p1	Next Side: p2*
	[m]	[m]	[m]			[m]	[%]	[%]	[m]	[%]	[%]
1	51.340	44.430	19.100	No	Yes	25.000	9.5000	25.000	25.000	67.000	25.000
2	101.00	63.000	19.100	Yes	No	-	-	-	-	-	-
3	167.21	84.375	19.100	Yes	Yes	9.5000	67.000	25.000	9.5000	67.000	25.000
4	176.07	61.064	19.100	Yes	No	-	-	-	-	-	-
5	175.87	-18.327	19.100	Yes	Yes	9.5000	67.000	25.000	9.5000	67.000	25.000
6	164.92	-23.678	19.100	Yes	Yes	9.5000	67.000	25.000	9.5000	67.000	25.000
7	101.00	2.0000	19.100	No	No	-	-	-	-	-	-
8	52.350	22.880	19.100	No	No	-	-	-	-	-	-

Side	x1 [m]	y1 [m]	x2 [m]	y2 [m]	G.M. Curve: Vertical			G.M. Curve: Horizontal		
1	51.340	44.430	101.00	63.000	No	vertical	ground movement	No	horizontal	ground movement
2	101.00	63.000	167.21	84.375	No	vertical	ground movement	No	horizontal	ground movement
3	167.21	84.375	176.07	61.064	No	vertical	ground movement	No	horizontal	ground movement
4	176.07	61.064	175.87	-18.327	No	vertical	ground movement	No	horizontal	ground movement
5	175.87	-18.327	164.92	-23.678	No	vertical	ground movement	No	horizontal	ground movement
6	164.92	-23.678	101.00	2.0000	No	vertical	ground movement	No	horizontal	ground movement
7	101.00	2.0000	52.350	22.880	No	vertical	ground movement	No	horizontal	ground movement



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Job No.	Sheet No.	Rev.
371654		
Drg. Ref.		
Made by MK	Date 09-Dec-2020	Checked Date

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FULL DEVELOPMENT LONG TERM_Smoothed

Side	x1 [m]	y1 [m]	x2 [m]	y2 [m]	G.M. Curve: Vertical	G.M. Curve: Horizontal
8	52.350	22.880	51.340	44.430	No vertical ground movement	No horizontal ground movement

Ref.
Excavation Name: 6 PLOT B WALL INST - 2
Surface level [m]: 21.700
Contribution: Positive
Surface movement curves which are selected are applied between surface and [m]: 11.700

Corner	x	y	Base Level	Arc Enabled	Stiffened	Prev. Side: d	Prev. Side: p1	Prev. Side: p2*	Next Side: d	Next Side: p1	Next Side: p2*
	[m]	[m]	[m]			[m]	[%]	[%]	[m]	[%]	[%]
1	101.00	2.0000	11.700	No	No	-	-	-	-	-	-
2	101.00	46.000	11.700	No	No	-	-	-	-	-	-
3	65.520	17.230	11.700	No	No	-	-	-	-	-	-

Side	x1 [m]	y1 [m]	x2 [m]	y2 [m]	G.M. Curve: Vertical	G.M. Curve: Horizontal
1	101.00	2.0000	101.00	46.000	No vertical ground movement	No horizontal ground movement
2	101.00	46.000	65.520	17.230	No vertical ground movement	No horizontal ground movement
3	65.520	17.230	101.00	2.0000	No vertical ground movement	No horizontal ground movement

Ref.
Excavation Name: 7 PLOT B EXC - 16.3mAOD (+ve)
Surface level [m]: 19.100
Contribution: Positive
Surface movement curves which are selected are applied between surface and [m]: 16.300

Corner	x	y	Base Level	Arc Enabled	Stiffened	Prev. Side: d	Prev. Side: p1	Prev. Side: p2*	Next Side: d	Next Side: p1	Next Side: p2*
	[m]	[m]	[m]			[m]	[%]	[%]	[m]	[%]	[%]
1	101.00	2.0000	16.300	No	Yes	9.5000	67.000	25.000	9.5000	67.000	25.000
2	101.00	46.000	16.300	No	No	-	-	-	-	-	-
3	65.520	17.230	16.300	Yes	No	-	-	-	-	-	-

Side	x1 [m]	y1 [m]	x2 [m]	y2 [m]	G.M. Curve: Vertical	G.M. Curve: Horizontal
1	101.00	2.0000	101.00	46.000	No vertical ground movement	No horizontal ground movement
2	101.00	46.000	65.520	17.230	No vertical ground movement	No horizontal ground movement
3	65.520	17.230	101.00	2.0000	No vertical ground movement	No horizontal ground movement

Ref.
Excavation Name: 8 PLOT C - WALL INST
Surface level [m]: 21.700
Contribution: Positive
Surface movement curves which are selected are applied between surface and [m]: 9.2000

Corner	x	y	Base Level	Arc Enabled	Stiffened	Prev. Side: d	Prev. Side: p1	Prev. Side: p2*	Next Side: d	Next Side: p1	Next Side: p2*
	[m]	[m]	[m]			[m]	[%]	[%]	[m]	[%]	[%]
1	167.21	84.375	9.2000	Yes	No	-	-	-	-	-	-
2	101.00	63.000	9.2000	No	No	-	-	-	-	-	-
3	101.00	2.0000	9.2000	No	No	-	-	-	-	-	-
4	164.92	-23.678	9.2000	Yes	No	-	-	-	-	-	-
5	175.87	-18.327	9.2000	Yes	No	-	-	-	-	-	-
6	176.07	61.064	9.2000	Yes	No	-	-	-	-	-	-

Side	x1 [m]	y1 [m]	x2 [m]	y2 [m]	G.M. Curve: Vertical	G.M. Curve: Horizontal
1	167.21	84.375	101.00	63.000	No vertical ground movement	No horizontal ground movement
2	101.00	63.000	101.00	2.0000	No vertical ground movement	No horizontal ground movement
3	101.00	2.0000	164.92	-23.678	No vertical ground movement	No horizontal ground movement
4	164.92	-23.678	175.87	-18.327	No vertical ground movement	No horizontal ground movement
5	175.87	-18.327	176.07	61.064	No vertical ground movement	No horizontal ground movement
6	176.07	61.064	167.21	84.375	No vertical ground movement	No horizontal ground movement

Ref.
Excavation Name: 9 PLOT C - EXC (+ve)
Surface level [m]: 19.100
Contribution: Positive
Surface movement curves which are selected are applied between surface and [m]: 13.400

Corner	x	y	Base Level	Arc Enabled	Stiffened	Prev. Side: d	Prev. Side: p1	Prev. Side: p2*	Next Side: d	Next Side: p1	Next Side: p2*
	[m]	[m]	[m]			[m]	[%]	[%]	[m]	[%]	[%]
1	167.21	84.375	13.400	Yes	Yes	9.5000	67.000	25.000	9.5000	67.000	25.000
2	101.00	63.000	13.400	Yes	Yes	25.000	9.5000	25.000	25.000	67.000	25.000
3	101.00	2.0000	13.400	Yes	Yes	25.000	9.5000	25.000	25.000	67.000	25.000
4	164.92	-23.678	13.400	Yes	Yes	9.4300	67.000	25.000	9.4300	67.000	25.000
5	175.87	-18.327	13.400	Yes	Yes	9.4300	67.000	25.000	9.4300	67.000	25.000
6	176.07	61.064	13.400	Yes	No	-	-	-	-	-	-

Side	x1 [m]	y1 [m]	x2 [m]	y2 [m]	G.M. Curve: Vertical	G.M. Curve: Horizontal
1	167.21	84.375	101.00	63.000	No vertical ground movement	No horizontal ground movement
2	101.00	63.000	101.00	2.0000	No vertical ground movement	No horizontal ground movement
3	101.00	2.0000	164.92	-23.678	No vertical ground movement	No horizontal ground movement
4	164.92	-23.678	175.87	-18.327	No vertical ground movement	No horizontal ground movement
5	175.87	-18.327	176.07	61.064	No vertical ground movement	No horizontal ground movement
6	176.07	61.064	167.21	84.375	No vertical ground movement	No horizontal ground movement

Ref.
Excavation Name: 10 PLOT A - 18.00mAOD - EXC (+ve)
Surface level [m]: 21.700
Contribution: Positive
Surface movement curves which are selected are applied between surface and [m]: 18.000

Corner	x	y	Base Level	Arc Enabled	Stiffened	Prev. Side: d	Prev. Side: p1	Prev. Side: p2*	Next Side: d	Next Side: p1	Next Side: p2*
	[m]	[m]	[m]			[m]	[%]	[%]	[m]	[%]	[%]
1	7.3100	46.290	18.000	Yes	Yes	9.5000	67.000	25.000	9.5000	67.000	25.000
2	18.390	46.290	18.000	Yes	No	-	-	-	-	-	-
3	42.430	45.000	18.000	Yes	No	-	-	-	-	-	-
4	51.340	44.430	18.000	No	Yes	9.5000	67.000	25.000	9.5000	67.000	25.000
5	52.350	22.880	18.000	No	No	-	-	-	-	-	-
6	52.350	14.320	18.000	Yes	Yes	9.5000	67.000	25.000	9.5000	67.000	25.000
7	42.430	14.320	18.000	No	No	-	-	-	-	-	-
8	7.9800	14.740	18.000	Yes	Yes	9.5000	67.000	25.000	9.5000	67.000	25.000

Side	x1 [m]	y1 [m]	x2 [m]	y2 [m]	G.M. Curve: Vertical	G.M. Curve: Horizontal

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FULL DEVELOPMENT LONG TERM_Smoothed

	[m]	[m]	[m]	[m]				
1	7.3100	46.290	18.390	46.290	No vertical ground movement	No horizontal ground movement	No horizontal ground movement	
2	18.390	46.290	42.430	45.000	No vertical ground movement	No horizontal ground movement	No horizontal ground movement	
3	42.430	45.000	42.430	42.430	No vertical ground movement	No horizontal ground movement	No horizontal ground movement	
4	51.340	44.430	52.350	22.880	No vertical ground movement	No horizontal ground movement	No horizontal ground movement	
5	52.350	22.880	52.350	14.320	No vertical ground movement	No horizontal ground movement	No horizontal ground movement	
6	52.350	14.320	42.430	14.320	No vertical ground movement	No horizontal ground movement	No horizontal ground movement	
7	42.430	14.320	9.800	1.740	No vertical ground movement	No horizontal ground movement	No horizontal ground movement	
8	7.9800	14.740	7.3100	46.290	No vertical ground movement	No horizontal ground movement	No horizontal ground movement	

Ref.	11
Excavation Name:	Proposed Contig Wall South 1
Surface level [m]:	21.700
Contribution:	Positive
Surface movement curves which are selected are applied between surface and [m]:	13.575

Corner	x	y	Base Level	Arc Enabled	Stiffened	Prev. Side:	Prev. d [m]	Prev. p1 [%]	Prev. p2* [%]	Next: Side:	Next: d [m]	Next: p1 [%]	Next: p2* [%]
1	52.345	22.880	13.575	No	No	-	-	-	-	-	-	-	-
2	52.345	14.320	13.575	No	No	-	-	-	-	-	-	-	-
3	52.350	14.320	13.575	Yes	No	-	-	-	-	-	-	-	-
4	52.350	22.880	13.575	Yes	No	-	-	-	-	-	-	-	-

Side	x1 [m]	y1 [m]	x2 [m]	y2 [m]	G.M. Curve: Vertical	G.M. Curve: Horizontal
1	52.345	22.880	52.345	14.320	No vertical ground movement	No horizontal ground movement
2	52.345	14.320	52.350	14.320	No vertical ground movement	No horizontal ground movement
3	52.350	14.320	52.350	22.880	No vertical ground movement	No horizontal ground movement
4	52.350	22.880	52.345	22.880	No vertical ground movement	No horizontal ground movement

Circular Excavations

Vertical Ground Movement Curves

Curve Name: No vertical ground movement
Coordinates: [Distance from wall / wall depth or max. excavation depth (x), Depth / wall depth or max. excavation depth (y), Settlement / wall depth or max. excavation depth (z) (%)
[0.000,0.000,0.000] [1.000,0.000,0.000] [0.000,1.000,0.000] [1.000,1.000,0.000]

```
Curve Fitting Method: Polynomial
x Order: 1
y Order: 0
Polynomial: z = 0.0x + 0.0
Coeff. of Determination:
```

Horizontal Ground Movement Curves

```
Curve Name: No horizontal ground movement
Coordinates: [Distance from wall / wall depth or max. excavation depth (x), Depth / wall
depth or max. excavation depth (y), Horizontal movement / wall depth or max.
excavation depth (z) (%)
[0.000,0.000,0.000][1.000,0.000,0.000][0.000,1.000,0.000][1.000,1.000,0.000]
Curve Fitting Method: Polynomial
x Order: 0
y Order: 0
Polynomial: z = 0.0
Coeff. of Determination:
```

Utility Dimensions

Ref.	Name	Internal Diameter [mm]	Wall Thickness [mm]
1	TWS(1)_1_2134mm Dia	2134.0	200.00
2	TWS(2)_1_1219mm Dia	1219.0	200.00
3	TWS(2)_2_1219mm Dia	1219.0	200.00
4	TWS(2)_3_1219mm Dia	1219.0	200.00
5	TWS(2)_4_1093mm Dia	1093.0	200.00
6	TW Fresh Water (a) - St Pancras	100.0	5.0000
7	TW Fresh Water (b) - St Pancras	100.0	5.0000
8	TW Fresh Water (c) - St Pancras	100.0	5.0000
9	TW Fresh Water (d) - St Pancras	100.0	5.0000
10	Assumed FW400 connection to TW2 1	400.0	5.0000

Acceptance Criteria/Parameters

[illegible]

Utility Strain Calculation Options

Neglect beneficial contribution of axial strains : Yes

Utilities

Ref. Poly segs	Utility Name	Start	End	Pipe	Sub-Utility	Jointed	Dimension	Acceptance	Displacement	Displacement Line	Displacement	Line	Poly segs
					Name			Criteria/Parameters	Data Type		Polyline	Length	continuous
continuous Distance												Segment	
: Strain	Along	Along	Length										: Pullout
Line	Line												
[m]	[m]	[m]										[m]	
1	TWS(1)_1	0.0	100.02	-	1	No	TWS(1)_1_2134mm Dia	Brick	Line	TWS(1)_1	-	100.02	-
2	TWS(2)_1	0.0	70.111	-	1	No	TWS(2)_1_1219mm Dia	Brick	Line	TWS(2)_1	-	70.112	-
3	TWS(2)_2	0.0	30.101	-	1	No	TWS(2)_2_1219mm Dia	Brick	Line	TWS(2)_2	-	30.101	-
4	TWS(2)_3	0.0	25.321	-	1	No	TWS(2)_3_1219mm Dia	Brick	Line	TWS(2)_3	-	25.321	-
5	TWS(2)_4	0.0		-	1	No	TWS(2)_4_1093mm Dia	Brick	Line	TWS(2)_4	-	94.377	-



RSK ENVIRONMENT LIMITED

UBB, London

TW Sewer Assessment

FULL DEVELOPMENT LONG TERM_Smoothed

Job No.	Sheet No.	Rev.
371654		
Drg. Ref.		
Made by MK	Date 09-Dec-2020	Checked Date

Ref. Poly segs	Utility Name Start End Pipe	Sub-Utility Jointed Name	Dimension	Acceptance Criteria/Parameters	Displacement Data Type	Displacement Line	Displacement Polyline	Line Length continuous	Poly segs
continuous Distance Segment									
-	0.0 94.377 -								-
6	TW Fresh Water (a) - St Pancras	1	Yes	TW Fresh Water (a) - St Pancras	Cast Iron	Line	TW Fresh Water (a) - St Pancras	-	85.061 -
-	0.0 85.060 3.6000								-
7	TW Fresh Water (b) - St Pancras	1	Yes	TW Fresh Water (b) - St Pancras	Cast Iron	Line	TW Fresh Water (b) - St Pancras	-	43.979 -
-	0.0 43.978 3.6000								-
8	TW Fresh Water (c) - St Pancras	1	Yes	TW Fresh Water (c) - St Pancras	Cast Iron	Line	TW Fresh Water (c) - St Pancras	-	65.904 -
-	0.0 65.904 3.6000								-
9	TW Fresh Water (d) - St Pancras	1	Yes	TW Fresh Water (d) - St Pancras	Cast Iron	Line	TW Fresh Water (d) - St Pancras	-	35.423 -
-	0.0 35.423 3.6000								-
10	Assumed FW400 connection to TW2_1	1	Yes	Assumed FW400 connection to TW2_1	Ductile Iron	Line	Assumed FW400 connection to TW2_1	-	7.2418 -
-	0.0 7.2410 3.6000								-

Warnings

- Multiple excavations have been specified. Displacements resulting from each excavation are summed with no account taken of the interactions between excavations (e.g. overlapping zones of influence or 'shielding' of one excavation by another).
- Embedded Wall Excavation PE1 : PLOT A - 17.2m AOD Basement Wall Install intersects PE10 : PLOT A - 18.00mAD - EXC (+ve).
- Embedded Wall Excavation PE2 : PLOT A - 17.2m AOD Excavation (+ve) intersects PE10 : PLOT A - 18.00mAD - EXC (+ve).
- Embedded Wall Excavation PE3 : Proposed Contig Wall south_2 intersects PE4 : PLOT B NEW WALL 1, , PE5 : PLOT B & C ALL EXC - 19.10m AOD (+ve), , PE10 : PLOT A - 18.00mAD - EXC (+ve), and PE11 : Proposed Contig Wall South 1.
- Embedded Wall Excavation PE4 : PLOT B NEW WALL 1 intersects PE3 : Proposed Contig Wall south_2, , PE5 : PLOT B & C ALL EXC - 19.10m AOD (+ve), PE6 : PLOT B WALL INST - 2, , PE7 : PLOT B EXC - 16.3m AOD (+ve), , PE8 : PLOT C - WALL INST, , PE9 : PLOT C - EXC (+ve), and PE10 : PLOT A - 18.00mAD - EXC (+ve).
- Embedded Wall Excavation PE5 : PLOT B & C ALL EXC - 19.10m AOD (+ve) intersects PE3 : Proposed Contig Wall south_2, , PE4 : PLOT B NEW WALL 1, , PE5 : PLOT B & C WALL INST, , PE9 : PLOT C - EXC (+ve), and PE10 : PLOT A - 18.00mAD - EXC (+ve).
- Embedded Wall Excavation PE6 : PLOT B WALL INST - 2 intersects PE4 : PLOT B NEW WALL 1, , PE8 : PLOT C - WALL INST, and PE9 : PLOT C - EXC (+ve).
- Embedded Wall Excavation PE7 : PLOT B EXC - 16.3m AOD (+ve) intersects PE4 : PLOT B NEW WALL 1, , PE5 : PLOT B & C ALL EXC - 19.10m AOD (+ve), , PE6 : PLOT B WALL INST - 2, and PE7 : PLOT B EXC - 16.3m AOD (+ve).
- Embedded Wall Excavation PE8 : PLOT C - WALL INST intersects PE4 : PLOT B NEW WALL 1, , PE5 : PLOT B & C ALL EXC - 19.10m AOD (+ve), , PE6 : PLOT B WALL INST - 2, and PE7 : PLOT B EXC - 16.3m AOD (+ve).
- Embedded Wall Excavation PE9 : PLOT C - EXC (+ve) intersects PE4 : PLOT B NEW WALL 1, , PE5 : PLOT B & C ALL EXC - 19.10m AOD (+ve), , PE6 : PLOT B WALL INST - 2, and PE7 : PLOT B EXC - 16.3m AOD (+ve).
- Embedded Wall Excavation PE10 : PLOT A - 18.00mAD - EXC (+ve) intersects PE1 : PLOT A - 17.2m AOD Basement Wall Install, , PE2 : PLOT A - 17.2m AOD Excavation (+ve), , PE3 : Proposed Contig Wall south_2, , PE4 : PLOT B NEW WALL 1, , PE5 : PLOT B & C ALL EXC - 19.10m AOD (+ve), and PE11 : Proposed Contig Wall South 1.
- Embedded Wall Excavation PE11 : Proposed Contig Wall South 1 intersects PE3 : Proposed Contig Wall south_2, and PE10 : PLOT A - 18.00mAD - EXC (+ve).
- If an embedded wall excavation is assigned a 'sub-surface' ground movement curve then displacements induced by it can only be calculated for those points that are level with or below the embedded wall excavation's 'surface level'. Others are ignored. An example of such a combination, for which displacements will not be calculated is Excavation XP2/Side 1/Line 6/Vertical. This is an example only. There are 111 others.

Errors

None

Displacement Results - Displacement Lines

Stage: Ref.	Stage: Name	Disp. Line: Ref.	Disp. Line: Name	Chainage	x	y	z	Δx	Δy	Δz	Δs//	ΔsPerp.	Angle	
				[m]	[m]	[m]	[m]	[mm]	[mm]	[mm]	[mm]	[mm]	[°]	
0	Base Model 1		TWS(1)_1	0.0	48.00000	60.00000	14.64700	0.0	0.0	0.0	0.0	0.0	271.15	*
				2.0004	48.04000	58.00000	14.64700	0.020000	-0.20000	1.0000	0.20036	0.015997	271.15	*
				4.0008	48.08000	56.00000	14.64700	0.080000	-0.46000	1.8000	0.46151	0.070786	271.15	*
				6.0012	48.12000	54.00000	14.64700	0.10897	-0.52581	2.4000	0.52788	0.098432	271.15	*
				8.0016	48.16000	52.00000	14.64700	0.080000	-0.50000	2.8000	0.50150	0.069986	271.15	*
				10.002	48.20000	50.00000	14.64700	0.030000	-0.42418	3.1500	0.42470	0.021512	271.15	*
				12.002	48.24000	48.00000	14.64700	0.0010000	-0.35000	3.2000	0.34995	-0.005998	271.15	*
				14.003	48.28000	46.00000	14.64700	-0.0077840	-0.22000	2.0000	0.21980	-0.012182	271.15	*
				16.003	48.32000	44.00000	14.64700	0.0	-0.10000	-1.0263	0.099980	-0.0019996	271.15	*
				18.004	48.36000	42.00000	14.64700	0.0	-0.035000	-6.1546	0.034993	-699.86E-6	271.15	*
				20.004	48.40000	40.00000	14.64700	0.0	-0.010000	-9.5000	0.0099980	-199.96E-6	271.15	*
				22.004	48.44000	38.00000	14.64700	0.0	0.0	-11.900	0.0	0.0	271.15	*
				24.005	48.48000	36.00000	14.64700	0.0	0.0	-13.150	0.0	0.0	271.15	*
				26.005	48.52000	34.00000	14.64700	0.0	0.0	-14.247	0.0	0.0	271.15	*
				28.006	48.56000	32.00000	14.64700	0.0	0.0	-15.044	0.0	0.0	271.15	*
				30.006	48.60000	30.00000	14.64700	0.0	0.0	-14.750	0.0	0.0	271.15	*
				32.006	48.64000	28.00000	14.64700	0.0	0.0	-13.800	0.0	0.0	271.15	*
				34.007	48.68000	26.00000	14.64700	0.0	0.0	-12.000	0.0	0.0	271.15	*
				36.007	48.72000	24.00000	14.64700	0.010000	0.020000	-10.000	-0.019796	0.010398	271.15	*
				38.008	48.76000	22.00000	14.64700	0.025000	0.10000	-8.0000	-0.099480	0.026995	271.15	*
				40.008	48.80000	20.00000	14.64700	0.060000	0.25000	-6.1000	-0.24875	0.064987	271.15	*
				42.008	48.84000	18.00000	14.64700	0.120000	0.40000	-4.2000	-0.39752	0.12797	271.15	*
				44.009	48.88000	16.00000	14.64700	0.165000	0.52500	-1.9542	-0.52160	0.17546	271.15	*
				46.009	48.92000	14.00000	14.64700	0.17780	0.57349	0.25000	-0.56982	0.18923	271.15	*
				48.010	48.96000	12.00000	14.64700	0.165000	0.52500	1.7000	-0.52160	0.17546	271.15	*
				50.010	49.00000	10.00000	14.64700	0.120000	0.40000	2.4050	-0.39752	0.12797	271.15	*
				52.010	49.04000	8.00000	14.64700	0.060000	0.28000	2.3800	-0.27874	0.065587	271.15	*
				54.011	49.08000	6.00000	14.64700	0.025000	0.13651	2.0000	-0.13598	0.027725	271.15	*
				56.011	49.12000	4.00000	14.64700	0.010000	0.050000	1.4500	-0.049790	0.010998	271.15	*
				58.012	49.16000	2.00000	14.64700	0.0	0.020000	0.80000	-0.019996	399.92E-6	271.15	*
				60.012	49.20000	0.00000	14.64700	0.0	0.0	0.41057	0.0	0.0	271.15	*
				62.012	49.24000	-2.00000	14.64700	0.0	0.0	0.31046	0.0	0.0	271.15	*
				64.013	49.28000	-4.00000	14.64700	0.0	0.0	0.30576	0.0	0.0	271.15	*
				66.013	49.32000	-6.00000	14.64700	0.0	0.0	0.37308	0.0	0.0	271.15	*
				68.014	49.36000	-8.00000	14.64700	0.0	0.0	0.45878	0.0	0.0	271.15	*
				70.014	49.40000	-10.00000	14.64700	0.0	0.0	0.55332	0.0	0.0	271.15	*
				72.014	49.44000	-12.00000	14.64700	0.0	0.0	0.65011	0.0	0.0	271.15	*
				74.015	49.48000	-14.00000	14.64700	0.0	0.0	0.74466	0.0	0.0	271.15	*
				76.015	49.52000	-16.00000	14.64700	0.0	0.0	0.83402	0.0	0.0	271.15	*
				78.016	49.56000	-18.00000	14.64700	0.0	0.0	0.91636	0.0	0.0	271.15	*
				80.016	49.60000	-20.00000	14.64700	0.0	0.0	0.99063	0.0	0.0	271.15	*
				82.016	49.64000	-22.00000	14.64700	0.0	0.0	1.0563	0.0	0.0	271.15	*
				84.017	49.68000	-24.00000	14.64700	0.0	0.0	1.1134	0.0	0.0	271.15	*
				86.017	49.72000	-26.00000	14.64700	0.0	0.0	1.1621	0.0	0.0	271.15	*
				88.018	49.76000	-28.00000	14.64700	0.0	0.0	1.2026	0.0	0.0	271.15	*
				90.018	49.80000	-30.00000	14.64700	0.0	0.0	1.2356	0.0	0.0	271.15	*
				92.018	49.84000	-32.00000	14.64700	0.0	0.0	1.2615	0.0	0.0	271.15	*
				94.019	49.88000	-34.00000	14.64700	0.0	0.0	1.2809	0.0	0.0	271.15	*
				96.019	49.92000	-36.00000	14.64700	0.0	0.0	1.2945	0.0	0.0	271.15	*
				98.020	49.96000	-38.00000	14.64700	0.0	0.0	1.3027	0.0	0.0	271.15	*
				100.02	50.00000	-40.00000	14.64700	0.0	0.0	1.3062	0.0	0.0	271.15	*
2			TWS(2)_1	0.0	-33.43100	6.49300	17.09950	0.0	0.0	-0.88723	0.0	0.0	392.26	*
				2.0032	-31.42786	6.50671	17.09950	0.0	0.0	-0.93795	0.0	0.0	392.26	*
				4.0064	-29.42471	6.52043	17.09950	0.0	0.0	-0.98993	0.0	0.0	392.26	*
				6.0096	-27.42157	6.53414	17.09950	0.0	0.0	-1.0405	0.0	0.0	392.26	*
				8.0128	-25.41843	6.54786	17.09950	0.0	0.0	-1.0903	0.0	0.0	392.26	*
				10.016	-23.41529	6.56157	17.09950	0.0	0.0	-1.1372	0.0	0.0	392.26	*
				12.019	-21.41214	6.57529	17.09950	0.0	0.0	-1.1789	0.0	0.0	392.26	*
				14.022	-19.40900	6.58900	17.09950	0.0	0.0	-1.2125	0.0	0.0	392.26	*
				16.026	-17.40586	6.60271	17.09950	0.0	0.0	-1.2342	0.0	0.0	392.26	*
				18.029	-15.40271	6.61643	17.09950	0.0	0.0	-1.2388	0.0	0.0	392.26	*
				20.032	-13.39957	6.63014	17.09950	0.0	0.0	-1.2196	0.0	0.0	392.26	*
				22.035	-11.39643	6.64386	17.09950	0.0	0.0	-1.1677	0.0	0.0	392.26	*
				24.038	-9.39329	6.65757	17.09950	0.0	0.0	-1.0713	0.0	0.0	392.26	*
				26.041	-7.39014	6.67129	17.09950	0.0	0.0	-0.91498	0.0	0.0	392.26	*
				28.045	-5.38700	6.68500	17.09950	0.0	0.0	-0.60012	0.0	0.0	392.26	*
				30.048	-3.38386	6.69871	17.09950	0.0	0.0	0.077955	0.0	0.0	392.26	*
				32.051	-1.38071	6.71243	17.09950	0.0	0.0	0.87163	0.0	0.0	392.26	*
				34.054	0.62243	6.72614	17.09950	0.096394	0.107097	1.8033	0.097125	0.10642	392.26	*
				36.057	2.62557	6.73986	17.09950	0.16426	0.27097	2.8809	0.16611	0.26984	392.26	*
				38.061	4.62871	6.75357	17.09950	0.15947	0.46368	4.0747	0.16264	0.46258	392.26	*



RSK ENVIRONMENT LIMITED

UBB, London

TW Sewer Assessment

FULL DEVELOPMENT LONG TERM_Smoothed

											Job No.	Sheet No.	Rev.
											371654		
											Drg. Ref.		
Stage: Ref.	Stage: Name	Disp. Line: Ref.	Disp. Line: Name	Chainage	x	y	z	δx	δy	δz	δH //	δH perp.	Angle
				[m]	[m]	[m]	[m]	[mm]	[mm]	[mm]	[mm]	[mm]	[°]
				40.064	6.63186	6.76729	17.09950	0.081803	0.65832	3.2923	0.086308	0.65774	0.39226 *
				42.067	8.63500	6.78100	17.09950	0.0092490	0.75866	6.3944	0.014443	0.75858	0.39226 *
				44.070	10.63814	6.79471	17.09950	0.0093460	0.76663	7.3135	0.014594	0.76655	0.39226 *
				46.073	12.64129	6.80843	17.09950	0.0094440	0.77462	7.9953	0.014747	0.77453	0.39226 *
				48.077	14.64443	6.82214	17.09950	0.0095410	0.78263	8.4477	0.014899	0.78254	0.39226 *
				50.080	16.64757	6.83586	17.09950	0.0096390	0.79065	8.7213	0.015052	0.79058	0.39226 *
				52.083	18.65071	6.84957	17.09950	0.0097380	0.79872	8.8674	0.015206	0.79863	0.39226 *
				54.086	20.65386	6.86329	17.09950	0.0098360	0.80680	8.9234	0.015359	0.80672	0.39226 *
				56.089	22.65700	6.87700	17.09950	0.0099350	0.81491	8.9136	0.015514	0.81482	0.39226 *
				58.093	24.66014	6.89071	17.09950	0.010034	0.82305	8.8537	0.015669	0.82296	0.39226 *
				60.096	26.66329	6.90443	17.09950	0.010134	0.83120	8.7532	0.015824	0.83112	0.39226 *
				62.099	28.66643	6.91814	17.09950	0.010233	0.83939	8.6157	0.015979	0.83930	0.39226 *
				64.102	30.66957	6.93186	17.09950	0.010334	0.84760	8.4377	0.016137	0.84751	0.39226 *
				66.105	32.67271	6.94557	17.09950	0.010434	0.85583	8.2071	0.016293	0.85574	0.39226 *
				68.108	34.67586	6.95929	17.09950	0.010535	0.86409	7.9010	0.016451	0.86400	0.39226 *
				70.112	36.67900	6.97300	17.09950	0.010636	0.87238	7.4834	-0.016608	0.87229	0.39226 *
				0.0	36.67900	6.97300	17.09950	0.010636	0.87238	7.4834	-0.090900	0.86770	353.32 *
				2.0068	38.67213	6.73960	17.09950	0.010086	0.82726	6.4137	-0.086199	0.82282	353.32 *
				4.0135	40.66527	6.50620	17.09950	0.0095450	0.78290	5.2230	-0.081577	0.77869	353.32 *
				6.0203	42.65840	6.27280	17.09950	0.007650	0.71898	3.8993	-0.074917	0.71512	353.32 *
				8.0270	44.65153	6.03940	17.09950	0.0063670	0.52225	2.4340	-0.054417	0.51944	353.32 *
				10.034	46.64467	5.80600	17.09950	0.0038710	0.31751	0.93471	-0.033084	0.31580	353.32 *
				12.041	48.63780	5.57260	17.09950	0.0016710	0.13707	-0.20855	-0.014282	0.13633	353.32 *
				14.047	50.63093	5.33920	17.09950	-5.5168E-12	-452.13E-12	-1.0920	47.107E-12	-449.70E-12	353.32 *
				16.054	52.62407	5.10580	17.09950	0.0	0.0	-1.7914	0.0	0.0	353.32 *
				18.061	54.61720	4.87240	17.09950	0.0	0.0	-2.3071	0.0	0.0	353.32 *
				20.068	56.61033	4.63900	17.09950	0.0	0.0	-2.6062	0.0	0.0	353.32 *
				22.074	58.60347	4.40560	17.09950	0.0	0.0	-2.8053	0.0	0.0	353.32 *
				24.081	60.59660	4.17220	17.09950	0.074691	0.17400	-2.1609	0.053947	0.18151	353.32 *
				26.088	62.58973	3.93880	17.09950	0.11492	0.26772	-2.2467	0.030003	0.27927	353.32 *
				28.095	64.58287	3.70540	17.09950	0.15568	0.36268	-2.3937	0.112441	0.37832	353.32 *
				30.101	66.57600	3.47200	17.09950	0.19716	0.45931	-2.4953	0.14240	0.47912	353.32 *
				0.0	66.57600	3.47200	17.09950	0.19716	0.45931	-2.4953	0.070546	0.49483	344.88 *
				1.9478	68.45638	2.96400	17.09950	0.21742	0.50650	-2.6906	0.077794	0.54567	344.88 *
				3.8956	70.33677	2.45600	17.09950	0.23790	0.55422	-2.8709	0.085127	0.59709	344.88 *
				5.8434	72.22115	1.94800	17.09950	0.25864	0.60253	-3.0334	0.092545	0.64943	344.88 *
				7.7912	74.09754	1.44000	17.09950	0.30146	0.70228	-3.1621	0.107886	0.75660	344.88 *
				9.7390	75.97792	0.93200	17.09950	0.40409	0.94137	-3.2579	0.14459	1.0142	344.88 *
				11.687	77.85831	0.42400	17.09950	0.50703	1.1812	-3.3534	0.18142	1.2725	344.88 *
				13.635	79.73869	-0.08400	17.09950	0.62093	1.4729	-3.4444	0.22486	1.5864	344.88 *
				15.582	81.61908	-0.59200	17.09950	0.77704	1.8203	-3.5393	0.27540	1.9599	344.88 *
				17.530	83.49946	-1.10000	17.09950	0.94679	2.2262	-3.6373	0.33340	2.3961	344.88 *
				19.478	85.37985	-1.60800	17.09950	1.1470	2.7079	-3.7331	0.40104	2.9133	344.88 *
				21.426	87.26023	-2.11600	17.09950	1.3870	3.2887	-3.8262	0.48129	3.5366	344.88 *
				23.374	89.14062	-2.62400	17.09950	1.6646	3.9653	-3.9266	0.57280	4.2622	344.88 *
				25.321	91.02100	-3.13200	17.09950	1.9482	4.6570	-4.0637	0.66559	5.0416	344.88 *
				0.0	91.02100	-3.13200	16.23650	1.2884	3.1299	-4.3638	-0.0068741	3.3847	337.51 *
				2.0080	92.87630	-3.90013	16.23650	1.7988	4.1154	-4.5269	0.087766	4.4905	337.51 *
				4.0160	94.73160	-4.66826	16.23650	2.4059	5.6496	-4.3157	0.061780	6.1402	337.51 *
				6.0241	96.58689	-5.43638	16.23650	3.1596	7.6355	-4.0177	0.0015531	8.1377	337.51 *
				8.0321	98.44219	-6.20451	16.23650	3.6563	8.9497	-3.9949	-0.045324	9.6677	337.51 *
				10.040	100.29749	-6.97264	16.23650	3.7939	9.3434	-4.6150	-0.068753	10.084	337.51 *
				12.048	102.15279	-7.74077	16.23650	3.9014	9.6367	-5.2176	-0.081645	10.396	337.51 *
				14.056	104.00809	-8.50889	16.23650	4.0073	9.8797	-5.7338	-0.076727	10.661	337.51 *
				16.064	105.86338	-9.27702	16.23650	4.0708	10.0935	-6.1359	-0.102637	10.913	337.51 *
				18.072	107.71868	-10.04515	16.23650	4.1520	10.336	-6.4257	-0.11756	11.138	337.51 *
				20.080	109.57398	-10.81328	16.23650	4.2240	10.515	-6.5105	-0.11959	11.331	337.51 *
				22.088	111.42928	-11.58140	16.23650	4.2957	10.694	-6.4011	-0.12163	11.524	337.51 *
				24.096	113.28457	-12.34953	16.23650	4.3673	10.872	-6.1557	-0.12365	11.715	337.51 *
				26.104	115.13987	-13.11766	16.23650	4.4395	11.050	-5.8431	-0.12567	11.907	337.51 *
				28.112	116.99517	-13.88579	16.23650	4.5096	11.226	-5.5209	-0.12768	12.097	337.51 *
				30.120	118.85047	-14.65391	16.23650	4.5804	11.402	-5.2267	-0.12968	12.287	337.51 *
				32.128	120.70577	-15.42204	16.23650	4.6510	11.578	-4.9709	-0.13168	12.477	337.51 *
				34.136	122.56167	-16.19017	16.23650	4.6516	11.580	-4.8331	-0.13170	12.478	337.51 *
				36.144	124.41636	-16.95830	16.23650	4.6527	11.582	-4.6548	-0.13145	12.457	337.51 *
				38.152	126.27166	-17.72643	16.23650	4.6537	11.540	-4.3521	-0.13125	12.436	337.51 *
				40.160	128.12696	-18.49455	16.23650	4.6278	11.520	-3.8956	-0.13103	12.414	337.51 *
				42.168	129.98226	-19.26268	16.23650	4.6199	11.501	-3.3033	-0.13080	12.393	337.51 *
				44.176	131.83755	-20.03081	16.23650	4.6119	11.481	-2.6225	-0.13058	12.372	337.51 *
				46.184	133.69285	-20.79894	16.23650	4.6040	11.462	-1.9481	-0.13035	12.351	337.51 *
				48.193	135.54815	-21.56706	16.23650	4.5961	11.441	-1.2649	-0.13013	12.329	337.51 *
				50.201	137.40345	-22.33519	16.23650	4.5881	11.422	-0.71186	-0.12990	12.308	337.51 *
				52.209	139.25874	-23.10332	16.23650	4.5802	11.402	-0.26028	-0.12968	12.287	337.51 *
				54.217	141.11404	-23.87145	16.23650	4.5723	11.382	0.14166	-0.12946	12.265	337.51 *
				56.225	142.96933	-24.63957	16.23650	4.5644	11.362	0.56648	-0.12924	12.243	337.51 *
				58.233	144.82464	-25.40770	16.23650	4.5565	11.343	1.0260	-0.12901	12.223	337.51 *
				60.241	146.67994	-26.17583	16.23650	4.5486	11.323	1.5319	-0.12878	12.202	337.51 *
				62.249	148.53523	-26.94396	16.23650	4.5406	11.303	2.0533	-0.12856	12.181	337.51 *
				64.257	150.39053	-27.71209	16.23650	4.5327	11.284	2.5676	-0.12834	12.159	337.51 *
				66.265	152.24583	-28.48021	16.23650	4.5248	11.264	3.0559	-0.12811	12.138	337.51 *
				68.273	154.10113	-29.24834	16.23650	4.5169	11.244	3.5454	-0.12789	12.117	337.51 *
				70.281	155.95643	-30.01647	16.23650	4.2633	10.613	3.5174	-0.12071	11.437	337.51 *
				72.289	157.81172	-30.78460	16.23650	4.1140	10.241	3.6206	-0.11648	11.036	337.51 *
				74.297	159.66702	-31.55272	16.23650	3.9651	9.8706	3.6622	-0.11226	10.637	337.51 *



RSK ENVIRONMENT LIMITED

UBB, London

TW Sewer Assessment

FULL DEVELOPMENT LONG TERM_Smoothed

Job No.	Sheet No.	Rev.
371654		
Drg. Ref.		
Made by MK	Date 09-Dec-2020	Checked Date

Stage Ref.	Stage Name	Disp. Line Ref.	Disp. Line Name	Chainage	x	y	z	δx	δy	δz	δH//	δHperp.	Angle
				[m]	[m]	[m]	[m]	[mm]	[mm]	[mm]	[mm]	[mm]	[°]
				5.9971	54.34338	2.35750	20.34000	-0.052675	0.5546	-2.5556	-0.44618	1.4902	345.27 *
				7.9961	56.27674	1.84928	20.34000	-0.062832	0.87469	-3.2397	-0.28314	0.82998	345.27 *
				9.9952	58.21009	1.34107	20.34000	-0.028322	0.24795	-3.5006	-0.090428	0.23260	345.27 *
				11.994	60.14344	0.83286	20.34000	76.752E-12	-671.77E-12	-3.1650	245.01E-12	-630.18E-12	345.27 *
				13.993	62.07679	0.32464	20.34000	0.0	0.0	-3.3009	0.0	0.0	345.27 *
				15.992	64.01014	-0.18357	20.34000	0.0	0.0	-3.4178	0.0	0.0	345.27 *
				17.991	65.94349	-0.69178	20.34000	0.0	0.0	-3.5211	0.0	0.0	345.27 *
				19.990	67.87684	-1.20000	20.34000	0.0	0.0	-3.6140	0.0	0.0	345.27 *
				21.989	69.81019	-1.70821	20.34000	0.0	0.0	-3.6985	0.0	0.0	345.27 *
				23.988	71.74354	-2.21642	20.34000	0.0	0.0	-3.7762	0.0	0.0	345.27 *
				25.987	73.67689	-2.72463	20.34000	0.0	0.0	-3.8493	0.0	0.0	345.27 *
				27.986	75.61025	-3.23285	20.34000	0.013196	0.030742	-3.9212	0.0049469	0.033087	345.27 *
				29.985	77.54360	-3.74106	20.34000	0.033747	0.078617	-3.9965	0.012651	0.084613	345.27 *
				31.985	79.47695	-4.24927	20.34000	0.070367	0.16649	-4.0723	0.025729	0.17891	345.27 *
				33.984	81.41030	-4.75749	20.34000	0.17587	0.42582	-4.1480	0.061834	0.45654	345.27 *
				35.983	83.34365	-5.26570	20.34000	0.30729	0.74866	-4.2445	0.10661	0.80315	345.27 *
				37.982	85.27700	-5.77391	20.34000	0.46968	1.1506	-4.3436	0.16174	1.2322	345.27 *
				39.981	87.21035	-6.28213	20.34000	0.66846	1.6421	-4.4297	0.22904	1.7581	345.27 *
				41.980	89.14370	-6.79034	20.34000	0.92983	2.2893	-4.4777	0.31727	2.4505	345.27 *
				43.979	91.07705	-7.29855	20.34000	1.2811	3.1604	-4.4561	0.43556	3.3822	345.27 *
				0.0	91.07705	-7.29855	19.73000	1.2811	3.1604	-4.4551	0.43556	3.3822	345.27 *
8			TW Fresh Water (c) - St Pancras	1.9971	92.94433	-8.00684	19.73000	1.6555	4.1164	-4.3902	0.097368	4.4395	339.23 *
				3.9942	94.81160	-8.71513	19.73000	2.0740	5.1322	-4.3300	0.11901	5.5342	339.23 *
				5.9913	96.67888	-9.42342	19.73000	2.6868	6.6885	-3.3926	0.14003	7.2066	339.23 *
				7.9884	98.54615	-10.13170	19.73000	2.7573	6.6639	-3.7693	0.14371	7.3357	339.23 *
				9.9855	100.41343	-10.83999	19.73000	2.8282	7.0480	-4.1500	0.14740	7.5859	339.23 *
				11.983	102.28070	-11.54828	19.73000	2.8996	7.2181	-4.4631	0.15112	7.7773	339.23 *
				13.980	104.14798	-12.25657	19.73000	2.9714	7.3969	-4.7137	0.15486	7.9699	339.23 *
				15.977	106.01525	-12.96486	19.73000	3.0436	7.5767	-4.8904	0.15863	8.1636	339.23 *
				17.974	107.88253	-13.67314	19.73000	3.1163	7.7576	-4.9838	0.16242	8.3586	339.23 *
				19.971	109.74980	-14.38143	19.73000	3.1894	7.9396	-4.9933	0.16620	8.5447	339.23 *
				21.968	111.61707	-15.08972	19.73000	3.2630	8.1227	-4.9296	0.17006	8.7520	339.23 *
				23.965	113.48435	-15.79801	19.73000	3.3370	8.3070	-4.8116	0.17392	8.9505	339.23 *
				25.962	115.35162	-16.50630	19.73000	3.4114	8.4922	-4.6599	0.17780	9.1501	339.23 *
				27.959	117.21890	-17.21459	19.73000	3.4863	8.6786	-4.4909	0.18170	9.3509	339.23 *
				29.956	119.08617	-17.92287	19.73000	3.5616	8.8661	-4.3118	0.18563	9.5529	339.23 *
				31.954	120.95345	-18.63116	19.73000	3.6000	8.9617	-4.1616	0.18763	9.6559	339.23 *
				33.951	122.82072	-19.33945	19.73000	3.6140	8.9965	-4.0098	0.18836	9.6934	339.23 *
				35.948	124.68800	-20.04774	19.73000	3.6279	9.0313	-3.8065	0.18908	9.7309	339.23 *
				37.945	126.55527	-20.75603	19.73000	3.6419	9.0661	-3.5361	0.18981	9.7684	339.23 *
				39.942	128.42255	-21.46431	19.73000	3.6559	9.1010	-3.1962	0.19054	9.8060	339.23 *
				41.939	130.28982	-22.17260	19.73000	3.6699	9.1358	-2.7992	0.19127	9.8435	339.23 *
				43.936	132.15710	-22.88089	19.73000	3.6840	9.1707	-2.3687	0.19200	9.8811	339.23 *
				45.933	134.02437	-23.58918	19.73000	3.6980	9.2056	-1.9334	0.19273	9.9187	339.23 *
				47.930	135.89165	-24.29747	19.73000	3.7120	9.2405	-1.5181	0.19346	9.9563	339.23 *
				49.927	137.75892	-25.00575	19.73000	3.7260	9.2755	-1.1333	0.19420	9.9940	339.23 *
				51.924	139.62619	-25.71404	19.73000	3.7401	9.3104	-0.77135	0.19493	10.032	339.23 *
				53.922	141.49347	-26.42233	19.73000	3.7541	9.3454	-0.41240	0.19566	10.069	339.23 *
				55.919	143.36074	-27.13062	19.73000	3.7682	9.3803	-0.038305	0.19639	10.107	339.23 *
				57.916	145.22802	-27.83891	19.73000	3.7822	9.4153	0.35777	0.19712	10.145	339.23 *
				59.913	147.09529	-28.54720	19.73000	3.7963	9.4504	0.77153	0.19786	10.182	339.23 *
				61.910	148.96257	-29.25548	19.73000	3.8104	9.4854	1.1929	0.19859	10.220	339.23 *
				63.907	150.82984	-29.96377	19.73000	3.8244	9.5204	1.6101	0.19932	10.258	339.23 *
				65.904	152.69712	-30.67206	19.73000	3.7961	9.4498	1.9578	0.19785	10.182	339.23 *
				0.0	152.69712	-30.67206	19.73000	3.7961	9.4498	1.9521	-0.58772	10.167	334.81 *
				1.9680	154.47786	-31.50979	19.20000	3.6361	9.0516	2.0617	-0.56296	9.7384	334.81 *
				3.9359	156.25860	-32.34753	19.20000	3.4785	8.6593	2.1379	-0.53856	9.3163	334.81 *
				5.9039	158.03934	-33.18526	19.20000	3.3233	8.2730	2.1845	-0.51453	8.9007	334.81 *
				7.8718	159.82008	-34.02299	19.20000	3.1705	7.8926	2.2116	-0.49087	8.4914	334.81 *
				9.8398	161.60084	-34.86073	19.20000	2.3282	7.4554	2.1907	-1.0670	7.7373	334.81 *
				11.808	163.38155	-35.69846	19.20000	1.0021	6.8128	1.9593	-1.9934	6.5913	334.81 *
				13.776	165.16229	-36.53619	19.20000	-0.094898	6.0251	1.5689	-2.6507	5.4116	334.81 *
				15.744	166.94303	-37.37393	19.20000	-0.88676	5.4421	1.2060	-3.1190	4.5469	334.81 *
				17.712	168.72377	-38.21166	19.20000	-1.3413	4.7335	0.78083	-3.2286	3.7122	334.81 *
				19.680	170.50451	-39.04940	19.20000	-1.4793	3.8802	0.35625	-2.9903	2.8814	334.81 *
				21.647	172.28525	-39.88713	19.20000	-1.3410	2.9101	-0.0040606	-2.4522	2.0624	334.81 *
				23.615	174.06599	-40.72486	19.20000	-0.96582	1.9759	-0.26935	-1.7151	1.3768	334.81 *
				25.583	175.84673	-41.56260	19.20000	-0.56123	1.1482	-0.46851	-0.99662	0.8007	334.81 *
				27.551	177.62747	-42.40033	19.20000	-0.12072	0.24698	-0.70135	-0.21437	0.17209	334.81 *
				29.519	179.40821	-43.23806	19.20000	3.8773E-9	-7.9235E-9	-0.89107	6.8814E-9	-5.5192E-9	334.81 *
				31.487	181.18895	-44.07580	19.20000	0.0	0.0	-0.94394	0.0	0.0	334.81 *
				33.455	182.96969	-44.91353	19.20000	0.0	0.0	-0.80065	0.0	0.0	334.81 *
				35.423	184.75043	-45.75126	19.20000	0.0	0.0	-0.67333	0.0	0.0	334.81 *
				0.0	52.86515	12.18589	16.51600	0.16949	0.42492	12.801	-0.34484	0.30062	289.34 *
				1.8105	53.46458	10.47755	16.51600	0.073504	0.18316	3.5993	-0.14849	0.13000	289.34 *
				3.6209	54.06400	8.76921	16.51600	0.0	0.0	0.79494	0.0	0.0	289.34 *
				5.4314	54.66343	7.06086	16.51600	0.0	0.0	-0.92578	0.0	0.0	289.34 *
				7.2418	55.26286	5.35252	16.51600	0.0	0.0	-2.1560	0.0	0.0	289.34 *

* Result includes imported displacement(s).

Displacement Results - Displacement Grids

Stage Ref.	Stage Name	Disp. Grid Ref.	Disp. Grid Name	x	y	z	δx	δy	δz
				[m]	[m]	[m]	[mm]	[mm]	[mm]

Specific Utility Damage Results - Coordinates & Displacements

Stage Ref.	Stage Name	Specific Utility Ref.	Specific Utility Name	Sub-utility Name	Iteration	Distance	x	y	z	δx (n)	δy (n)	δz (n)	δH/(n)	δHperp. (n)	δx (n-Lp)	δy (n-Lp)
						from start of utility	[m]	[m]	[m]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
0	Base Model	1	TWS(1)_1	1	Unjointed											
		2	TWS(2)_1	1	Unjointed											
		3	TWS(2)_2	1	Unjointed											
		4	TWS(2)_3	1	Unjointed											
		5	TWS(2)_4	1	Unjointed											
		6	TW Fresh Water (a) - St Pancras	1	Unjointed											
0.00000	-0.78306	0.00000	0.00000	0.00000	0.00000	-0.95546	0.00000	3.95632	-32.55421	2.82127	20.65500	0.00000	0.00000	-0.86725	0.00000	0.00000
0.00000	-0.87592	0.00000	0.00000	0.00000	0.00000	-1.05237	0.00000	7.91263	-28.59823	2.87302	20.65500	0.00000	0.00000	-0.96426	0.00000	0.00000
0.00000	-0.97306	0.00000	0.00000	0.00000	0.00000	-1.14093	0.00000	11.86895	-24.64226	2.92477	20.65500	0.00000	0.00000	-1.06099	0.00000	0.00000
0.00000	-1.06922	0.00000	0.00000	0.00000	0.00000	-1.20632	0.00000	15.82526	-20.68628	2.97652	20.65500	0.00000	0.00000	-1.14846	0.00000	0.00000
0.00000	-1.15490	0.00000	0.00000	0.00000	0.00000	-1.22407	0.00000	19.78158	-16.73030	3.02827	20.65500	0.00000	0.00000	-1.21118	0.00000	0.00000
0.00000	-1.21381	0.00000	0.00000	0.00000	0.00000	-1.15547	0.00000	23.73790	-12.77432	3.08002	20.65500	0.00000	0.00000	-1.22368	0.00000	0.00000
0.00000	-1.21929	0.00000	0.00000	0.00000	0.00000	-0.94361	0.00000	27.69421	-8.81834	3.13177	20.65500	0.00000	0.00000	-1.14584	0.00000	0.00000
0.00000	-1.12956	0.00000	0.00000	0.01765	0.02647	-0.26305	0.01799	31.65053	-4.86237	3.18352	20.65500	0.00000	0.00000	-0.91905	0.00000	0.00000
0.00000	-0.87885	0.00000	0.00000	0.011497	0.36908	0.90252	0.11979	35.60684	-0.90639	3.23527	20.65500	0.02152	0.03228	-0.16797	0.02194	0.03200
0.06344	-0.06355	0.03558	0.06298	0.05654	0.85248	2.06344	0.06769	39.56316	3.04959	3.28701	20.65500	0.11936	0.40508	1.01035	0.12465	0.40348
0.44840	1.11857	0.12235	0.44684	0.01375	1.12748	2.95233	0.02849	43.51948	7.00557	3.33876	20.65500	0.04624	0.89793	2.16281	0.05799	0.89725
0.92301	2.24599	0.05226	0.92240	0.01651	1.35452	3.54074	0.03423	47.47579	10.96154	3.39051	20.65500	0.01399	1.14732	3.02434	0.02899	1.14704
1.16763	3.08224	0.02951	1.16734	0.01869	1.53271	3.81500	0.03873	51.43211	14.91752	3.44226	20.65500	0.01677	1.37528	3.58357	0.03475	1.37494
1.39649	3.61266	0.03529	1.39615	0.01941	1.59171	3.85170	0.04022	55.38843	18.87350	3.49401	20.65500	0.01879	1.54143	3.83037	0.03895	1.54105
1.54641	3.83580	0.03908	1.54603	0.02008	1.64701	3.74510	0.04162	59.34474	22.82948	3.54576	20.65500	0.01947	1.59669	3.84975	0.04035	1.59630
1.60167	3.84177	0.04048	1.60128	0.02075	1.70235	3.52153	0.04302	63.30106	26.78545	3.59751	20.65500	0.02014	1.65199	3.73185	0.04175	1.65159
1.65697	3.71352	0.04187	1.65657	0.02143	1.75774	3.15071	0.04442	67.25737	30.74143	3.64926	20.65500	0.02081	1.70734	3.49767	0.04315	1.70692
1.71232	3.46715	0.04327	1.71190	0.02211	1.81317	2.54781	0.04582	71.21369	34.69741	3.70101	20.65500	0.02149	1.76273	3.11171	0.04454	1.76229



RSK ENVIRONMENT LIMITED

UBB, London

TW Sewer Assessment

FULL DEVELOPMENT LONG TERM_Smoothed

Job No.	Sheet No.	Rev.
371654		
Drg. Ref.		
Made by MK	Date 09-Dec-2020	Checked Date

										US-DEC-2020							
Stage: Δx (n-Lp) Ref.	Stage: Name Δy // (n-Lp) Ref.	Specific Utility: Name Δx (n-Lp) Ref.	Specific Utility: Name Δy (n-Lp)	Sub-utility Iteration Δx (n-Lp)	Sub-utility Iteration Δy // (n-Lp) Name	Distance x	y	z	Δx (n)	Δy (n)	Δz (n)	Δy // (n)	Δx (n-Lp)	Δy (n-Lp)			
1.76772	3.06187	0.04467	1.76728	0.00666	4.05864	2.86025	0.05974	1.81772	38.65339	3.75276	20.65500	0.02217	1.81817	2.48472	0.04595	1.81772	0.02155
1.82316	2.40697	0.04607	1.82272	0.00145	4.45040	1.71201	0.05966	4.54435	3.80451	20.65500	0.00317	4.54478	3.03759	0.06262	4.54435	0.02223	
0.00000	-0.82875	0.00000	0.00000	0.00000	0.00000	-1.00431	0.00000	5.93447	-30.57622	2.84714	20.65500	0.00000	0.00000	-0.91541	0.00000	0.00000	
0.00000	-0.92421	0.00000	0.00000	0.00000	0.00000	-1.09844	0.00000	9.89079	-26.62024	2.89889	20.65500	0.00000	0.00000	-1.01311	0.00000	0.00000	
0.00000	-1.02173	0.00000	0.00000	0.00000	0.00000	-1.17778	0.00000	13.84711	-22.66427	2.95064	20.65500	0.00000	0.00000	-1.10666	0.00000	0.00000	
0.00000	-1.11419	0.00000	0.00000	0.00000	0.00000	-1.22318	0.00000	17.80342	-18.70829	3.00239	20.65500	0.00000	0.00000	-1.18422	0.00000	0.00000	
0.00000	-1.18907	0.00000	0.00000	0.00000	0.00000	-1.20367	0.00000	21.75974	-14.75231	3.05414	20.65500	0.00000	0.00000	-1.22581	0.00000	0.00000	
0.00000	-1.22543	0.00000	0.00000	0.00000	0.00000	-1.07172	0.00000	25.71605	-10.79633	3.10589	20.65500	0.00000	0.00000	-1.19927	0.00000	0.00000	
0.00000	-1.18965	0.00000	0.00000	0.00000	0.00000	-0.73606	0.00000	29.67237	-6.84036	3.15764	20.65500	0.00000	0.00000	-1.05544	0.00000	0.00000	
0.00000	-1.03087	0.00000	0.00000	0.08175	0.17408	0.30730	0.08402	33.62869	-2.88438	3.20939	20.65500	0.00000	0.00000	-0.69586	0.00000	0.00000	
0.00581	-0.60078	0.00395	0.00576	0.10630	0.60227	1.50292	0.11416	37.58500	1.07160	3.26114	20.65500	0.09498	0.20524	0.41172	0.09765	0.20398	0.00388
0.24123	0.51955	0.10252	0.23991	0.01870	1.01206	2.54140	0.03193	41.54132	5.02758	3.31289	20.65500	0.10342	0.64559	1.61113	0.11186	0.64419	0.09937
0.69105	1.71051	0.10216	0.68977	0.01511	1.23974	3.28787	0.03133	45.49764	8.98355	3.36464	20.65500	0.01264	1.03714	2.62458	0.02621	1.03688	0.09312
1.05698	2.69658	0.02671	1.05673	0.01794	1.47183	3.71595	0.03719	49.45395	12.93953	3.41639	20.65500	0.01536	1.26004	3.34577	0.03184	1.25973	0.01289
1.28080	3.38861	0.03237	1.28048	0.01907	1.56408	3.85513	0.03953	53.41027	16.89551	3.46814	20.65500	0.01820	1.49305	3.74504	0.03773	1.49268	0.01562
1.50176	3.76041	0.03795	1.50139	0.01974	1.61936	3.81340	0.04092	57.36658	20.85149	3.51989	20.65500	0.01913	1.56906	3.86057	0.03965	1.56867	0.01831
1.57403	3.85862	0.03978	1.57365	0.02042	1.67467	3.64843	0.04232	61.32290	24.80747	3.57164	20.65500	0.01980	1.62434	3.80541	0.04105	1.62394	0.01919
1.62932	3.79216	0.04117	1.62892	0.02109	1.73004	3.35876	0.04372	65.27922	28.76344	3.62339	20.65500	0.02048	1.67966	3.63011	0.04245	1.67925	0.01986
1.68464	3.60625	0.04257	1.68423	0.02177	1.78545	2.88484	0.04512	69.23553	32.71942	3.67514	20.65500	0.02115	1.73502	3.32824	0.04385	1.73460	0.02054
1.74001	3.28924	0.04397	1.73959	0.02244	1.84091	2.13081	0.04652	73.19185	36.67540	3.72689	20.65500	0.02183	1.79044	2.83500	0.04525	1.79000	0.02121
1.79543	2.77190	0.04537	1.79499	0.00256	4.51599	2.45222	0.06163	77.14816	40.63138	3.77864	20.65500	0.02251	1.84591	2.05306	0.04665	1.84545	0.02189
2.33204	2.23040	0.04952	2.33159	0.00022	4.10126	0.88539	0.05387	81.10448	44.58735	3.83038	20.65500	0.00243	4.50966	2.32362	0.06142	4.50925	0.01902
3.83526	0.46633	-0.97504	3.70925	-0.06081	1.01009	-3.10347	-0.31561	85.27922	52.41003	2.86571	20.34000	-0.00209	2.23214	-1.70644	-0.56950	2.15827	0.00000
2.09723	-1.87552	-0.54494	2.02523	-0.00564	0.04937	-3.23182	-0.01801	89.23553	56.27674	1.84928	20.34000	-0.06284	0.87469	-3.23971	-0.28314	0.82998	-0.01217
7.4989	-3.29166	-0.24477	0.71103	0.00000	0.00000	-3.39451	0.00000	93.19941	60.14344	0.83286	20.34000	0.00000	-0.00000	-3.16499	0.00000	-0.00000	-0.05596
0.00000	-3.19204	0.00000	-0.00000	0.00000	0.00000	-3.59553	0.00000	97.15922	64.01014	-0.18357	20.34000	0.00000	0.00000	-3.41780	0.00000	0.00000	0.00000
0.00000	-3.43837	0.00000	0.00000	0.00000	0.00000	-3.76072	0.00000	101.19903	67.87684	-1.20000	20.34000	0.00000	0.00000	-3.61403	0.00000	0.00000	0.00000
0.00000	-3.63085	0.00000	0.00000	0.01057	0.02462	-3.90686	0.00396	105.23983	71.74354	-2.21642	20.34000	0.00000	0.00000	-3.77619	0.00000	0.00000	0.00000
0.00000	-3.79075	0.00000	0.00000	0.06307	0.14899	-4.05723	0.02312	109.27964	75.61025	-3.23285	20.34000	0.01320	0.03074	-3.92117	0.00495	0.03309	0.00000
0.04028	-3.93618	0.00648	0.04335	0.28112	0.68518	-4.22528	0.09769	113.31985	79.47695	-4.24927	20.34000	0.07037	0.16649	-4.07232	0.02573	0.17891	0.01729
0.21813	-0.08740	0.03292	0.23419	0.62888	1.54419	-4.41252	0.21564	117.35983	83.34365	-5.26570	20.34000	0.30729	0.74966	-4.24449	0.10661	0.80315	0.09138
0.82949	-4.26422	0.11759	0.88858	1.21116	2.98691	-4.46045	0.41200	121.80315	87.21035	-6.28213	20.34000	0.66846	1.64206	-4.42967	0.22904	1.75805	0.33963
2.89712	-0.82628	-0.73694	2.80183	-0.03519	0.37275	-3.44867	-0.12880	125.99709	54.34338	2.35750	20.34000	-0.05267	1.55462	-2.55555	-0.44618	1.49015	-0.00042
1.41923	-2.69178	-0.41371	1.35869	0.00000	-0.00000	-3.27380	0.00000	129.99516	58.21009	1.34107	20.34000	-0.02832	0.24795	-3.50062	-0.09403	0.23260	-0.05470
0.19858	-3.43379	-0.07242	0.18629	0.00000	0.00000	-3.50054	0.00000	133.99322	62.07679	0.32464	20.34000	0.00000	0.00000	-3.30085	0.00000	0.00000	-0.02268
0.00000	-3.32414	0.00000	0.00000	0.00000	0.00000	-3.68169	0.00000	137.99128	65.94349	-0.69178	20.34000	0.00000	0.00000	-3.52111	0.00000	0.00000	0.00000
0.00000	-3.53961	0.00000	0.00000	0.00000	0.00000	-3.83474	0.00000	141.98935	69.81019	-1.70821	20.34000	0.00000	0.00000	-3.69851	0.00000	0.00000	0.00000
0.00000	-3.71398	0.00000	0.00000	0.02965	0.06908	-3.98153	0.01112	145.99709	73.67689	-2.72463	20.34000	0.00000	0.00000	-3.84930	0.00000	0.00000	0.00000
0.00612	-3.86361	0.00099	0.00659	0.15486	0.37418	-4.13295	0.05464	149.99854	77.54360	-3.74106	20.34000	0.03375	0.07862	-3.99654	0.01265	0.08461	0.00263
0.09611	-4.01163	0.01526	0.10339	0.43734	1.07073	-4.32384	0.15076	153.98353	81.41030	-4.75749	20.34000	0.17587	0.42582	-4.14802	0.06183	0.45654	0.04104
0.49031	-4.16723	0.07075	0.52556	0.87779	2.16043	-4.46817	0.29970	157.98160	85.27700	-5.77391	20.34000	0.46968	1.15056	-4.34356	0.16174	1.23217	0.20204
3.34906	-4.44232	0.08100	3.61263	2.74339	6.82930	-3.71075	0.14298	161.99419	94.81160	-8.71513	19.73000	2.07402	5.13223	-4.32999	0.11901	5.53418	1.35699
5.43940	-4.14497	0.12316	5.86429	2.88550	7.18307	-4.40142	0.15039	165.99838	98.54615	-10.13170	19.73000	2.75730	6.86394	-3.			

UBB, London

TW Sewer Assessment

FULL DEVELOPMENT LONG TERM_Smoothed

Stage	Stage: Name	Specific Utility: Name	Sub-utility Iteration	Distance	x	y	z	δx (n)	δy (n)	δz (n)	δH/(n)	δPerp. (n)	δx (n-Lp)	δy (n-Lp)
δz (n-Lp)	δH/(n-Lp)	δPerp. (n-Lp)	δx (n-Lp)	δy (n-Lp)	δz (n-Lp)	δH/(n-Lp)	δPerp. (n-Lp)							
Ref.			Utility: Name											
9.42225	0.43944	0.19727	0.15215	3.80167	9.46374	1.88918	0.19814	10.22017						
9.38183	1.97077	-0.58350	9 TW Fresh Water (d - St Pancras	1	3.93590	156.25860	-32.34753	19.20000	3.47853	8.65933	2.13789	-0.53856	9.31633	3.76876
8.59338	2.14586	-0.53446	9.24539	1.22843	6.92250	1.99878	-1.83525	9.31633	7.87180	159.82008	-34.02299	19.20000	3.17052	7.89259
7.81797	2.20803	-0.58920	8.36270	-0.75160	5.54159	1.26796	-0.30399	8.49142	11.10771	163.38155	-35.69846	19.20000	1.00208	6.81282
6.67837	1.89264	-2.10557	6.38992	-1.45574	4.02587	0.42872	-0.30101	6.59129	15.74361	166.94303	-37.37393	19.20000	-0.88676	5.44208
5.32113	1.13344	-3.13774	4.40442	-1.02986	2.13540	-0.22407	-1.84091	4.54689	19.67951	170.50451	-39.04940	19.20000	-1.47930	3.88023
3.71464	0.29475	-2.89849	2.74160	-0.19591	0.40081	-0.66160	-0.34789	2.88138	23.61541	174.06599	-40.72486	19.20000	-0.96582	1.97594
1.83466	-0.30334	-1.59245	1.27839	0.00000	-0.00000	-0.93491	0.00000	1.37683	27.55131	177.62747	-42.40033	19.20000	-0.12072	0.24698
0.20482	-0.73373	-0.17778	0.14272	0.00000	0.00000	-0.69507	0.00000	0.17209	31.48721	181.18895	-44.07580	19.20000	0.00000	0.00000
8.98464	2.07469	-0.55879	9.66633	2.47197	7.53002	2.19428	-0.96864	0.00000	5.90385	158.03934	-33.18526	19.20000	3.32333	8.27299
8.20806	2.18916	-0.51049	8.83083	0.09234	6.15957	1.63552	-2.53850	8.90069	9.83975	161.60081	-34.86073	19.20000	2.32819	7.45540
7.34572	2.15121	-1.22509	7.54165	-1.26368	4.85444	0.85340	-3.20994	7.73725	13.77566	165.16229	-36.53619	19.20000	-0.09490	6.02512
5.92560	1.50695	-2.73063	5.26396	-1.36461	3.07571	0.05774	-2.54409	5.41111	17.71156	168.72377	-38.21166	19.20000	-1.34125	4.73349
4.58785	0.70836	-3.18797	3.57042	-0.63029	1.28949	-0.43452	-1.11925	3.71224	21.64746	172.28525	-39.88713	19.20000	-1.34101	2.91013
2.75068	-0.04934	-2.32643	1.94542	-0.02061	0.04216	-0.85868	-0.03659	2.06244	25.58336	175.84673	-41.56260	19.20000	-0.56123	1.14821
0.99438	-0.50825	-0.86310	0.69288	0.00000	0.00000	-0.82511	0.00000	0.80007	29.51926	179.40821	-43.23806	19.20000	0.00000	-0.00000
0.42213	12.69473	-0.34257	Assumed FW400 connection to TW2_1	1	3.62091	54.06400	8.76921	16.51600	0.00000	0.00000	0.79494	0.00000	0.00000	0.16838

Specific Utility Damage Results - Pullouts & Rotations

Stage:	Stage:	Name	Specific	Specific	Utility	Utility	Sub-utility	Iteration	Distance	x	y	z	Pullout:	Pullout:	Pullout:	Pullout:	Pullout:	Pullout:	Pullout:	Pullout:	Pullout:
Ref.	Pullout:	Pullout:	Utility:	Pullout:	Pullout:	Pullout:	Name	Check:	Check:	Rotation:	Rotation:	Check:	Check:	Vertical	Pullout:	Pullout:	Pullout:	Pullout:	Pullout:	Pullout:	Pullout:
Right	Total:	Total:	Ref.	Total:	Total:	Total:				from	Unfactored	Factored	Rotation:	Rotation:	Left	Left	Left	Left	Right	Right	Right
Seg.:	Axis:	Axis:	Ref.	Flex.:	Flex.:	Total:	Total:	Threshold	Limit		start of		Threshold	Limit	Axis:	Axis:	Flex.:	Flex.:	Axis:	Axis:	Axis:
Flex.:	Unfactored	Factored	Unfactored	Factored	Unfactored	Factored				utility					Unfactored	Factored	Unfactored	Factored	Unfactored	Factored	Unfactored
Factored																					
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
0	Base Model	1	TWS(1)_1																		
		2	TWS(2)_1																		
		3	TWS(2)_2																		
		4	TWS(2)_3																		
		5	TWS(2)_4																		
		6	TW Fresh Water (a) - St Pancras																		
0.00006	0.00000	0.00000	0.000012	0.00012	0.00012	0.00012	1	-	OK	3.95632	-32.55421	2.82127	20.65500	OK	0.00000	0.00000	0.00006	0.00006	0.00000	0.00000	0.00006
0.00000	0.00000	0.00000	0.00001	0.00001	0.00001	0.00001	-	OK	7.91263	-28.59823	2.87302	20.65500	OK	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
0.00012	0.00000	0.00000	0.00024	0.00024	0.00024	0.00024	-	OK	11.86895	-24.64226	2.92477	20.65500	OK	0.00000	0.00000	0.00012	0.00012	0.00000	0.00000	0.00000	0.00012
0.00033	0.00000	0.00000	0.00065	0.00065	0.00065	0.00065	-	OK	15.82526	-20.68628	2.97652	20.65500	OK	0.00000	0.00000	0.00033	0.00033	0.00000	0.00000	0.00000	0.00033
0.00066	0.00000	0.00000	0.00133	0.00133	0.00133	0.00133	-	OK	19.78158	-16.73030	3.02827	20.65500	OK	0.00000	0.00000	0.00066	0.00066	0.00000	0.00000	0.00000	0.00066
0.00119	0.00000	0.00000	0.00239	0.00239	0.00239	0.00239	-	OK	23.73790	-12.77432	3.08002	20.65500	OK	0.00000	0.00000	0.00119	0.00119	0.00000	0.00000	0.00000	0.00119
0.00197	0.00000	0.00000	0.00394	0.00394	0.00394	0.00394	-	OK	27.69421	-9.81834	3.13177	20.65500	OK	0.00000	0.00000	0.00197	0.00197	0.00000	0.00000	0.00000	0.00197
0.00682	0.00900	0.00900	0.01364	0.01364	0.02263	0.02263	-	OK	31.65053	-4.86237	3.18352	20.65500	OK	0.00000	0.00000	0.00682	0.00682	0.00900	0.00900	0.00900	0.00682
0.00719	0.05989	0.05989	0.01438	0.01438	0.07427	0.07427	-	OK	35.60684	-0.90639	3.23527	20.65500	OK	0.01097	0.01097	0.00719	0.00719	0.07087	0.07087	0.07087	0.00719
0.00168	0.01605	0.01605	0.00335	0.00335	0.01941	0.01941	-	OK	39.56316	3.04959	3.28701	20.65500	OK	0.08012	0.08012	0.00168	0.00168	0.09617	0.09617	0.09617	0.00168
0.00515	-0.04693	-0.04693	0.01029	0.01029	0.01029	0.01029	-	OK	43.51948	7.00557	3.3876	20.65500	OK	0.09017	0.09017	0.00515	0.00515	0.04324	0.04324	0.04324	0.00515
0.00401	-0.00902	-0.00902	0.00802	0.00802	0.00802	0.00802	-	OK	47.47579	10.96154	3.39051	20.65500	OK	0.04063	0.04063	0.00401	0.00401	0.03161	0.03161	0.03161	0.00401
0.00419	0.00461	0.00461	0.00839	0.00839	0.01300	0.01300	-	OK	51.43211	14.91752	3.44226	20.65500	OK	0.03213	0.03213	0.00419	0.00419	0.03674	0.03674	0.03674	0.00419
0.00333	0.00247	0.00247	0.00666	0.00666	0.00913	0.00913	-	OK	55.38843	18.87350	3.49401	20.65500	OK	0.03712	0.03712	0.00333	0.00333	0.03959	0.03959	0.03959	0.00333
0.00181	0.00127	0.00127	0.00362	0.00362	0.00490	0.00490	-	OK	59.34474	22.82948	3.54576	20.65500	OK	0.03971	0.03971	0.00181	0.00181	0.04099	0.04099	0.04099	0.00181
0.00153	0.00127	0.00127	0.00307	0.00307	0.00434	0.00434	-	OK	63.30106	26.78545	3.59751	20.65500	OK	0.04111	0.04111	0.00153	0.00153	0.04238	0.04238	0.04238	0.00153
0.00200	0.00127	0.00127	0.00401	0.00401	0.00528	0.00528	-	OK	67.25737	30.74143	3.64926	20.65500	OK	0.04251	0.04251	0.00200	0.00200	0.04378	0.04378	0.04378	0.00200
0.00318	0.00127	0.00127	0.00637	0.00637	0.00764	0.00764	-	OK	71.21369	34.69741	3.70101	20.65500	OK	0.04391	0.04391	0.00318	0.00318	0.04518	0.04518	0.04518	0.00318
0.03649	0.00754	0.00754	0.07298	0.07298	0.08051	0.08051	-	OK	75.17001	38.65339	3.75276	20.65500	OK	0.04531	0.04531	0.03649	0.03649	0.05284	0.05284	0.05284	0.03649
0.05238	0.00679	0.00679	0.01477	0.01477	0.11156	0.11156	-	OK	79.12632	42.60916	3.80451	20.65500	OK	0.05435	0.05435	0.05238	0.05238	0.06114	0.06114	0.06114	0.05238
0.00003	0.00000	0.00000	0.00007	0.00007	0.00007	0.00007	-	OK	9.3447	-30.57622	2.84714	20.65500	OK	0.00000	0.00000	0.00003	0.00003	0.00000	0.00000	0.00000	0.00003
0.00005	0.00000	0.00000	0.00011	0.00011	0.00011	0.00011	-	OK	9.89079	-26.62024	2.98889	20.65500	OK	0.00000	0.00000	0.00005	0.00005	0.00000	0.00000	0.00000	0.00005
0.00021	0.00000	0.00000	0.00042	0.00042	0.00042	0.00042	-	OK	13.84711	-22.66427	2.95064	20.65500	OK	0.00000	0.00000	0.00021	0.00021	0.00000	0.00000	0.00000	0.00021
0.00047	0.00000	0.00000	0.00095	0.00095	0.00095	0.00095	-	OK	17.80342	-18.70829	3.00239	20.65500	OK	0.00000	0.00000	0.00047	0.00047	0.00000	0.00000	0.00000	0.00047
0.00090	0.00000	0.00000	0.00180	0.00180	0.00180	0.00180	-	OK	21.75974	-14.75921	3.05414	20.65500	OK	0.00000	0.00000	0.00090	0.00090	0.00000	0.00000	0.00000	0.00090
0.00155	0.00000	0.00000	0.00310	0.00310	0.00310	0.00310	-	OK	25.71605	-10.79633	3.10589	20.65500	OK	0.00000	0.00000	0.00155	0.00155	0.00000	0.00000	0.00000	0.00155
0.00283	0.00000	0.00000	0.00566	0.00566	0.00566	0.00566	-	OK	29.67237	-6.84036	3.15764	20.65500	OK	0.00000	0.00000	0.00283	0.00283	0.00000	0.00000	0.00000	0.00283
0.01054	0.04201	0.04201	0.02109	0.02109	0.06310	0.06310	-	OK	33.62865	-2.88438	3.20939	20.65500	OK	0.00000	0.00000	0.01054	0.01054	0.04201	0.04201	0.04201	0.01054
0.00326	0.05511	0.05511	0.00653	0.00653	0.06163	0.06163	-	OK	37.58500	1.07160	3.26114	20.65500	OK	0.05080	0.05080	0.00326	0.00326	0.10591	0.10591	0.10591	0.00326
0.00253	-0.03529	-0.03529	0.00506	0.00506	0.00506	0.00506	-	OK	41.54132	5.02758	3.31289	20.65500	OK	0.01719	0.01719	0.00253	0.00253	0.07190	0.07190	0.07190	0.00253
0.00442	-0.03541	-0.03541	0.00884	0.00884	0.00884	0.00884	-	OK	45.49764	8.98355	3.36464	20.65500	OK	0.06418	0.06418	0.00442	0.00442	0.02877	0.02877	0.02877	0.00442
0.00426	0.00524	0.00524	0.00853	0.00853	0.01377	0.01377	-	OK	49.45395	12.93953	3.41639	20.65500	OK	0.02928	0.02928	0.00426	0.00426	0.03452	0.03452	0.03452	0.00426
0.00434	0.00358	0.00358	0.00868	0.00868	0.01225	0.01225	-	OK	53.41027	16.89551	3.46814	20.65500	OK	0.03505	0.03505	0.00434	0.00434	0.03863	0.03863	0.03863	0.00434
0.00227	0.00149	0.00149	0.00453	0.00453	0.00602	0.00602	-	OK	57.36658	20.85149	3.51989	20.65500	OK	0.03880	0.03880	0.00227	0.00227	0.04029	0.04029	0.04029	0.00227
0.00159	0.00127	0.00127	0.00317	0.00317	0.00444	0.00444	-	OK	61.32290	24.80277	3.57164	20.65500	OK	0.04041	0.04041	0.00159	0.00159	0.04168	0.04168	0.04168	0.00159
0.00167	0.00127	0.00127	0.00334	0.00334	0.00461	0.00461	-	OK	65.27922	28.76344	3.62339	20.65500	OK	0.04181	0.04181	0.00167	0.00167	0.04308	0.04308	0.04308	0.00167
0.00253	0.00127	0.00127	0.00505	0.00505	0.00633	0.00633	-	OK	69.23553	32.71942	3.67514	20.65500	OK	0.04321	0.04321	0.00253	0.00253	0.04448	0.04448	0.04448	0.00253
0.00382	0.00127	0.00127	0.00764	0.00764	0.00891	0.00891	-	OK	73.19185	36.67540	3.72689	20.65500	OK	0.04461	0.04461	0.00382	0.00382	0.04588	0.04588	0.04588	0.00382
0.04351	0.00813	0.00813	0.08703	0.08703	0.09516	0.09516	-	OK	77.14816	40.63138	3.77864	20.65500	OK	0.04601	0.04601	0.04351	0.04351	0.05414	0.05414	0.05414	0.04351
0.04592	0.00217	0.00217	0.019183	0.019183	0.09400	0.09400	-	OK	81.10448	44.58735	3.83038	20.65500	OK	0.05547	0.05547	0.04592	0.04592	0.05764	0.05764	0.05764	0.04592
0.01303	0.32971	0.32971	0.02606	0.02606	0.35577	0.35577	-	OK	3.99806	52.41003	2.86571	20.34000	OK	-0.77227	-0.77227	0.01303	0.01303	-0.44255	-0.44255	-0.44255	0.01303
0.02188	0.26347	0.26347	0.04377	0.04377	0.30724	0.30724	-	OK	7.99613	56.27674	1.84928	20.34000	OK	-0.41404	-0.41404	0.02188	0.02188	-0.15058	-0.15058	-0.15058	0.02188
0.01215	0.12238	0.12238	0.02430	0.02430	0.14668	0.14668	-	OK	11.99419	60.14877	0.83286	20.34000	OK	-0.12238	-0.12238	0.01215	0.01215	0.00000	0.00000	0.00000	0.01215



RSK ENVIRONMENT LIMITED

UBB, London

TW Sewer Assessment

FULL DEVELOPMENT LONG TERM_Smoothed

Oasys															Job No.										Sheet No.										Rev.									
RISK ENVIRONMENT LIMITED															371654																													
UBB, London															Drg. Ref.																													
TW Sewer Assessment															Date										Checked										Date									
FULL DEVELOPMENT LONG TERM_Smoothed															Made by MK										09-Dec-2020																			
Stage: Ref. Right	Stage: Pullout: Total:	Stage: Name: Pullout: Total:	Specific Utility: Pullout: Total:	Specific Utility: Name: Pullout: Total:	Sub-utility Name: Pullout: Total:	Iteration	Distance	x	y	z	Check: Rotation:	Check: Rotation:	Check: Rotation:	Check: Rotation:	Pullout: Left	Pullout: Left	Pullout: Left	Pullout: Left	Pullout: Right	Pullout: Right	Pullout: Right	Pullout: Right	Pullout: Right	Pullout: Right																				
0.00073	-0.00000	-0.00000	0.00147	0.00147	0.00147	0.00147	-	OK	15.99225	64.01014	-0.18357	20.34000	0.00000	0.00000	0.00073	0.00073	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00073	0.00073																				
0.00044	0.00000	0.00000	0.00089	0.00089	0.00089	0.00089	-	OK	19.99031	67.87684	-1.20000	20.34000	0.00000	0.00000	0.00044	0.00044	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00044	0.00044																				
0.00046	0.00198	0.00198	0.00093	0.00093	0.00291	0.00291	-	OK	23.98838	71.74354	-2.21642	20.34000	0.00000	0.00000	0.00046	0.00046	0.00198	0.00198	0.00198	0.00198	0.00198	0.00198	0.00046	0.00046																				
0.00144	0.01156	0.01156	0.00288	0.00288	0.01444	0.01444	-	OK	27.98644	75.61025	-3.23285	20.34000	0.00247	0.00247	0.00144	0.00144	0.01404	0.01404	0.01404	0.01404	0.01404	0.01404	0.00144	0.00144																				
0.00642	0.04561	0.04561	0.01283	0.01283	0.05844	0.05844	-	OK	31.98450	79.47695	-4.24927	20.34000	0.01610	0.01610	0.00642	0.00642	0.06171	0.06171	0.06171	0.06171	0.06171	0.06171	0.00642	0.00642																				
0.00430	0.09136	0.09136	0.00860	0.00860	0.09996	0.09996	-	OK	35.98257	83.34365	-5.26570	20.34000	0.06976	0.06976	0.00430	0.00430	0.16112	0.16112	0.16112	0.16112	0.16112	0.16112	0.00430	0.00430																				
0.00894	0.14721	0.14721	0.01787	0.01787	0.16508	0.16508	-	OK	39.98063	87.21035	-6.28213	20.34000	0.17331	0.17331	0.00894	0.00894	0.32052	0.32052	0.32052	0.32052	0.32052	0.32052	0.00894	0.00894																				
0.01305	0.30407	0.30407	0.02609	0.02609	0.33016	0.33016	-	OK	5.99709	54.34338	-2.35750	20.34000	-0.59156	-0.59156	0.01305	0.01305	-0.28749	-0.28749	-0.28749	-0.28749	-0.28749	-0.28749	0.01305	0.01305																				
0.02090	0.20686	0.20686	0.04179	0.04179	0.24865	0.24865	-	OK	9.99516	58.21009	-1.34107	20.34000	-0.25207	-0.25207	0.02090	0.02090	-0.04521	-0.04521	-0.04521	-0.04521	-0.04521	-0.04521	0.02090	0.02090																				
0.00582	0.03621	0.03621	0.01165	0.01165	0.04786	0.04786	-	OK	13.99322	62.07679	-0.32464	20.34000	-0.03621	-0.03621	0.00582	0.00582	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00582	0.00582																				
0.00056	0.00000	0.00000	0.00111	0.00111	0.00111	0.00111	-	OK	17.99128	65.94349	-0.69178	20.34000	0.00000	0.00000	0.00056	0.00056	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00056	0.00056																				
0.00035	0.00000	0.00000	0.00069	0.00069	0.00069	0.00069	-	OK	21.98935	69.81019	-1.70821	20.34000	0.00000	0.00000	0.00035	0.00035	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00035	0.00035																				
0.00114	0.00556	0.00556	0.00227	0.00227	0.00783	0.00783	-	OK	25.98741	73.67689	-2.72463	20.34000	0.00000	0.00000	0.00114	0.00114	0.00556	0.00556	0.00556	0.00556	0.00556	0.00556	0.00114	0.00114																				
0.00365	0.02683	0.02683	0.00729	0.00729	0.03412	0.03412	-	OK	29.98547	77.54360	-3.74106	20.34000	0.00682	0.00682	0.00365	0.00365	0.03365	0.03365	0.03365	0.03365	0.03365	0.03365	0.00365	0.00365																				
0.00518	0.06775	0.06775	0.01037	0.01037	0.07812	0.07812	-	OK	33.98353	81.41030	-4.75749	20.34000	0.03854	0.03854	0.00518	0.00518	0.10630	0.10630	0.10630	0.10630	0.10630	0.10630	0.00518	0.00518																				
0.00577	0.11447	0.11447	0.01153	0.01153	0.12601	0.12601	-	OK	37.98160	85.27700	-5.77391	20.34000	0.11624	0.11624	0.00577	0.00577	0.23072	0.23072	0.23072	0.23072	0.23072	0.23072	0.00577	0.00577																				
0.00789	0.03099	0.03099	0.01577	0.01577	0.04676	0.04676	-	OK	3.99419	94.81160	-8.71513	19.73000	0.10001	0.10001	0.00789	0.00789	0.13100	0.13100	0.13100	0.13100	0.13100	0.13100	0.00789	0.00789																				
0.02341	0.01361	0.01361	0.04682	0.04682	0.06044	0.06044	-	OK	7.98838	58.54615	-10.13170	19.73000	0.13343	0.13343	0.02341	0.02341	0.14705	0.14705	0.14705	0.14705	0.14705	0.14705	0.02341	0.02341																				
0.00321	0.00672	0.00672	0.00643	0.00643	0.01315	0.01315	-	OK	11.98257	102.28070	-11.54828	19.73000	0.14778	0.14778	0.00321	0.00321	0.15450	0.15450	0.15450	0.15450	0.15450	0.15450	0.00321	0.00321																				
0.00423	0.00681	0.00681	0.00846	0.00846	0.01526	0.01526	-	OK	15.97676	106.01525	-12.96486	19.73000	0.15525	0.15525	0.00423	0.00423	0.16205	0.16205	0.16205	0.16205	0.16205	0.16205	0.00423	0.00423																				
0.00371	0.00689	0.00689	0.00742	0.00742	0.01431	0.01431	-	OK	19.97095	109.74980	-14.38143	19.73000	0.16280	0.16280	0.00371	0.00371	0.16969	0.16969	0.16969	0.16969	0.16969	0.16969	0.00371	0.00371																				
0.00181	0.00697	0.00697	0.00361	0.00361	0.01059	0.01059	-	OK	23.96513	113.48435	-15.79801	19.73000	0.17045	0.17045	0.00181	0.00181	0.17742	0.17742	0.17742	0.17742	0.17742	0.17742	0.00181	0.00181																				
0.00118	0.00627	0.00627	0.00235	0.00235	0.00862	0.00862	-	OK	27.95932	117.21890	-17.21459	19.73000	0.17819	0.17819	0.00118	0.00118	0.18447	0.18447	0.18447	0.18447	0.18447	0.18447	0.00118	0.00118																				
0.00303	0.00323	0.00323	0.00607	0.00607	0.00930	0.00930	-	OK	31.95351	120.95345	-18.63116	19.73000	0.18505	0.18505	0.00303	0.00303	0.18828	0.18828	0.18828	0.18828	0.18828	0.18828	0.00303	0.00303																				
0.00333	0.00131	0.00131	0.00667	0.00667	0.00798	0.00798	-	OK	35.94770	124.68800	-20.04774	19.73000	0.18843	0.18843	0.00333	0.00333	0.18974	0.18974	0.18974	0.18974	0.18974	0.18974	0.00333	0.00333																				
0.00284	0.00132	0.00132	0.00567	0.00567	0.00699	0.00699	-	OK	39.94189	128.42255	-21.46431	19.73000	0.18989	0.18989	0.00284	0.00284	0.19120	0.19120	0.19120	0.19120	0.19120	0.19120	0.00284	0.00284																				
0.00030	0.00132	0.00132	0.00059	0.00059	0.00191	0.00191	-	OK	43.93608	132.15710	-22.88089	19.73000	0.19135	0.19135	0.00030	0.00030	0.19266	0.19266	0.19266	0.19266	0.19266	0.19266	0.00030	0.00030																				
0.00137	0.00132	0.00132	0.00273	0.00273	0.00405	0.00405	-	OK	47.93027	135.89165	-24.29747	19.73000	0.19281	0.19281	0.00137	0.00137	0.19412	0.19412	0.19412	0.19412	0.19412	0.19412	0.00137	0.00137																				
0.00018	0.00132	0.00132	0.00035	0.00035	0.00167	0.00167	-	OK	51.92446	139.62619	-25.71404	19.73000	0.19427	0.19427	0.00018	0.00018	0.19559	0.19559	0.19559	0.19559	0.19559	0.19559	0.00018	0.00018																				
0.00101	0.00132	0.00132	0.00202	0.00202	0.00334	0.00334	-	OK	55.91865	143.36074	-27.13062	19.73000	0.19573	0.19573	0.00101	0.00101	0.19705	0.19705	0.19705	0.19705	0.19705	0.19705	0.00101	0.00101																				
0.00038	0.00132	0.00132	0.00075	0.00075	0.00207	0.00207	-	OK	59.91284	147.09529	-28.54720	19.73000	0.19720	0.19720	0.00038	0.00038	0.19852	0.19852	0.19852	0.19852	0.19852	0.19852	0.00038	0.00038																				
0.04233	0.02252	0.02252	0.08467	0.08467	0.10718	0.10718	-	2 OK	5.99128	96.67888	-9.42342	19.73000	0.12084	0.12084	0.04233	0.04233	0.14335	0.14335	0.14335	0.14335	0.14335	0.14335	0.04233	0.04233																				
0.00254	0.00668	0.00668	0.00508	0.00508	0.01177	0.01177	-	OK	9.98547	100.41343	-10.83999	1																																



RSK ENVIRONMENT LIMITED

UBB, London

TW Sewer Assessment

FULL DEVELOPMENT LONG TERM_Smoothed

Job No.	Sheet No.	Rev.
371654		
Drg. Ref.		
Made by MK	Date 09-Dec-2020	Checked Date

244.46489	Base Model	1	TWS(1)_1	1	2.00040	48.04000	58.00000	14.64700	115.46	115.46	64.505	129.01	-64.505	-64.505	179.96005		
209.73587	OK	-64.50484	-64.50484	OK	1.9642E+4	-	190.97686	48.08000	56.00000	14.64700	81.926	81.926	63.905	127.81	-63.905	-63.905	145.83070
141.56336	OK	-63.90517	-63.90517	OK	1.9826E+4	-	172.27140	48.12000	54.00000	14.64700	10.027	10.027	65.768	131.54	-65.768	-65.768	75.79530
34.10792	OK	-65.76806	-65.76806	OK	1.9265E+4	-	164.33319	48.16000	52.00000	14.64700	-25.773	-25.773	17.054	34.108	-17.054	-17.054	17.05396
190.43725	OK	-42.82698	-42.82698	OK	7.4294E+4	-	158.17112	48.20000	50.00000	14.64700	-37.875	-37.875	95.219	190.44	-95.219	-95.219	95.21862
791.67351	Fails	-133.09329	-133.09329	OK	1.3306E+4	-	183.99717	48.24000	48.00000	14.64700	-51.173	-51.173	395.84	791.67	-395.84	-395.84	395.83676
1156.53222	Fails	-447.00959	-447.00959	OK	3.2008E+3	-	180.97751	48.28000	46.00000	14.64700	-61.922	-61.922	578.27	1156.5	-578.27	-578.27	578.26611
1331.13916	Fails	-640.18814	-640.18814	OK	2.1910E+3	-	180.51340	48.32000	44.00000	14.64700	-44.115	-44.115	665.57	1331.1	-665.57	-665.57	665.56958
1129.06433	Fails	-709.68485	-709.68485	OK	1.9036E+3	-	179.75790	48.36000	42.00000	14.64700	-20.248	-20.248	564.53	1129.1	-564.53	-564.53	564.53216
598.65319	Fails	-584.78014	-584.78014	OK	2.2443E+3	-	0.02570	48.40000	40.00000	14.64700	-7.7154	-7.7154	299.33	598.65	-299.33	-299.33	299.32659
728.23366	Fails	-307.04196	-307.04196	OK	4.2328E+3	-	0.01818	48.44000	38.00000	14.64700	-2.0828	-2.0828	364.12	728.23	-364.12	-364.12	364.11683
97.35948	OK	-366.19967	-366.19967	OK	3.4797E+3	-	0.00996	48.48000	36.00000	14.64700	0.17200	0.17200	48.594	97.187	-48.594	-48.594	48.76574
189.37525	OK	-48.59374	-48.59374	OK	2.6073E+4	-	0.00000	48.52000	34.00000	14.64700	0.11208	0.11208	94.632	189.26	-94.632	-94.632	94.74366
691.39949	Fails	-94.63159	-94.63159	OK	1.3389E+4	-	0.00000	48.56000	32.00000	14.64700	0.0079183	0.0079183	345.70	691.39	-345.70	-345.70	345.70370
415.34881	OK	-345.69579	-345.69579	OK	3.6651E+3	-	0.00000	48.60000	30.00000	14.64700	0.048355	0.048355	207.65	415.30	-207.65	-207.65	207.69858
538.49591	Fails	-207.65023	-207.65023	OK	6.1016E+3	-	0.00000	48.64000	28.00000	14.64700	0.23623	0.23623	269.13	538.26	-269.13	-269.13	269.36607
126.82039	OK	-269.12984	-269.12984	OK	4.7078E+3	-	0.00000	48.68000	26.00000	14.64700	-4.4969	-4.4969	63.410	126.82	-63.410	-63.410	63.41019
3.92534	OK	-67.90714	-67.90714	OK	1.9981E+4	-	2.97511	48.72000	24.00000	14.64700	-24.365	-24.365	1.9627	3.9253	-1.9627	-1.9627	1.96267
64.75788	OK	-26.32789	-26.32789	OK	6.4555E+5	-	270.00000	48.76000	22.00000	14.64700	-56.752	-56.752	32.379	64.758	-32.379	-32.379	32.37894
15.82800	OK	-89.13081	-89.13081	OK	3.9130E+4	-	192.07676	48.80000	20.00000	14.64700	-74.044	-74.044	7.9140	15.828	-7.9140	-7.9140	7.91400
219.18548	OK	-81.95778	-81.95778	OK	1.6010E+5	-	48.80000	48.84000	18.00000	14.64700	-67.660	-67.660	109.59	219.19	-109.59	-109.59	109.59274
33.89418	OK	-177.25315	-177.25315	OK	1.1561E+4	-	2.56610	48.88000	16.00000	14.64700	-42.448	-42.448	16.947	33.894	-16.947	-16.947	16.94709
478.34099	OK	-59.39538	-59.39538	OK	7.4762E+4	-	140.94713	48.92000	14.00000	14.64700	0.41712	0.41712	238.96	477.92	-238.96	-238.96	239.37906
515.46403	Fails	-238.96193	-238.96193	OK	5.3021E+3	-	177.90908	48.96000	12.00000	14.64700	43.212	43.212	236.13	472.25	-236.13	-236.13	279.33812
523.08186	Fails	-236.12592	-236.12592	OK	5.3658E+3	-	177.40828	49.00000	10.00000	14.64700	60.716	60.716	231.18	462.37	-231.18	-231.18	291.89870
290.71594	OK	-231.18316	-231.18316	OK	5.4805E+3	-	178.83093	49.04000	8.00000	14.64700	65.378	65.378	112.67	225.34	-112.67	-112.67	178.04674
165.73496	OK	-112.66920	-112.66920	OK	1.1245E+4	-	183.95201	49.08000	6.00000	14.64700	57.254	57.254	54.240	108.48	-54.240	-54.240	111.49459
92.47865	OK	-54.24037	-54.24037	OK	2.3359E+4	-	187.70701	49.12000	4.00000	14.64700	29.035	29.035	31.722	63.443	-31.722	-31.722	60.75690
177.60707	OK	-31.72175	-31.72175	OK	3.9941E+4	-	183.50722	49.16000	2.00000	14.64700	12.479	12.479	82.564	165.13	-82.564	-82.564	95.04292
188.22468	OK	-82.56415	-82.56415	OK	1.5346E+4	-	-2.24129	49.20000	0.00000	14.64700	5.0055	5.0055	91.610	183.22	-91.610	-91.610	96.61508
60.41387	OK	-91.60960	-91.60960	OK	1.3830E+4	-	-0.07920	49.24000	-2.00000	14.64700	343.09E-6	343.09E-6	30.207	60.414	-30.207	-30.207	30.20711
45.60188	OK	-30.20677	-30.20677	OK	4.1944E+4	-	0.00000	49.28000	-4.00000	14.64700	122.47E-6	122.47E-6	22.801	45.602	-22.801	-22.801	22.80100
11.64330	OK	-22.80088	-22.80088	OK	5.5568E+4	-	0.00000	49.32000	-6.00000	14.64700	731.35E-6	731.35E-6	5.8213	11.643	-5.8213	-5.8213	5.82202
5.60394	OK	-5.82129	-5.82129	OK	2.1765E+5	-	0.00000	49.36000	-8.00000	14.64700	0.0010149	0.0010149	2.8015	5.6029	-2.8015	-2.8015	2.80248
1.42047	OK	-2.80146	-2.80146	OK	4.5226E+5	-	0.00000	49.40000	-10.00000	14.64700	0.0011436	0.0011436	0.70967	1.4193	-0.70967	-0.70967	0.71081
1.41970	OK	-0.70967	-0.70967	OK	1.7853E+6	-	0.00000	49.44000	-12.00000	14.64700	0.0011436	0.0011436	0.70928	1.4186	-0.70928	-0.70928	0.71042
3.28480	OK	-0.70928	-0.70928	OK	1.7863E+6	-	180.00000	49.48000	-14.00000	14.64700	0.0010565	0.0010565	1.6419	3.2837	-1.6419	-1.6419	1.64293
4.44894	OK	-1.64187	-1.64187	OK	7.7168E+5	-	180.00000	49.52000	-16.00000	14.64700	920.92E-6	920.92E-6	2.2240	4.4480	-2.2240	-2.2240	2.22493
5.11057	OK	-2.22401	-2.22401	OK	5.6969E+5	-	180.00000	49.56000	-18.00000	14.64700	766.13E-6	766.13E-6	2.5549	5.1098	-2.5549	-2.5549	2.55567
5.41499	OK	-2.55490	-2.55490	OK	4.9591E+5	-	180.00000	49.60000	-20.00000	14.64700	612.15E-6	612.15E-6	2.7072	5.4144	-2.7072	-2.7072	2.70780
5.46888	OK	-2.70719	-2.70719	OK	4.6801E+5	-	180.00000	49.64000	-22.00000	14.64700	471.07E-6	471.07E-6	2.7342	5.4684	-2.7342	-2.7342	2.73468
5.35060	OK	-2.73421	-2.73421	OK	4.6339E+5	-	180.00000	49.68000	-24.00000	14.64700	349.12E-6	349.12E-6	2.6751	5.3502	-2.6751	-2.6751	2.67547
5.11766	OK	-2.67512	-2.67512	OK	4.7362E+5	-	180.00000	49.72000	-26.00000	14.64700	248.48E-6	248.48E-6	2.5587	5.1174	-2.5587	-2.5587	2.55895
4.81211	OK	-2.55870	-2.55870	OK	4.9517E+5	-	180.00000	49.76000	-28.00000	14.64700	168.79E-6	168.79E-6	2.4060	4.8119	-2.4060	-2.4060	2.40614
4.46453	OK	-2.40597	-2.40597	OK	5.2661E+5	-	180.00000	49.80000	-30.00000	14.64700	108.22E-6	108.22E-6	2.2322	4.4644	-2.2322	-2.2322	2.23232
4.09691	OK	-2.23221	-2.23221	OK	5.6760E+5	-	180.00000	49.84000	-32.00000	14.64700	64.213E-6	64.213E-6	2.0484	4.0968	-2.0484	-2.0484	2.04849
3.72488	OK	-2.04842	-2.04842	OK	6.1852E+5	-	180.00000	49.88000	-34.00000	14.64700	33.992E-6	33.992E-6	1.8624	3.7248	-1.8624	-1.8624	1.86246
3.35930	OK	-1.86242	-1.86242	OK	6.8030E+5	-	180.00000	49.92000	-36.00000	14.64700	14.846E-6	14.846E-6	1.6796	3.3593	-1.6796	-1.6796	



RSK ENVIRONMENT LIMITED

UBB, London

TW Sewer Assessment

FULL DEVELOPMENT LONG TERM_Smoothed

Job No.	Sheet No.	Rev.
371654		
Drg. Ref.		
Made by MK	Date 09-Dec-2020	Checked Date

Stage:	Stage:	Name	Specific	Utility:	Name	Sub-utility	Distance	x	y	z	Ax.	Ax.	Flexural:	Flexural:	Flexural:	Flexural:	Tension:																
																		Ref:	Check:	Compn.:	Check:	Compn.:	Rad. of	Rad. of	Peak	Flex.	Strain:	Strain:	Tension:	Tension:	Compn.:	Compn.:	Total:
																		Total:	Tension	Utility:	Compn.:	Curv.	Rad. of	Rad. of	from	Tens.	Strain	Strain:	Tension:	Tension:	Compn.:	Compn.:	Total:
92.64267	OK	-46.26329	-46.26329	OK	1.7498E+4	-	-	46.07337	12.64129	6.80843	0.11609	0.11609	46.263	92.527	-46.263	-46.263	46.37938																
72.27960	OK	-36.09354	-36.09354	OK	2.2428E+4	-	-	48.07656	14.64443	6.82214	0.092517	0.092517	36.094	72.187	-36.094	-36.094	36.18606																
51.48988	OK	-25.70386	-25.70386	OK	3.1493E+4	-	-	50.07975	16.64757	6.83586	0.082166	0.082166	25.704	51.408	-25.704	-25.704	25.78602																
36.41957	OK	-18.17077	-18.17077	OK	4.4550E+4	-	-	52.08293	18.65071	6.84957	0.078037	0.078037	18.171	36.342	-18.171	-18.171	18.24880																
26.63113	OK	-13.27711	-13.27711	OK	6.0970E+4	-	-	54.08612	20.65386	6.86329	0.076915	0.076915	13.277	26.554	-13.277	-13.277	13.35402																
20.30978	OK	-10.11622	-10.11622	OK	8.0020E+4	-	-	56.08931	22.65700	6.87700	0.077334	0.077334	10.116	20.232	-10.116	-10.116	10.19356																
16.44873	OK	-8.18521	-8.18521	OK	9.8898E+4	-	-	58.09250	24.66014	6.89071	0.078320	0.078320	8.1852	16.370	-8.1852	-8.1852	8.26353																
15.00916	OK	-7.46490	-7.46490	OK	1.0844E+5	-	-	60.09569	26.66329	6.90443	0.079368	0.079368	7.4649	14.930	-7.4649	-7.4649	7.54426																
16.42357	OK	-8.17126	-8.17126	OK	9.9067E+4	-	-	62.09888	28.66643	6.91814	0.081041	0.081041	8.1713	16.343	-8.1713	-8.1713	8.25231																
21.31599	OK	-10.61625	-10.61625	OK	7.6251E+4	-	-	64.10207	30.66957	6.93186	0.083479	0.083479	10.616	21.233	-10.616	-10.616	10.69973																
30.53159	OK	-15.22213	-15.22213	OK	5.3179E+4	-	-	66.10526	32.67271	6.94557	0.087341	0.087341	15.222	30.444	-15.222	-15.222	15.30947																
51.16012	OK	-24.33907	-24.33907	OK	3.3259E+4	-	-	2.00675	38.67213	6.73960	2.4820	2.4820	24.339	48.678	-24.339	-24.339	26.82105																
57.39071	OK	-27.19148	-27.19148	OK	2.9770E+4	-	-	4.01351	40.66527	6.50620	3.0078	3.0078	27.191	54.383	-27.191	-27.191	30.19923																
113.90604	OK	-53.43978	-53.43978	OK	1.5148E+4	-	-	6.02026	42.65840	6.27280	7.0265	7.0265	53.440	106.88	-53.440	-53.440	60.46626																
69.90136	OK	-29.60036	-29.60036	OK	2.7348E+4	-	-	8.02701	44.65153	6.03940	10.701	10.701	29.600	59.201	-29.600	-29.600	40.30100																
117.20110	OK	-53.49722	-53.49722	OK	1.5132E+4	-	-	10.03376	46.64467	5.80600	10.207	10.207	53.497	106.99	-53.497	-53.497	63.70388																
114.27006	OK	-52.94816	-52.94816	OK	1.5289E+4	-	-	12.04052	48.63780	5.57260	8.3737	8.3737	52.948	105.90	-52.948	-52.948	61.32189																
95.69893	OK	-46.03102	-46.03102	OK	1.7586E+4	-	-	14.04727	50.63093	5.33920	3.6369	3.6369	46.031	92.062	-46.031	-46.031	49.66791																
73.90441	OK	-36.92929	-36.92929	OK	2.1920E+4	-	-	16.05402	52.62407	5.10580	0.045833	0.045833	36.929	73.859	-36.929	-36.929	36.97512																
87.11745	OK	-43.54842	-43.54842	OK	1.8589E+4	-	-	18.06077	54.61720	4.87240	0.020607	0.020607	43.548	87.097	-43.548	-43.548	43.56903																
40.17738	OK	-20.08484	-20.08484	OK	4.0304E+4	-	-	20.06753	56.61033	4.63900	0.0077052	0.0077052	20.085	40.170	-20.085	-20.085	20.09254																
360.36452	OK	-173.45804	-173.45804	OK	4.6668E+3	-	-	22.07428	58.60347	4.40560	13.448	13.448	173.46	346.92	-173.46	-173.46	186.90649																
331.79679	OK	-155.55253	-155.55253	OK	5.2040E+3	-	-	24.08103	60.59660	4.17220	20.692	20.692	155.55	311.11	-155.55	-155.55	176.24426																
21.36751	OK	-3.39485	-3.39485	OK	2.3845E+5	-	-	26.08778	62.58973	3.93880	14.578	14.578	3.3948	6.7897	-3.3948	-3.3948	17.97267																
11.35939	OK	-3.78434	-3.78434	OK	2.1391E+5	-	-	28.09559	64.37617	2.45600	3.7907	3.7907	3.7843	7.5687	-3.7843	-3.7843	7.57505																
33.56406	OK	-13.86152	-13.86152	OK	5.8399E+4	-	-	5.84339	66.37315	1.94800	5.8410	5.8410	13.862	27.723	-13.862	-13.862	19.70254																
78.94650	OK	-32.79067	-32.79067	OK	2.4687E+4	-	-	7.79119	74.09754	1.44000	13.365	13.365	32.791	65.581	-32.791	-32.791	46.15584																
19.23831	OK	-0.17307	-0.17307	OK	4.6773E+6	-	-	9.73898	75.97792	0.93200	18.892	18.892	0.17307	0.34614	-0.17307	-0.17307	19.06524																
44.40549	OK	-11.89316	-11.89316	OK	6.8064E+4	-	-	11.68678	77.85831	0.42400	20.619	20.619	11.893	23.786	-11.893	-11.893	32.51234																
49.67666	OK	-12.76719	-12.76719	OK	6.3405E+4	-	-	13.63457	79.73869	-0.08400	24.142	24.142	12.767	25.534	-12.767	-12.767	36.90947																
54.64298	OK	-13.37906	-13.37906	OK	6.0505E+4	-	-	15.58237	81.61908	-0.59200	27.885	27.885	13.379	26.758	-13.379	-13.379	41.26392																
66.85925	OK	-17.28902	-17.28902	OK	4.6822E+4	-	-	17.53017	83.49946	-1.10000	32.281	32.281	17.289	34.578	-17.289	-17.289	49.57023																
83.31516	OK	-22.65372	-22.65372	OK	3.5734E+4	-	-	19.47796	85.37985	-1.60800	38.008	38.008	22.654	45.307	-22.654	-22.654	60.66144																
87.91845	OK	-21.88232	-21.88232	OK	3.6993E+4	-	-	21.42576	87.26023	-2.11600	44.154	44.154	21.882	43.765	-21.882	-21.882	66.03613																
261.80071	OK	-122.23516	-122.23516	OK	6.1071E+3	-	-	2.00802	92.87630	-3.90013	16.23650	17.330	122.24	244.47	-122.24	-122.24	139.56555																
178.27369	OK	-110.92816	-110.92816	OK	8.3748E+3	-	-	4.01604	94.71697	-4.66826	16.23650	-21.791	178.27	178.27	-89.137	-89.137	89.13684																
285.13042	OK	-168.84531	-168.84531	OK	5.2362E+3	-	-	6.02406	96.59689	-5.43638	16.23650	-26.280	142.57	285.13	-142.57	-142.57	142.56521																
436.39071	OK	-234.81441	-234.81441	OK	3.4212E+3	-	-	8.03209	98.44219	-6.20451	16.23650	-16.619	218.20	436.39	-218.20	-218.20	218.19535																
39.11797	OK	-28.54013	-28.54013	OK	3.8167E+4	-	-	10.04011	100.22749	-6.97264	16.23650	-8.9811	19.559	39.118	-19.559	-19.559	19.55898																
36.45044	OK	-20.16149	-20.16149	OK	4.0960E+4	-	-	12.04813	102.15279	-7.74077	16.23650	-1.9363	18.225	36.450	-18.225	-18.225	18.22522																
42.59744	OK	-26.49060	-26.49060	OK	3.5049E+4	-	-	14.05615	104.00809	-8.50889	16.23650	-5.1919	21.299	42.597	-21.299	-21.299	21.29872																
42.58238	OK	-31.43586	-31.43586	OK	3.5061E+4	-	-	16.06417	105.86338	-9.27702	16.23650	-10.145	21.291	42.582	-21.291	-21.291	21.29119																
76.94913	OK	-42.68784	-42.68784	OK	1.9402E+4	-	-	18.07219	107.71868	-10.04515	16.23650	-4.2133	38.475	76.949	-38.475	-38.475	38.47457																
71.86236	OK	-36.93997	-36.93997	OK	2.0776E+4	-	-	20.08021	109.57398	-10.81328	16.23650	-1.0088	35.931	71.862	-35.931	-35.931	35.93118																
50.40585	OK	-26.20455	-26.20455	OK	2.9620E+4	-	-	22.08824	111.42928	-11.58140	16.23650	-1.0016	25.203	50.406	-25.203	-25.203	25.20292																
24.84534	OK	-13.41526	-13.41526	OK	6.0092E+4	-	-	24.09626	113.28457	-12.34953	16.23650	-0.99259	12.423	24.845	-12.423	-12.423	12.42267																
3.56014	OK	-2.76641	-2.76641	OK	4.1937E+5	-	-	26.10428	115.13987	-13.11766	16.23650	-0.98634	1.7801	3.5601	-1.7801	-1.7801	1.78007																
10.33392	OK	-6.15063	-6.																														



RSK ENVIRONMENT LIMITED

UBB, London

TW Sewer Assessment

FULL DEVELOPMENT LONG TERM_Smoothed

Job No.	Sheet No.	Rev.
371654		
Drg. Ref.		
Made by MK	Date 09-Dec-2020	Checked Date

Stage: Ref.	Stage: Name	Specific Compn.: Total:	Specific Compn.: Total:	Utility: Name	Rad. of	Sub-utility Name	Distance from	x	y	z	Ax.	Ax.	Flexural:	Flexural:	Flexural:	Flexural:	Tension:		
Total:	Tension	OK	OK	OK	OK	Rad. of	Rad. of	Tens. Strain			Strain:	Strain:	Tension:	Tension:	Compn.:	Compn.:	Total:		
18.18075	OK	-21.78986	-21.78986	OK	8.2120E+4	-	-	143.20249	76.30482	161.52232	-32.32085	16.23650	-437.66	-437.66	194.96	389.93	-194.96	-194.96	194.96342
389.92685	OK	-632.62782	-632.62782	OK	3.8289E+3	-	-	103.22023	78.31284	163.31776	-33.08898	16.23650	-762.95	-762.95	52.053	104.11	-52.053	-52.053	52.05297
104.10593	OK	-815.00519	-815.00519	OK	1.4341E+4	-	-	158.84596	80.32086	165.23291	-33.85711	16.23650	-609.08	-609.08	111.02	222.03	-111.02	-111.02	111.01726
222.03452	OK	-720.09924	-720.09924	OK	6.7242E+3	-	-	77.53986	82.32888	167.08821	-34.62523	16.23650	-390.92	-390.92	38.946	77.893	-38.946	-38.946	38.94648
77.89296	OK	-429.86568	-429.86568	OK	1.9167E+4	-	-	180.41543	84.33690	168.94351	-35.39336	16.23650	-109.78	-109.78	18.531	37.062	-18.531	-18.531	18.53077
37.06154	OK	-128.31385	-128.31385	OK	4.0284E+4	-	-	188.35511	86.34492	170.79881	-36.16149	16.23650	181.05	181.05	48.152	96.304	-48.152	-48.152	229.20374
277.35596	OK	-48.15221	-48.15221	OK	1.5503E+4	-	-	73.60279	88.35295	172.65411	-36.92962	16.23650	369.36	369.36	25.685	51.369	-25.685	-25.685	395.04188
420.72644	OK	-25.68456	-25.68456	OK	2.9064E+4	-	-	130.959	90.36097	174.50940	-37.69774	16.23650	413.72	413.72	27.491	54.982	-27.491	-27.491	441.21281
468.70360	OK	-27.49079	-27.49079	OK	2.7155E+4	-	-	20.75394	90.36097	174.50940	-37.69774	16.23650	413.72	413.72	27.491	54.982	-27.491	-27.491	441.21281
0.01693	OK	-0.01688	-0.01688	OK	3.2589E+6	-	-	180.00000	93.95632	-32.55421	2.82127	20.65500	289.02E-6	57.803E-6	0.016877	0.016877	-0.016877	-0.016877	0.01717
0.00981	OK	-0.00975	-0.00975	OK	5.6436E+6	-	-	180.00000	93.9447	-30.57622	2.84714	20.65500	300.64E-6	60.128E-6	0.0097455	0.0097455	-0.0097455	-0.0097455	0.01005
0.00017	OK	-0.00011	-0.00011	OK	4.8757E+8	-	-	0.00000	7.91263	-28.59823	2.87302	20.65500	304.90E-6	60.981E-6	0.016877	0.016877	-0.016877	-0.016877	0.01717
0.01351	OK	-0.01345	-0.01345	OK	4.0898E+6	-	-	0.00000	9.89079	-26.62024	2.89889	20.65500	298.91E-6	59.782E-6	0.013448	0.013448	-0.013448	-0.013448	0.01375
0.03125	OK	-0.03119	-0.03119	OK	1.7633E+6	-	-	0.00000	11.86895	-24.64226	2.92477	20.65500	279.61E-6	55.921E-6	0.031192	0.031192	-0.031192	-0.031192	0.03147
0.05454	OK	-0.05450	-0.05450	OK	1.0093E+6	-	-	0.00000	13.84711	-22.66427	2.95064	20.65500	244.35E-6	48.871E-6	0.054495	0.054495	-0.054495	-0.054495	0.05474
0.08480	OK	-0.08476	-0.08476	OK	6.4887E+5	-	-	0.00000	15.82526	-20.66828	2.97652	20.65500	192.13E-6	38.425E-6	0.084762	0.084762	-0.084762	-0.084762	0.08495
0.12371	OK	-0.12368	-0.12368	OK	4.4468E+5	-	-	0.00000	17.80342	-18.70829	3.00239	20.65500	125.67E-6	25.134E-6	0.12368	0.12368	-0.12368	-0.12368	0.12381
0.17325	OK	-0.17324	-0.17324	OK	3.1748E+5	-	-	0.00000	19.78158	-16.73030	3.02827	20.65500	55.274E-6	11.055E-6	0.17324	0.17324	-0.17324	-0.17324	0.17330
0.23566	OK	-0.23566	-0.23566	OK	2.3339E+5	-	-	0.00000	21.75974	-14.75231	3.05414	20.65500	4.9955E-6	999.10E-9	0.23566	0.23566	-0.23566	-0.23566	0.23566
0.31321	OK	-0.31321	-0.31321	OK	1.7560E+5	-	-	0.00000	23.73790	-12.77432	3.08002	20.65500	22.509E-6	4.5018E-6	0.31321	0.31321	-0.31321	-0.31321	0.31323
0.40780	OK	-0.40776	-0.40776	OK	1.3488E+5	-	-	0.00000	25.71605	-10.73633	3.10589	20.65500	193.55E-6	38.710E-6	0.40776	0.40776	-0.40776	-0.40776	0.40795
0.51991	OK	-0.51977	-0.51977	OK	1.0582E+5	-	-	0.00000	27.69421	-8.81834	3.13177	20.65500	660.84E-6	132.17E-6	0.51977	0.51977	-0.51977	-0.51977	0.52043
0.64665	OK	-0.64632	-0.64632	OK	8.5097E+4	-	-	0.00000	29.67237	-6.84036	3.15764	20.65500	0.0016431	328.62E-6	0.64632	0.64632	-0.64632	-0.64632	0.64796
1.22074	OK	-1.21991	-1.21991	OK	4.5085E+4	-	-	0.00000	31.65053	-4.86237	3.18352	20.65500	0.0041301	826.03E-6	1.2199	1.2199	-1.2199	-1.2199	1.22404
5.41923	OK	-4.30639	-4.30639	OK	1.2772E+4	-	-	0.00000	33.62869	-2.88438	3.20939	20.65500	5.5642	1.1128	4.3064	4.3064	-4.3064	-4.3064	9.87061
7.04245	OK	-2.09782	-2.09782	OK	2.6218E+4	-	-	0.00000	35.60684	-0.00639	3.23527	20.65500	24.723	4.9446	2.0978	2.0978	-2.0978	-2.0978	26.82099
5.67160	OK	-0.46970	-0.46970	OK	1.1701E+5	-	-	0.00000	37.58500	1.07160	3.26114	20.65500	26.010	5.2019	0.46970	0.46970	-0.46970	-0.46970	26.47920
1.30842	OK	-0.57978	-0.57978	OK	9.4863E+4	-	-	0.00000	39.56316	3.04959	3.28701	20.65500	3.6432	0.72864	0.57978	0.57978	-0.57978	-0.57978	4.22296
0.71170	OK	-17.51204	-17.51204	OK	7.7279E+4	-	-	0.00000	41.54132	5.02758	3.31289	20.65500	-16.800	-3.3601	0.71170	0.71170	-0.71170	-0.71170	0.71170
2.03452	OK	-23.64590	-23.64590	OK	2.7033E+4	-	-	0.00000	43.51948	7.00557	3.33876	20.65500	-21.611	-4.3223	2.0345	2.0345	-2.0345	-2.0345	2.03452
0.96484	OK	-8.26696	-8.26696	OK	5.7004E+4	-	-	0.00000	45.49764	8.98355	3.36464	20.65500	-7.3021	-1.4604	0.96484	0.96484	-0.96484	-0.96484	0.96484
1.38997	OK	-1.10156	-1.10156	OK	4.9929E+4	-	-	0.00000	47.47579	10.96154	3.39051	20.65500	1.4421	0.28842	1.1016	1.1016	-1.1016	-1.1016	2.54365
1.46956	OK	-1.17602	-1.17602	OK	4.6768E+4	-	-	0.00000	49.45395	12.93953	3.41639	20.65500	1.4677	0.29353	1.1760	1.1760	-1.1760	-1.1760	2.64369
1.37254	OK	-1.07350	-1.07350	OK	5.1234E+4	-	-	0.00000	51.43211	14.91752	3.44226	20.65500	1.4952	0.29905	1.0735	1.0735	-1.0735	-1.0735	2.56872
1.66050	OK	-1.44771	-1.44771	OK	3.7991E+4	-	-	0.00000	53.41027	16.89551	3.46814	20.65500	1.0639	0.21279	1.4477	1.4477	-1.4477	-1.4477	2.51166
0.92509	OK	-0.82790	-0.82790	OK	6.6433E+4	-	-	0.00000	55.38843	18.87358	3.49401	20.65500	0.48594	0.097188	0.82790	0.82790	-0.82790	-0.82790	1.31384
0.64705	OK	-0.57642	-0.57642	OK	9.5416E+4	-	-	0.00000	57.36658	20.85149	3.51989	20.65500	0.35316	0.070632	0.57642	0.57642	-0.57642	-0.57642	0.92958
0.54199	OK	-0.47133	-0.47133	OK	1.1669E+5	-	-	0.00000	59.34474	22.82948	3.54576	20.65500	0.35331	0.070662	0.47133	0.47133	-0.47133	-0.47133	0.82463
0.48139	OK	-0.41065	-0.41065	OK	1.3393E+5	-	-	0.00000	61.32290	24.80747	3.57164	20.65500	0.35372	0.070744	0.41065	0.41065	-0.41065	-0.41065	0.76437
0.46705	OK	-0.39613	-0.39613	OK	1.3884E+5	-	-	0.00000	63.30106	26.78545	3.59751	20.65500	0.35458	0.070916	0.39613	0.39613	-0.39613	-0.39613	0.75071
0.50245	OK	-0.43136	-0.43136	OK	1.2750E+5	-	-	0.00000	65.27922	28.76444	3.62339	20.65500	0.35542	0.071085	0.43136	0.43136	-0.43136	-0.43136	0.78679
0.59133	OK	-0.52000	-0.52000	OK	1.0577E+5	-	-	0.00000	67.25737	30.74143	3.64926	20.65500	0.35666	0.071332	0.52000	0.52000	-0.52000	-0.52000	0.87666
0.73372	OK	-0.66200	-0.66200																



RSK ENVIRONMENT LIMITED

UBB, London

TW Sewer Assessment

FULL DEVELOPMENT LONG TERM_Smoothed

Job No.	Sheet No.	Rev.
371654		
Drg. Ref.		
Made by MK	Date 09-Dec-2020	Checked Date

Stage:	Stage:	Name	Specific	Specific	Utility:	Name	Sub-utility	Distance	x	y	z	Ax.	Ax.	Flexural:	Flexural:	Flexural:	Flexural:	Tension:
Tension:	Check:	Compn.:	Compn.:	Check:	Rad. of	Rad. of	Check:	Peak	Flex.									
Ref.	Tension	Utility:	Compn.:	Check:	Rad. of	Rad. of	Check:	Peak	Flex.									
Total:	Tension	Total:	Total:	Compn.:	Curv.	Rad. of	Rad. of	Tens. Strain				Strain:	Strain:	Tension:	Tension:	Compn.:	Compn.:	Total:
1.05637	OK	-0.68132	-0.68132	OK	8.0725E+4	-	-	9.98547	100.41343	-10.83999	19.73000	1.8752	0.37505	0.68132	0.68132	-0.68132	-0.68132	2.55656
1.22816	OK	-0.85166	-0.85166	OK	6.4580E+4	-	-	11.98257	102.28070	-11.54828	19.73000	1.8825	0.37650	0.85166	0.85166	-0.85166	-0.85166	2.73416
1.39732	OK	-1.01933	-1.01933	OK	5.3957E+4	-	-	13.97966	104.14798	-12.25657	19.73000	1.8900	0.37799	1.0193	1.0193	-1.0193	-1.0193	2.90928
1.52760	OK	-1.14803	-1.14803	OK	4.7908E+4	-	-	15.97676	106.01525	-12.96486	19.73000	1.8979	0.37957	1.1480	1.1480	-1.1480	-1.1480	3.04588
1.53918	OK	-1.15763	-1.15763	OK	4.7511E+4	-	-	17.97385	107.88253	-13.67314	19.73000	1.9077	0.38154	1.1576	1.1576	-1.1576	-1.1576	3.06534
1.39359	OK	-1.00978	-1.00978	OK	5.4467E+4	-	-	19.97095	109.74980	-14.38143	19.73000	1.9190	0.38381	1.0098	1.0098	-1.0098	-1.0098	2.92883
1.13545	OK	-0.74920	-0.74920	OK	7.3411E+4	-	-	21.96804	111.61707	-15.08972	19.73000	1.9312	0.38625	0.74920	0.74920	-0.74920	-0.74920	2.68044
0.85319	OK	-0.46440	-0.46440	OK	1.1843E+5	-	-	23.96513	113.48435	-15.79801	19.73000	1.9440	0.38879	0.46440	0.46440	-0.46440	-0.46440	2.40837
0.63101	OK	-0.23973	-0.23973	OK	2.2942E+5	-	-	25.96223	115.35162	-16.50630	19.73000	1.9564	0.39128	0.23973	0.23973	-0.23973	-0.23973	2.19613
0.53399	OK	-0.14028	-0.14028	OK	3.9207E+5	-	-	27.95932	117.21890	-17.21459	19.73000	1.9685	0.39371	0.14028	0.14028	-0.14028	-0.14028	2.10883
1.72048	OK	-1.42249	-1.42249	OK	3.8665E+4	-	-	29.95642	119.08617	-17.92287	19.73000	1.4900	0.29800	1.4225	1.4225	-1.4225	-1.4225	2.91248
1.04063	OK	-0.90325	-0.90325	OK	6.0891E+4	-	-	31.95351	120.95345	-18.63116	19.73000	0.68690	0.13738	0.90325	0.90325	-0.90325	-0.90325	1.59016
0.78298	OK	-0.70918	-0.70918	OK	7.7554E+4	-	-	33.95061	122.82702	-19.33945	19.73000	0.36899	0.073797	0.70918	0.70918	-0.70918	-0.70918	1.07817
1.00089	OK	-0.92643	-0.92643	OK	5.9368E+4	-	-	35.94770	124.68800	-20.04774	19.73000	0.37227	0.074454	0.92643	0.92643	-0.92643	-0.92643	1.29870
1.03333	OK	-0.95791	-0.95791	OK	5.7417E+4	-	-	37.94480	126.55527	-20.75603	19.73000	0.37711	0.075423	0.95791	0.95791	-0.95791	-0.95791	1.33502
0.86418	OK	-0.78767	-0.78767	OK	6.9826E+4	-	-	39.94189	128.42255	-21.46431	19.73000	0.38257	0.076514	0.78767	0.78767	-0.78767	-0.78767	1.17024
0.53970	OK	-0.46223	-0.46223	OK	1.1899E+5	-	-	41.93899	130.28982	-22.17260	19.73000	0.38736	0.077472	0.46223	0.46223	-0.46223	-0.46223	0.84959
0.14347	OK	-0.06557	-0.06557	OK	8.3877E+5	-	-	43.93608	132.15710	-22.88089	19.73000	0.38951	0.077901	0.065572	0.065572	-0.065572	-0.065572	0.45508
0.35274	OK	-0.27502	-0.27502	OK	1.9998E+5	-	-	45.93317	134.02437	-23.58918	19.73000	0.38857	0.077714	0.27502	0.27502	-0.27502	-0.27502	0.66359
0.49866	OK	-0.42140	-0.42140	OK	1.3052E+5	-	-	47.93027	135.89165	-24.29747	19.73000	0.38630	0.077261	0.42140	0.42140	-0.42140	-0.42140	0.80770
0.39115	OK	-0.31434	-0.31434	OK	1.7497E+5	-	-	49.92736	137.75892	-25.00575	19.73000	0.38406	0.076813	0.31434	0.31434	-0.31434	-0.31434	0.69840
0.11835	OK	-0.04178	-0.04178	OK	1.3163E+6	-	-	51.92446	139.62619	-25.71404	19.73000	0.38281	0.076562	0.041783	0.041783	-0.041783	-0.041783	0.42459
0.28561	OK	-0.20889	-0.20889	OK	2.6330E+5	-	-	53.92155	141.49347	-26.42233	19.73000	0.38362	0.076724	0.20889	0.20889	-0.20889	-0.20889	0.59251
0.38030	OK	-0.30316	-0.30316	OK	1.8142E+5	-	-	55.91865	143.36074	-27.13062	19.73000	0.38572	0.077144	0.30316	0.30316	-0.30316	-0.30316	0.68888
0.32124	OK	-0.24370	-0.24370	OK	2.2568E+5	-	-	57.91574	145.22802	-27.83891	19.73000	0.38771	0.077541	0.24370	0.24370	-0.24370	-0.24370	0.63141
0.18262	OK	-0.10478	-0.10478	OK	5.2489E+5	-	-	59.91284	147.09529	-28.54720	19.73000	0.38918	0.077836	0.10478	0.10478	-0.10478	-0.10478	0.49396
0.13437	OK	-0.05646	-0.05646	OK	9.7416E+5	-	-	61.90993	148.96257	-29.25548	19.73000	0.38953	0.077907	0.056459	0.056459	-0.056459	-0.056459	0.44599
2.98618	OK	-0.48315	-0.48315	OK	1.1384E+5	-	-	1.96795	154.47786	-31.50979	19.20000	12.515	2.5030	0.48315	0.48315	-0.48315	-0.48315	12.99831
2.89491	OK	-0.42960	-0.42960	OK	1.2803E+5	-	-	3.93590	156.25860	-32.34753	19.20000	12.327	2.4653	0.42960	0.42960	-0.42960	-0.42960	12.75616
2.72015	OK	-0.29253	-0.29253	OK	1.8802E+5	-	-	5.90385	158.03934	-33.18526	19.20000	12.138	2.4276	0.29253	0.29253	-0.29253	-0.29253	12.43066
4.94524	OK	-145.25949	-145.25949	OK	1.1122E+4	-	-	7.87180	159.82008	-34.02299	19.20000	-140.31	-28.063	4.9452	4.9452	-4.9452	-4.9452	4.94524
6.31668	OK	-387.94200	-387.94200	OK	8.7071E+3	-	-	9.83975	161.60081	-34.86073	19.20000	-381.63	-76.325	6.3167	6.3167	-6.3167	-6.3167	6.31668
2.30760	OK	-404.49972	-404.49972	OK	2.3834E+4	-	-	11.80771	163.38155	-35.69846	19.20000	-402.19	-80.438	2.3076	2.3076	-2.3076	-2.3076	2.30760
4.49158	OK	-290.33427	-290.33427	OK	1.2245E+4	-	-	13.77566	165.16229	-36.53619	19.20000	-285.84	-57.169	4.4916	4.4916	-4.4916	-4.4916	4.49158
0.98228	OK	-147.71120	-147.71120	OK	5.5992E+4	-	-	15.74361	166.94303	-37.37393	19.20000	-146.73	-29.346	0.98228	0.98228	-0.98228	-0.98228	0.98228
6.61651	OK	-0.05449	-0.05449	OK	1.0093E+6	-	-	17.71156	168.72377	-38.21166	19.20000	32.810	6.5620	0.054495	0.054495	-0.054495	-0.054495	32.86457
40.40200	OK	-0.92834	-0.92834	OK	5.9246E+4	-	-	19.67951	170.50451	-39.04940	19.20000	197.37	39.474	0.92834	0.92834	-0.92834	-0.92834	198.29664
67.14357	OK	-2.32514	-2.32514	OK	2.3654E+4	-	-	21.64746	172.28525	-39.88713	19.20000	324.09	64.818	2.3251	2.3251	-2.3251	-2.3251	326.41726
75.78694	OK	-1.80867	-1.80867	OK	3.0409E+4	-	-	23.61541	174.06599	-40.72486	19.20000	369.89	73.978	1.8087	1.8087	-1.8087	-1.8087	371.69999
77.13835	OK	-0.87040	-0.87040	OK	6.3189E+4	-	-	25.58336	175.84673	-41.56260	19.20000	381.34	76.268	0.87040	0.87040	-0.87040	-0.87040	382.21017
57.15106	OK	-6.50306	-6.50306	OK	8.4576E+3	-	-	27.55131	177.62747	-42.40033	19.20000	253.24	50.648	6.5031	6.5031	-6.5031	-6.5031	259.74304
14.01630	OK	-3.12253	-3.12253	OK	1.7614E+4	-	-	29.51926	179.40821	-43.23806	19.20000	54.469	10.894	3.1225	3.1225	-3.1225	-3.1225	57.59140
2.78571	OK	-2.78566	-2.78566	OK	1.9744E+4	-	-	31.48721	181.18895	-44.07580	19.20000	262.09E-6	52.417E-6	2.7857	2.7857	-2.7857	-2.7857	2.78592
76.61706	OK	-68.25880	-68.25880	OK	3.0033E+3	-	-	3.62091	54.06400	8.76921	16.51600	41.791	8.3583	68.259	68.259	-68.259	-68.259	110.05013

Summary: There is failure at one (or many) location(s). e.g. Stage 0, Specific Utility 1, location (49.000000|10.000000|14.647000)
Note: Tensile strains are +ve, compressive strains are -ve.
Note: The peak flexural tensile strain orientation angle is measured with respect to the global z-axis by looking at the end point of the utility from the start point. Anti-clockwise is positive.

Specific Utility Damage Results - Maximum Values

Stage:	Stage:	Name	Specific	Specific	Utility:	Name	Jointed	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.
Max.	Max.	Max.	Max.	Max.	Utility:	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.
Ref.	Disp:	Disp:	Disp:	Disp:	Ref.	Disp:	Disp:	Disp:	Disp:	Disp:	Disp:	Disp:	Disp:	Disp:	Disp:	Disp:	Disp:	Disp:	Disp:
Horiz.	Horiz.	Horiz.	Horiz.	Horiz.	Horiz.	Horiz.	Horiz.	Horiz.	Horiz.	Horiz.	Horiz.	Horiz.	Horiz.	Horiz.	Horiz.	Horiz.	Horiz.	Horiz.	Horiz.
x:	x:	y:	y:	y:	y:	y:	y:	y:	y:	y:	y:	y:	y:	y:	y:	y:	y:	y:	y:
Location	Location	Location	Location	Location	Location	Location	Location	Location	Location	Location	Location	Location	Location	Location	Location	Location	Location	Location	Location
[m]	[mm]	[m]	[mm]	[m]	[mm]	[m]	[mm]	[m]	[mm]	[m]	[mm]	[m]	[mm]	[m]	[mm]	[m]	[mm]	[m]	[mm]
0	Base Model	1	TWS(1)_1	No	-	-	-	-	-	16.00320	1331.13916*	16.00320	-709.68485	16.003	1.9036E+3	28.006	-15.044		
46.009	-0.56982	46.009	0.18923	No	-	-	-	-	-	28.04466	146.57721	28.04466	-73.27325	28.045	1.1048E+4	54.086	8.9234		
36.057	0.16611	70.111	0.87229	No	-	-	-	-	-	22.07428	360.36452	22.07428	-173.45804	22.074	4.6668E+3	0.0	7.4834		
30.101	0.14240	0.0	0.86770	No	-	-	-	-	-	21.42576	87.91845	7.79119	-32.79067	7.7912	2.4687E+4	25.321	-4.0636		
25.321	0.66357	25.321	5.0134	No	-	-	-	-	-	90.36097	468.70360	78.31284	-815.00519	8.0321	3.4212E+3	20.080	-6.5105		
84.337	-4.8033	34.136	12.478	No	-	-	-	-	-	79.12632	46.03132	79.12632	-45.23891	79.126	1.2158E+3	57.367	3.8606		
39.563	0.12465	79.126	4.5443	Yes	3.9981	0.35577	7.9961	0.02280	9.99516	23.79225	9.99516	-9.62381	9.9952	5.7150E+3	41.980	-4.4777			
0.0	-1.0239	0.0	3.8951	Yes	5.9913	0.10718	5.9913	0.04410	5.99128	28.76820	5.99128	-27.50804	5.9913	1.9994E+3	19.971	-4.9933			
63.907	0.19932	63.907	10.258	Yes	23.615	1.2850	9.8398	0.01865	25.58336	77.13835	11.80771	-82.74602	27.551	8.4576E+3	7.8718	2.2116			
17.712	-3.2286	0.0	10.167	Yes	3.6209	1.1926	3.6209	0.14273	3.62091	76.61706	3.62091	-68.25880	-	-	0.0	12.801			
0.0	-0.34484	0.0	0.30062																



RSK ENVIRONMENT LIMITED

UBB, London

TW Sewer Assessment

FULL DEVELOPMENT LONG TERM (S) + Structural Solution

Job No.	Sheet No.	Rev.
371654		
Drg. Ref.		
Made by MK	Date 09-Dec-2020	Checked Date

Titles

Job No.: 371654
Job Title: UBB, London
Sub-title: TW Sewer Assessment
Calculation Heading: FULL DEVELOPMENT LONG TERM (S) + Structural Solution
Initials: MK
Checker:
Date Saved: 09-Dec-2020
Date Checked:
Notes:
File Name: FULL DEVELOPMENT LONG TERM (1)_(S)+Structural Solution.xdd
File Path: G:\Geoconsult\Projects\371600 - 371699\371654 Ugly Brown Building (UBB)\GMA\REV 02_OCTNOV 2020_TW Only\2 TW\Combinations CSVs for XDISP\CS Vs from XDISP_SMOOTHED

History

Date	Time	By	Notes
19-Jun-2017	11:17	tyler_a	
19-Jun-2017	11:21	tyler_a	
19-Jun-2017	11:24	tyler_a	
19-Jun-2017	11:37	tyler_a	
30-Jun-2017	11:50	tyler_a	
07-Jul-2017	16:50	MKentish	
07-Jul-2017	17:21	MKentish	
10-Jul-2017	09:37	MKentish	
10-Jul-2017	13:57	MKentish	
10-Jul-2017	14:31	MKentish	
10-Jul-2017	16:58	MKentish	
12-Jul-2017	11:37	tyler_a	
13-Jul-2017	17:41	MKentish	
19-Jul-2017	16:52	MKentish	
17-Aug-2017	15:45	MKentish	
17-Aug-2017	15:51	MKentish	
17-Aug-2017	16:49	MKentish	
21-Aug-2017	12:26	TYLER_A	
19-Oct-2017	16:52	MKentish	
19-Oct-2017	17:05	MKentish	
20-Oct-2017	16:16	MKentish	
23-Oct-2017	13:06	MKentish	
05-May-2020	19:22	MKentish	
06-May-2020	17:45	MKentish	
07-May-2020	18:26	MKentish	
11-May-2020	17:18	MKentish	
14-May-2020	11:09	MKentish	
29-Jul-2020	17:55	MKentish	
30-Jul-2020	11:40	MKentish	
30-Jul-2020	15:51	MKentish	
30-Jul-2020	20:18	MKentish	
30-Jul-2020	22:06	MKentish	
31-Jul-2020	10:14	MKentish	
31-Jul-2020	13:16	MKentish	
03-Aug-2020	17:53	MKentish	
07-Aug-2020	14:54	MKentish	
11-Aug-2020	00:42	MKentish	
12-Aug-2020	14:42	MKentish	
29-Oct-2020	17:18	MKentish	
02-Nov-2020	17:52	MKentish	
04-Nov-2020	15:38	MKentish	
05-Nov-2020	12:45	MKentish	
10-Nov-2020	18:01	MKentish	
11-Nov-2020	12:03	MKentish	
11-Nov-2020	15:33	MKentish	
12-Nov-2020	11:57	MKentish	
16-Nov-2020	11:43	MKentish	
16-Nov-2020	13:57	MKentish	
16-Nov-2020	17:37	MKentish	
03-Dec-2020	14:30	MKentish	
04-Dec-2020	18:08	MKentish	
07-Dec-2020	09:40	MKentish	
09-Dec-2020	11:38	MKentish	
09-Dec-2020	13:34	MKentish	

Displacement Lines

Ref.	Name	x1	y1	z1	x2	y2	z2	Intervals	Surface type for tunnels	Interpolate imported displacements	Calculate
		[m]	[m]	[m]	[m]	[m]	[m]	[No.]			
1	TWS(1)_1	48.00000	60.00000	14.64700	50.00000	-40.00000	14.64700	50	Surface	Yes	Yes
2	TWS(2)_1	-33.43100	6.49300	17.09950	36.67900	6.97300	17.09950	35	Surface	Yes	Yes
3	TWS(2)_2	36.67900	6.97300	17.09950	66.57600	3.47200	17.09950	15	Surface	Yes	Yes
4	TWS(2)_3	66.57600	3.47200	17.09950	91.02100	-3.13200	17.09950	13	Surface	Yes	Yes
6	TWS(2)_4	91.02100	-3.13200	16.23650	178.22000	-39.23400	16.23650	47	Surface	Yes	Yes
4	TW Fresh Water (a) - St Pancras	-36.51019	2.76952	20.65500	48.54333	3.88213	20.65500	43	Surface	Yes	Yes
7	TW Fresh Water (b) - St Pancras	48.54333	3.88213	20.34000	91.07705	-7.29855	20.34000	22	Surface	Yes	Yes
8	TW Fresh Water (c) - St Pancras	91.07705	-7.29855	19.73000	152.69712	-30.67206	19.73000	33	Surface	Yes	Yes
9	TW Fresh Water (d) - St Pancras	152.69712	-30.67206	19.20000	184.75043	-45.75126	19.20000	18	Surface	Yes	Yes
10	Assumed FW400 connection to TW2_1	52.86515	12.18589	16.51600	55.26286	5.35252	16.51600	4	Surface	Yes	Yes

Displacement Grids

Ref.	Name	Extrusion: Direction	Base line start: X	Base line start: Y	Base line start: Z (level)	Base line end: X	Base line end: Y	Base line end: Z (level)	Base line end: Intervals	Extrusion: Distance	Extrusion: Intervals	Surface type for tunnels	Calculate
			[m]	[m]	[m]	[m]	[m]	[m]	[No.]	[m]	[No.]		
1	Grid 1	Global X	-20.00000	-70.00000	21.70000	-	100.00000	21.70000	100	250.00000	250	Surface	No

Imported Displacements

Set:	Set:	Result:	Coordinates:	Coordinates:	Coordinates:	Displacements:	Displacements:	Displacements:
Ref.	Name	Ref.	x	y	z	x	y	z
			[m]	[m]	[m]	[mm]	[mm]	[mm]
1	ID Set #	1	48.00000	60.00000	14.64700	0.00000	0.00000	0.28768
		2	48.04000	58.00000	14.64700	0.02000	-0.20000	1.37746
		3	48.08000	56.00000	14.64700	0.08000	-0.46000	2.30057
		4	48.12000	54.00000	14.64700	0.10897	-0.52581	3.07378
		5	48.16000	52.00000	14.64700	0.08000	-0.50000	3.72573
		6	48.20000	50.00000	14.64700	0.03000	-0.42418	4.45846
		7	48.24000	48.00000	14.64700	0.00100	-0.35000	5.11832
		8	48.28000	46.00000	14.64700	-0.00778	-0.22000	4.89518
		9	48.32000	44.00000	14.64700	0.00000	-0.10000	3.15882
		10	48.36000	42.00000	14.64700	0.00000	-0.03500	-0.85992
		11	48.40000	40.00000	14.64700	0.00000	-0.01000	-3.50413
		12	48.44000	38.00000	14.64700	0.00000	0.00000	-5.48681
		13	48.48000	36.00000	14.64700	0.00000	0.00000	-6.48508
		14	48.52000	34.00000	14.64700	0.00000	0.00000	-7.43206
		15	48.56000	32.00000	14.64700	0.00000	0.00000	-8.15014
		16	48.60000	30.00000	14.64700	0.00000	0.00000	-7.83055
		17	48.64000	28.00000	14.64700	0.00000	0.00000	-6.90336
		18	48.68000	26.00000	14.64700	0.00000	0.00000	-5.17612
		19	48.72000	24.00000	14.64700	0.01000	0.02000	-3.30882



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FULL DEVELOPMENT LONG TERM (S) + Structural Solution

Job No.	Sheet No.	Rev.
371654		
Drg. Ref.		
Made by MK	Date 09-Dec-2020	Checked Date

Set: Ref.	Set: Name	Result: Ref.	Coordinates: x [m]	Coordinates: y [m]	Coordinates: z [m]	Displacements: x [mm]	Displacements: y [mm]	Displacements: z [mm]
20			48.760000	22.000000	14.647000	0.025000	0.100000	-1.52338
21			48.800000	20.000000	14.647000	0.060000	0.250000	0.03714
22			48.840000	18.000000	14.647000	0.120000	0.400000	1.38972
23			48.880000	16.000000	14.647000	0.165000	0.525000	2.74602
24			48.920000	14.000000	14.647000	0.177800	0.57349	3.70902
25			48.960000	12.000000	14.647000	0.165000	0.525000	4.00740
26			49.000000	10.000000	14.647000	0.120000	0.400000	3.95121
27			49.040000	8.000000	14.647000	0.060000	0.280000	3.45649
28			49.080000	6.000000	14.647000	0.025000	0.13651	2.77451
29			49.120000	4.000000	14.647000	0.010000	0.050000	2.02075
30			49.160000	2.000000	14.647000	0.000000	0.020000	1.22788
31			49.200000	0.000000	14.647000	0.000000	0.000000	0.73533
32			49.240000	-2.000000	14.647000	0.000000	0.000000	0.55915
33			49.280000	-4.000000	14.647000	0.000000	0.000000	0.49733
34			49.320000	-6.000000	14.647000	0.000000	0.000000	0.52118
35			49.360000	-8.000000	14.647000	0.000000	0.000000	1.57344
36			49.400000	-10.000000	14.647000	0.000000	0.000000	0.64202
37			49.440000	-12.000000	14.647000	0.000000	0.000000	0.71851
38			49.480000	-14.000000	14.647000	0.000000	0.000000	0.79709
39			49.520000	-16.000000	14.647000	0.000000	0.000000	0.87384
40			49.560000	-18.000000	14.647000	0.000000	0.000000	0.94618
41			49.600000	-20.000000	14.647000	0.000000	0.000000	1.01250
42			49.640000	-22.000000	14.647000	0.000000	0.000000	1.07190
43			49.680000	-24.000000	14.647000	0.000000	0.000000	1.12394
44			49.720000	-26.000000	14.647000	0.000000	0.000000	1.16856
45			49.760000	-28.000000	14.647000	0.000000	0.000000	1.20592
46			49.800000	-30.000000	14.647000	0.000000	0.000000	1.23634
47			49.840000	-32.000000	14.647000	0.000000	0.000000	1.26025
48			49.880000	-34.000000	14.647000	0.000000	0.000000	1.27811
49			49.920000	-36.000000	14.647000	0.000000	0.000000	1.29044
50			49.960000	-38.000000	14.647000	0.000000	0.000000	1.29774
51			50.000000	-40.000000	14.647000	0.000000	0.000000	1.30052
52			-33.43100	6.49300	17.100000	0.000000	0.000000	-0.89484
53			-31.42786	6.50671	17.100000	0.000000	0.000000	-0.94567
54			-29.42471	6.52043	17.100000	0.000000	0.000000	-0.99714
55			-27.42157	6.53414	17.100000	0.000000	0.000000	-1.04838
56			-25.41843	6.54786	17.100000	0.000000	0.000000	-1.09820
57			-23.41529	6.56157	17.100000	0.000000	0.000000	-1.14498
58			-21.41214	6.57529	17.100000	0.000000	0.000000	-1.18653
59			-19.40900	6.58900	17.100000	0.000000	0.000000	-1.21994
60			-17.40586	6.60271	17.100000	0.000000	0.000000	-1.24131
61			-15.40271	6.61643	17.100000	0.000000	0.000000	-1.24552
62			-13.39957	6.63014	17.100000	0.000000	0.000000	-1.22576
63			-11.39643	6.64386	17.100000	0.000000	0.000000	-1.17307
64			-9.39329	6.65757	17.100000	0.000000	0.000000	-0.97564
65			-7.39014	6.67129	17.100000	0.000000	0.000000	-0.91805
66			-5.38700	6.68500	17.100000	0.000000	0.000000	-0.60159
67			-3.38386	6.69871	17.100000	0.000000	0.000000	0.07849
68			-1.38071	6.71243	17.100000	0.000000	0.000000	0.87463
69			0.62243	6.72614	17.100000	0.09639	0.10708	1.80929
70			2.62557	6.73986	17.100000	0.16426	0.27097	2.89063
71			4.62871	6.75357	17.100000	0.15947	0.46368	4.08899
72			6.63186	6.76729	17.100000	0.08180	0.65832	5.31222
73			8.63500	6.78100	17.100000	0.00925	0.75866	6.42107
74			10.63814	6.79471	17.100000	0.00935	0.76663	7.34834
75			12.64129	6.80843	17.100000	0.00944	0.77462	8.04007
76			14.64443	6.82214	17.100000	0.00954	0.78263	8.50457
77			16.64757	6.83586	17.100000	0.00964	0.79066	8.79268
78			18.65071	6.84957	17.100000	0.00974	0.79872	8.95641
79			20.65386	6.86329	17.100000	0.00984	0.80680	9.03374
80			22.65700	6.87700	17.100000	0.00993	0.81491	9.04966
81			24.66014	6.89071	17.100000	0.01003	0.82305	9.02071
82			26.66329	6.90443	17.100000	0.01013	0.83120	8.95749
83			28.66643	6.91814	17.100000	0.01023	0.83939	8.86474
84			30.66957	6.93186	17.100000	0.01033	0.84760	8.74023
85			32.67271	6.94557	17.100000	0.01043	0.85583	8.57308
86			34.67586	6.95929	17.100000	0.01053	0.86409	8.34139
87			36.67900	6.97300	17.100000	0.01064	0.87238	8.00912
88			38.68213	6.98671	17.100000	0.01009	0.82726	7.01376
89			40.68527	6.50602	17.100000	0.00954	0.78290	5.89090
90			42.65840	6.27280	17.100000	0.00877	0.71898	4.61789
91			44.65153	6.03940	17.100000	0.00637	0.52225	3.08866
92			46.64467	5.80600	17.100000	0.00387	0.31751	1.67595
93			48.63780	5.57260	17.100000	0.00167	0.13707	0.49880
94			50.63094	5.33920	17.100000	0.00000	0.00000	-0.44170
95			52.62407	5.10580	17.100000	0.00000	0.00000	-1.21225
96			54.61720	4.87240	17.100000	0.00000	0.00000	-1.80398
97			56.61033	4.63900	17.100000	0.00000	0.00000	-2.17700
98			58.60347	4.40560	17.100000	0.00000	0.00000	-2.44395
99			60.59660	4.17220	17.100000	0.00000	0.00000	-2.65938
100			62.58973	3.93880	17.100000	0.01149	0.26772	-2.03587
101			64.58287	3.70540	17.100000	0.15568	0.36268	-2.18778
102			66.57600	3.47200	17.100000	0.19716	0.45931	-2.32634
103			68.56913	2.96400	17.100000	0.21742	0.50650	-2.55437
104			70.56227	2.45600	17.100000	0.23790	0.55422	-2.76139
105			72.55540	1.94800	17.100000	0.25864	0.60253	-2.94578
106			74.54854	1.44000	17.100000	0.30146	0.70228	-3.09229
107			76.54167	0.93200	17.100000	0.40409	0.94137	-3.20267
108			78.53481	0.42400	17.100000	0.50703	1.18119	-3.31021
109			80.52795	-0.08400	17.100000	0.63083	1.47288	-3.41053
110			82.52109	-0.59200	17.100000	0.77704	1.82029	-3.51394
111			84.51423	-1.10000	17.100000	0.94679	2.22623	-3.61846
112			86.50737	-1.60800	17.100000	1.14697	2.70786	-3.71969
113			88.50051	-2.11600	17.100000	1.38701	3.28867	-3.81721
114			89.49365	-2.62400	17.100000	1.66459	3.96529	-3.92131
115			91.48679	-3.13200	17.100000	1.94819	4.66697	-4.06114
116			93.47993	-3.64000	16.23650	1.28838	3.12987	-4.36104
117			95.47307	-4.14800	16.23651	1.79883	4.11536	-4.52664
118			97.46621	-4.64826	16.23652	2.40589	5.64955	-4.31748
119			99.45935	-5.14338	16.23653	3.15956	7.63552	-4.02068
120			101.45249	-5.64041	16.23654	3.65630	8.94973	-3.99941
121			103.44563	-6.12764	16.23655	3.79391	9.34335	-4.62047
122			105.43877	-6.60479	16.23656	3.90140	9.63668	-5.22382
123			107.43191	-7.07989	16.23657	4.00734	9.87970	-5.74052
124			109.42505	-7.55272	16.23659	4.07979	10.12243	-6.34277
125			111.41819	-8.02155	16.23660	4.15201	10.33588	-6.43315
126			113.41133	-8.48691	16.23661	4.22400	10.51507	-6.51805
127			115.40447	-8.94914	16.23662	4.29575	10.69369	-6.40879
128			117.39761	-9.40937	16.23663	4.36726	10.87172	-6.16334
129			119.39075	-9.86756	16.23664	4.43854	11.04916	-5.85074
130			121.38389	-10.32379	16.23665	4.50959	11.22602	-5.52850
131			123.37703	-10.77802	16.23666	4.58040	11.40229	-5.23413
132			125.37017	-11.22953	16.23667	4.65097	11.57798	-4.97822
133			127.36331	-11.67800	16.23668	4.65163	11.57960	-4.84031
134		</						



RSK ENVIRONMENT LIMITED

UBB, London

TW Sewer Assessment

FULL DEVELOPMENT LONG TERM (S) + Structural Solution

Job No.	Sheet No.	Rev.
371654		
Drg. Ref.		
Made by MK	Date 09-Dec-2020	Checked Date

Ref.	Set: Name	Result: Ref.	Coordinates: x [m]	Coordinates: y [m]	Coordinates: z [m]	Displacements: x [mm]	Displacements: y [mm]	Displacements: z [mm]
		161	174.50940	-37.69774	16.23698	-1.91965	3.92734	0.21232
		162	176.36470	-38.46587	16.23699	-1.41549	2.89590	-0.11738
		163	178.22000	-39.23400	16.23700	-0.95525	1.95431	-0.33771
		164	-36.51019	2.76952	20.65500	0.00000	0.00000	-0.78221
		165	-34.53220	2.79539	20.65500	0.00000	0.00000	-0.82776
		166	-32.55921	2.82127	20.65500	0.00000	0.00000	-0.87485
		167	-30.57622	2.84714	20.65500	0.00000	0.00000	-0.92312
		168	-28.59823	2.87302	20.65500	0.00000	0.00000	-0.97206
		169	-26.62024	2.89889	20.65500	0.00000	0.00000	-1.02096
		170	-24.64226	2.92477	20.65500	0.00000	0.00000	-1.06886
		171	-22.66427	2.95064	20.65500	0.00000	0.00000	-1.11449
		172	-20.68628	2.97652	20.65500	0.00000	0.00000	-1.15617
		173	-18.70829	3.00239	20.65500	0.00000	0.00000	-1.19175
		174	-16.73030	3.02827	20.65500	0.00000	0.00000	-1.21844
		175	-14.75231	3.05414	20.65500	0.00000	0.00000	-1.23269
		176	-12.77432	3.08002	20.65500	0.00000	0.00000	-1.23003
		177	-10.79633	3.10589	20.65500	0.00000	0.00000	-1.20493
		178	-8.81834	3.13177	20.65500	0.00000	0.00000	-1.15062
		179	-6.84036	3.15764	20.65500	0.00000	0.00000	-1.05909
		180	-4.86237	3.18352	20.65500	0.00000	0.00000	-0.92130
		181	-2.88438	3.20939	20.65500	0.00000	0.00000	-0.69637
		182	-0.90639	3.23527	20.65500	0.02152	0.03228	-0.16634
		183	1.07160	3.26114	20.65500	0.09498	0.20524	0.41598
		184	3.04959	3.28701	20.65500	0.11936	0.40508	1.01780
		185	5.02958	3.31289	20.65500	0.10342	0.64559	1.59246
		186	7.00557	3.33876	20.65500	0.04624	0.89794	2.17882
		187	8.98355	3.36464	20.65500	0.01264	1.03714	2.64622
		188	10.96154	3.39051	20.65500	0.01399	1.14732	3.05276
		189	12.93953	3.41639	20.65500	0.01536	1.26004	3.38232
		190	14.91752	3.44226	20.65500	0.01677	1.37528	3.62984
		191	16.89551	3.46814	20.65500	0.01820	1.49305	3.80230
		192	18.87350	3.49401	20.65500	0.01879	1.54143	3.90202
		193	20.85149	3.51989	20.65500	0.01913	1.56906	3.94858
		194	22.82948	3.54576	20.65500	0.01947	1.59669	3.95713
		195	24.80747	3.57164	20.65500	0.01980	1.62434	3.93558
		196	26.78545	3.59751	20.65500	0.02014	1.65199	3.88873
		197	28.76344	3.62339	20.65500	0.02048	1.67966	3.81805
		198	30.74143	3.64926	20.65500	0.02082	1.70734	3.72140
		199	32.71942	3.67514	20.65500	0.02115	1.73502	3.59261
		200	34.69741	3.70101	20.65500	0.02149	1.76273	3.42130
		201	36.67540	3.72689	20.65500	0.02183	1.79044	3.19345
		202	38.65339	3.75276	20.65500	0.02217	1.81817	2.89370
		203	40.63138	3.77864	20.65500	0.02251	1.84591	2.51095
		204	42.60936	3.80451	20.65500	0.00317	4.54478	3.53830
		205	44.58735	3.83038	20.65500	0.00243	4.50967	2.85603
		206	46.56534	3.85626	20.65500	0.00123	4.43738	2.12623
		207	48.54333	3.88213	20.65500	0.00000	4.02741	1.28013
		208	48.54333	3.88213	20.34000	0.00000	4.02741	-1.28013
		209	50.47668	3.37392	20.34000	0.00000	3.06246	-0.11825
		210	52.41003	2.86571	20.34000	-0.00209	2.23214	-1.27881
		211	54.34338	2.35750	20.34000	-0.05267	1.55462	-2.18841
		212	56.27674	1.84928	20.34000	-0.06284	0.87470	-2.92876
		213	58.21009	1.34107	20.34000	-0.02832	0.24795	-3.23998
		214	60.14344	0.83286	20.34000	0.00000	0.00000	-2.94826
		215	62.07679	0.32464	20.34000	0.00000	0.00000	-3.12181
		216	64.01014	-0.18357	20.34000	0.00000	0.00000	-3.27073
		217	65.94349	-0.69178	20.34000	0.00000	0.00000	-3.40097
		218	67.87684	-1.20000	20.34000	0.00000	0.00000	-3.51645
		219	69.81019	-1.70821	20.34000	0.00000	0.00000	-3.61976
		220	71.74354	-2.21642	20.34000	0.00000	0.00000	-3.71311
		221	73.67689	-2.72463	20.34000	0.00000	0.00000	-3.79923
		222	75.61025	-3.23285	20.34000	0.01320	0.03074	-3.88188
		223	77.54360	-3.74106	20.34000	0.03375	0.07862	-3.96618
		224	79.47695	-4.24927	20.34000	0.07037	0.16649	-4.04933
		225	81.41030	-4.75749	20.34000	0.11787	0.42582	-4.11310
		226	83.34365	-5.26570	20.34000	0.30729	0.74966	-4.23255
		227	85.27700	-5.77391	20.34000	0.46968	1.15056	-4.33573
		228	87.21035	-6.28213	20.34000	0.66846	1.64206	-4.42518
		229	89.14370	-6.79034	20.34000	0.92983	2.28932	-4.47598
		230	91.07705	-7.29855	20.34000	1.28111	3.16036	-4.45559
		231	91.07705	-7.29855	19.73000	1.28111	3.16036	-4.45557
		232	92.94433	-8.00684	19.73000	1.66555	4.11639	-4.39246
		233	94.81160	-8.71513	19.73000	2.07402	5.13223	-4.33371
		234	96.67888	-9.42342	19.73000	2.68682	6.68848	-3.99749
		235	98.54615	-10.13170	19.73000	2.75730	6.86394	-3.79472
		236	100.41343	-10.83999	19.73000	2.82823	7.04049	-4.15714
		237	102.28070	-11.54828	19.73000	2.89959	7.21814	-4.46999
		238	104.14798	-12.25657	19.73000	2.97139	7.39687	-4.72096
		239	106.01525	-12.96486	19.73000	3.04363	7.57670	-4.89790
		240	107.88253	-13.67314	19.73000	3.11631	7.75763	-4.99150
		241	109.74980	-14.38143	19.73000	3.18942	7.93964	-5.00109
		242	111.61707	-15.08972	19.73000	3.26298	8.12275	-4.93740
		243	113.48435	-15.79801	19.73000	3.33697	8.30695	-4.81935
		244	115.35162	-16.50630	19.73000	3.41141	8.49224	-4.66760
		245	117.21890	-17.21459	19.73000	3.48628	8.67863	-4.49848
		246	119.08617	-17.92287	19.73000	3.56159	8.86611	-4.31922
		247	120.95345	-18.63116	19.73000	3.59999	8.96168	-4.16884
		248	122.82072	-19.33945	19.73000	3.61396	8.99648	-4.01686
		249	124.68800	-20.04774	19.73000	3.62795	9.03130	-3.81346
		250	126.55527	-20.75603	19.73000	3.64194	9.06612	-3.54286
		251	128.42255	-21.46431	19.73000	3.65594	9.10097	-3.20279
		252	130.28982	-22.17260	19.73000	3.66994	9.13584	-2.80561
		253	132.15710	-22.88089	19.73000	3.68396	9.17071	-2.37490
		254	134.02437	-23.58918	19.73000	3.69797	9.20561	-1.93944
		255	135.89165	-24.29747	19.73000	3.71200	9.24052	-1.52392
		256	137.75892	-25.00575	19.73000	3.72603	9.27545	-1.13896
		257	139.62619	-25.71404	19.73000	3.74007	9.31040	-0.77681
		258	141.49347	-26.42233	19.73000	3.75411	9.34536	-0.41768
		259	143.36074	-27.13062	19.73000	3.76817	9.38034	-0.04341
		260	145.22802	-27.83891	19.73000	3.78222	9.41534	0.35283
		261	147.09529	-28.54720	19.73000	3.79629	9.45035	0.76675
		262	148.96257	-29.25548	19.73000	3.81036	9.48539	1.18826
		263	150.82984	-29.96377	19.73000	3.82444	9.52044	1.60567
		264	152.69712	-30.67206	19.73000	3.79607	9.44980	1.95349
		265	152.69712	-30.67206	19.20000	3.79607	9.44980	1.94774
		266	154.47786	-31.50979	19.20000	3.63610	9.05160	2.05751
		267	156.25860	-32.34753	19.20000	3.47853	8.65933	2.13386
		268	158.03934	-33.18526	19.20000	3.32333	8.27299	2.18064
		269	159.82008	-34.02299	19.20000	3.17052	7.89259	2.20783
		270	161.60081	-34.86073	19.20000	2.32819	7.45540	2.18706
		271	163.38155	-35.69846	19.20000	1.00208	6.81282	1.95574
		272	165.16229	-36.53619	19.20000	-0.09490	6.02512	1.56548
		273	166.94303	-37.37393	19.20000	-0.88676	5.44208	1.20271
		274	168.72377	-38.21166	19.20000	-1.34125	4.73349	0.77763
		275	170.50451	-39.04940	19.20000	-2.49310	3.88022	0.35315
		276	172.28525	-39.88713	19.20000	-1.34101	2.91013	-0.00706
		277	174.06599	-40.72486	19.20000	-0.96582	1.97594	-0.27225
		278	1					



RSK ENVIRONMENT LIMITED

UBB, London

TW Sewer Assessment

FULL DEVELOPMENT LONG TERM (S) + Structural Solution

Job No.	Sheet No.	Rev.
371654		
Drg. Ref.		
Made by MK	Date 09-Dec-2020	Checked Date

Corner	x	y	Base Level	Arc Enabled	Stiffened	Prev. Side: d	Prev. p1	Prev. p2*	Next Side: d	Next p1	Next p2*
	[m]	[m]	[m]			[m]	[%]	[%]	[m]	[%]	[%]
1	42.430	45.000	13.450	Yes	No	-	-	-	-	-	-
2	18.390	46.290	13.450	No	No	-	-	-	-	-	-
3	7.3100	46.290	13.450	Yes	No	-	-	-	-	-	-
4	7.9800	14.740	13.700	Yes	No	-	-	-	-	-	-
5	42.430	14.320	13.700	Yes	No	-	-	-	-	-	-

Side	x1 [m]	y1 [m]	x2 [m]	y2 [m]	G.M. Curve: Vertical			G.M. Curve: Horizontal		
1	42.430	45.000	18.390	46.290	No	vertical	ground movement	No	horizontal	ground movement
2	18.390	46.290	7.3100	46.290	No	vertical	ground movement	No	horizontal	ground movement
3	7.3100	46.290	7.9800	14.740	No	vertical	ground movement	No	horizontal	ground movement
4	7.9800	14.740	42.430	14.320	No	vertical	ground movement	No	horizontal	ground movement
5	42.430	14.320	42.430	45.000	No	vertical	ground movement	No	horizontal	ground movement

Ref.
Excavation Name: 2
Surface level [m]: PLOT A - 17.2m AOD Excavation (+ve)
Contribution: 18.000
Surface movement curves which are
selected are applied between
surface and [m]: Positive
17.200

Corner	x	y	Base Level	Arc Enabled	Stiffened	Prev. Side: d	Prev. p1	Prev. p2*	Next Side: d	Next p1	Next p2*
	[m]	[m]	[m]			[m]	[%]	[%]	[m]	[%]	[%]
1	42.430	45.000	17.200	Yes	No	-	-	-	-	-	-
2	18.390	46.290	17.200	No	No	-	-	-	-	-	-
3	7.3100	46.290	17.200	Yes	Yes	9.5000	67.000	25.000	9.5000	67.000	25.000
4	7.9800	14.740	17.200	Yes	Yes	9.5000	67.000	25.000	9.5000	67.000	25.000
5	42.430	14.320	17.200	Yes	No	-	-	-	-	-	-

Side	x1 [m]	y1 [m]	x2 [m]	y2 [m]	G.M. Curve: Vertical			G.M. Curve: Horizontal		
1	42.430	45.000	18.390	46.290	No	vertical	ground movement	No	horizontal	ground movement
2	18.390	46.290	7.3100	46.290	No	vertical	ground movement	No	horizontal	ground movement
3	7.3100	46.290	7.9800	14.740	No	vertical	ground movement	No	horizontal	ground movement
4	7.9800	14.740	42.430	14.320	No	vertical	ground movement	No	horizontal	ground movement
5	42.430	14.320	42.430	45.000	No	vertical	ground movement	No	horizontal	ground movement

Ref.
Excavation Name: 3
Surface level [m]: Proposed Contig Wall south_2
Contribution: 21.700
Surface movement curves which are
selected are applied between
surface and [m]: Positive
13.575

Corner	x	y	Base Level	Arc Enabled	Stiffened	Prev. Side: d	Prev. p1	Prev. p2*	Next Side: d	Next p1	Next p2*
	[m]	[m]	[m]			[m]	[%]	[%]	[m]	[%]	[%]
1	51.335	44.430	13.575	No	No	-	-	-	-	-	-
2	52.345	22.880	13.575	No	No	-	-	-	-	-	-
3	52.350	22.880	13.575	Yes	No	-	-	-	-	-	-
4	51.340	44.430	13.575	Yes	No	-	-	-	-	-	-

Side	x1 [m]	y1 [m]	x2 [m]	y2 [m]	G.M. Curve: Vertical			G.M. Curve: Horizontal		
1	51.335	44.430	52.345	22.880	No	vertical	ground movement	No	horizontal	ground movement
2	52.345	22.880	52.350	22.880	No	vertical	ground movement	No	horizontal	ground movement
3	52.350	22.880	51.340	44.430	No	vertical	ground movement	No	horizontal	ground movement
4	51.340	44.430	51.335	44.430	No	vertical	ground movement	No	horizontal	ground movement

Ref.
Excavation Name: 4
Surface level [m]: PLOT B NEW WALL 1
Contribution: 21.700
Surface movement curves which are
selected are applied between
surface and [m]: Positive
13.700

Corner	x	y	Base Level	Arc Enabled	Stiffened	Prev. Side: d	Prev. p1	Prev. p2*	Next Side: d	Next p1	Next p2*
	[m]	[m]	[m]			[m]	[%]	[%]	[m]	[%]	[%]
1	51.340	44.430	13.700	No	No	-	-	-	-	-	-
2	101.00	63.000	13.700	No	No	-	-	-	-	-	-
3	101.00	46.000	13.700	No	No	-	-	-	-	-	-
4	65.520	17.230	13.700	No	No	-	-	-	-	-	-
5	52.350	22.880	13.700	No	No	-	-	-	-	-	-

Side	x1 [m]	y1 [m]	x2 [m]	y2 [m]	G.M. Curve: Vertical			G.M. Curve: Horizontal		
1	51.340	44.430	101.00	63.000	No	vertical	ground movement	No	horizontal	ground movement
2	101.00	63.000	101.00	46.000	No	vertical	ground movement	No	horizontal	ground movement
3	101.00	46.000	65.520	17.230	No	vertical	ground movement	No	horizontal	ground movement
4	65.520	17.230	52.350	22.880	No	vertical	ground movement	No	horizontal	ground movement
5	52.350	22.880	51.340	44.430	No	vertical	ground movement	No	horizontal	ground movement

Ref.
Excavation Name: 5
Surface level [m]: PLOT B & C ALL EXC - 19.10m AOD (+ve)
Contribution: 21.700
Surface movement curves which are
selected are applied between
surface and [m]: Positive
19.100

Corner	x	y	Base Level	Arc Enabled	Stiffened	Prev. Side: d	Prev. p1	Prev. p2*	Next Side: d	Next p1	Next p2*
	[m]	[m]	[m]			[m]	[%]	[%]	[m]	[%]	[%]
1	51.340	44.430	19.100	No	Yes	25.000	9.5000	25.000	25.000	67.000	25.000
2	101.00	63.000	19.100	Yes	No	-	-	-	-	-	-
3	167.21	84.375	19.100	Yes	Yes	9.5000	67.000	25.000	9.5000	67.000	25.000
4	176.07	61.064	19.100	Yes	No	-	-	-	-	-	-
5	175.87	-18.327	19.100	Yes	Yes	9.5000	67.000	25.000	9.5000	67.000	25.000
6	164.92	-23.678	19.100	Yes	Yes	9.5000	67.000	25.000	9.5000	67.000	25.000
7	101.00	2.0000	19.100	No	No	-	-	-	-	-	-
8	52.350	22.880	19.100	No	No	-	-	-	-	-	-

Side	x1 [m]	y1 [m]	x2 [m]	y2 [m]	G.M. Curve: Vertical			G.M. Curve: Horizontal		
1	51.340	44.430	101.00	63.000	No	vertical	ground movement	No	horizontal	ground movement
2	101.00	63.000	167.21	84.375	No	vertical	ground movement	No	horizontal	ground movement
3	167.21	84.375	176.07	61.064	No	vertical	ground movement	No	horizontal	ground movement
4	176.07	61.064	175.87	-18.327	No	vertical	ground movement	No	horizontal	ground movement
5	175.87	-18.327	164.92	-23.678	No	vertical	ground movement	No	horizontal	ground movement
6	164.92	-23.678	101.00	2.0000	No	vertical	ground movement	No	horizontal	ground movement
7	101.00	2.0000	52.350	22.880	No	vertical	ground movement	No	horizontal	ground movement



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Job No.	Sheet No.	Rev.
371654		
Drg. Ref.		
Made by MK	Date 09-Dec-2020	Checked Date

Side	x1 [m]	y1 [m]	x2 [m]	y2 [m]	G.M. Curve: Vertical	G.M. Curve: Horizontal
8	52.350	22.880	51.340	44.430	No vertical ground movement	No horizontal ground movement

Ref.
Excavation Name: 6
Surface level [m]: PLOT B WALL INST - 2
Contribution: 21.700
Surface movement curves which are
selected are applied between
surface and [m]: 11.700

Corner	x	y	Base Level	Arc Enabled	Stiffened	Prev. Side: d	Prev. Side: p1	Prev. Side: p2*	Next Side: d	Next Side: p1	Next Side: p2*
	[m]	[m]	[m]			[m]	[%]	[%]	[m]	[%]	[%]
1	101.00	2.0000	11.700	No	No	-	-	-	-	-	-
2	101.00	46.000	11.700	No	No	-	-	-	-	-	-
3	65.520	17.230	11.700	No	No	-	-	-	-	-	-

Side	x1 [m]	y1 [m]	x2 [m]	y2 [m]	G.M. Curve: Vertical	G.M. Curve: Horizontal
1	101.00	2.0000	101.00	46.000	No vertical ground movement	No horizontal ground movement
2	101.00	46.000	65.520	17.230	No vertical ground movement	No horizontal ground movement
3	65.520	17.230	101.00	2.0000	No vertical ground movement	No horizontal ground movement

Ref.
Excavation Name: 7
Surface level [m]: PLOT B EXC - 16.3mAOD (+ve)
Contribution: 19.100
Surface movement curves which are
selected are applied between
surface and [m]: 16.300

Corner	x	y	Base Level	Arc Enabled	Stiffened	Prev. Side: d	Prev. Side: p1	Prev. Side: p2*	Next Side: d	Next Side: p1	Next Side: p2*
	[m]	[m]	[m]			[m]	[%]	[%]	[m]	[%]	[%]
1	101.00	2.0000	16.300	No	Yes	9.5000	67.000	25.000	9.5000	67.000	25.000
2	101.00	46.000	16.300	No	No	-	-	-	-	-	-
3	65.520	17.230	16.300	Yes	No	-	-	-	-	-	-

Side	x1 [m]	y1 [m]	x2 [m]	y2 [m]	G.M. Curve: Vertical	G.M. Curve: Horizontal
1	101.00	2.0000	101.00	46.000	No vertical ground movement	No horizontal ground movement
2	101.00	46.000	65.520	17.230	No vertical ground movement	No horizontal ground movement
3	65.520	17.230	101.00	2.0000	No vertical ground movement	No horizontal ground movement

Ref.
Excavation Name: 8
Surface level [m]: PLOT C - WALL INST
Contribution: 21.700
Surface movement curves which are
selected are applied between
surface and [m]: 9.2000

Corner	x	y	Base Level	Arc Enabled	Stiffened	Prev. Side: d	Prev. Side: p1	Prev. Side: p2*	Next Side: d	Next Side: p1	Next Side: p2*
	[m]	[m]	[m]			[m]	[%]	[%]	[m]	[%]	[%]
1	167.21	84.375	9.2000	Yes	No	-	-	-	-	-	-
2	101.00	63.000	9.2000	No	No	-	-	-	-	-	-
3	101.00	2.0000	9.2000	No	No	-	-	-	-	-	-
4	164.92	-23.678	9.2000	Yes	No	-	-	-	-	-	-
5	175.87	-18.327	9.2000	Yes	No	-	-	-	-	-	-
6	176.07	61.064	9.2000	Yes	No	-	-	-	-	-	-

Side	x1 [m]	y1 [m]	x2 [m]	y2 [m]	G.M. Curve: Vertical	G.M. Curve: Horizontal
1	167.21	84.375	101.00	63.000	No vertical ground movement	No horizontal ground movement
2	101.00	63.000	101.00	2.0000	No vertical ground movement	No horizontal ground movement
3	101.00	2.0000	164.92	-23.678	No vertical ground movement	No horizontal ground movement
4	164.92	-23.678	175.87	-18.327	No vertical ground movement	No horizontal ground movement
5	175.87	-18.327	176.07	61.064	No vertical ground movement	No horizontal ground movement
6	176.07	61.064	167.21	84.375	No vertical ground movement	No horizontal ground movement

Ref.
Excavation Name: 9
Surface level [m]: PLOT C - EXC (+ve)
Contribution: 19.100
Surface movement curves which are
selected are applied between
surface and [m]: 13.400

Corner	x	y	Base Level	Arc Enabled	Stiffened	Prev. Side: d	Prev. Side: p1	Prev. Side: p2*	Next Side: d	Next Side: p1	Next Side: p2*
	[m]	[m]	[m]			[m]	[%]	[%]	[m]	[%]	[%]
1	167.21	84.375	13.400	Yes	Yes	9.5000	67.000	25.000	9.5000	67.000	25.000
2	101.00	63.000	13.400	Yes	Yes	25.000	9.5000	25.000	25.000	67.000	25.000
3	101.00	2.0000	13.400	Yes	Yes	25.000	9.5000	25.000	25.000	67.000	25.000
4	164.92	-23.678	13.400	Yes	Yes	9.4300	67.000	25.000	9.4300	67.000	25.000
5	175.87	-18.327	13.400	Yes	Yes	9.4300	67.000	25.000	9.4300	67.000	25.000
6	176.07	61.064	13.400	Yes	No	-	-	-	-	-	-

Side	x1 [m]	y1 [m]	x2 [m]	y2 [m]	G.M. Curve: Vertical	G.M. Curve: Horizontal
1	167.21	84.375	101.00	63.000	No vertical ground movement	No horizontal ground movement
2	101.00	63.000	101.00	2.0000	No vertical ground movement	No horizontal ground movement
3	101.00	2.0000	164.92	-23.678	No vertical ground movement	No horizontal ground movement
4	164.92	-23.678	175.87	-18.327	No vertical ground movement	No horizontal ground movement
5	175.87	-18.327	176.07	61.064	No vertical ground movement	No horizontal ground movement
6	176.07	61.064	167.21	84.375	No vertical ground movement	No horizontal ground movement

Ref.
Excavation Name: 10
Surface level [m]: PLOT A - 18.00mAOD - EXC (+ve)
Contribution: 21.700
Surface movement curves which are
selected are applied between
surface and [m]: 18.000

Corner	x	y	Base Level	Arc Enabled	Stiffened	Prev. Side: d	Prev. Side: p1	Prev. Side: p2*	Next Side: d	Next Side: p1	Next Side: p2*
	[m]	[m]	[m]			[m]	[%]	[%]	[m]	[%]	[%]
1	7.3100	46.290	18.000	Yes	Yes	9.5000	67.000	25.000	9.5000	67.000	25.000
2	18.390	46.290	18.000	Yes	No	-	-	-	-	-	-
3	42.430	45.000	18.000	Yes	No	-	-	-	-	-	-
4	51.340	44.430	18.000	No	Yes	9.5000	67.000	25.000	9.5000	67.000	25.000
5	52.350	22.880	18.000	No	No	-	-	-	-	-	-
6	52.350	14.320	18.000	Yes	Yes	9.5000	67.000	25.000	9.5000	67.000	25.000
7	42.430	14.320	18.000	No	No	-	-	-	-	-	-
8	7.9800	14.740	18.000	Yes	Yes	9.5000	67.000	25.000	9.5000	67.000	25.000

Side	x1 [m]	y1 [m]	x2 [m]	y2 [m]	G.M. Curve: Vertical	G.M. Curve: Horizontal

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	[m]	[m]	[m]	[m]				
1	7.3100	46.290	18.390	46.290	No vertical ground movement	No horizontal ground movement	No horizontal ground movement	
2	18.390	46.290	42.430	45.000	No vertical ground movement	No horizontal ground movement	No horizontal ground movement	
3	42.430	45.000	42.430	42.430	No vertical ground movement	No horizontal ground movement	No horizontal ground movement	
4	51.340	44.430	52.350	22.880	No vertical ground movement	No horizontal ground movement	No horizontal ground movement	
5	52.350	22.880	52.350	14.320	No vertical ground movement	No horizontal ground movement	No horizontal ground movement	
6	52.350	14.320	42.430	14.320	No vertical ground movement	No horizontal ground movement	No horizontal ground movement	
7	42.430	14.320	9.800	1.740	No vertical ground movement	No horizontal ground movement	No horizontal ground movement	
8	7.9800	14.740	7.3100	46.290	No vertical ground movement	No horizontal ground movement	No horizontal ground movement	

Ref.	11
Excavation Name:	Proposed Contig Wall South 1
Surface level [m]:	21.700
Contribution:	Positive
Surface movement curves which are selected are applied between surface and [m]:	13.575

Corner	x	y	Base Level	Arc Enabled	Stiffened	Prev. Side:	Prev. d	Prev. p1	Next: Side:	Next: d	Next: p1	Next: p2*
	[m]	[m]	[m]			[m]	[%]	[%]	[m]	[m]	[%]	[%]
1	52.345	22.880	13.575	No	No	-	-	-	-	-	-	-
2	52.345	14.320	13.575	No	No	-	-	-	-	-	-	-
3	52.350	14.320	13.575	Yes	No	-	-	-	-	-	-	-
4	52.350	22.880	13.575	Yes	No	-	-	-	-	-	-	-

Side	x1 [m]	y1 [m]	x2 [m]	y2 [m]	G.M. Curve: Vertical	G.M. Curve: Horizontal
1	52.345	22.880	52.345	14.320	No vertical ground movement	No horizontal ground movement
2	52.345	14.320	52.350	14.320	No vertical ground movement	No horizontal ground movement
3	52.350	14.320	52.350	22.880	No vertical ground movement	No horizontal ground movement
4	52.350	22.880	52.345	22.880	No vertical ground movement	No horizontal ground movement

Circular Excavations

Vertical Ground Movement Curves

Curve Name: No vertical ground movement
Coordinates: [Distance from wall / wall depth or max. excavation depth (x), Depth / wall depth or max. excavation depth (y), Settlement / wall depth or max. excavation depth (z){%}]
[0.000,0.000,0.000][1.000,0.000,0.000][0.000,1.000,0.000][1.000,1.000,0.000]

```
Curve Fitting Method: Polynomial
x Order: 1
y Order: 0
Polynomial: z = 0.0x + 0.0
Coeff. of Determination:
```

Horizontal Ground Movement Curves

```
Curve Name: No horizontal ground movement
Coordinates: [Distance from wall / wall depth or max. excavation depth (x), Depth / wall
depth or max. excavation depth (y), Horizontal movement / wall depth or max.
excavation depth (z) (%)
[0.000,0.000,0.000][1.000,0.000,0.000][0.000,1.000,0.000][1.000,1.000,0.000]
Curve Fitting Method: Polynomial
x Order: 0
y Order: 0
Polynomial: z = 0.0
Coeff. of Determination:
```

Utility Dimensions

Ref.	Name	Internal Diameter [mm]	Wall Thickness [mm]
1	TWS(1)_1_2134mm Dia	2134.0	200.00
2	TWS(2)_1_1219mm Dia	1219.0	200.00
3	TWS(2)_2_1219mm Dia	1219.0	200.00
4	TWS(2)_3_1219mm Dia	1219.0	200.00
5	TWS(2)_4_1093mm Dia	1093.0	200.00
6	TW Fresh Water (a) - St Pancras	100.0	5.0000
7	TW Fresh Water (b) - St Pancras	100.0	5.0000
8	TW Fresh Water (c) - St Pancras	100.0	5.0000
9	TW Fresh Water (d) - St Pancras	100.0	5.0000
10	Assumed FW400 connection to TW2 1	400.0	5.0000

Acceptance Criteria/Parameters

[illegible]

Utility Strain Calculation Options

Neglect beneficial contribution of axial strains : Yes

Utilities

Ref. Poly segs	Utility Name	Start	End	Pipe	Sub-Utility	Jointed	Dimension	Acceptance	Displacement	Displacement Line	Displacement	Line	Poly segs
					Name			Criteria/Parameters	Data Type		Polyline	Length	continuous
continuous	Distance	Distance	Distance	Segment									
: Strain	Along	Along	Length										: Pullout
Line	Line												
[m]	[m]	[m]										[m]	
1	TWS(1)_1	0.0	100.02	-	1	No TWS(1)_1_2134mm Dia	Brick	Line	TWS(1)_1	-	100.02	-	
2	TWS(2)_1	0.0	70.111	-	1	No TWS(2)_1_1219mm Dia	Brick	Line	TWS(2)_1	-	70.112	-	
3	TWS(2)_2	0.0	30.101	-	1	No TWS(2)_2_1219mm Dia	Brick	Line	TWS(2)_2	-	30.101	-	
4	TWS(2)_3	0.0	25.321	-	1	No TWS(2)_3_1219mm Dia	Brick	Line	TWS(2)_3	-	25.321	-	
5	TWS(2)_4			-	1	No TWS(2)_4_1093mm Dia	Brick	Line	TWS(2)_4	-	94.377	-	



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Ref.	Utility Name		Sub-Utility	Jointed	Dimension	Acceptance	Displacement	Displacement Line	Displacement	Line	Poly segs
Poly segs	Start	End	Pipe								
				Name		Criteria/Parameters	Data Type			Polyline	Length continuous
continuous Distance Distance Segment											
-	0.0	94.377	-								--
6	TW Fresh Water (a) - St Pancras	1	Yes	TW Fresh Water (a) - St Pancras	Cast Iron	Line	TW Fresh Water (a) - St Pancras	-	85.061	-	
-	0.0	85.060	3.6000								
7	TW Fresh Water (b) - St Pancras	1	Yes	TW Fresh Water (b) - St Pancras	Cast Iron	Line	TW Fresh Water (b) - St Pancras	-	43.979	-	
-	0.0	43.978	3.6000								
8	TW Fresh Water (c) - St Pancras	1	Yes	TW Fresh Water (c) - St Pancras	Cast Iron	Line	TW Fresh Water (c) - St Pancras	-	65.904	-	
-	0.0	65.904	3.6000								
9	TW Fresh Water (d) - St Pancras	1	Yes	TW Fresh Water (d) - St Pancras	Cast Iron	Line	TW Fresh Water (d) - St Pancras	-	35.423	-	
-	0.0	35.423	3.6000								
10	Assumed FW400 connection to TW2_1	1	Yes	Assumed FW400 connection to TW2_1	Ductile Iron	Line	Assumed FW400 connection to TW2_1	-	7.2418	-	
-	0.0	7.2410	3.6000								

Warnings

- Multiple excavations have been specified. Displacements resulting from each excavation are summed with no account taken of the interactions between excavations (e.g. overlapping zones of influence or 'shielding' of one excavation by another).
- Embedded Wall Excavation PE1 : PLOT A - 17.2m AOD Basement Wall Install intersects PE10 : PLOT A - 18.00mAD - EXC (+ve).
- Embedded Wall Excavation PE2 : PLOT A - 17.2m AOD Excavation (+ve) intersects PE10 : PLOT A - 18.00mAD - EXC (+ve).
- Embedded Wall Excavation PE3 : Proposed Contig Wall south_2 intersects PE4 : PLOT B NEW WALL 1, , PE5 : PLOT B & C ALL EXC - 19.10m AOD (+ve), , PE10 : PLOT A - 18.00mAD - EXC (+ve), and PE11 : Proposed Contig Wall South 1.
- Embedded Wall Excavation PE4 : PLOT B NEW WALL 1 intersects PE3 : Proposed Contig Wall south_2, , PE5 : PLOT B & C ALL EXC - 19.10m AOD (+ve), PE6 : PLOT B WALL INST - 2, , PE7 : PLOT B EXC - 16.3m AOD (+ve), , PE8 : PLOT C - WALL INST, , PE9 : PLOT C - EXC (+ve), and PE10 : PLOT A - 18.00mAD - EXC (+ve).
- Embedded Wall Excavation PE5 : PLOT B & C ALL EXC - 19.10m AOD (+ve) intersects PE3 : Proposed Contig Wall south_2, , PE4 : PLOT B NEW WALL 1, , PE5 : PLOT C - WALL INST, , PE9 : PLOT C - EXC (+ve), and PE10 : PLOT A - 18.00mAD - EXC (+ve).
- Embedded Wall Excavation PE6 : PLOT B WALL INST - 2 intersects PE4 : PLOT B NEW WALL 1, , PE8 : PLOT C - WALL INST, and PE9 : PLOT C - EXC (+ve).
- Embedded Wall Excavation PE7 : PLOT B EXC - 16.3m AOD (+ve) intersects PE4 : PLOT B NEW WALL 1, , PE5 : PLOT B & C ALL EXC - 19.10m AOD (+ve), , PE6 : PLOT B WALL INST - 2, and PE7 : PLOT B EXC - 16.3m AOD (+ve).
- Embedded Wall Excavation PE8 : PLOT C - WALL INST intersects PE4 : PLOT B NEW WALL 1, , PE5 : PLOT B & C ALL EXC - 19.10m AOD (+ve), , PE6 : PLOT B WALL INST - 2, and PE7 : PLOT B EXC - 16.3m AOD (+ve).
- Embedded Wall Excavation PE9 : PLOT C - EXC (+ve) intersects PE4 : PLOT B NEW WALL 1, , PE5 : PLOT B & C ALL EXC - 19.10m AOD (+ve), , PE6 : PLOT B WALL INST - 2, and PE7 : PLOT B EXC - 16.3m AOD (+ve).
- Embedded Wall Excavation PE10 : PLOT A - 18.00mAD - EXC (+ve) intersects PE1 : PLOT A - 17.2m AOD Basement Wall Install, , PE2 : PLOT A - 17.2m AOD Excavation (+ve), , PE3 : Proposed Contig Wall south_2, , PE4 : PLOT B NEW WALL 1, , PE5 : PLOT B & C ALL EXC - 19.10m AOD (+ve), and PE11 : Proposed Contig Wall South 1.
- Embedded Wall Excavation PE11 : Proposed Contig Wall South 1 intersects PE3 : Proposed Contig Wall south_2, and PE10 : PLOT A - 18.00mAD - EXC (+ve).
- If an embedded wall excavation is assigned a 'sub-surface' ground movement curve then displacements induced by it can only be calculated for those points that are level with or below the embedded wall excavation's 'surface level'. Others are ignored. An example of such a combination, for which displacements will not be calculated is Excavation XP2/Side 1/Line 6/Vertical. This is an example only. There are 111 others.

Errors

None

Displacement Results - Displacement Lines

Stage: Ref.	Stage: Name	Disp. Line: Ref.	Disp. Line: Name	Chainage	x	y	z	Δx	Δy	Δz	Δs//	ΔsPerp.	Angle
				[m]	[m]	[m]	[m]	[mm]	[mm]	[mm]	[mm]	[mm]	[°]
0	Base Model 1		TWS(1)_1	0.0	48.00000	60.00000	14.64700	0.0	0.0	0.28768	0.0	0.0	271.15 *
				2.0004	48.04000	58.00000	14.64700	0.020000	-0.20000	1.3775	0.20036	0.015997	271.15 *
				4.0008	48.08000	56.00000	14.64700	0.080000	-0.46000	2.3006	0.46151	0.070786	271.15 *
				6.0012	48.12000	54.00000	14.64700	0.10897	-0.52581	3.0738	0.52788	0.098432	271.15 *
				8.0016	48.16000	52.00000	14.64700	0.080000	-0.50000	3.7257	0.50150	0.069986	271.15 *
				10.002	48.20000	50.00000	14.64700	0.030000	-0.42418	4.4585	0.42470	0.021512	271.15 *
				12.002	48.24000	48.00000	14.64700	0.0010000	-0.35000	5.1183	0.34995	-0.0059988	271.15 *
				14.003	48.28000	46.00000	14.64700	-0.0077840	-0.22000	4.8952	0.21980	-0.012182	271.15 *
				16.003	48.32000	44.00000	14.64700	0.0	-0.10000	3.1588	0.099980	-0.0019996	271.15 *
				18.004	48.36000	42.00000	14.64700	0.0	-0.035000	-0.85992	0.034993	-699.86E-6	271.15 *
				20.004	48.40000	40.00000	14.64700	0.0	-0.010000	-3.5041	0.0099980	-199.96E-6	271.15 *
				22.004	48.44000	38.00000	14.64700	0.0	0.0	-5.4868	0.0	0.0	271.15 *
				24.005	48.48000	36.00000	14.64700	0.0	0.0	-6.4851	0.0	0.0	271.15 *
				26.005	48.52000	34.00000	14.64700	0.0	0.0	-7.4321	0.0	0.0	271.15 *
				28.006	48.56000	32.00000	14.64700	0.0	0.0	-8.1501	0.0	0.0	271.15 *
				30.006	48.60000	30.00000	14.64700	0.0	0.0	-7.8306	0.0	0.0	271.15 *
				32.006	48.64000	28.00000	14.64700	0.0	0.0	-6.9034	0.0	0.0	271.15 *
				34.007	48.68000	26.00000	14.64700	0.0	0.0	-5.1761	0.0	0.0	271.15 *
				36.007	48.72000	24.00000	14.64700	0.010000	0.020000	-3.3088	-0.019796	0.010398	271.15 *
				38.008	48.76000	22.00000	14.64700	0.025000	0.10000	-1.5234	-0.099480	0.026995	271.15 *
				40.008	48.80000	20.00000	14.64700	0.060000	0.25000	0.037135	-0.24875	0.064987	271.15 *
				42.008	48.84000	18.00000	14.64700	0.12000	0.40000	1.3897	-0.39752	0.12797	271.15 *
				44.009	48.88000	16.00000	14.64700	0.16500	0.52500	2.7460	-0.52160	0.17546	271.15 *
				46.009	48.92000	14.00000	14.64700	0.17780	0.57349	3.7090	-0.56982	0.18923	271.15 *
				48.010	48.96000	12.00000	14.64700	0.16500	0.52500	4.0074	-0.52160	0.17546	271.15 *
				50.010	49.00000	10.00000	14.64700	0.12000	0.40000	3.9512	-0.39752	0.12797	271.15 *
				52.010	49.04000	8.00000	14.64700	0.060000	0.28000	3.4565	-0.27874	0.065587	271.15 *
				54.011	49.08000	6.00000	14.64700	0.025000	0.13651	2.7745	-0.13598	0.027725	271.15 *
				56.011	49.12000	4.00000	14.64700	0.010000	0.050000	2.0207	-0.049790	0.010998	271.15 *
				58.012	49.16000	2.00000	14.64700	0.0	0.020000	1.2279	-0.019996	399.92E-6	271.15 *
				60.012	49.20000	0.00000	14.64700	0.0	0.0	0.73533	0.0	0.0	271.15 *
				62.012	49.24000	-2.00000	14.64700	0.0	0.0	0.55915	0.0	0.0	271.15 *
				64.013	49.28000	-4.00000	14.64700	0.0	0.0	0.49733	0.0	0.0	271.15 *
				66.013	49.32000	-6.00000	14.64700	0.0	0.0	0.52118	0.0	0.0	271.15 *
				68.014	49.36000	-8.00000	14.64700	0.0	0.0	0.57344	0.0	0.0	271.15 *
				70.014	49.40000	-10.00000	14.64700	0.0	0.0	0.64202	0.0	0.0	271.15 *
				72.014	49.44000	-12.00000	14.64700	0.0	0.0	0.71851	0.0	0.0	271.15 *
				74.015	49.48000	-14.00000	14.64700	0.0	0.0	0.79709	0.0	0.0	271.15 *
				76.015	49.52000	-16.00000	14.64700	0.0	0.0	0.87384	0.0	0.0	271.15 *
				78.016	49.56000	-18.00000	14.64700	0.0	0.0	0.94618	0.0	0.0	271.15 *
				80.016	49.60000	-20.00000	14.64700	0.0	0.0	1.0125	0.0	0.0	271.15 *
				82.016	49.64000	-22.00000	14.64700	0.0	0.0	1.0719	0.0	0.0	271.15 *
				84.017	49.68000	-24.00000	14.64700	0.0	0.0	1.1239	0.0	0.0	271.15 *
				86.017	49.72000	-26.00000	14.64700	0.0	0.0	1.1686	0.0	0.0	271.15 *
				88.018	49.76000	-28.00000	14.64700	0.0	0.0	1.2059	0.0	0.0	271.15 *
				90.018	49.80000	-30.00000	14.64700	0.0	0.0	1.2363	0.0	0.0	271.15 *
				92.018	49.84000	-32.00000	14.64700	0.0	0.0	1.2602	0.0	0.0	271.15 *
				94.019	49.88000	-34.00000	14.64700	0.0	0.0	1.2781	0.0	0.0	271.15 *
				96.019	49.92000	-36.00000	14.64700	0.0	0.0	1.2904	0.0	0.0	271.15 *
				98.020	49.96000	-38.00000	14.64700	0.0	0.0	1.2977	0.0	0.0	271.15 *
				100.02	50.00000	-40.00000	14.64700	0.0	0.0	1.3005	0.0	0.0	271.15 *
		2	TWS(2)_1	0.0	-33.43100	6.49300	17.09950	0.0	0.0	-0.89484	0.0	0.0	0.39226 *
				2.0032	-31.42786	6.50671	17.09950	0.0	0.0	-0.94567	0.0	0.0	0.39226 *
				4.0064	-29.42471	6.52043	17.09950	0.0	0.0	-0.99714	0.0	0.0	0.39226 *
				6.0096	-27.42157	6.53414	17.09950	0.0	0.0	-1.0484	0.0	0.0	0.39226 *
				8.0128	-25.41843	6.54786	17.09950	0.0	0.0	-1.0982	0.0	0.0	0.39226 *
				10.016	-23.41529	6.56157	17.09950	0.0	0.0	-1.1450	0.0	0.0	0.39226 *
				12.019	-21.41214	6.57529	17.09950	0.0	0.0	-1.1865	0.0	0.0	0.39226 *
				14.022	-19.40900	6.58900	17.09950	0.0	0.0	-1.2199	0.0	0.0	0.39226 *
				16.026	-17.40586	6.60271	17.09950	0.0	0.0	-1.2413	0.0	0.0	0.39226 *
				18.029	-15.40271	6.61643	17.09950	0.0	0.0	-1.2455	0.0	0.0	0.39226 *
				20.032	-13.39957	6.63014	17.09950	0.0	0.0	-1.2258	0.0	0.0	0.39226 *
				22.035	-11.39643	6.64386	17.09950	0.0	0.0	-1.1731	0.0	0.0	0.39226 *
				24.038	-9.39329	6.65757	17.09950	0.0	0.0	-1.0756	0.0	0.0	0.39226 *
				26.041	-7.39014	6.67129	17.09950	0.0	0.0	-0.91805	0.0	0.0	0.39226 *
				28.045	-5.38700	6.68500	17.09950	0.0	0.0	-0.60159	0.0	0.0	0.39226 *
				30.048	-3.38386	6.69871	17.09950	0.0	0.0	0.078487	0.0	0.0	0.39226 *
				32.051	-1.38071	6.71243	17.09950	0.0	0.0	0.87463	0.0	0.0	0.39226 *
				34.054	0.62243	6.72614	17.09950	0.096394	0.10709	1.8093	0.097125	0.10642	0.39226 *
				36.057	2.62557	6.73986	17.09950	0.16426	0.27097	2.8906	0.16611	0.26984	0.39226 *
				38.061	4.62871	6.75357	17.09950	0.15947	0.46368	4.0890	0.16264	0.46258	0.39226 *



RSK ENVIRONMENT LIMITED

UBB, London

TW Sewer Assessment

FULL DEVELOPMENT LONG TERM (S) + Structural Solution

Oasys													Job No.	Sheet No.	Rev.			
RSK ENVIRONMENT LIMITED													371654					
UBB, London													Drg. Ref.					
TW Sewer Assessment													Made by MK			Date 09-Dec-2020	Checked	Date
FULL DEVELOPMENT LONG TERM (S) + Structural Solution																		
Stage: Ref.	Stage: Name	Disp. Line: Ref.	Disp. Line: Name	Chainage	x	y	z	δx	δy	δz	δH//	δH _{perp.}	Angle					
				[m]	[m]	[m]	[m]	[mm]	[mm]	[mm]	[mm]	[mm]	[°]					
				40.064	6.63186	6.76729	17.09950	0.081803	0.65832	5.3122	0.086308	0.65774	0.39226	*				
				42.067	8.63500	6.78100	17.09950	0.0092490	0.75866	6.4211	0.014443	0.75858	0.39226	*				
				44.070	10.63814	6.79471	17.09950	0.0093460	0.76663	7.3483	0.014594	0.76655	0.39226	*				
				46.073	12.64129	6.80843	17.09950	0.0094440	0.77462	8.0401	0.014747	0.77453	0.39226	*				
				48.077	14.64443	6.82214	17.09950	0.0095410	0.78263	8.5046	0.014899	0.78254	0.39226	*				
				50.080	16.64757	6.83586	17.09950	0.0096390	0.79066	8.7927	0.015052	0.79058	0.39226	*				
				52.083	18.65071	6.84957	17.09950	0.0097380	0.79872	8.9564	0.015206	0.79863	0.39226	*				
				54.086	20.65386	6.86329	17.09950	0.0098360	0.80680	9.0337	0.015359	0.80672	0.39226	*				
				56.089	22.65700	6.87700	17.09950	0.0099350	0.81491	9.0497	0.015514	0.81482	0.39226	*				
				58.093	24.66014	6.89071	17.09950	0.010034	0.82305	9.0207	0.015669	0.82296	0.39226	*				
				60.096	26.66329	6.90443	17.09950	0.010134	0.83120	8.9575	0.015824	0.83112	0.39226	*				
				62.099	28.66643	6.91814	17.09950	0.010233	0.83939	8.8647	0.015979	0.83930	0.39226	*				
				64.102	30.66957	6.93186	17.09950	0.010334	0.84760	8.7402	0.016137	0.84751	0.39226	*				
				66.105	32.67271	6.94557	17.09950	0.010434	0.85583	8.5731	0.016293	0.85574	0.39226	*				
				68.108	34.67586	6.95929	17.09950	0.010535	0.86409	8.3414	0.016451	0.86400	0.39226	*				
				70.112	36.67900	6.97300	17.09950	0.010636	0.87238	8.0091	-0.090900	0.86770	353.32	*				
	3		TWS(2)_2	0.0	36.67900	6.97300	17.09950	0.010636	0.87238	8.0091	-0.090900	0.86770	353.32	*				
				2.0068	38.67213	6.73960	17.09950	0.010086	0.82726	7.0138	-0.086199	0.82282	353.32	*				
				4.0135	40.66527	6.50620	17.09950	0.0095450	0.78290	5.8909	-0.081577	0.77869	353.32	*				
				6.0203	42.65840	6.27280	17.09950	0.0087650	0.71898	4.6179	-0.074917	0.71512	353.32	*				
				8.0270	44.65153	6.03940	17.09950	0.0063670	0.52225	3.0887	-0.054417	0.51944	353.32	*				
				10.034	46.64467	5.80600	17.09950	0.0038710	0.31751	1.6760	-0.033084	0.31580	353.32	*				
				12.041	48.63780	5.57260	17.09950	0.0016710	0.13707	0.49880	-0.014282	0.13633	353.32	*				
				14.047	50.63093	5.33920	17.09950	-2.7568E-12	-226.11E-12	-0.44170	23.563E-12	-224.92E-12	353.32	*				
				16.054	52.62407	5.10580	17.09950	0.0	0.0	-1.212E+0	0.0	0.0	353.32	*				
				18.061	54.61720	4.87240	17.09950	0.0	0.0	-1.8040	0.0	0.0	353.32	*				
				20.068	56.61033	4.63900	17.09950	0.0	0.0	-2.1770	0.0	0.0	353.32	*				
				22.074	58.60347	4.40560	17.09950	0.0	0.0	-2.4440	0.0	0.0	353.32	*				
				24.081	60.59660	4.17220	17.09950	0.074691	0.17400	-1.8594	0.053947	0.18151	353.32	*				
				26.088	62.58973	3.93880	17.09950	0.114492	0.26772	-2.0359	0.083003	0.27927	353.32	*				
				28.095	64.58287	3.70540	17.09950	0.15568	0.36268	-2.1878	0.11244	0.37832	353.32	*				
				30.101	66.57600	3.47200	17.09950	0.19716	0.45931	-2.3263	0.14240	0.47912	353.32	*				
	4		TWS(2)_3	0.0	66.57600	3.47200	17.09950	0.19716	0.45931	-2.3263	0.070546	0.49483	344.88	*				
				1.9478	68.56338	3.24000	17.09950	0.21742	0.50650	-2.5544	0.077794	0.54567	344.88	*				
				3.8956	70.55677	3.00600	17.09950	0.23790	0.55222	-2.7614	0.085129	0.59709	344.88	*				
				5.8434	72.55115	2.76900	17.09950	0.25864	0.60253	-2.9458	0.092545	0.64913	344.88	*				
				7.7912	74.54554	2.53200	17.09950	0.30146	0.70228	-3.0923	0.10786	0.75660	344.88	*				
				9.7390	76.53792	0.93200	17.09950	0.40409	0.94137	-3.2027	0.14459	1.0142	344.88	*				
				11.687	78.53531	0.42400	17.09950	0.50703	1.1812	-3.3102	0.18142	1.2725	344.88	*				
				13.635	79.73869	-0.08400	17.09950	0.61203	1.4729	-3.4105	0.22486	1.5864	344.88	*				
				15.582	81.61908	-0.59200	17.09950	0.77704	1.8203	-3.5139	0.27540	1.9599	344.88	*				
				17.530	83.49946	-1.10000	17.09950	0.94679	2.2262	-3.6185	0.33340	2.3961	344.88	*				
				19.478	85.37985	-1.60800	17.09950	1.1470	2.7079	-3.7197	0.40104	2.9133	344.88	*				
				21.426	87.26023	-2.11600	17.09950	1.3870	3.2887	-3.8172	0.48129	3.5366	344.88	*				
				23.374	89.14062	-2.62400	17.09950	1.6646	3.9653	-3.9213	0.57280	4.2622	344.88	*				
				25.321	91.02100	-3.13200	17.09950	1.9482	4.6670	-4.0611	0.66559	5.0136	344.88	*				
	5		TWS(2)_4	0.0	91.02100	-3.13200	16.23650	1.2884	3.1299	-4.3610	-0.0068741	3.3847	337.51	*				
				2.0080	92.87630	-3.90013	16.23650	1.7988	4.1154	-4.5266	0.087766	4.4905	337.51	*				
				4.0160	94.73160	-4.66826	16.23650	2.4059	5.6496	-4.3175	0.061780	6.1402	337.51	*				
				6.0241	96.58689	-5.43638	16.23650	3.1596	7.6355	-4.0207	-0.015531	8.0071	337.51	*				
				8.0321	98.44219	-6.20451	16.23650	3.6563	8.9497	-3.9994	-0.045324	9.6677	337.51	*				
				10.040	100.29749	-6.97264	16.23650	3.7939	9.3434	-4.6205	-0.068753	10.084	337.51	*				
				12.048	102.15579	-7.74077	16.23650	3.9014	9.6367	-5.2238	-0.081645	10.396	337.51	*				
				14.056	104.00809	-8.50889	16.23650	4.0073	9.8797	-5.7405	-0.076727	10.661	337.51	*				
				16.064	105.86338	-9.27702	16.23650	4.0798	10.122	-6.1428	-0.102676	10.913	337.51	*				
				18.072	107.71868	-10.04515	16.23650	4.1520	10.336	-6.4332	-0.11756	11.138	337.51	*				
				20.080	109.57398	-10.81328	16.23650	4.2240	10.515	-6.5181	-0.11959	11.331	337.51	*				
				22.088	111.42928	-11.58140	16.23650	4.2957	10.694	-6.4088	-0.12163	11.524	337.51	*				
				24.096	113.28457	-12.34953	16.23650	4.3673	10.872	-6.1633	-0.12365	11.715	337.51	*				
				26.104	115.13987	-13.11766	16.23650	4.4395	11.049	-5.8507	-0.12567	11.907	337.51	*				
				28.112	116.99517	-13.88579	16.23650	4.5096	11.226	-5.5285	-0.12768	12.097	337.51	*				
				30.120	118.85047	-14.65391												



RSK ENVIRONMENT LIMITED

UBB, London

TW Sewer Assessment

FULL DEVELOPMENT LONG TERM (S) + Structural Solution

Job No.	Sheet No.	Rev.
371654		
Drg. Ref.		
Made by MK	Date 09-Dec-2020	Checked Date

Stage Ref.	Stage Name	Disp. Line Ref.	Disp. Line Name	Chainage	x	y	z	δx	δy	δz	δH//	δHperp.	Angle
				[m]	[m]	[m]	[m]	[mm]	[mm]	[mm]	[mm]	[mm]	[°]
				5.9971	54.34338	2.35750	20.34000	-0.052675	1.5546	-2.1884	-0.44618	1.4902	345.27
				7.9961	56.27674	1.84928	20.34000	-0.062836	0.87469	-2.9288	-0.28314	0.82998	345.27
				9.9952	58.21009	1.34107	20.34000	-0.028322	0.24795	-3.2400	-0.090428	0.23260	345.27
				11.994	60.14344	0.83286	20.34000	-0.028322	-335.76E-12	-2.9483	122.45E-12	-314.98E-12	345.27
				13.993	62.07679	0.32464	20.34000	0.0	0.0	-3.1218	0.0	0.0	345.27
				15.992	64.01014	-0.18357	20.34000	0.0	0.0	-3.2707	0.0	0.0	345.27
				17.991	65.94349	-0.69178	20.34000	0.0	0.0	-3.4010	0.0	0.0	345.27
				19.990	67.87684	-1.20000	20.34000	0.0	0.0	-3.5165	0.0	0.0	345.27
				21.989	69.81019	-1.70821	20.34000	0.0	0.0	-3.6198	0.0	0.0	345.27
				23.988	71.74354	-2.21642	20.34000	0.0	0.0	-3.7131	0.0	0.0	345.27
				25.987	73.67689	-2.72463	20.34000	0.0	0.0	-3.7992	0.0	0.0	345.27
				27.986	75.61025	-3.23285	20.34000	0.013196	0.030742	-3.8819	0.0049469	0.033087	345.27
				29.985	77.54360	-3.74106	20.34000	0.033747	0.078617	-3.9662	0.012651	0.084613	345.27
				31.985	79.47695	-4.24927	20.34000	0.070367	0.16649	-4.0493	0.025729	0.17891	345.27
				33.984	81.41030	-4.75749	20.34000	0.17587	0.42582	-4.1311	0.061834	0.45654	345.27
				35.983	83.34365	-5.26570	20.34000	0.307229	0.74866	-4.2229	0.10661	0.80315	345.27
				37.982	85.27700	-5.77391	20.34000	0.46968	1.1506	-4.3357	0.16174	1.2322	345.27
				39.981	87.21035	-6.28213	20.34000	0.66846	1.6421	-4.4252	0.22904	1.7581	345.27
				41.980	89.14370	-6.79034	20.34000	0.92983	2.2893	-4.4760	0.31727	2.4505	345.27
				43.979	91.07705	-7.29855	20.34000	1.2811	3.1604	-4.4566	0.43556	3.3822	345.27
				0.0	91.07705	-7.29855	19.73000	1.2811	3.1604	-4.4566	0.43556	3.3822	345.27
8			TW Fresh Water (c) - St Pancras	1.9971	92.94433	-8.00684	19.73000	1.6555	4.1164	-4.3925	0.097368	4.4395	339.23
				3.9942	94.81160	-8.71513	19.73000	2.0740	5.1322	-4.3337	0.11901	5.5342	339.23
				5.9913	96.67888	-9.42342	19.73000	2.6868	6.6885	-3.3975	0.14003	7.2066	339.23
				7.9884	98.54615	-10.13170	19.73000	2.7573	6.8639	-3.7947	0.14371	7.3357	339.23
				9.9855	100.41343	-10.83999	19.73000	2.8282	7.0480	-4.1570	0.14740	7.5859	339.23
				11.983	102.28070	-11.54828	19.73000	2.8996	7.2181	-4.4700	0.15112	7.7773	339.23
				13.980	104.14798	-12.25657	19.73000	2.9714	7.3969	-4.7210	0.15486	7.9699	339.23
				15.977	106.01525	-12.96486	19.73000	3.0436	7.5767	-4.8979	0.15863	8.1636	339.23
				17.974	107.88253	-13.67314	19.73000	3.1163	7.7576	-4.9915	0.16242	8.3586	339.23
				19.971	109.74980	-14.38143	19.73000	3.1894	7.9396	-5.0011	0.16623	8.5447	339.23
				21.968	111.61707	-15.08972	19.73000	3.2630	8.1227	-4.9374	0.17006	8.7520	339.23
				23.965	113.48435	-15.79801	19.73000	3.3370	8.3070	-4.8194	0.17392	8.9505	339.23
				25.962	115.35162	-16.50630	19.73000	3.4114	8.4922	-4.6676	0.17780	9.1501	339.23
				27.959	117.21890	-17.21459	19.73000	3.4863	8.6786	-4.4985	0.18170	9.3509	339.23
				29.956	119.08617	-17.92287	19.73000	3.5616	8.8661	-4.3192	0.18563	9.5529	339.23
				31.954	120.95345	-18.63116	19.73000	3.6000	8.9617	-4.1688	0.18763	9.6559	339.23
				33.951	122.82072	-19.33945	19.73000	3.6140	8.9965	-4.0169	0.18836	9.6934	339.23
				35.948	124.68800	-20.04774	19.73000	3.6279	9.0313	-3.8135	0.18908	9.7309	339.23
				37.945	126.55527	-20.75603	19.73000	3.6419	9.0661	-3.5429	0.18981	9.7684	339.23
				39.942	128.42255	-21.46431	19.73000	3.6559	9.1010	-3.2028	0.19054	9.8060	339.23
				41.939	130.28982	-22.17260	19.73000	3.6699	9.1358	-2.8056	0.19127	9.8435	339.23
				43.936	132.15710	-22.88089	19.73000	3.6840	9.1707	-2.3749	0.19200	9.8811	339.23
				45.933	134.02437	-23.58918	19.73000	3.6980	9.2056	-1.9394	0.19273	9.9187	339.23
				47.930	135.89165	-24.29747	19.73000	3.7120	9.2405	-1.5239	0.19346	9.9563	339.23
				49.927	137.75892	-25.00575	19.73000	3.7260	9.2755	-1.1390	0.19420	9.9940	339.23
				51.924	139.62619	-25.71404	19.73000	3.7401	9.3104	-0.77681	0.19493	10.032	339.23
				53.922	141.49347	-26.42233	19.73000	3.7541	9.3454	-0.41768	0.19566	10.069	339.23
				55.919	143.36074	-27.13062	19.73000	3.7682	9.3803	-0.043414	0.19639	10.107	339.23
				57.916	145.22802	-27.83891	19.73000	3.7822	9.4153	0.35283	0.19712	10.145	339.23
				59.913	147.09529	-28.54720	19.73000	3.7963	9.4504	0.76675	0.19786	10.182	339.23
				61.910	148.96257	-29.25548	19.73000	3.8104	9.4854	1.1883	0.19859	10.220	339.23
				63.907	150.82984	-29.96377	19.73000	3.8244	9.5204	1.6057	0.19932	10.258	339.23
				65.904	152.69712	-30.67206	19.73000	3.7961	9.4498	1.9535	0.19785	10.182	339.23
				0.0	152.69712	-30.67206	19.73000	3.7961	9.4498	1.9477	-0.58772	10.167	334.81
				1.9680	154.47786	-31.38079	19.73000	3.6361	9.0516	2.0575	-0.56296	9.7384	334.81
				3.9359	156.25860	-32.08753	19.73000	3.4785	8.6593	2.1339	-0.53856	9.3163	334.81
				5.9039	158.03934	-32.79427	19.73000	3.3233	8.2730	2.1806	-0.51453	8.9007	334.81
				7.8718	159.82008	-33.50101	19.73000	3.1705	7.8926	2.2078	-0.49087	8.4914	334.81
				9.8398	161.60083	-34.20774	19.73000	2.3282	7.4554	2.1871	-1.0670	7.7373	334.81
				11.808	163.38155	-34.91448	19.73000	1.0021	6.8128	1.9557	-1.9934	6.5913	334.81
				13.776	165.16229	-35.62123	19.73000	-0.094898	6.0251	1.5655	-2.6507	5.4116	334.81
				15.744	166.94303	-36.32797	19.73000	-0.88676	5.4421	1.2027	-3.1190	4.5469	334.81
				17.712	168.72377	-37.03471	19.73000	-1.3413	4.7335	0.77663	-3.2286	3.7122	334.81
				19.680	170.50451	-37.74145	19.73000	-1.4793	3.8802	0.35315	-2.9903	2.8814	334.81
				21.647	172.28525	-38.44819	19.73000	-1.3410	2.9101	-0.0070569	-2.4522	2.0624	334.81
				23.615	174.06599	-39.15493	19.73000	-0.96582	1.9759	-0.27225	-1.7151	1.3768	334.81
				25.583	175.84673	-39.86167	19.73000	-0.56123	1.1482	-0.47132	-0.99662	0.80007	334.81
				27.551	177.62747	-40.56841	19.73000	-0.12072	0.24698	-0.70407	-0.21437	0.17209	334.81
				29.519	179.40821	-41.27515	19.73000	1.9373E-9	-3.9635E-9	-0.89370	3.4402E-9	-2.7617E-9	334.81
				31.487	181.18895	-41.98189	19.73000	0.0	0.0	-0.94649	0.0	0.0	334.81
				33.455	182.96969	-42.68863	19.73000	0.0	0.0	-0.80313	0.0	0.0	334.81
				35.423	184.75043	-43.39537	19.73000	0.0	0.0	-0.67574	0.0	0.0	334.81
				0.0	52.86515	12.18589	16.51600	0.16949	0.42492	14.536	-0.34484	0.30062	289.34
				1.8105	53.46458	10.47755	16.51600	0.073504	0.18316	4.8204	-0.14849	0.13000	289.34
				3.6209	54.06400	8.76921	16.51600	0.0	0.0	1.6913	0.0	0.0	289.34
				5.4314	54.66343	7.06086	16.51600	0.0	0.0	-0.25091	0.0	0.0	289.34
				7.2418	55.26286	5.35252	16.51600	0.0	0.0	-1.6391	0.0	0.0	289.34

* Result includes imported displacement(s).

Displacement Results - Displacement Grids

Stage Ref.	Stage Name	Disp. Grid Ref.	Disp. Grid Name	x	y	z	δx	δy	δz
				[m]	[m]	[m]	[mm]	[mm]	[mm]

Specific Utility Damage Results - Coordinates & Displacements

Stage Ref.	Stage Name	Specific Utility Ref.	Specific Utility Name	Sub-utility Name	Iteration	Distance	x	y	z	δx (n)	δy (n)	δz (n)	δH/(n)	δHperp. (n)	δx (n-Lp)	δy (n-Lp)		
						from start of utility	[m]	[m]	[m]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]		
0	Base Model	1	TWS(1)_1	1	Unjointed													
		2	TWS(2)_1	1	Unjointed													
		3	TWS(2)_2	1	Unjointed													
		4	TWS(2)_3	1	Unjointed													
		5	TWS(2)_4	1	Unjointed													
		6	TW Fresh Water (a) - St Pancras	1	Unjointed													
0.00000	-0.79041	0.00000	0.00000	0.00000	0.00000	-0.96325	0.00000	0.00000	3.95632	-32.55421	2.82127	20.65500	0.00000	0.00000	-0.87485	0.00000	0.00000	0.00000
0.00000	-0.88355	0.00000	0.00000	0.00000	0.00000	-1.06023	0.00000	0.00000	7.91263	-28.59823	2.87302	20.65500	0.00000	0.00000	-0.97206	0.00000	0.00000	0.00000
0.00000	-0.98087	0.00000	0.00000	0.00000	0.00000	-1.14867	0.00000	0.00000	11.86895	-24.64226	2.92477	20.65500	0.00000	0.00000	-1.06886	0.00000	0.00000	0.00000
0.00000	-1.07708	0.00000	0.00000	0.00000	0.00000	-1.21363	0.00000	0.00000	15.82526	-20.68628	2.97652	20.65500	0.00000	0.00000	-1.15617	0.00000	0.00000	0.00000
0.00000	-1.16258	0.00000	0.00000	0.00000	0.00000	-1.23051	0.00000	0.00000	19.78158	-16.73030	3.02827	20.65500	0.00000	0.00000	-1.21844	0.00000	0.00000	0.00000
0.00000	-1.22101	0.00000	0.00000	0.00000	0.00000	-1.16040	0.00000	0.00000	23.73790	-12.77432	3.08002	20.65500	0.00000	0.00000	-1.23003	0.00000	0.00000	0.00000
0.00000	-1.22551	0.00000	0.00000	0.00000	0.00000	-0.94612	0.00000	0.00000	27.69421	-8.81834	3.13177	20.65500	0.00000	0.00000	-1.15062	0.00000	0.00000	0.00000
0.00000	-1.13413	0.00000	0.00000	0.01765	0.02647	-0.26181	0.01799	0.00000	31.65053	-4.86237	3.18352	20.65500	0.00000	0.00000	-0.92130	0.00000	0.00000	0.00000
0.00000	-0.88078	0.00000	0.00000	0.11497	0.36908	0.90940	0.11979	0.03200	33.60684	-0.90639	3.23527	20.65500	0.02152	0.03228	-0.16634	0.02194	0.03200	0.00000
0.06344	-0.06145	0.03558	0.06298	0.05654	0.85248	2.07860	0.06769	0.40348	39.56316	3.04959	3.28701	20.65500	0.11936	0.40508	0.10180	0.12465	0.40348	0.03475
0.44840	1.12671	0.12235	0.44684	0.01375	1.12748	2.97954	0.02849	0.89725	43.51948	7.00557	3.33876	20.65500	0.04624	0.89793	2.17882	0.05799	0.89725	0.11649
0.92301	2.26301	0.05226	0.92240	0.01651	1.35452	3.58526	0.03423	1.14704	47.47579	10.96154	3.39051	20.65500	0.01399	1.14732	3.05276	0.02899	1.14704	0.04019
1.16763	3.11213	0.02951	1.16734	0.01869	1.53271	3.88416	0.03873	1.33894	51.43211	14.91752	3.44226	20.65500	0.01677	1.37528	3.62984	0.03475	1.37494	0.01424
1.39649	3.66101	0.03529	1.39615	0.01941	1.59171	3.95559	0.04022	1.54105	55.38843	18.87350	3.49401	20.65500	0.01879	1.54143	3.90202	0.03895	1.54105	0.01703
1.54641	3.91040	0.03908	1.54603	0.02008	1.64701	3.89717	0.04162	1.55030	59.34474	22.82948	3.54576	20.65500	0.01947	1.59669	3.95713	0.04035	1.59630	0.01885
1.60167	3.95325	0.04048	1.60128	0.02075	1.70235	3.73881	0.04302	1.65159	63.30106	26.78545	3.59751	20.65500	0.02014	1.65199	3.88873	0.04175	1.65159	0.01953
1.65697	3.87600	0.04187	1.65657	0.02143	1.75774	3.45216	0.04442	1.70692	67.25737	30.74143	3.64926	20.65500	0.02081	1.70734	3.72140	0.04315	1.70692	0.02020
1.71232	3.69820	0.04327	1.71190	0.02211	1.81317	2.94769	0.04582	1.76229	71.21369	34.69741	3.70101	20.65500	0.02149	1.76273	3.42130	0.04454	1.76229	0.02088



RSK ENVIRONMENT LIMITED

UBB, London

TW Sewer Assessment

FULL DEVELOPMENT LONG TERM (S) + Structural Solution

Job No.	Sheet No.	Rev.
371654		
Drg. Ref.		
Made by MK	Date 09-Dec-2020	Checked Date

Stage: Name Specific			Specific Utility: Name			Sub-utility Iteration		Distance			x	y	z	Δx (n)	Δy (n)	Δz (n)	Δl / (n)	Δperp. (n)	Δx (n-Lp)	Δy (n-Lp)	
Δx (n-Lp)	Δy (n-Lp)	Δz (n-Lp)	Δx (n-Lp)	Δy (n-Lp)	Δz (n-Lp)	Δl / (n-Lp)	Δperp. (n-Lp)	Name	from start of utility	Δx (n-Lp)	Δy (n-Lp)	Δz (n-Lp)	Δl / (n-Lp)	Δperp. (n-Lp)	Δx (n-Lp)	Δy (n-Lp)	Δz (n-Lp)	Δl / (n-Lp)	Δperp. (n-Lp)	Δx (n-Lp)	Δy (n-Lp)
1.76772	3.38026	0.04467	1.76728	0.00666	4.05864	3.35325	0.05974		75.17001	38.65339	3.75276	20.65500	0.02217	1.81817	2.89370	0.04595	1.81772	0.02155			
1.82316	2.82475	0.04607	1.82272	0.00145	4.45040	2.25768	0.05966		1.81772												
0.00000	-0.83624	0.00000	0.00000	0.00000	0.00000	-1.01215	0.00000		79.12632	42.60936	3.80451	20.65500	0.00317	4.54478	3.53830	0.06262	4.54435	0.02223			
0.00000	-0.93194	0.00000	0.00000	0.00000	0.00000	-1.10627	0.00000		4.54435												
0.00000	-1.02959	0.00000	0.00000	0.00000	0.00000	-1.18535	0.00000		30.57622	2.84714	20.65500	0.00000	0.00000	-0.92312	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	
0.00000	-1.12200	0.00000	0.00000	0.00000	0.00000	-1.23012	0.00000		9.89079	-26.62024	2.89889	20.65500	0.00000	0.00000	-1.02096	0.00000	0.00000	0.00000	0.00000	0.00000	
0.00000	-1.19656	0.00000	0.00000	0.00000	0.00000	-1.20945	0.00000		0.00000												
0.00000	-1.23221	0.00000	0.00000	0.00000	0.00000	-1.07558	0.00000		13.84711	-22.66427	2.95064	20.65500	0.00000	0.00000	-1.11449	0.00000	0.00000	0.00000	0.00000	0.00000	
0.00000	-1.19515	0.00000	0.00000	0.00000	0.00000	-0.73689	0.00000		17.80342	-18.70829	3.00239	20.65500	0.00000	0.00000	-1.19175	0.00000	0.00000	0.00000	0.00000	0.00000	
0.00000	-1.03427	0.00000	0.00000	0.08175	0.17408	0.31109	0.08402		21.75974	-14.75231	3.05414	20.65500	0.00000	0.00000	-1.23269	0.00000	0.00000	0.00000	0.00000	0.00000	
0.00581	-0.60090	0.00395	0.00576	0.10630	0.60227	1.51354	0.11416		0.00000												
0.24123	0.52438	0.10252	0.23991	0.01870	1.01206	2.56203	0.03193		37.58500	1.07160	3.26114	20.65500	0.09498	0.20524	0.41598	0.09765	0.20398	0.00388			
0.69105	1.72267	0.10216	0.68977	0.01511	1.23974	3.32296	0.03133		41.54132	5.02758	3.31289	20.65500	0.10342	0.64559	1.62246	0.11186	0.64419	0.09937			
1.05698	2.71945	0.02671	1.05673	0.01794	1.47183	3.77172	0.03719		45.49764	8.98355	3.36464	20.65500	0.01264	1.03714	2.64622	0.02621	1.03688	0.09312			
1.28080	3.42691	0.03237	1.28048	0.01907	1.56408	3.94019	0.03953		49.45395	12.93953	3.41639	20.65500	0.01536	1.26004	3.38232	0.03184	1.25973	0.01289			
1.50176	3.82075	0.03795	1.50139	0.01974	1.61936	3.93946	0.04092		53.41027	16.89551	3.46814	20.65500	0.01820	1.49305	3.80290	0.03773	1.49268	0.01562			
1.57403	3.95012	0.03978	1.57365	0.02042	1.67467	3.83078	0.04232		1.49268												
1.62932	3.92714	0.04117	1.62892	0.02109	1.73004	3.61581	0.04372		57.35658	20.85149	3.51989	20.65500	0.01913	1.56906	3.94858	0.03965	1.56867	0.01831			
1.68464	3.80064	0.04257	1.68423	0.02177	1.78545	3.23450	0.04512		1.56867												
1.74001	3.56175	0.04397	1.73959	0.02244	1.84091	2.57989	0.04652		61.32290	24.80747	3.57164	20.65500	0.01980	1.62434	3.93558	0.04105	1.62394	0.01919			
1.79543	3.13946	0.04537	1.79499	0.00256	4.51599	2.97892	0.06163		1.62394												
2.33204	2.69600	0.04952	2.33159	0.00022	4.10126	1.43253	0.05387		65.27922	28.76344	3.62339	20.65500	0.02048	1.67966	3.81805	0.04245	1.67925	0.01986			
3.83526	1.00167	-0.97504	3.70925	-0.06081	1.01009	-2.78134	-0.31561		1.67925												
2.09723	-1.45994	-0.54494	2.02523	-0.00564	0.04937	-3.00635	-0.01801		69.23553	32.71942	3.67514	20.65500	0.02115	1.73502	3.59261	0.04385	1.73460	0.02054			
0.74989	-2.99074	-0.24477	0.71103	0.00000	0.00000	-3.24108	0.00000		1.73460												
0.00000	-2.98282	0.00000	-0.00000	0.00000	0.00000	-3.49346	0.00000		73.19185	36.67540	3.72689	20.65500	0.02183	1.79044	3.19345	0.04525	1.79000	0.02121			
0.00000	-3.29667	0.00000	0.00000	0.00000	0.00000	-3.69452	0.00000		1.79000												
0.00000	-3.53703	0.00000	0.00000	0.01057	0.02462	-3.86542	0.00396		77.14816	40.63138	3.77864	20.65500	0.02251	1.84591	2.51095	0.04665	1.84545	0.02189			
0.00000	-3.73026	0.00000	0.00000	0.06307	0.14899	-4.03277	0.02312		1.84545												
0.04083	-3.89867	0.00648	0.04335	0.28112	0.68518	-4.21235	0.09769		81.10448	44.58735	3.83038	20.65500	0.02243	4.50966	2.85603	0.06142	4.50925	0.01902			
0.21813	-4.06561	0.03292	0.23419	0.62888	1.54419	-4.40737	0.21564		4.50925												
0.82949	-4.25310	0.11759	0.88858	1.21116	2.98691	-4.46045	0.41200		3.99806	52.41003	2.86571	20.34000	-0.00209	2.23214	-1.27881	-0.56950	2.15827	0.00000			
2.89712	-0.34935	-0.73694	2.80183	-0.03519	0.37275	-3.17801	-0.12880		5.99709	56.27674	1.84928	20.34000	-0.06284	0.87469	-2.92876	-0.28314	0.82998	-0.01217			
1.41923	-2.33583	-0.41371	1.35869	0.00000	-0.00000	-3.08725	0.00000		11.99419	60.14344	0.83286	20.34000	0.00000	-0.00000	-2.94826	0.00000	-0.00000	-0.05596			
0.19858	-3.18189	-0.07242	0.18629	0.00000	0.00000	-3.37504	0.00000		-0.00000												
0.00000	-3.15146	0.00000	0.00000	0.00000	0.00000	-3.59919	0.00000		19.99225	64.01014	-0.18357	20.34000	0.00000	0.00000	-3.27073	0.00000	0.00000	0.00000			
0.00000	-3.42397	0.00000	0.00000	0.00000	0.00000	-3.78208	0.00000		19.99031	67.87684	-1.20000	20.34000	0.00000	0.00000	-3.51645	0.00000	0.00000	0.00000			
0.00000	-3.63835	0.00000	0.00000	0.02965	0.06908	-3.94939	0.01112		23.98838	71.74354	-2.21642	20.34000	0.00000	0.00000	-3.71311	0.00000	0.00000	0.00000			
0.00612	-3.81569	0.00099	0.00659	0.15486	0.37418	-4.11481	0.05464		27.98644	75.61025	-3.23285	20.34000	0.01320	0.03074	-3.88188	0.00495	0.03309	0.00000			
0.09611	-3.98274	0.01526	0.10339	0.43734	1.07073	-4.31518	0.15076		0.03309												
0.49031	-4.15130	0.07075	0.52556	0.87779	2.16043	-4.46586	0.29970		31.98450	79.47695	-4.24927	20.34000	0.07037	0.16649	-4.04933	0.02573	0.17891	0.01729			
3.34906	-4.44312	0.08100	3.61263	2.74339	6.82930	-3.71632	0.14298		35.98257	83.34365	-5.26570	20.34000	0.30729	0.74966	-4.23255	0.10661	0.80315	0.09138			
5.43940	-4.14892	0.12316	5.86429	2.88550	7.18307	-4.40824	0.15039		39.98063	87.21035	-6.28213	20.34000	0.66846	1.64206	-4.42518	0.22904	1.75805	0.33963			
6.89878	-3.86626	0.14444	7.43320	3.02937	7.54121	-4.86297	0.15789		1.75805												
7.25341	-4.51953	0.15186	7.81530	3.17499	7.903719																



RSK ENVIRONMENT LIMITED

UBB, London

TW Sewer Assessment

FULL DEVELOPMENT LONG TERM (S) + Structural Solution

Oasys RISK ENVIRONMENT LIMITED																	Job No.	Sheet No.	Rev.												
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UBB, London TW Sewer Assessment FULL DEVELOPMENT LONG TERM (S) + Structural Solution																	Drg. Ref.														
																	Made by MK	Date 09-Dec-2020	Checked	Date											
Stage: δx (n-Lp)	Stage: δy (n-Lp)	Stage: δz (n-Lp)	Stage: $\delta \theta$ (n-Lp)	Stage: $\delta \phi$ (n-Lp)	Stage: $\delta \psi$ (n-Lp)	Stage: $\delta \chi$ (n-Lp)	Stage: $\delta \omega$ (n-Lp)	Stage: $\delta \nu$ (n-Lp)	Stage: $\delta \xi$ (n-Lp)	Stage: $\delta \zeta$ (n-Lp)	Stage: $\delta \eta$ (n-Lp)	Stage: $\delta \theta$ (n-Lp)	Stage: $\delta \phi$ (n-Lp)	Stage: $\delta \psi$ (n-Lp)	Stage: $\delta \chi$ (n-Lp)	Stage: $\delta \omega$ (n-Lp)	Distance	x	y	z	δx (n)	δy (n)	δz (n)	$\delta \theta$ (n)	$\delta \phi$ (n)	$\delta \psi$ (n)	$\delta \chi$ (n-Lp)	$\delta \omega$ (n-Lp)	$\delta \nu$ (n-Lp)		
Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.		
9.42225	0.43453	0.19727	9	0.19727	10.15215	3.80167	9.46374	1.88484	0.19814	10.22017	3.93590	156.25860	-32.34753	19.20000	3.47853	8.65933	2.13386	-0.53856	9.31633	3.76876											
9.38183	1.96648	-0.58350	9	0.19727	10.09366	3.19660	7.95752	2.20319	-0.49491	9.31633	7.87180	159.82008	-34.02299	19.20000	3.17052	7.89259	2.20783	-0.49087	8.49142	3.45204											
8.59338	2.14185	-0.53446	9	0.19727	9.24539	1.22843	6.92250	1.99523	-1.83525	8.49142	11.80771	163.38155	-35.69846	19.20000	1.00208	6.81282	1.95574	-1.99338	6.59129	3.02675											
7.81797	2.20428	-0.58920	9	0.19727	8.36270	-0.75160	5.54159	1.26463	-0.03909	6.59129	15.74361	166.94303	-37.37393	19.20000	-0.88676	5.44208	1.20271	-3.11903	4.54689	0.81485											
6.67837	1.88913	-2.10557	9	0.19727	6.38992	-1.45574	4.02587	0.42560	-0.03101	4.54689	19.67951	170.50451	-39.04940	19.20000	-1.47930	3.88023	0.35315	-2.99034	2.88138	-0.96434											
5.32113	1.13016	-3.13774	9	0.19727	4.40442	-1.02986	2.13540	-0.22699	-1.84091	2.88138	23.61541	174.06599	-40.72486	19.20000	-0.96582	1.97594	-0.27225	-1.71508	1.37683	-1.45569											
3.71464	0.29167	-2.89849	9	0.19727	2.74160	-0.19591	0.40081	-0.66434	-0.34789	1.37683	27.55131	177.62747	-42.40033	19.20000	-0.12072	0.24698	-0.70407	-0.21437	0.17209	-0.89677											
1.83466	-0.30623	-1.59245	9	0.19727	1.27839	0.00000	-0.00000	-0.93748	0.00000	0.17209	31.48721	181.18895	-44.07580	19.20000	0.00000	0.00000	-0.94649	0.00000	0.00000	-0.10012											
0.20482	-0.73644	-0.17778	9	0.19727	0.14272	0.00000	0.00000	-0.69748	0.00000	0.00000	5.90385	158.03934	-33.18526	19.20000	3.32333	8.27299	2.18064	-0.51453	8.90069	3.60921											
8.98464	2.07054	-0.55879	9	0.19727	9.66633	2.47197	7.53002	2.19061	-0.96864	8.90069	9.83975	161.60081	-34.86073	19.20000	2.32819	7.45540	2.18706	-1.06697	7.73725	3.29725											
8.20806	2.18528	-0.51049	9	0.19727	8.83083	0.09234	6.15957	1.63209	-2.53850	7.73725	13.77566	165.16229	-36.53619	19.20000	-0.09490	6.02512	1.56548	-2.65069	5.41155	2.10184											
7.34572	2.14758	-1.22509	9	0.19727	7.54165	-1.26368	4.85444	0.85019	-3.20994	5.41155	17.71156	168.72377	-38.21166	19.20000	-1.34125	4.73349	0.77763	-3.22865	3.71224	-0.23006											
5.92560	1.50356	-2.73063	9	0.19727	5.26396	-1.36461	3.07571	0.05443	-2.54409	3.71224	21.64746	172.28525	-39.88713	19.20000	-1.34101	2.91013	-0.07006	-2.45225	2.06244	-1.36481											
4.58785	0.70518	-3.18797	9	0.19727	3.57042	-0.63029	1.28949	-0.43734	-1.11925	2.06244	25.58336	175.84673	-41.56260	19.20000	-0.56123	1.14821	-0.47132	-0.99662	0.80007	-1.27697											
2.75068	-0.05232	-2.32643	9	0.19727	1.94542	-0.02061	0.04216	-0.86133	-0.03659	0.80007	29.51926	179.40821	-43.23806	19.20000	0.00000	-0.00000	-0.89370	0.00000	-0.00000	-0.48605											
0.99438	-0.51105	-0.86310	9	0.19727	0.69288	0.00000	0.00000	-0.82760	0.00000	-0.00000	3.62091	54.06400	8.76921	16.51600	0.00000	0.00000	1.69132	0.00000	0.00000	0.16838											
0.42213	14.42407	-0.34257	9	0.19727	0.29865	0.00000	0.00000	-1.62311	0.00000	0.00000																					
Specific Utility Damage Results - Pullouts & Rotations																															
Stage: δx (n-Lp)	Stage: δy (n-Lp)	Stage: δz (n-Lp)	Stage: $\delta \theta$ (n-Lp)	Stage: $\delta \phi$ (n-Lp)	Stage: $\delta \psi$ (n-Lp)	Stage: $\delta \chi$ (n-Lp)	Stage: $\delta \omega$ (n-Lp)	Stage: $\delta \nu$ (n-Lp)	Stage: $\delta \xi$ (n-Lp)	Stage: $\delta \zeta$ (n-Lp)	Stage: $\delta \eta$ (n-Lp)	Stage: $\delta \theta$ (n-Lp)	Stage: $\delta \phi$ (n-Lp)	Stage: $\delta \psi$ (n-Lp)	Stage: $\delta \chi$ (n-Lp)	Stage: $\delta \omega$ (n-Lp)	Distance	x	y	z	Pullout: δx (n)	Pullout: δy (n)	Pullout: δz (n)	Pullout: $\delta \theta$ (n)	Pullout: $\delta \phi$ (n)	Pullout: $\delta \psi$ (n)	Pullout: $\delta \chi$ (n-Lp)	Pullout: $\delta \omega$ (n-Lp)	Pullout: $\delta \nu$ (n-Lp)		
Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.		
9.42225	0.43453	0.19727	9	0.19727	10.15215	3.80167	9.46374	1.88484	0.19814	10.22017	3.93590	156.25860	-32.34753	19.20000	3.47853	8.65933	2.13386	-0.53856	9.31633	3.76876											
9.38183	1.96648	-0.58350	9	0.19727	10.09366	3.19660	7.95752	2.20319	-0.49491	9.31633	7.87180	159.82008	-34.02299	19.20000	3.17052	7.89259	2.20783	-0.49087	8.49142	3.45204											
8.59338	2.14185	-0.53446	9	0.19727	9.24539	1.22843	6.92250	1.99523	-1.83525	8.49142	11.80771	163.38155	-35.69846	19.20000	1.00208	6.81282	1.95574	-1.99338	6.59129	3.02675											
7.81797	2.20428	-0.58920	9	0.19727	8.36270	-0.75160	5.54159	1.26463	-0.03909	6.59129	15.74361	166.94303	-37.37393	19.20000	-0.88676	5.44208	1.20271	-3.11903	4.54689	0.81485											
6.67837	1.88913	-2.10557	9	0.19727	6.38992	-1.45574	4.02587	0.42560	-0.03101	4.54689	19.67951	170.50451	-39.04940	19.20000	-1.47930	3.88023	0.35315	-2.99034	2.88138	-0.96434											
5.32113	1.13016	-3.13774	9	0.19727	4.40442	-1.02986	2.13540	-0.22699	-1.84091	2.88138	23.61541	174.06599	-40.72486	19.20000	-0.96582	1.97594	-0.27225	-1.71508	1.37683	-1.45569											
3.71464	0.29167	-2.89849	9	0.19727	2.74160	-0.19591	0.40081	-0.66434	-0.34789	1.37683	27.55131	177.62747	-42.40033	19.20000	-0.12072	0.24698	-0.70407	-0.21437	0.17209	-0.89677											
1.83466	-0.30623	-1.59245	9	0.19727	1.27839	0.00000	-0.00000	-0.93748	0.00000	0.17209	31.48721	181.18895	-44.07580	19.20000	0.00000	0.00000	-0.94649	0.00000	0.00000	-0.10012											
0.20482	-0.73644	-0.17778	9	0.19727	0.14272	0.00000	0.00000	-0.69748	0.00000	0.00000	5.90385	158.03934	-33.18526	19.20000	3.32333	8.27299	2.18064	-0.51453	8.90069	3.60921											
8.98464	2.07054	-0.55879	9	0.19727	9.66633	2.47197	7.53002	2.19061	-0.96864	8.90069	9.83975	161.60081	-34.86073	19.20000	2.32819	7.45540	2.18706	-1.06697	7.73725	3.29725											
8.20806	2.18528	-0.51049	9	0.19727	8.83083	0.09234	6.15957	1.63209	-2.53850	7.73725	13.77566	165.16229	-36.53619	19.20000	-0.09490	6.02512	1.56548	-2.65069	5.41155	2.10184											
7.34572	2.14758	-1.22509	9	0.19727	7.54165	-1.26368	4.85444	0.85019	-3.20994	5.41155	17.71156	168.72377	-38.21166	19.20000	-1.34125	4.73349	0.77763	-3.22865	3.71224	-0.23006											
5.92560	1.50356	-2.73063	9	0.19727	5.26396	-1.36461	3.07571	0.05443	-2.54409																						



RSK ENVIRONMENT LIMITED

UBB, London

TW Sewer Assessment

FULL DEVELOPMENT LONG TERM (S) + Structural Solution

Oasys										RISK ENVIRONMENT LIMITED										Job No.		Sheet No.		Rev.			
																				371654							
UBB, London										TW Sewer Assessment										Drg. Ref.							
FULL DEVELOPMENT LONG TERM (S) + Structural Solution																				Made by MK		Date 09-Dec-2020		Checked		Date	
Stage: Ref. Right	Stage: Pullout: Total:	Stage: Name Pullout: Total:	Specific Utility: Pullout: Total:	Specific Utility: Name Pullout: Total:	Sub-utility Name Pullout: Total:	Iteration Check:	Distance Check:	x Rotation:	y Rotation:	z Check:	Pullout: Check: Left Seg.	Pullout: Vertical Left	Pullout: Left	Pullout: Right	Pullout: Right	Pullout: Right	Pullout: Right										
0.00100	-0.00000	-0.00000	0.00199	0.00199	0.00199	0.00199	-	OK	15.99225	64.01014	-0.18357	20.34000	0.00000	0.00000	0.00100	0.00100	0.00000	0.00100									
0.00064	0.00000	0.00000	0.00127	0.00127	0.00127	0.00127	-	OK	19.99031	67.87684	-1.20000	20.34000	0.00000	0.00000	0.00064	0.00064	0.00000	0.00064									
0.00054	0.00198	0.00198	0.00109	0.00109	0.00307	0.00307	-	OK	23.98838	71.74354	-2.21642	20.34000	0.00000	0.00000	0.00054	0.00054	0.00198	0.00198									
0.00144	0.01156	0.01156	0.00287	0.00287	0.01443	0.01443	-	OK	27.98644	75.61025	-3.23285	20.34000	0.00247	0.00247	0.00144	0.00144	0.01404	0.01404									
0.00641	0.04561	0.04561	0.01283	0.01283	0.05843	0.05843	-	OK	31.98450	79.47695	-4.24927	20.34000	0.01610	0.01610	0.00641	0.00641	0.06171	0.06171									
0.00430	0.09136	0.09136	0.00860	0.00860	0.09996	0.09996	-	OK	35.98257	83.34365	-5.26570	20.34000	0.06976	0.06976	0.00430	0.00430	0.16112	0.16112									
0.00894	0.14721	0.14721	0.01789	0.01789	0.16510	0.16510	-	OK	39.98063	87.21035	-6.28213	20.34000	0.17331	0.17331	0.00894	0.00894	0.32052	0.32052									
0.01324	0.30407	0.30407	0.02649	0.02649	0.33056	0.33056	-	OK	43.97809	91.04338	-7.35750	20.34000	-0.59156	-0.59156	0.01324	0.01324	-0.28749	-0.28749									
0.02114	0.20686	0.20686	0.04229	0.04229	0.24914	0.24914	-	OK	47.99516	95.21009	-8.34107	20.34000	-0.25207	-0.25207	0.02114	0.02114	-0.04521	-0.04521									
0.00557	0.03621	0.03621	0.01114	0.01114	0.04735	0.04735	-	OK	51.99322	99.07679	-9.32464	20.34000	-0.03621	-0.03621	0.00557	0.00557	0.00000	0.00000									
0.00078	0.00000	0.00000	0.00157	0.00157	0.00157	0.00157	-	OK	55.99128	103.04338	-10.30539	20.34000	0.00000	0.00000	0.00078	0.00078	0.00000	0.00000									
0.00051	0.00000	0.00000	0.00102	0.00102	0.00102	0.00102	-	OK	59.98935	107.01019	-11.27081	20.34000	0.00000	0.00000	0.00051	0.00051	0.00000	0.00000									
0.00115	0.00556	0.00556	0.00230	0.00230	0.00785	0.00785	-	OK	63.98747	111.04338	-12.27463	20.34000	0.00000	0.00000	0.00115	0.00115	0.00556	0.00556									
0.00365	0.02683	0.02683	0.00729	0.00729	0.03412	0.03412	-	OK	67.98547	115.04338	-13.27463	20.34000	0.00682	0.00682	0.00365	0.00365	0.03365	0.03365									
0.00518	0.06775	0.06775	0.01036	0.01036	0.07811	0.07811	-	OK	71.98353	119.04103	-14.27549	20.34000	0.03854	0.03854	0.00518	0.00518	0.10630	0.10630									
0.00577	0.11447	0.11447	0.01154	0.01154	0.12602	0.12602	-	OK	75.98160	123.04338	-15.27791	20.34000	0.11624	0.11624	0.00577	0.00577	0.23072	0.23072									
0.00790	0.03099	0.03099	0.01580	0.01580	0.04679	0.04679	-	OK	79.98419	127.04110	-16.27513	19.73000	0.10001	0.10001	0.00790	0.00790	0.13100	0.13100									
0.02340	0.01361	0.01361	0.04681	0.04681	0.06042	0.06042	-	OK	83.98238	131.04338	-17.27463	19.73000	0.13343	0.13343	0.02340	0.02340	0.14705	0.14705									
0.00322	0.00672	0.00672	0.00644	0.00644	0.01317	0.01317	-	OK	87.98044	135.04338	-18.27463	19.73000	0.14771	0.14778	0.00322	0.00322	0.15450	0.15450									
0.00423	0.00681	0.00681	0.00847	0.00847	0.01527	0.01527	-	OK	91.97676	139.04125	-19.26486	19.73000	0.15525	0.15525	0.00423	0.00423	0.16205	0.16205									
0.00372	0.00689	0.00689	0.00743	0.00743	0.01432	0.01432	-	OK	95.97095	143.04338	-20.27463	19.73000	0.16280	0.16280	0.00372	0.00372	0.16969	0.16969									
0.00181	0.00697	0.00697	0.00362	0.00362	0.01059	0.01059	-	OK	99.96513	147.04335	-21.79801	19.73000	0.17045	0.17045	0.00181	0.00181	0.17742	0.17742									
0.00118	0.00627	0.00627	0.00235	0.00235	0.00862	0.00862	-	OK	103.95932	151.04335	-22.72159	19.73000	0.17819	0.17819	0.00118	0.00118	0.18447	0.18447									
0.00303	0.00323	0.00323	0.00607	0.00607	0.00930	0.00930	-	OK	107.95351	155.04335	-23.63116	19.73000	0.18505	0.18505	0.00303	0.00303	0.18828	0.18828									
0.00333	0.00131	0.00131	0.00667	0.00667	0.00798	0.00798	-	OK	111.94770	159.04330	-24.68800	19.73000	0.18843	0.18843	0.00333	0.00333	0.18974	0.18974									
0.00284	0.00132	0.00132	0.00567	0.00567	0.00699	0.00699	-	OK	115.94189	163.04225	-25.46431	19.73000	0.18989	0.18989	0.00284	0.00284	0.19120	0.19120									
0.00030	0.00132	0.00132	0.00059	0.00059	0.00191	0.00191	-	OK	119.93608	167.04130	-26.88089	19.73000	0.19135	0.19135	0.00030	0.00030	0.19266	0.19266									
0.00137	0.00132	0.00132	0.00273	0.00273	0.00405	0.00405	-	OK	123.93027	171.04135	-27.29747	19.73000	0.19281	0.19281	0.00137	0.00137	0.19412	0.19412									
0.00018	0.00132	0.00132	0.00035	0.00035	0.00167	0.00167	-	OK	127.92446	175.04261	-28.71404	19.73000	0.19427	0.19427	0.00018	0.00018	0.19559	0.19559									
0.00101	0.00132	0.00132	0.00202	0.00202	0.00334	0.00334	-	OK	131.91865	179.04304	-29.71306	19.73000	0.19573	0.19573	0.00101	0.00101	0.19705	0.19705									
0.00038	0.00132	0.00132	0.00075	0.00075	0.00207	0.00207	-	OK	135.91284	183.04295	-30.75470	19.73000	0.19720	0.19720	0.00038	0.00038	0.19852	0.19852									
0.04232	0.02252	0.02252	0.08465	0.08465	0.10717	0.10717	-	OK	139.92446	187.04261	-31.71404	19.73000	0.19869	0.19869	0.04232	0.04232	0.14335	0.14335									
0.00255	0.00668	0.00668	0.00510	0.00510	0.01179	0.01179	-	OK	143.98547	191.04343	-32.83999	19.73000	0.19961	0.19961	0.00255	0.00255	0.15077	0.15077									
0.00382	0.00677	0.00677	0.00764	0.00764	0.01441	0.01441	-	OK	147.97966	195.04348	-33.72567	19.73000	0.20053	0.20053	0.00382	0.00382	0.15827	0.15827									
0.00423	0.00685	0.00685	0.00847	0.00847	0.01532	0.01532	-	OK	151.97385	199.04343	-34.67314	19.73000	0.20145	0.20145	0.00423	0.00423	0.16586	0.16586									
0.00281	0.00693	0.00693	0.00562	0.00562	0.01255	0.01255	-	OK	155.96804	203.04343	-35.68972	19.73000	0.20237	0.20237	0.00281	0.00281	0.17355	0.17355									
0.00102	0.00701	0.00701	0.00204	0.00204	0.00905	0.00905	-	OK	159.96223	207.04316	-36.50630	19.73000	0.20329	0.20329	0.00102	0.00102	0.18132	0.18132									
0.00358	0.00482	0.00482	0.00715	0.00715	0.01197	0.01197	-	OK	163.95642	211.04817	-37.92287	19.73000	0.20421	0.20421	0.00358	0.00358	0.18692	0.18692									
0.00240	0.00182	0.00182	0.00480	0.00480	0.00662	0.00662	-	OK	167.95061	215.04207	-38.33945	19.73000	0.20513	0.20513	0.00240	0.00240	0.18901	0.18901									
0.00344	0.00131	0.00131	0.00687	0.00687	0.00819	0.00819	-	OK	171.94480	219.04552	-39.75603	19.73000	0.20605	0.20605	0.00344	0.00344	0.19047	0.19047									
0.00168	0.00132	0.00132	0.00336	0.00336	0.00468	0.00468	-	OK	175.93899	223.04282	-40.72720	19.73000	0.20697	0.20697	0.00168	0.00168	0.19193	0.19193									
0.00087	0.00132	0.00132	0.00173	0.00173	0.00305	0.00305	-	OK	179.93317	227.04277	-41.58918	19.73000	0.20789	0.20789	0.00087	0.00087	0.19339	0.19339									
0.00104	0.00132	0.00132	0.00208	0.00208																							



RSK ENVIRONMENT LIMITED

UBB, London

TW Sewer Assessment

FULL DEVELOPMENT LONG TERM (S) + Structural Solution

Oasys RSK ENVIRONMENT LIMITED UBB, London TW Sewer Assessment FULL DEVELOPMENT LONG TERM (S) + Structural Solution															Job No.		Sheet No.		Rev.	
															371654					
															Drg. Ref.					
Made by MK		Date 09-Dec-2020		Checked		Date														
0	Base Model	1	TWS(1)_1																	
223.83941	OK	-54.17942	-54.17942	OK	2.3385E+4	-	-	2.00040	48.04000	58.00000	14.64700	115.48	115.48	54.179	108.36	-54.179	-54.179	169.65999		
178.42978	OK	-48.23780	-48.23780	OK	2.6266E+4	-	-	4.00080	48.08000	56.00000	14.64700	81.954	81.954	48.238	96.476	-48.238	-48.238	130.19198		
94.65532	OK	-42.29793	-42.29793	OK	2.9954E+4	-	-	6.00120	48.12000	54.00000	14.64700	10.059	10.059	42.298	84.596	-42.298	-42.298	52.35738		
52.69185	OK	-52.07662	-52.07662	OK	4.8091E+4	-	-	8.00160	48.16000	52.00000	14.64700	-25.731	-25.731	26.346	52.692	-26.346	-26.346	26.34593		
48.00938	OK	-61.82377	-61.82377	OK	5.2781E+4	-	-	10.00200	48.20000	50.00000	14.64700	-37.819	-37.819	24.005	48.009	-24.005	-24.005	24.00469		
559.32086	Fails	-330.86862	-330.86862	OK	4.5305E+3	-	-	12.00240	48.24000	48.00000	14.64700	-51.208	-51.208	279.66	559.32	-279.66	-279.66	279.66043		
958.29952	Fails	-541.50982	-541.50982	OK	2.6443E+3	-	-	14.00280	48.28000	46.00000	14.64700	-62.360	-62.360	479.15	958.30	-479.15	-479.15	479.14976		
1445.31557	Fails	-767.81571	-767.81571	OK	1.7533E+3	-	-	16.00320	48.32000	44.00000	14.64700	-45.158	-45.158	722.66	1445.3	-722.66	-722.66	722.65778		
870.41355	Fails	-456.31097	-456.31097	OK	2.9113E+3	-	-	18.00360	48.36000	42.00000	14.64700	-21.104	-21.104	435.21	870.41	-435.21	-435.21	435.20678		
418.91022	OK	-217.53287	-217.53287	OK	6.0490E+3	-	-	20.00400	48.40000	40.00000	14.64700	-8.0778	-8.0778	209.46	418.91	-209.46	-209.46	209.45511		
623.38082	Fails	-313.91183	-313.91183	OK	4.0649E+3	-	-	22.00440	48.44000	38.00000	14.64700	-2.2214	-2.2214	311.69	623.38	-311.69	-311.69	311.69041		
32.59140	OK	-16.23660	-16.23660	OK	7.8034E+4	-	-	24.00480	48.48000	36.00000	14.64700	0.11820	0.11820	16.237	32.473	-16.237	-16.237	16.35480		
145.03773	OK	-72.47556	-72.47556	OK	1.7482E+4	-	-	26.00520	48.52000	34.00000	14.64700	0.086604	0.086604	72.476	144.95	-72.476	-72.476	72.56217		
657.10453	Fails	-328.54978	-328.54978	OK	3.8563E+3	-	-	28.00560	48.56000	32.00000	14.64700	0.0049604	0.0049604	328.55	657.10	-328.55	-328.55	328.55474		
384.81332	OK	-192.38238	-192.38238	OK	6.5858E+3	-	-	30.00600	48.60000	30.00000	14.64700	0.048558	0.048558	192.38	384.76	-192.38	-192.38	192.43094		
506.84474	Fails	-253.31232	-253.31232	OK	5.0017E+3	-	-	32.00640	48.64000	28.00000	14.64700	0.22010	0.22010	253.31	506.62	-253.31	-253.31	253.53242		
88.94048	OK	-49.01465	-49.01465	OK	2.8491E+4	-	-	34.00680	48.68000	26.00000	14.64700	-4.5444	-4.5444	44.470	88.940	-44.470	-44.470	44.47024		
51.98743	OK	-50.44195	-50.44195	OK	4.8743E+4	-	-	36.00720	48.72000	24.00000	14.64700	-24.448	-24.448	25.994	51.987	-25.994	-25.994	25.99371		
143.07778	OK	-128.41617	-128.41617	OK	1.7711E+4	-	-	38.00760	48.76000	22.00000	14.64700	-56.877	-56.877	71.539	143.08	-71.539	-71.539	71.53889		
132.61980	OK	-140.53968	-140.53968	OK	1.9107E+4	-	-	40.00800	48.80000	20.00000	14.64700	-74.230	-74.230	66.310	132.62	-66.310	-66.310	66.30990		
10.09306	OK	-73.01463	-73.01463	OK	2.5106E+5	-	-	42.00840	48.84000	18.00000	14.64700	-67.968	-67.968	5.0465	10.093	-5.0465	-5.0465	5.04653		
249.97825	OK	-167.88799	-167.88799	OK	1.0137E+4	-	-	44.00880	48.88000	16.00000	14.64700	-42.899	-42.899	124.99	249.98	-124.99	-124.99	124.98912		
421.27274	OK	-210.61152	-210.61152	OK	6.0158E+3	-	-	46.00920	48.92000	14.00000	14.64700	0.049701	0.049701	210.61	421.22	-210.61	-210.61	210.66122		
268.61362	OK	-112.77233	-112.77233	OK	1.1235E+4	-	-	48.00960	48.96000	12.00000	14.64700	43.069	43.069	112.77	225.54	-112.77	-112.77	155.84130		
338.57026	OK	-138.92984	-138.92984	OK	9.1197E+3	-	-	50.01000	49.00000	10.00000	14.64700	60.711	60.711	138.93	277.86	-138.93	-138.93	199.64042		
185.00881	OK	-59.79657	-59.79657	OK	2.1189E+4	-	-	52.01040	49.04000	8.00000	14.64700	65.416	65.416	59.797	119.59	-59.797	-59.797	125.21224		
104.68233	OK	-23.69537	-23.69537	OK	5.3470E+4	-	-	54.01080	49.08000	6.00000	14.64700	57.292	57.292	23.695	47.391	-23.695	-23.695	80.98696		
54.12598	OK	-12.53054	-12.53054	OK	1.0111E+5	-	-	56.01120	49.12000	4.00000	14.64700	29.065	29.065	12.531	25.061	-12.531	-12.531	41.59544		
202.78431	OK	-95.14384	-95.14384	OK	1.3317E+4	-	-	58.01160	49.16000	2.00000	14.64700	12.497	12.497	95.144	190.29	-95.144	-95.144	107.64048		
205.34702	OK	-100.16752	-100.16752	OK	1.2649E+4	-	-	60.01200	49.20000	0.00000	14.64700	5.0120	5.0120	100.17	200.34	-100.17	-100.17	105.17949		
72.42637	OK	-36.21230	-36.21230	OK	3.4988E+4	-	-	62.01240	49.24000	-2.00000	14.64700	0.0017694	0.0017694	36.212	72.425	-36.212	-36.212	36.21407		
54.24478	OK	-27.12237	-27.12237	OK	4.6714E+4	-	-	64.01280	49.28000	-4.00000	14.64700	45.027E-6	45.027E-6	27.122	54.245	-27.122	-27.122	27.12241		
17.98909	OK	-8.99445	-8.99445	OK	1.4086E+5	-	-	66.01320	49.32000	-6.00000	14.64700	180.91E-6	180.91E-6	8.9945	17.989	-8.9945	-8.9945	8.99463		
10.34112	OK	-5.17033	-5.17033	OK	2.4505E+5	-	-	68.01360	49.36000	-8.00000	14.64700	456.14E-6	456.14E-6	5.1703	10.341	-5.1703	-5.1703	5.17079		
5.00580	OK	-2.50257	-2.50257	OK	5.0628E+5	-	-	70.01400	49.40000	-10.00000	14.64700	657.43E-6	657.43E-6	2.5026	5.0051	-2.5026	-2.5026	2.50323		
1.32762	OK	-0.66343	-0.66343	OK	1.9098E+6	-	-	72.01440	49.44000	-12.00000	14.64700	751.18E-6	751.18E-6	0.66343	1.3269	-0.66343	-0.66343	0.66419		
1.16189	OK	-0.58057	-0.58057	OK	2.1823E+6	-	-	74.01480	49.48000	-14.00000	14.64700	753.72E-6	753.72E-6	0.58057	1.1611	-0.58057	-0.58057	0.58132		
2.79396	OK	-1.39663	-1.39663	OK	9.0718E+5	-	-	76.01520	49.52000	-16.00000	14.64700	694.34E-6	694.34E-6	1.3966	2.7933	-1.3966	-1.3966	1.39733		
3.81120	OK	-1.90530	-1.90530	OK	6.6499E+5	-	-	78.01560	49.56000	-18.00000	14.64700	600.60E-6	600.60E-6	1.9053	3.8106	-1.9053	-1.9053	1.90590		
4.38861	OK	-2.19406	-2.19406	OK	5.7747E+5	-	-	80.01600	49.60000	-20.00000	14.64700	493.67E-6	493.67E-6	2.1941	4.3881	-2.1941	-2.1941	2.19455		
4.65392	OK	-2.32677	-2.32677	OK	5.4453E+5	-	-	82.01640	49.64000	-22.00000	14.64700	387.90E-6	387.90E-6	2.3268	4.6535	-2.3268	-2.3268	2.32716		
4.70062	OK	-2.35017	-2.35017	OK	5.3911E+5	-	-	84.01680	49.68000	-24.00000	14.64700	291.88E-6	291.88E-6	2.3502	4.7003	-2.3502	-2.3502	2.35046		
4.59731	OK	-2.29855	-2.29855	OK	5.5122E+5	-	-	86.01720	49.72000	-26.00000	14.64700	209.95E-6	209.95E-6	2.2986	4.5971	-2.2986	-2.2986	2.29876		
4.39421	OK	-2.19703	-2.19703	OK	5.7669E+5	-	-	88.01760	49.76000	-28.00000	14.64700	143.52E-6	143.52E-6	2.1970	4.3941	-2.1970	-2.1970	2.		



RSK ENVIRONMENT LIMITED

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FULL DEVELOPMENT LONG TERM (S) + Structural Solution

Job No.	Sheet No.	Rev.
371654		
Drg. Ref.		
Made by MK	Date 09-Dec-2020	Checked Date

Stage:	Name	Specific	Specific Utility:			Sub-utility			Distance	x	y	z	Ax.	Ax.	Flexural:	Flexural:	Flexural:	Flexural:	Tension:	
			Tension:	Check:	Compn.:	Rad. of	Check:	Rad. of												Check:
			Ref.		Utility:	Name		Name												From
Total:	Tension	OK	Total:	Total:	Compn.	Curv.	Rad. of	Rad. of	Tens.	Strain	Strain:	Strain:	Tension:	Tension:	Compn.:	Compn.:	Total:			
91.79740	OK	-45.83987	-45.83987	OK	1.7659E+4	-	-	46.07337	12.64129	6.80843	17.09950	0.11766	0.11766	45.840	91.680	-45.840	-45.840	45.95753		
71.26081	OK	-35.58353	-35.58353	OK	2.2749E+4	-	-	48.07656	14.64443	6.82214	17.09950	0.093743	0.093743	35.584	71.167	-35.584	-35.584	35.67728		
50.26240	OK	-25.08968	-25.08968	OK	3.2264E+4	-	-	50.07975	16.64757	6.83586	17.09950	0.083040	0.083040	25.090	50.179	-25.090	-25.090	25.17272		
34.94173	OK	-17.43158	-17.43158	OK	4.6439E+4	-	-	52.08293	18.65071	6.84957	17.09950	0.078574	0.078574	17.432	34.863	-17.432	-17.432	17.51015		
24.85427	OK	-12.38857	-12.38857	OK	6.5342E+4	-	-	54.08612	20.65386	6.86329	17.09950	0.077119	0.077119	12.389	24.777	-12.389	-12.389	12.46569		
18.17859	OK	-9.05070	-9.05070	OK	8.9441E+4	-	-	56.08931	22.65700	6.87700	17.09950	0.077188	0.077188	9.0507	18.101	-9.0507	-9.0507	9.12789		
13.90353	OK	-6.91287	-6.91287	OK	1.1710E+5	-	-	58.09250	24.66014	6.89071	17.09950	0.077783	0.077783	6.9129	13.826	-6.9129	-6.9129	6.99066		
11.99232	OK	-5.95698	-5.95698	OK	1.3589E+5	-	-	60.09569	26.66329	6.90443	17.09950	0.078361	0.078361	5.9570	11.914	-5.9570	-5.9570	6.03534		
12.89457	OK	-6.40758	-6.40758	OK	1.2633E+5	-	-	62.09888	28.66643	6.91814	17.09950	0.079411	0.079411	6.4076	12.815	-6.4076	-6.4076	6.48699		
17.28427	OK	-8.60167	-8.60167	OK	9.4110E+4	-	-	64.10207	30.66957	6.93186	17.09950	0.080927	0.080927	8.6017	17.203	-8.6017	-8.6017	8.68260		
26.12424	OK	-13.02046	-13.02046	OK	6.2171E+4	-	-	66.10526	32.67271	6.94557	17.09950	0.083323	0.083323	13.020	26.041	-13.020	-13.020	13.10378		
53.72411	OK	-25.63072	-25.63072	OK	3.1583E+4	-	1	2.00675	38.67213	6.73960	17.09950	2.4627	2.4627	25.631	51.261	-25.631	-25.631	28.09338		
63.85486	OK	-30.43266	-30.43266	OK	2.6600E+4	-	-	4.01351	40.66527	6.50620	17.09950	2.9895	2.9895	30.433	60.865	-30.433	-30.433	33.42220		
122.91041	OK	-57.94882	-57.94882	OK	1.3969E+4	-	-	6.02026	42.65840	6.27280	17.09950	7.0128	7.0128	57.949	115.90	-57.949	-57.949	64.96160		
75.65520	OK	-23.47927	-23.47927	OK	3.4477E+4	-	-	8.02701	44.65153	6.03940	17.09950	10.697	10.697	23.479	46.959	-23.479	-23.479	34.17593		
105.41162	OK	-47.59943	-47.59943	OK	1.7007E+4	-	-	10.03376	46.64467	5.80600	17.09950	10.213	10.213	47.599	95.199	-47.599	-47.599	57.81220		
105.09177	OK	-48.35317	-48.35317	OK	1.6741E+4	-	-	12.04052	48.63780	5.57260	17.09950	8.3854	8.3854	48.353	96.706	-48.353	-48.353	56.73860		
91.24234	OK	-43.79617	-43.79617	OK	1.8483E+4	-	-	14.04727	50.63933	5.33920	17.09950	3.6500	3.6500	43.796	87.592	-43.796	-43.796	47.44617		
71.95130	OK	-35.94685	-35.94685	OK	2.2519E+4	-	-	16.05402	52.62407	5.10580	17.09950	0.057604	0.057604	35.947	71.894	-35.947	-35.947	36.00445		
87.95353	OK	-43.96232	-43.96232	OK	1.8413E+4	-	-	18.06077	54.61720	4.87240	17.09950	0.028890	0.028890	43.962	87.925	-43.962	-43.962	43.99121		
42.65702	OK	-21.32215	-21.32215	OK	3.7965E+4	-	-	20.06753	56.61033	4.63900	17.09950	0.012713	0.012713	21.322	42.644	-21.322	-21.322	21.33487		
363.47674	OK	-175.01566	-175.01566	OK	4.6253E+3	-	-	22.07428	58.60347	4.40560	17.09950	13.445	13.445	175.02	350.03	-175.02	-175.02	188.46108		
328.50825	OK	-153.90986	-153.90986	OK	5.2596E+3	-	-	24.08103	60.59660	4.17220	17.09950	20.689	20.689	153.91	307.82	-153.91	-153.91	174.59839		
24.47494	OK	-4.94773	-4.94773	OK	1.6361E+5	-	-	26.08778	62.58973	3.93880	17.09950	14.579	14.579	4.9477	9.8955	-4.9477	-4.9477	19.52722		
13.44994	OK	-4.82903	-4.82903	OK	1.6763E+5	-	-	3.89559	70.33677	2.45600	17.09950	3.7919	3.7919	4.8290	9.6581	-4.8290	-4.8290	8.62092		
34.48765	OK	-14.32291	-14.32291	OK	5.6518E+4	-	-	5.84339	72.21715	1.94800	17.09950	5.8418	5.8418	14.323	28.646	-14.323	-14.323	20.16474		
79.25662	OK	-32.94547	-32.94547	OK	2.4571E+4	-	-	7.79119	74.09754	1.44000	17.09950	13.366	13.366	32.945	65.891	-32.945	-32.945	46.31115		
20.15053	OK	-0.62901	-0.62901	OK	1.2870E+6	-	-	9.73898	75.97992	0.93200	17.09950	18.893	18.893	0.62901	1.2580	-0.62901	-0.62901	19.52153		
44.50728	OK	-11.94391	-11.94391	OK	6.7775E+4	-	-	11.68678	77.85831	0.42400	17.09950	20.619	20.619	11.944	23.888	-11.944	-11.944	32.56337		
49.62658	OK	-12.74203	-12.74203	OK	6.3530E+4	-	-	13.63457	79.73869	-0.08400	17.09950	24.143	24.143	12.742	25.484	-12.742	-12.742	36.88454		
54.62488	OK	-13.36991	-13.36991	OK	6.0546E+4	-	-	15.58237	81.61098	-0.59200	17.09950	27.885	27.885	13.370	26.740	-13.370	-13.370	41.25496		
66.87643	OK	-17.29753	-17.29753	OK	4.6799E+4	-	-	17.53017	83.49946	-1.10000	17.09950	32.281	32.281	17.298	34.595	-17.298	-17.298	49.57890		
83.32800	OK	-22.66008	-22.66008	OK	3.5724E+4	-	-	19.47796	85.37985	-1.60800	17.09950	38.008	38.008	22.660	45.320	-22.660	-22.660	60.66792		
87.89495	OK	-21.87052	-21.87052	OK	3.7013E+4	-	-	21.42576	87.26023	-2.11600	17.09950	44.154	44.154	21.871	43.741	-21.871	-21.871	66.02443		
261.90948	OK	-122.28955	-122.28955	OK	6.1044E+3	-	-	2.00802	92.87630	-3.90013	16.23650	17.330	17.330	122.29	244.58	-122.29	-122.29	139.61993		
178.32022	OK	-110.94244	-110.94244	OK	8.3734E+3	-	-	4.01604	94.73160	-4.66826	16.23650	-21.791	-21.791	89.151	178.30	-89.151	-89.151	89.15101		
285.08493	OK	-168.82262	-168.82262	OK	5.2370E+3	-	-	6.02406	96.58689	-5.43638	16.23650	-26.280	-26.280	142.54	285.08	-142.54	-142.54	142.54246		
436.33428	OK	-234.78611	-234.78611	OK	3.4217E+3	-	-	8.03209	98.44219	-6.20451	16.23650	-16.619	-16.619	218.17	436.33	-218.17	-218.17	218.16714		
39.13202	OK	-28.54702	-28.54702	OK	3.8153E+4	-	-	10.04011	100.29734	-6.97264	16.23650	-8.9810	-8.9810	19.566	39.132	-19.566	-19.566	19.56601		
36.51075	OK	-20.19156	-20.19156	OK	4.0892E+4	-	-	12.04813	102.15279	-7.74077	16.23650	-1.9362	-1.9362	18.255	36.511	-18.255	-18.255	18.25538		
42.65292	OK	-26.51829	-26.51829	OK	3.5003E+4	-	-	14.05615	104.00809	-8.50889	16.23650	-5.1918	-5.1918	21.326	42.653	-21.326	-21.326	21.32646		
42.62645	OK	-31.45786	-31.45786	OK	3.5025E+4	-	-	16.06417	105.86338	-9.27702	16.23650	-10.145	-10.145	21.313	42.626	-21.313	-21.313	21.31323		
76.98544	OK	-42.70599	-42.70599	OK	1.9393E+4	-	-	18.07219	107.71868	-10.04515	16.23650	-4.2133	-4.2133	38.493	76.985	-38.493	-38.493	38.49272		
71.89204	OK	-36.95481	-36.95481	OK	2.0767E+4	-	-	20.08021	109.57398	-10.81328	16.23650	-1.0088	-1.0088	35.946	71.892	-35.946	-35.946	35.94602		
50.42973	OK	-26.21649	-26.21649	OK	2.9606E+4	-	-	22.08824	111.42928	-11.581										



RSK ENVIRONMENT LIMITED

UBB, London

TW Sewer Assessment

FULL DEVELOPMENT LONG TERM (S) + Structural Solution

Job No.	Sheet No.	Rev.
371654		
Drg. Ref.		
Made by MK	Date 09-Dec-2020	Checked Date

Stage:	Tension:	Name	Specific Compn.:	Utility:	Name	Specific Compn.:	Utility:	Name	Sub-utility:	Distance:	x	y	z	Ax.	Ax.	Flexural:	Flexural:	Flexural:	Flexural:	Tension:	
																					Ref.
Total:	Tension:	Ref.	Compn.:	Utility:	Total:	Compn.:	Utility:	Total:	Compn.:	Utility:	Rad. of	Check:	Rad. of	Check:	Rad. of	Check:	Rad. of	Check:	Rad. of	Check:	Tension:
18.18216	OK	-21.79056	-21.79056	OK	8.2113E+4	-	-	143.20583	-	-	76.30482	161.52232	-32.32085	16.23650	-437.66	-437.66	194.96	389.93	-194.96	-194.96	194.96362
389.92725	OK	-632.62802	-632.62802	OK	3.8289E+3	-	-	103.22047	-	-	78.31284	163.37762	-33.08898	16.23650	-762.95	-762.95	52.054	104.11	-52.054	-52.054	52.05375
104.10750	OK	-815.00598	-815.00598	OK	1.4341E+4	-	-	158.84629	-	-	80.32086	165.23291	-33.85711	16.23650	-609.08	-609.08	111.02	222.03	-111.02	-111.02	111.01709
222.03417	OK	-720.09909	-720.09909	OK	6.7242E+3	-	-	77.54027	-	-	82.32888	167.08821	-34.62523	16.23650	-390.92	-390.92	38.947	77.895	-38.947	-38.947	38.94727
77.89454	OK	-429.86648	-429.86648	OK	1.9167E+4	-	-	180.41543	-	-	84.33690	168.94351	-35.39336	16.23650	-109.78	-109.78	18.532	37.063	-18.532	-18.532	18.53153
37.06305	OK	-128.31461	-128.31461	OK	4.0283E+4	-	-	188.35474	-	-	86.34492	170.79881	-36.16149	16.23650	181.05	181.05	48.152	96.304	-48.152	-48.152	229.20352
277.35552	OK	-48.15201	-48.15201	OK	1.5503E+4	-	-	73.60364	-	-	88.35295	172.65411	-36.92962	16.23650	369.36	369.36	25.684	51.368	-25.684	-25.684	395.04116
420.72501	OK	-25.68385	-25.68385	OK	2.9065E+4	-	-	1.30963	-	-	90.36097	174.50940	-37.69774	16.23650	413.72	413.72	27.490	54.980	-27.490	-27.490	441.21215
468.70230	OK	-27.49015	-27.49015	OK	2.7155E+4	-	-	20.75444	-	-	93.95632	-32.55421	2.82127	20.65500	290.52E-6	58.104E-6	0.016579	0.016579	-0.016579	-0.016579	0.01687
0.01664	OK	-0.01658	-0.01658	OK	3.3175E+6	-	-	180.00000	-	-	5.93447	-20.57622	2.84714	20.65500	301.87E-6	60.375E-6	0.0093669	0.0093669	-0.0093669	-0.0093669	0.00967
0.00943	OK	-0.00937	-0.00937	OK	5.8717E+6	-	-	180.00000	-	-	7.91263	-28.59823	2.87302	20.65500	305.77E-6	61.153E-6	587.37E-6	587.37E-6	-587.37E-6	-587.37E-6	0.00089
0.00065	OK	-0.00059	-0.00059	OK	9.3638E+7	-	-	0.00000	-	-	9.89079	-26.62024	2.89889	20.65500	299.30E-6	59.859E-6	0.014037	0.014037	-0.014037	-0.014037	0.01434
0.01410	OK	-0.01404	-0.01404	OK	3.9181E+6	-	-	0.00000	-	-	11.86895	-24.64226	2.92477	20.65500	279.42E-6	55.884E-6	0.031918	0.031918	-0.031918	-0.031918	0.03220
0.03197	OK	-0.03192	-0.03192	OK	1.7232E+6	-	-	0.00000	-	-	13.84711	-22.66427	2.95064	20.65500	243.54E-6	48.708E-6	0.055384	0.055384	-0.055384	-0.055384	0.05563
0.05543	OK	-0.05538	-0.05538	OK	9.9306E+5	-	-	0.00000	-	-	15.82526	-20.68628	2.97652	20.65500	190.71E-6	38.142E-6	0.085845	0.085845	-0.085845	-0.085845	0.08604
0.08588	OK	-0.08585	-0.08585	OK	6.4069E+5	-	-	0.00000	-	-	17.80342	-18.70829	3.00239	20.65500	123.85E-6	24.770E-6	0.12500	0.12500	-0.12500	-0.12500	0.12512
0.12502	OK	-0.12500	-0.12500	OK	4.4001E+5	-	-	0.00000	-	-	19.78158	-16.73030	3.02827	20.65500	53.525E-6	10.705E-6	0.17483	0.17483	-0.17483	-0.17483	0.17488
0.17484	OK	-0.17483	-0.17483	OK	3.1459E+5	-	-	0.00000	-	-	21.75974	-14.71521	3.05414	20.65500	4.2929E-6	858.59E-9	0.23757	0.23757	-0.23757	-0.23757	0.23758
0.23757	OK	-0.23757	-0.23757	OK	2.3151E+5	-	-	0.00000	-	-	23.73790	-12.77432	3.08002	20.65500	24.613E-6	4.9226E-6	0.31551	0.31551	-0.31551	-0.31551	0.31554
0.31552	OK	-0.31551	-0.31551	OK	1.7432E+5	-	-	0.00000	-	-	25.71605	-10.77933	3.10589	20.65500	201.46E-6	40.291E-6	0.41053	0.41053	-0.41053	-0.41053	0.41073
0.41057	OK	-0.41053	-0.41053	OK	1.3397E+5	-	-	0.00000	-	-	27.69421	-8.81834	3.13177	20.65500	679.41E-6	135.88E-6	0.52309	0.52309	-0.52309	-0.52309	0.52377
0.52322	OK	-0.52309	-0.52309	OK	1.0515E+5	-	-	0.00000	-	-	29.67237	-6.84036	3.15764	20.65500	0.0016799	335.97E-6	0.65029	0.65029	-0.65029	-0.65029	0.65197
0.65062	OK	-0.65029	-0.65029	OK	8.4578E+4	-	-	0.00000	-	-	31.65053	-4.86237	3.18352	20.65500	0.0042027	840.53E-6	1.2247	1.2247	-1.2247	-1.2247	1.22885
1.22549	OK	-1.22465	-1.22465	OK	4.4911E+4	-	-	0.00000	-	-	33.62869	-2.88438	3.20939	20.65500	5.5644	1.1129	4.3120	4.3120	-4.3120	-4.3120	9.87642
5.42489	OK	-4.31201	-4.31201	OK	1.2755E+4	-	-	-5.98678	-	-	35.60684	-0.90639	3.23527	20.65500	24.724	4.9447	2.1002	2.1002	-2.1002	-2.1002	26.82368
7.04487	OK	-2.10017	-2.10017	OK	2.6188E+4	-	-	-69.52367	-	-	37.58500	1.07160	3.26114	20.65500	26.010	5.2020	0.47430	0.47430	-0.47430	-0.47430	26.48424
5.67629	OK	-0.47430	-0.47430	OK	1.1596E+5	-	-	-54.66740	-	-	39.56316	3.04959	3.28701	20.65500	3.6437	0.72874	0.58036	0.58036	-0.58036	-0.58036	4.22408
1.30910	OK	-0.58036	-0.58036	OK	9.4769E+4	-	-	-86.07123	-	-	41.54132	5.02758	3.31289	20.65500	-16.800	-3.3599	0.70069	0.70069	-0.70069	-0.70069	0.70069
0.70069	OK	-17.50039	-4.06063	OK	7.8494E+4	-	-	194.36156	-	-	43.51948	7.00557	3.33876	20.65500	-21.611	-4.3221	2.0262	2.0262	-2.0262	-2.0262	2.02617
2.02617	OK	-23.63688	-6.34831	OK	2.7145E+4	-	-	128.10275	-	-	45.49764	8.98355	3.36464	20.65500	-7.3014	-1.4603	0.95042	0.95042	-0.95042	-0.95042	0.95042
0.95042	OK	-8.25185	-2.41071	OK	5.7869E+4	-	-	154.16316	-	-	47.47579	10.96154	3.39051	20.65500	1.4428	0.28856	1.0826	1.0826	-1.0826	-1.0826	2.52543
1.37120	OK	-1.08264	-1.08264	OK	5.0802E+4	-	-	181.87957	-	-	49.45395	12.93953	3.41639	20.65500	1.4683	0.29366	1.1537	1.1537	-1.1537	-1.1537	2.62199
1.44734	OK	-1.15367	-1.15367	OK	4.7674E+4	-	-	181.76379	-	-	51.43211	14.87452	3.44226	20.65500	1.4958	0.29916	1.0472	1.0472	-1.0472	-1.0472	2.54295
1.34632	OK	-1.04717	-1.04717	OK	5.2523E+4	-	-	181.94402	-	-	53.41027	16.89551	3.46814	20.65500	1.0644	0.21287	1.4250	1.4250	-1.4250	-1.4250	2.48936
1.63787	OK	-1.42500	-1.42500	OK	3.8597E+4	-	-	136.82455	-	-	55.38843	18.87350	3.49401	20.65500	0.48619	0.097238	0.79415	0.79415	-0.79415	-0.79415	1.28034
0.89139	OK	-0.79415	-0.79415	OK	6.9256E+4	-	-	158.45423	-	-	57.36658	20.81549	3.51989	20.65500	0.35325	0.070649	0.53440	0.53440	-0.53440	-0.53440	0.88765
0.60505	OK	-0.53440	-0.53440	OK	1.0292E+5	-	-	180.01507	-	-	59.34474	22.82948	3.54576	20.65500	0.35322	0.070643	0.42295	0.42295	-0.42295	-0.42295	0.77617
0.49359	OK	-0.42295	-0.42295	OK	1.3004E+5	-	-	180.01714	-	-	61.32290	24.80747	3.57164	20.65500	0.35342	0.070685	0.35567	0.35567	-0.35567	-0.35567	0.70910
0.42636	OK	-0.35567	-0.35567	OK	1.5464E+5	-	-	180.02264	-	-	63.30106	26.78545	3.59751	20.65500	0.35404	0.070808	0.33486	0.33486	-0.33486	-0.33486	0.68890
0.40567	OK	-0.33486	-0.33486	OK	1.64																



RSK ENVIRONMENT LIMITED

UBB, London

TW Sewer Assessment

FULL DEVELOPMENT LONG TERM (S) + Structural Solution

Job No.	Sheet No.	Rev.
371654		
Drg. Ref.		
Made by MK	Date 09-Dec-2020	Checked Date

Stage:	Stage:	Name	Specific	Specific	Utility:	Name	Sub-utility	Distance	x	y	z	Ax.	Ax.	Flexural:	Flexural:	Flexural:	Flexural:	Tension:
Tension:	Check:	Compn.:	Compn.:	Check:	Rad. of	Rad. of	Check:	Peak	Flex.									
Ref.	Tension	Utility:	Compn.:	Check:	Rad. of	Rad. of	Check:	Peak	Flex.									
Total:	Tension	Total:	Total:	Compn.	Curv.	Rad. of	Rad. of	Tens. Strain				Strain:	Strain:	Tension:	Tension:	Compn.:	Compn.:	Total:
1.05876	OK	-0.68370	-0.68370	OK	8.0445E+4	-	-	9.98547	100.41343	-10.83999	19.73000	1.8753	0.37506	0.68370	0.68370	-0.68370	-0.68370	2.55899
1.23011	OK	-0.85360	-0.85360	OK	6.4433E+4	-	-	11.98257	102.28070	-11.54828	19.73000	1.8825	0.37651	0.85360	0.85360	-0.85360	-0.85360	2.73614
1.39890	OK	-1.02091	-1.02091	OK	5.3873E+4	-	-	13.97966	104.14798	-12.25657	19.73000	1.8900	0.37799	1.0209	1.0209	-1.0209	-1.0209	2.91088
1.52889	OK	-1.14932	-1.14932	OK	4.7854E+4	-	-	15.97676	106.01525	-12.96486	19.73000	1.8979	0.37957	1.1493	1.1493	-1.1493	-1.1493	3.04718
1.54022	OK	-1.15868	-1.15868	OK	4.7468E+4	-	-	17.97385	107.88253	-13.67314	19.73000	1.9077	0.38154	1.1587	1.1587	-1.1587	-1.1587	3.06639
1.39444	OK	-1.01063	-1.01063	OK	5.4422E+4	-	-	19.97095	109.74980	-14.38143	19.73000	1.9190	0.38381	1.0106	1.0106	-1.0106	-1.0106	2.92967
1.13613	OK	-0.74988	-0.74988	OK	7.3345E+4	-	-	21.96804	111.61707	-15.08972	19.73000	1.9312	0.38625	0.74988	0.74988	-0.74988	-0.74988	2.68112
0.85374	OK	-0.46494	-0.46494	OK	1.1829E+5	-	-	23.96513	113.48435	-15.79801	19.73000	1.9440	0.38879	0.46494	0.46494	-0.46494	-0.46494	2.40891
0.63144	OK	-0.24016	-0.24016	OK	2.2901E+5	-	-	25.96223	115.35162	-16.50630	19.73000	1.9564	0.39128	0.24016	0.24016	-0.24016	-0.24016	2.19656
0.53433	OK	-0.14062	-0.14062	OK	3.9114E+5	-	-	27.95932	117.21890	-17.21459	19.73000	1.9686	0.39371	0.14062	0.14062	-0.14062	-0.14062	2.10917
1.72041	OK	-1.42241	-1.42241	OK	3.8667E+4	-	-	29.95642	119.08617	-17.92287	19.73000	1.4900	0.29800	1.4224	1.4224	-1.4224	-1.4224	2.91241
1.04064	OK	-0.90326	-0.90326	OK	6.0891E+4	-	-	31.95351	120.95345	-18.63116	19.73000	0.68691	0.13738	0.90326	0.90326	-0.90326	-0.90326	1.59017
0.78312	OK	-0.70932	-0.70932	OK	7.7539E+4	-	-	33.95061	122.82772	-19.33945	19.73000	0.36899	0.07379	0.70932	0.70932	-0.70932	-0.70932	1.07832
1.00099	OK	-0.92653	-0.92653	OK	5.9361E+4	-	-	35.94770	124.68800	-20.04774	19.73000	0.37228	0.07456	0.92653	0.92653	-0.92653	-0.92653	1.29881
1.03340	OK	-0.95797	-0.95797	OK	5.7413E+4	-	-	37.94480	126.55527	-20.75603	19.73000	0.37713	0.07542	0.95797	0.95797	-0.95797	-0.95797	1.33510
0.86422	OK	-0.78770	-0.78770	OK	6.9823E+4	-	-	39.94189	128.42255	-21.46431	19.73000	0.38259	0.07651	0.78770	0.78770	-0.78770	-0.78770	1.17029
0.53972	OK	-0.46224	-0.46224	OK	1.1898E+5	-	-	41.93899	130.28982	-22.17260	19.73000	0.38738	0.07747	0.46224	0.46224	-0.46224	-0.46224	0.84963
0.14347	OK	-0.06556	-0.06556	OK	8.3887E+5	-	-	43.93608	132.15710	-22.88089	19.73000	0.38953	0.07790	0.06556	0.06556	-0.06556	-0.06556	0.45509
0.35276	OK	-0.27505	-0.27505	OK	1.9997E+5	-	-	45.93317	134.02437	-23.58918	19.73000	0.38859	0.07771	0.27505	0.27505	-0.27505	-0.27505	0.66363
0.49870	OK	-0.42144	-0.42144	OK	1.3051E+5	-	-	47.93027	135.89165	-24.29747	19.73000	0.38632	0.07726	0.42144	0.42144	-0.42144	-0.42144	0.80776
0.39120	OK	-0.31438	-0.31438	OK	1.7495E+5	-	-	49.92736	137.75892	-25.00575	19.73000	0.38408	0.07681	0.31438	0.31438	-0.31438	-0.31438	0.69846
0.11840	OK	-0.04184	-0.04184	OK	1.3147E+6	-	-	51.92446	139.62619	-25.71404	19.73000	0.38283	0.07656	0.04183	0.04183	-0.04183	-0.04183	0.42466
0.28556	OK	-0.20883	-0.20883	OK	2.6337E+5	-	-	53.92155	141.49447	-26.42233	19.73000	0.38364	0.07672	0.20883	0.20883	-0.20883	-0.20883	0.59247
0.38024	OK	-0.30309	-0.30309	OK	1.8146E+5	-	-	55.91865	143.36074	-27.13062	19.73000	0.38574	0.07714	0.30309	0.30309	-0.30309	-0.30309	0.68883
0.32118	OK	-0.24364	-0.24364	OK	2.2574E+5	-	-	57.91574	145.22802	-27.83891	19.73000	0.38772	0.07754	0.24364	0.24364	-0.24364	-0.24364	0.63136
0.18256	OK	-0.10472	-0.10472	OK	5.2522E+5	-	-	59.91284	147.09529	-28.54720	19.73000	0.38920	0.07783	0.10472	0.10472	-0.10472	-0.10472	0.49391
0.13444	OK	-0.05653	-0.05653	OK	9.7300E+5	-	-	61.90993	148.96257	-29.25548	19.73000	0.38955	0.07791	0.05652	0.05652	-0.05652	-0.05652	0.44608
2.98625	OK	-0.48322	-0.48322	OK	1.1382E+5	-	-	63.90590	150.83155	-30.00575	19.73000	12.515	2.5030	0.48322	0.48322	-0.48322	-0.48322	12.99838
2.89497	OK	-0.42966	-0.42966	OK	1.2801E+5	-	-	65.90385	152.70000	-30.71404	19.73000	12.138	2.4276	0.42966	0.42966	-0.42966	-0.42966	12.75622
2.72022	OK	-0.29259	-0.29259	OK	1.8798E+5	-	-	67.90180	154.56855	-31.42299	19.73000	12.000	2.4000	0.29259	0.29259	-0.29259	-0.29259	12.43072
4.94525	OK	-145.25950	-145.25950	OK	1.1122E+4	-	-	69.89975	156.43700	-32.13062	19.73000	-140.31	-28.063	4.9453	4.9453	-4.9453	-4.9453	4.94525
6.31671	OK	-387.94203	-387.94203	OK	8.7071E+3	-	-	71.89715	158.30555	-32.83891	19.73000	-381.63	-76.325	6.3167	6.3167	-6.3167	-6.3167	6.31671
2.30766	OK	-404.49979	-404.49979	OK	2.3834E+4	-	-	73.89410	160.17400	-33.54720	19.73000	-402.19	-80.438	2.3077	2.3077	-2.3077	-2.3077	2.30766
4.49157	OK	-290.33428	-290.33428	OK	1.2245E+4	-	-	75.89105	162.04255	-34.25548	19.73000	-285.84	-57.169	4.4916	4.4916	-4.4916	-4.4916	4.49157
0.98234	OK	-147.71126	-147.71126	OK	5.5989E+4	-	-	77.88800	163.91100	-34.96431	19.73000	-146.73	-29.346	0.98234	0.98234	-0.98234	-0.98234	0.98234
6.61650	OK	-0.05449	-0.05449	OK	1.0094E+6	-	-	79.88495	165.77955	-35.67260	19.73000	32.810	6.5620	0.05448	0.05448	-0.05448	-0.05448	32.86455
40.40194	OK	-0.92828	-0.92828	OK	5.9249E+4	-	-	81.88190	167.64800	-36.38089	19.73000	197.37	39.474	0.92828	0.92828	-0.92828	-0.92828	198.29657
67.14354	OK	-2.32511	-2.32511	OK	2.3655E+4	-	-	83.87885	169.51655	-37.08918	19.73000	324.09	64.818	2.3251	2.3251	-2.3251	-2.3251	326.41722
75.78691	OK	-1.80865	-1.80865	OK	3.0409E+4	-	-	85.87580	171.38510	-37.79801	19.73000	369.89	73.978	1.8086	1.8086	-1.8086	-1.8086	371.69996
77.13838	OK	-0.87043	-0.87043	OK	6.3187E+4	-	-	87.87275	173.25365	-38.50630	19.73000	381.34	76.268	0.87043	0.87043	-0.87043	-0.87043	382.21019
57.15105	OK	-6.50306	-6.50306	OK	8.4576E+3	-	-	89.86970	175.12220	-39.21459	19.73000	253.24	50.648	6.5031	6.5031	-6.5031	-6.5031	259.74303
14.01628	OK	-3.12250	-3.12250	OK	1.7614E+4	-	-	91.86665	176.99075	-39.92287	19.73000	54.469	10.894	3.1225	3.1225	-3.1225	-3.1225	57.59136
2.78567	OK	-2.78561	-2.78561	OK	1.9744E+4	-	-	93.86360	178.85930	-40.63116	19.73000	31.48721	181.18895	2.7856	2.7856	-2.7856	-2.7856	2.78588
83.07156	OK	-74.67332	-74.67332	OK	2.4735E+3	-	-	95.86055	180.72785	-41.33945	19.73000	41.991	8.3982	74.673	74.673	-74.673	-74.673	116.66455

Summary: There is failure at one (or many) location(s). e.g. Stage 0, Specific Utility 1, location (48.640000|28.000000|14.647000)
Note: Tensile strains are +ve, compressive strains are -ve.
Note: The peak flexural tensile strain orientation angle is measured with respect to the global z-axis by looking at the end point of the utility from the start point. Anti-clockwise is positive.

Specific Utility Damage Results - Maximum Values

Stage:	Stage:	Name	Specific	Specific	Utility:	Name	Jointed	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.
Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.
Ref.	Disp.	Disp.	Utility:	Disp.	Disp.	Disp.	Disp.	Disp.	Disp.	Disp.	Disp.	Disp.	Disp.	Disp.	Disp.	Disp.	Disp.	Disp.	Disp.
Horiz.	Horiz.	Horiz.	Ref.	Horiz.	Horiz.	Horiz.	Horiz.	Horiz.	Horiz.	Horiz.	Horiz.	Horiz.	Horiz.	Horiz.	Horiz.	Horiz.	Horiz.	Horiz.	Horiz.
x:	x:	y:	y:	y:	y:	y:	y:	y:	y:	y:	y:	y:	y:	y:	y:	y:	y:	y:	y:
Location	Location	Location	Location	Location	Location	Location	Location	Location	Location	Location	Location	Location	Location	Location	Location	Location	Location	Location	Location
[m]	[mm]	[m]	[mm]	[m]	[mm]	[m]	[mm]	[m]	[mm]	[m]	[mm]	[m]	[mm]	[m]	[mm]	[m]	[mm]	[m]	[mm]
0	Base Model	1	TWS(1)_1	No	-	-	-	-	-	16.00320	1445.31557*	16.00320	-767.81571	16.003	1.7533E+3	28.006	-8.1501		
46.009	-0.56982	46.009	0.18923	No	-	-	-	-	-	28.04466	146.73644	28.04466	-73.35275	28.045	1.1036E+4	56.089	9.0497		
36.057	0.16611	70.111	0.87229	No	-	-	-	-	-	22.07428	363.47674	22.07428	-175.01566	22.074	4.6253E+3	0.0	8.0091		
30.101	0.14240	0.0	0.86770	No	-	-	-	-	-	21.42576	87.89495	7.79119	-32.94547	7.7912	2.4571E+4	25.321	-4.0611		
25.321	0.66357	25.321	5.0134	No	-	-	-	-	-	90.36097	468.70230	78.31284	-815.00598	8.0321	3.4217E+3	20.080	-6.5181		
84.337	-4.8033	34.136	12.478	No	-	-	-	-	-	79.12632	46.11435	79.12632	-45.32163	79.126	1.2135E+3	59.345	3.9571		
39.563	0.12465	79.126	4.5443	Yes	79.126	0.11223	79.126	0.05492	79.12632	46.11435	79.12632	-45.32163	79.126	1.2135E+3	59.345	3.9571			
0.0	-1.0239	0.0	3.8951	Yes	3.9981	0.35583	7.9961	0.02309	9.99516	23.86745	9.99516	-9.69904	9.9952	5.6707E+3	41.980	-4.4760			
63.907	0.19932	63.907	10.258	Yes	5.9913	0.10717	5.9913	0.04409	5.99128	28.76582	5.99128	-27.50568	5.9913	1.9996E+3	19.971	-5.0011			
17.712	-3.2286	0.0	10.167	Yes	23.615	1.2850	9.8398	0.01865	25.58336	77.13838	11.80771	-82.74608	27.551	8.4576E+3	7.8718	2.2078			
0.0	-0.34484	0.0	0.30062	Yes	3.6209	1.2445	3.6209	0.14997	3.62091	83.07156	3.62091	-74.67332	-	-	0.0	14.536			



RSK ENVIRONMENT LIMITED

UBB, London

TW Sewer Assessment

FULL DEVELOPMENT LONG TERM (S) + Structural Solution-Smoothed

Job No.	Sheet No.	Rev.
371654		
Drg. Ref.		
Made by MK	Date 09-Dec-2020	Checked Date

Titles

Job No.: 371654
Job Title: UBB, London
Sub-title: TW Sewer Assessment
Calculation Heading: FULL DEVELOPMENT LONG TERM (S) + Structural Solution
Initials: MK
Checker:
Date Saved: 09-Dec-2020
Date Checked:
Notes:
File Name: FULL DEVELOPMENT LONG TERM (1)_(S)+Structural Solution_Smoothedrev5.xdd
File Path: G:\Geoconsult\Projects\371600 - 371699\371654 Ugly Brown Building (UBB)\GMA\REV 02_OCTNOV 2020_TW Only\2 TW\Combinations CSVs for XDISP\CS Vs from XDISP_SMOOTHED

History

Date	Time	By	Notes
19-Jun-2017	11:17	tyler_a	
19-Jun-2017	11:21	tyler_a	
19-Jun-2017	11:24	tyler_a	
19-Jun-2017	11:37	tyler_a	
30-Jun-2017	11:50	tyler_a	
07-Jul-2017	16:50	MKentish	
07-Jul-2017	7:21	MKentish	
10-Jul-2017	08:37	MKentish	
10-Jul-2017	13:57	MKentish	
10-Jul-2017	14:31	MKentish	
10-Jul-2017	16:58	MKentish	
12-Jul-2017	11:37	tyler_a	
13-Jul-2017	17:41	MKentish	
19-Jul-2017	16:52	MKentish	
17-Aug-2017	15:45	MKentish	
17-Aug-2017	15:51	MKentish	
17-Aug-2017	16:49	MKentish	
21-Aug-2017	12:26	TYLER_A	
19-Oct-2017	16:52	MKentish	
19-Oct-2017	17:05	MKentish	
20-Oct-2017	16:16	MKentish	
23-Oct-2017	13:06	MKentish	
05-May-2020	19:22	MKentish	
06-May-2020	17:45	MKentish	
07-May-2020	18:26	MKentish	
11-May-2020	17:18	MKentish	
14-May-2020	11:09	MKentish	
29-Jul-2020	17:55	MKentish	
30-Jul-2020	11:40	MKentish	
30-Jul-2020	15:51	MKentish	
30-Jul-2020	20:18	MKentish	
30-Jul-2020	22:06	MKentish	
31-Jul-2020	10:14	MKentish	
31-Jul-2020	13:16	MKentish	
03-Aug-2020	17:53	MKentish	
07-Aug-2020	14:54	MKentish	
11-Aug-2020	00:42	MKentish	
12-Aug-2020	14:42	MKentish	
29-Oct-2020	17:18	MKentish	
02-Nov-2020	17:52	MKentish	
04-Nov-2020	15:38	MKentish	
05-Nov-2020	12:45	MKentish	
10-Nov-2020	18:01	MKentish	
11-Nov-2020	12:03	MKentish	
11-Nov-2020	15:33	MKentish	
12-Nov-2020	11:57	MKentish	
16-Nov-2020	11:43	MKentish	
16-Nov-2020	13:57	MKentish	
16-Nov-2020	17:37	MKentish	
03-Dec-2020	14:30	MKentish	
04-Dec-2020	18:08	MKentish	
07-Dec-2020	09:40	MKentish	
09-Dec-2020	11:38	MKentish	
09-Dec-2020	14:55	MKentish	

Displacement Lines

Ref.	Name	x1	y1	z1	x2	y2	z2	Intervals	Surface type for tunnels	Interpolate imported displacements	Calculate
		[m]	[m]	[m]	[m]	[m]	[m]	[No.]			
1	TWS(1)_1	48.00000	60.00000	14.64700	50.00000	-40.00000	14.64700	50	Surface	Yes	Yes
2	TWS(2)_1	-33.43100	6.49300	17.09950	36.67900	6.97300	17.09950	35	Surface	Yes	Yes
3	TWS(2)_2	36.67900	6.97300	17.09950	66.57600	3.47200	17.09950	15	Surface	Yes	Yes
5	TWS(2)_3	66.57600	3.47200	17.09950	91.02100	-3.13200	17.09950	13	Surface	Yes	Yes
3	TWS(2)_4	91.02100	-3.13200	16.23650	178.22000	-39.23400	16.23650	47	Surface	Yes	Yes
6	TW Fresh Water (a) - St Pancras	-36.51019	2.76952	20.65500	48.54333	3.88213	20.65500	43	Surface	Yes	Yes
7	TW Fresh Water (b) - St Pancras	48.54333	3.88213	20.34000	91.07705	-7.29855	20.34000	22	Surface	Yes	Yes
8	TW Fresh Water (c) - St Pancras	91.07705	-7.29855	19.73000	152.69712	-30.67206	19.73000	33	Surface	Yes	Yes
9	TW Fresh Water (d) - St Pancras	152.69712	-30.67206	19.20000	184.75043	-45.75126	19.20000	18	Surface	Yes	Yes
10	Assumed FW400 connection to TW2_1	52.86515	12.18589	16.51600	55.26286	5.35252	16.51600	4	Surface	Yes	Yes

Displacement Grids

Ref.	Name	Extrusion: Direction	Base line start: X	Base line start: Y	Base line start: Z (level)	Base line end: X	Base line end: Y	Base line end: Z (level)	Base line: Intervals	Extrusion: Distance	Extrusion: Intervals	Surface type for tunnels	Calculate
			[m]	[m]	[m]	[m]	[m]	[m]	[No.]	[m]	[No.]		
1	Grid 1	Global X	-20.00000	-70.00000	21.70000	-	100.00000	21.70000	100	250.00000	250	Surface	No

Imported Displacements

Set: Ref.	Set: Name	Result: Ref.	Coordinates: x [m]	Coordinates: y [m]	Coordinates: z [m]	Displacements: x [mm]	Displacements: y [mm]	Displacements: z [mm]
1	ID Set #	1	48.00000	60.00000	14.64700	0.00000	0.00000	0.28768
		2	48.04000	58.00000	14.64700	0.02000	-0.20000	1.70000
		3	48.08000	56.00000	14.64700	0.08000	-0.46000	2.70000
		4	48.12000	54.00000	14.64700	0.10897	-0.52581	3.70000
		5	48.16000	52.00000	14.64700	0.08000	-0.50000	4.40000
		6	48.20000	50.00000	14.64700	0.03000	-0.42418	4.90000
		7	48.24000	48.00000	14.64700	0.00100	-0.35000	5.11832
		8	48.28000	46.00000	14.64700	-0.00778	-0.22000	4.20000
		9	48.32000	44.00000	14.64700	0.00000	-0.10000	2.80000
		10	48.36000	42.00000	14.64700	0.00000	-0.03500	0.50000
		11	48.40000	40.00000	14.64700	0.00000	-0.01000	-2.50000
		12	48.44000	38.00000	14.64700	0.00000	0.00000	-4.80000
		13	48.48000	36.00000	14.64700	0.00000	0.00000	-6.48508
		14	48.52000	34.00000	14.64700	0.00000	0.00000	-7.60000
		15	48.56000	32.00000	14.64700	0.00000	0.00000	-8.15014
		16	48.60000	30.00000	14.64700	0.00000	0.00000	-7.83055
		17	48.64000	28.00000	14.64700	0.00000	0.00000	-6.90336
		18	48.68000	26.00000	14.64700	0.00000	0.00000	-5.17612



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TW Sewer Assessment

FULL DEVELOPMENT LONG TERM (S) + Structural Solution-Smoothed

Job No.	Sheet No.	Rev.
371654		
Drg. Ref.		
Made by MK	Date 09-Dec-2020	Checked Date

Ref.	Set: Name	Result: Ref.	Coordinates: x [m]	Coordinates: y [m]	Coordinates: z [m]	Displacements: x [mm]	Displacements: y [mm]	Displacements: z [mm]
19			48.720000	24.000000	14.647000	0.010000	0.020000	-3.308822
20			48.760000	22.000000	14.647000	0.025000	0.100000	-1.523388
21			48.800000	20.000000	14.647000	0.060000	0.250000	0.037174
22			48.840000	18.000000	14.647000	0.120000	0.400000	1.389722
23			48.880000	16.000000	14.647000	0.165000	0.525000	2.746022
24			48.920000	14.000000	14.647000	0.177800	0.573499	3.709002
25			48.960000	12.000000	14.647000	0.165000	0.525000	4.007400
26			49.000000	10.000000	14.647000	0.120000	0.400000	3.951212
27			49.040000	8.000000	14.647000	0.060000	0.280000	3.456449
28			49.080000	6.000000	14.647000	0.025000	0.136511	2.774511
29			49.120000	4.000000	14.647000	0.010000	0.050000	2.020755
30			49.160000	2.000000	14.647000	0.000000	0.020000	1.227888
31			49.200000	0.000000	14.647000	0.000000	0.000000	0.735333
32			49.240000	-2.000000	14.647000	0.000000	0.000000	0.559155
33			49.280000	-4.000000	14.647000	0.000000	0.000000	0.497733
34			49.320000	-6.000000	14.647000	0.000000	0.000000	0.521188
35			49.360000	-8.000000	14.647000	0.000000	0.000000	0.573444
36			49.400000	-10.000000	14.647000	0.000000	0.000000	0.642022
37			49.440000	-12.000000	14.647000	0.000000	0.000000	0.718511
38			49.480000	-14.000000	14.647000	0.000000	0.000000	0.797099
39			49.520000	-16.000000	14.647000	0.000000	0.000000	0.873844
40			49.560000	-18.000000	14.647000	0.000000	0.000000	0.946188
41			49.600000	-20.000000	14.647000	0.000000	0.000000	1.012550
42			49.640000	-22.000000	14.647000	0.000000	0.000000	1.077190
43			49.680000	-24.000000	14.647000	0.000000	0.000000	1.123944
44			49.720000	-26.000000	14.647000	0.000000	0.000000	1.168556
45			49.760000	-28.000000	14.647000	0.000000	0.000000	1.205922
46			49.800000	-30.000000	14.647000	0.000000	0.000000	1.236334
47			49.840000	-32.000000	14.647000	0.000000	0.000000	1.260255
48			49.880000	-34.000000	14.647000	0.000000	0.000000	1.278111
49			49.920000	-36.000000	14.647000	0.000000	0.000000	1.290444
50			49.960000	-38.000000	14.647000	0.000000	0.000000	1.297774
51			50.000000	-40.000000	14.647000	0.000000	0.000000	1.300522
52			-33.431000	6.493000	17.099500	0.000000	0.000000	-0.894884
53			-31.422666	6.506711	17.099500	0.000000	0.000000	-0.945677
54			-29.424711	6.520433	17.099500	0.000000	0.000000	-0.997124
55			-27.421577	6.534144	17.099500	0.000000	0.000000	-1.048388
56			-25.418433	6.547866	17.099500	0.000000	0.000000	-1.098820
57			-23.415129	6.561577	17.099500	0.000000	0.000000	-1.144498
58			-21.412144	6.575299	17.099500	0.000000	0.000000	-1.186533
59			-19.409000	6.589000	17.099500	0.000000	0.000000	-1.213944
60			-17.405866	6.602711	17.099500	0.000000	0.000000	-1.241311
61			-15.402711	6.616433	17.099500	0.000000	0.000000	-1.245522
62			-13.399577	6.630144	17.099500	0.000000	0.000000	-1.225766
63			-11.396433	6.643866	17.099500	0.000000	0.000000	-1.173707
64			-9.393299	6.657577	17.099500	0.000000	0.000000	-1.075644
65			-7.390144	6.671299	17.099500	0.000000	0.000000	-0.918055
66			-5.387000	6.685000	17.099500	0.000000	0.000000	-0.601559
67			-3.383866	6.698711	17.099500	0.000000	0.000000	0.078449
68			-1.380722	6.712423	17.099500	0.000000	0.000000	0.874633
69			0.622433	6.726144	17.099500	0.096399	0.107088	1.809299
70			2.625577	6.739866	17.099500	0.164266	0.270977	2.890633
71			4.628711	6.753577	17.099500	0.159477	0.463668	4.088999
72			6.631866	6.767299	17.099500	0.081800	0.658332	5.312222
73			8.635000	6.781000	17.099500	0.009255	0.758666	6.421077
74			10.638144	6.794711	17.099500	0.009355	0.766633	7.348334
75			12.641299	6.808433	17.099500	0.009444	0.774622	8.040077
76			14.644433	6.822144	17.099500	0.009544	0.782633	8.504577
77			16.647577	6.835866	17.099500	0.009644	0.790666	8.792668
78			18.650722	6.849577	17.099500	0.009744	0.798722	8.956444
79			20.653866	6.863299	17.099500	0.009844	0.806800	9.033374
80			22.657000	6.877000	17.099500	0.009933	0.814911	9.049666
81			24.660144	6.890711	17.099500	0.010033	0.823000	9.020711
82			26.663299	6.904433	17.099500	0.010133	0.831200	8.957449
83			28.666433	6.918144	17.099500	0.010233	0.839399	8.864774
84			30.669577	6.931866	17.099500	0.010333	0.847600	8.740223
85			32.672722	6.945577	17.099500	0.010433	0.855833	8.573308
86			34.675866	6.959299	17.099500	0.010533	0.864000	8.341399
87			36.679000	6.973000	17.099500	0.010644	0.872388	8.009122
88			38.682144	6.986722	17.099500	0.010099	0.827266	7.013766
89			40.685299	6.005200	17.099500	0.009544	0.782900	5.890900
90			42.688444	6.272800	17.099500	0.008777	0.718988	4.617899
91			44.651533	6.039400	17.099500	0.006377	0.522255	3.088666
92			46.644677	5.806000	17.099500	0.003877	0.317511	1.675959
93			48.637811	5.572600	17.099500	0.001677	0.137077	0.498880
94			50.630933	5.339200	17.099500	-0.000000	-0.000000	-0.441700
95			52.624077	5.105800	17.099500	0.000000	0.000000	-1.212255
96			54.617200	4.872400	17.099500	0.000000	0.000000	-1.803998
97			56.610333	4.639000	17.099500	0.000000	0.000000	-2.177700
98			58.603477	4.405600	17.099500	0.000000	0.000000	-2.443935
99			60.596600	4.172200	17.099500	0.074699	0.174000	-1.859388
100			62.589733	3.938800	17.099500	0.114922	0.267722	-2.035877
101			64.582877	3.705400	17.099500	0.155668	0.362668	-2.187778
102			66.576000	3.472000	17.099500	0.197166	0.459391	-2.326334
103			68.569133	3.238600	17.099500	0.217442	0.506500	-2.554377
104			70.562277	2.456000	17.099500	0.237900	0.554222	-2.761339
105			72.555411	1.948000	17.099500	0.258644	0.602533	-2.945788
106			74.548544	1.440000	17.099500	0.301466	0.702288	-3.092229
107			75.977922	0.932000	17.099500	0.404009	0.941377	-3.202677
108			77.859511	0.424000	17.099500	0.507033	1.181199	-3.310211
109			79.738699	-0.084000	17.099500	0.630833	1.472888	-3.410533
110			81.619088	-0.592000	17.099500	0.777044	1.820299	-3.513944
111			83.499466	-1.100000	17.099500	0.946799	2.226223	-3.618466
112			85.379855	-1.608000	17.099500	1.146977	2.707877	-3.719669
113			87.260233	-2.116000	17.099500	1.387011	3.288677	-3.817211
114			89.140622	-2.624000	17.099500	1.664599	3.965299	-3.921311
115			91.021000	-3.132000	17.099500	1.948199	4.666977	-4.061144
116			91.021000	-3.132000	16.236500	1.288388	3.129877	-4.361044
117			92.876300	-3.900133	16.236500	1.798833	4.115366	-4.526644
118			94.731600	-4.668266	16.236500	2.405899	5.649555	-4.317488
119			96.586899	-5.436388	16.236500	3.159566	7.635522	-4.020688
120			98.442199	-6.204511	16.236500	3.656300	8.949733	-3.999411
121			100.297499	-6.972644	16.236500	3.793911	9.343355	-4.620477
122			102.152799	-7.740777	16.236500	3.901400	9.636688	-5.223882
123			104.008099	-8.508900	16.236500	4.007344	9.879700	-5.740522
124			105.863388	-9.277022	16.236500	4.079799	10.122443	-6.142777
125			107.718688	-10.045155	16.236500	4.152011	10.335888	-6.433155
126			109.573988	-10.813288	16.236500	4.224000	10.515077	-6.518055
127			111.429288	-11.581400	16.236500	4.295755	10.693669	-6.408799
128			113.284577	-12.349533	16.236500	4.367266	10.871722	-6.163334
129</								



RSK ENVIRONMENT LIMITED

UBB, London

TW Sewer Assessment

FULL DEVELOPMENT LONG TERM (S) + Structural Solution-Smoothed

Job No.	Sheet No.	Rev.
371654		
Drg. Ref.		
Made by MK	Date 09-Dec-2020	Checked Date

Ref.	Set: Name	Result: Ref.	Coordinates: x [m]	Coordinates: y [m]	Coordinates: z [m]	Displacements: x [mm]	Displacements: y [mm]	Displacements: z [mm]
160			172.65411	-36.92962	16.23650	-2.38891	4.88737	0.68088
161			174.50940	-37.69774	16.23650	-1.91965	3.92734	0.21232
162			176.36470	-38.46587	16.23650	-1.41549	2.89590	-0.11738
163			178.22000	-39.23400	16.23650	-0.95525	1.95431	-0.33771
164			-36.51019	2.76952	20.65500	0.00000	0.00000	-0.78221
165			-34.53220	2.79539	20.65500	0.00000	0.00000	-0.82776
166			-32.55421	2.82127	20.65500	0.00000	0.00000	-0.87485
167			-30.57622	2.84714	20.65500	0.00000	0.00000	-0.92312
168			-28.59823	2.87302	20.65500	0.00000	0.00000	-0.97206
169			-26.62024	2.89889	20.65500	0.00000	0.00000	-1.02096
170			-24.64226	2.92477	20.65500	0.00000	0.00000	-1.06886
171			-22.66427	2.95064	20.65500	0.00000	0.00000	-1.11449
172			-20.68628	2.97652	20.65500	0.00000	0.00000	-1.15617
173			-18.70829	3.00239	20.65500	0.00000	0.00000	-1.19175
174			-16.73030	3.02827	20.65500	0.00000	0.00000	-1.21844
175			-14.75231	3.05284	20.65500	0.00000	0.00000	-1.23269
176			-12.77432	3.08002	20.65500	0.00000	0.00000	-1.23003
177			-10.79633	3.10589	20.65500	0.00000	0.00000	-1.20493
178			-8.81834	3.13177	20.65500	0.00000	0.00000	-1.15062
179			-6.84036	3.15764	20.65500	0.00000	0.00000	-1.05909
180			-4.86237	3.18352	20.65500	0.00000	0.00000	-0.92130
181			-2.88438	3.20939	20.65500	0.00000	0.00000	-0.69637
182			-0.90639	3.23527	20.65500	0.02152	0.03228	-0.16634
183			1.07160	3.26114	20.65500	0.09498	0.20524	0.41598
184			3.04989	3.28701	20.65500	0.19396	0.40508	1.01780
185			5.02758	3.31289	20.65500	0.10342	0.64559	1.62246
186			7.00557	3.33876	20.65500	0.04624	0.89794	2.17882
187			8.98355	3.36464	20.65500	0.01264	1.03714	2.64622
188			10.96154	3.39051	20.65500	0.01399	1.14732	3.05276
189			12.93953	3.41639	20.65500	0.01536	1.26094	3.38232
190			14.91752	3.44226	20.65500	0.01677	1.37528	3.62984
191			16.89551	3.46814	20.65500	0.01820	1.49305	3.80290
192			18.87350	3.49401	20.65500	0.01879	1.54143	3.90202
193			20.85149	3.51989	20.65500	0.01913	1.56906	3.94858
194			22.82948	3.54576	20.65500	0.01947	1.59669	3.95713
195			24.80747	3.57164	20.65500	0.01980	1.62434	3.93558
196			26.78545	3.59751	20.65500	0.02014	1.65199	3.88873
197			28.76344	3.62339	20.65500	0.02048	1.67966	3.81805
198			30.74143	3.64926	20.65500	0.02082	1.70734	3.72140
199			32.71942	3.67514	20.65500	0.02115	1.73502	3.59261
200			34.69741	3.70101	20.65500	0.02149	1.76273	3.42130
201			36.67540	3.72689	20.65500	0.02183	1.79044	3.19345
202			38.65339	3.75276	20.65500	0.02217	1.81817	2.89370
203			40.63138	3.77864	20.65500	0.02251	1.84591	2.51095
204			42.60937	3.80451	20.65500	0.00317	4.54478	3.53830
205			44.58735	3.83038	20.65500	0.00243	4.50967	3.85603
206			46.56534	3.85626	20.65500	0.00123	4.43738	2.12623
207			48.54333	3.88213	20.65500	0.00000	4.02741	1.28013
208			48.54333	3.88213	20.34000	0.00000	4.02741	1.28013
209			50.52132	3.90801	20.34000	0.00000	3.06247	-0.11825
210			52.41003	2.86571	20.34000	-0.00209	2.23214	-1.27881
211			54.34338	2.35750	20.34000	-0.05267	1.55462	-2.18841
212			56.27674	1.84928	20.34000	-0.06284	0.87469	-2.92876
213			58.21009	1.34107	20.34000	-0.02832	0.24795	-3.23998
214			60.14344	0.83286	20.34000	0.00000	-0.00000	-3.94826
215			62.07679	0.32464	20.34000	0.00000	0.00000	-3.12181
216			64.01014	-0.18357	20.34000	0.00000	0.00000	-3.27073
217			65.94349	-0.69178	20.34000	0.00000	0.00000	-3.40097
218			67.87684	-1.20000	20.34000	0.00000	0.00000	-3.51645
219			69.81009	-1.70821	20.34000	0.00000	0.00000	-3.61976
220			71.74354	-2.21642	20.34000	0.00000	0.00000	-3.71311
221			73.67689	-2.72463	20.34000	0.00000	0.00000	-3.79923
222			75.61025	-3.23285	20.34000	0.01320	0.03074	-3.88188
223			77.54360	-3.74106	20.34000	0.03375	0.07862	-3.96618
224			79.47695	-4.24927	20.34000	0.07037	0.16649	-4.04933
225			81.41030	-4.75749	20.34000	0.17587	0.42582	-4.13110
226			83.34365	-5.26570	20.34000	0.30729	0.74966	-4.23255
227			85.27700	-5.77391	20.34000	0.46968	1.15056	-4.33573
228			87.21035	-6.28213	20.34000	0.66846	1.64206	-4.42518
229			89.14370	-6.79034	20.34000	0.92983	2.28932	-4.47598
230			91.07705	-7.29855	20.34000	1.28111	3.16036	-4.45659
231			91.07705	-7.29855	19.73000	1.28111	3.16036	-4.45557
232			92.94433	-8.00684	19.73000	1.66555	4.11638	-4.39246
233			94.81160	-8.71513	19.73000	2.07402	5.13223	-4.33371
234			96.67884	-9.42342	19.73000	2.68682	6.68847	-3.39749
235			98.54615	-10.13170	19.73000	2.75730	6.86394	-3.79472
236			100.41343	-10.83999	19.73000	2.82823	7.04049	-4.15714
237			102.28070	-11.54828	19.73000	2.89959	7.21814	-4.46999
238			104.14798	-12.25657	19.73000	2.97139	7.39687	-4.72096
239			106.01525	-12.96486	19.73000	3.04363	7.57670	-4.89790
240			107.88253	-13.67314	19.73000	3.11631	7.75763	-4.99150
241			109.74980	-14.38143	19.73000	3.18942	7.93964	-5.00109
242			111.61707	-15.08972	19.73000	3.26298	8.12275	-4.93740
243			113.48435	-15.79801	19.73000	3.33697	8.30695	-4.81935
244			115.35162	-16.50630	19.73000	3.41141	8.49224	-4.66760
245			117.21890	-17.21459	19.73000	3.48628	8.67863	-4.49848
246			119.08617	-17.92287	19.73000	3.56159	8.86611	-4.31922
247			120.95345	-18.63116	19.73000	3.59999	8.96168	-4.16884
248			122.82072	-19.33945	19.73000	3.61396	8.99648	-4.01686
249			124.68800	-20.04774	19.73000	3.62795	9.03129	-3.81346
250			126.55527	-20.75603	19.73000	3.64194	9.06612	-3.54286
251			128.42255	-21.46431	19.73000	3.65594	9.10097	-3.20279
252			130.28982	-22.17260	19.73000	3.66994	9.13583	-2.80561
253			132.15710	-22.88089	19.73000	3.68396	9.17071	-2.37490
254			134.02437	-23.58918	19.73000	3.69797	9.20561	-1.93944
255			135.89165	-24.29747	19.73000	3.71200	9.24052	-1.52392
256			137.75892	-25.00575	19.73000	3.72603	9.27545	-1.13896
257			139.62619	-25.71404	19.73000	3.74007	9.31040	-0.77681
258			141.49347	-26.42233	19.73000	3.75411	9.34536	-0.41768
259			143.36074	-27.13062	19.73000	3.76817	9.38034	-0.04341
260			145.22802	-27.83891	19.73000	3.78222	9.41534	0.35283
261			147.09529	-28.54720	19.73000	3.79629	9.45035	0.76675
262			148.96257	-29.25548	19.73000	3.81036	9.48539	1.18826
263			150.82984	-29.96377	19.73000	3.82444	9.52043	1.60567
264			152.69712	-30.67206	19.73000	3.79607	9.44980	1.95349
265			152.69712	-30.67206	19.20000	3.79607	9.44980	1.94774
266			154.47786	-31.50979	19.20000	3.63610	9.05160	2.05751
267			156.25860	-32.34753	19.20000	3.47853	8.65933	2.13386
268			158.03934	-33.18526	19.20000	3.32333	8.27299	2.18064
269			159.82008	-34.02299	19.20000	3.17052	7.89259	2.20783
270			161.60081	-34.86073	19.20000	2.32819	7.45540	2.18706
271			163.38155	-35.69846	19.20000	1.00208	6.81282	1.95574
272			165.16229	-36.53619	19.20000	-0.09490	6.02512	1.56548
273			166.94303	-37.37393	19.20000	-0.88676	5.44208	1.20271
274			168.72377	-38.21166	19.20000	-1.34125	4.73349	0.77763
275			170.50451	-39.04940	19.20000	-1.47930	3.88023	0.35315
276			172.28525	-39.88713	19.20000	-1.34101	2.91013	-0.00706
277			174.06599	-40.72486	19.20000	-0.96582	1.97594	-0.27225
278			175.84673	-41.56260	19.20000	-0.56122	1.14821	-

Polygonal Excavations

Ref.	1
Excavation Name:	PLOT A - 17.2mAOD Basement Wall Install
Surface level [m]:	21.700
Contribution:	Positive
Surface movement curves which are selected are applied between surface and [m]:	13.450



RSK ENVIRONMENT LIMITED

UBB, London

TW Sewer Assessment

FULL DEVELOPMENT LONG TERM (S) + Structural Solution-Smoothed

Job No.	Sheet No.	Rev.
371654		
Drg. Ref.		
Made by MK	Date 09-Dec-2020	Checked Date

Corner	x	y	Base Level	Arc Enabled	Stiffened	Prev. Side: d	Prev. Side: p1	Prev. Side: p2*	Next Side: d	Next Side: p1	Next Side: p2*
	[m]	[m]	[m]			[m]	[%]	[%]	[m]	[%]	[%]
1	42.430	45.000	13.450	Yes	No	-	-	-	-	-	-
2	18.390	46.290	13.450	No	No	-	-	-	-	-	-
3	7.3100	46.290	13.450	Yes	No	-	-	-	-	-	-
4	7.9800	14.740	13.700	Yes	No	-	-	-	-	-	-
5	42.430	14.320	13.700	Yes	No	-	-	-	-	-	-

Side	x1 [m]	y1 [m]	x2 [m]	y2 [m]	G.M. Curve: Vertical			G.M. Curve: Horizontal		
1	42.430	45.000	18.390	46.290	No	vertical	ground movement	No	horizontal	ground movement
2	18.390	46.290	7.3100	46.290	No	vertical	ground movement	No	horizontal	ground movement
3	7.3100	46.290	7.9800	14.740	No	vertical	ground movement	No	horizontal	ground movement
4	7.9800	14.740	42.430	14.320	No	vertical	ground movement	No	horizontal	ground movement
5	42.430	14.320	42.430	45.000	No	vertical	ground movement	No	horizontal	ground movement

Ref.
Excavation Name: 2
Surface level [m]: PLOT A - 17.2m AOD Excavation (+ve)
Contribution: 18.000
Surface movement curves which are
selected are applied between
surface and [m]: Positive
17.200

Corner	x	y	Base Level	Arc Enabled	Stiffened	Prev. Side: d	Prev. Side: p1	Prev. Side: p2*	Next Side: d	Next Side: p1	Next Side: p2*
	[m]	[m]	[m]			[m]	[%]	[%]	[m]	[%]	[%]
1	42.430	45.000	17.200	Yes	No	-	-	-	-	-	-
2	18.390	46.290	17.200	No	No	-	-	-	-	-	-
3	7.3100	46.290	17.200	Yes	Yes	9.5000	67.000	25.000	9.5000	67.000	25.000
4	7.9800	14.740	17.200	Yes	Yes	9.5000	67.000	25.000	9.5000	67.000	25.000
5	42.430	14.320	17.200	Yes	No	-	-	-	-	-	-

Side	x1 [m]	y1 [m]	x2 [m]	y2 [m]	G.M. Curve: Vertical			G.M. Curve: Horizontal		
1	42.430	45.000	18.390	46.290	No	vertical	ground movement	No	horizontal	ground movement
2	18.390	46.290	7.3100	46.290	No	vertical	ground movement	No	horizontal	ground movement
3	7.3100	46.290	7.9800	14.740	No	vertical	ground movement	No	horizontal	ground movement
4	7.9800	14.740	42.430	14.320	No	vertical	ground movement	No	horizontal	ground movement
5	42.430	14.320	42.430	45.000	No	vertical	ground movement	No	horizontal	ground movement

Ref.
Excavation Name: 3
Surface level [m]: Proposed Contig Wall south_2
Contribution: 21.700
Surface movement curves which are
selected are applied between
surface and [m]: Positive
13.575

Corner	x	y	Base Level	Arc Enabled	Stiffened	Prev. Side: d	Prev. Side: p1	Prev. Side: p2*	Next Side: d	Next Side: p1	Next Side: p2*
	[m]	[m]	[m]			[m]	[%]	[%]	[m]	[%]	[%]
1	51.335	44.430	13.575	No	No	-	-	-	-	-	-
2	52.345	22.880	13.575	No	No	-	-	-	-	-	-
3	52.350	22.880	13.575	Yes	No	-	-	-	-	-	-
4	51.340	44.430	13.575	Yes	No	-	-	-	-	-	-

Side	x1 [m]	y1 [m]	x2 [m]	y2 [m]	G.M. Curve: Vertical			G.M. Curve: Horizontal		
1	51.335	44.430	52.345	22.880	No	vertical	ground movement	No	horizontal	ground movement
2	52.345	22.880	52.350	22.880	No	vertical	ground movement	No	horizontal	ground movement
3	52.350	22.880	51.340	44.430	No	vertical	ground movement	No	horizontal	ground movement
4	51.340	44.430	51.335	44.430	No	vertical	ground movement	No	horizontal	ground movement

Ref.
Excavation Name: 4
Surface level [m]: PLOT B NEW WALL 1
Contribution: 21.700
Surface movement curves which are
selected are applied between
surface and [m]: Positive
13.700

Corner	x	y	Base Level	Arc Enabled	Stiffened	Prev. Side: d	Prev. Side: p1	Prev. Side: p2*	Next Side: d	Next Side: p1	Next Side: p2*
	[m]	[m]	[m]			[m]	[%]	[%]	[m]	[%]	[%]
1	51.340	44.430	13.700	No	No	-	-	-	-	-	-
2	101.00	63.000	13.700	No	No	-	-	-	-	-	-
3	101.00	46.000	13.700	No	No	-	-	-	-	-	-
4	65.520	17.230	13.700	No	No	-	-	-	-	-	-
5	52.350	22.880	13.700	No	No	-	-	-	-	-	-

Side	x1 [m]	y1 [m]	x2 [m]	y2 [m]	G.M. Curve: Vertical			G.M. Curve: Horizontal		
1	51.340	44.430	101.00	63.000	No	vertical	ground movement	No	horizontal	ground movement
2	101.00	63.000	101.00	46.000	No	vertical	ground movement	No	horizontal	ground movement
3	101.00	46.000	65.520	17.230	No	vertical	ground movement	No	horizontal	ground movement
4	65.520	17.230	52.350	22.880	No	vertical	ground movement	No	horizontal	ground movement
5	52.350	22.880	51.340	44.430	No	vertical	ground movement	No	horizontal	ground movement

Ref.
Excavation Name: 5
Surface level [m]: PLOT B & C ALL EXC - 19.10m AOD (+ve)
Contribution: 21.700
Surface movement curves which are
selected are applied between
surface and [m]: Positive
19.100

Corner	x	y	Base Level	Arc Enabled	Stiffened	Prev. Side: d	Prev. Side: p1	Prev. Side: p2*	Next Side: d	Next Side: p1	Next Side: p2*
	[m]	[m]	[m]			[m]	[%]	[%]	[m]	[%]	[%]
1	51.340	44.430	19.100	No	Yes	25.000	9.5000	25.000	25.000	67.000	25.000
2	101.00	63.000	19.100	Yes	No	-	-	-	-	-	-
3	167.21	84.375	19.100	Yes	Yes	9.5000	67.000	25.000	9.5000	67.000	25.000
4	176.07	61.064	19.100	Yes	No	-	-	-	-	-	-
5	175.87	-18.327	19.100	Yes	Yes	9.5000	67.000	25.000	9.5000	67.000	25.000
6	164.92	-23.678	19.100	Yes	Yes	9.5000	67.000	25.000	9.5000	67.000	25.000
7	101.00	2.0000	19.100	No	No	-	-	-	-	-	-
8	52.350	22.880	19.100	No	No	-	-	-	-	-	-

Side	x1 [m]	y1 [m]	x2 [m]	y2 [m]	G.M. Curve: Vertical			G.M. Curve: Horizontal		
1	51.340	44.430	101.00	63.000	No	vertical	ground movement	No	horizontal	ground movement
2	101.00	63.000	167.21	84.375	No	vertical	ground movement	No	horizontal	ground movement
3	167.21	84.375	176.07	61.064	No	vertical	ground movement	No	horizontal	ground movement
4	176.07	61.064	175.87	-18.327	No	vertical	ground movement	No	horizontal	ground movement
5	175.87	-18.327	164.92	-23.678	No	vertical	ground movement	No	horizontal	ground movement
6	164.92	-23.678	101.00	2.0000	No	vertical	ground movement	No	horizontal	ground movement
7	101.00	2.0000	52.350	22.880	No	vertical	ground movement	No	horizontal	ground movement



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Drg. Ref.		
Made by MK	Date 09-Dec-2020	Checked Date

Side	x1 [m]	y1 [m]	x2 [m]	y2 [m]	G.M. Curve: Vertical	G.M. Curve: Horizontal
8	52.350	22.880	51.340	44.430	No vertical ground movement	No horizontal ground movement

Ref.
Excavation Name: 6
Surface level [m]: PLOT B WALL INST - 2
Contribution: 21.700
Surface movement curves which are
selected are applied between
surface and [m]: 11.700

Corner	x	y	Base Level	Arc Enabled	Stiffened	Prev. Side: d	Prev. Side: p1	Prev. Side: p2*	Next Side: d	Next Side: p1	Next Side: p2*
	[m]	[m]	[m]			[m]	[%]	[%]	[m]	[%]	[%]
1	101.00	2.0000	11.700	No	No	-	-	-	-	-	-
2	101.00	46.000	11.700	No	No	-	-	-	-	-	-
3	65.520	17.230	11.700	No	No	-	-	-	-	-	-

Side	x1 [m]	y1 [m]	x2 [m]	y2 [m]	G.M. Curve: Vertical	G.M. Curve: Horizontal
1	101.00	2.0000	101.00	46.000	No vertical ground movement	No horizontal ground movement
2	101.00	46.000	65.520	17.230	No vertical ground movement	No horizontal ground movement
3	65.520	17.230	101.00	2.0000	No vertical ground movement	No horizontal ground movement

Ref.
Excavation Name: 7
Surface level [m]: PLOT B EXC - 16.3mAOD (+ve)
Contribution: 19.100
Surface movement curves which are
selected are applied between
surface and [m]: 16.300

Corner	x	y	Base Level	Arc Enabled	Stiffened	Prev. Side: d	Prev. Side: p1	Prev. Side: p2*	Next Side: d	Next Side: p1	Next Side: p2*
	[m]	[m]	[m]			[m]	[%]	[%]	[m]	[%]	[%]
1	101.00	2.0000	16.300	No	Yes	9.5000	67.000	25.000	9.5000	67.000	25.000
2	101.00	46.000	16.300	No	No	-	-	-	-	-	-
3	65.520	17.230	16.300	Yes	No	-	-	-	-	-	-

Side	x1 [m]	y1 [m]	x2 [m]	y2 [m]	G.M. Curve: Vertical	G.M. Curve: Horizontal
1	101.00	2.0000	101.00	46.000	No vertical ground movement	No horizontal ground movement
2	101.00	46.000	65.520	17.230	No vertical ground movement	No horizontal ground movement
3	65.520	17.230	101.00	2.0000	No vertical ground movement	No horizontal ground movement

Ref.
Excavation Name: 8
Surface level [m]: PLOT C - WALL INST
Contribution: 21.700
Surface movement curves which are
selected are applied between
surface and [m]: 9.2000

Corner	x	y	Base Level	Arc Enabled	Stiffened	Prev. Side: d	Prev. Side: p1	Prev. Side: p2*	Next Side: d	Next Side: p1	Next Side: p2*
	[m]	[m]	[m]			[m]	[%]	[%]	[m]	[%]	[%]
1	167.21	84.375	9.2000	Yes	No	-	-	-	-	-	-
2	101.00	63.000	9.2000	No	No	-	-	-	-	-	-
3	101.00	2.0000	9.2000	No	No	-	-	-	-	-	-
4	164.92	-23.678	9.2000	Yes	No	-	-	-	-	-	-
5	175.87	-18.327	9.2000	Yes	No	-	-	-	-	-	-
6	176.07	61.064	9.2000	Yes	No	-	-	-	-	-	-

Side	x1 [m]	y1 [m]	x2 [m]	y2 [m]	G.M. Curve: Vertical	G.M. Curve: Horizontal
1	167.21	84.375	101.00	63.000	No vertical ground movement	No horizontal ground movement
2	101.00	63.000	101.00	2.0000	No vertical ground movement	No horizontal ground movement
3	101.00	2.0000	164.92	-23.678	No vertical ground movement	No horizontal ground movement
4	164.92	-23.678	175.87	-18.327	No vertical ground movement	No horizontal ground movement
5	175.87	-18.327	176.07	61.064	No vertical ground movement	No horizontal ground movement
6	176.07	61.064	167.21	84.375	No vertical ground movement	No horizontal ground movement

Ref.
Excavation Name: 9
Surface level [m]: PLOT C - EXC (+ve)
Contribution: 19.100
Surface movement curves which are
selected are applied between
surface and [m]: 13.400

Corner	x	y	Base Level	Arc Enabled	Stiffened	Prev. Side: d	Prev. Side: p1	Prev. Side: p2*	Next Side: d	Next Side: p1	Next Side: p2*
	[m]	[m]	[m]			[m]	[%]	[%]	[m]	[%]	[%]
1	167.21	84.375	13.400	Yes	Yes	9.5000	67.000	25.000	9.5000	67.000	25.000
2	101.00	63.000	13.400	Yes	Yes	25.000	9.5000	25.000	25.000	67.000	25.000
3	101.00	2.0000	13.400	Yes	Yes	25.000	9.5000	25.000	25.000	67.000	25.000
4	164.92	-23.678	13.400	Yes	Yes	9.4300	67.000	25.000	9.4300	67.000	25.000
5	175.87	-18.327	13.400	Yes	Yes	9.4300	67.000	25.000	9.4300	67.000	25.000
6	176.07	61.064	13.400	Yes	No	-	-	-	-	-	-

Side	x1 [m]	y1 [m]	x2 [m]	y2 [m]	G.M. Curve: Vertical	G.M. Curve: Horizontal
1	167.21	84.375	101.00	63.000	No vertical ground movement	No horizontal ground movement
2	101.00	63.000	101.00	2.0000	No vertical ground movement	No horizontal ground movement
3	101.00	2.0000	164.92	-23.678	No vertical ground movement	No horizontal ground movement
4	164.92	-23.678	175.87	-18.327	No vertical ground movement	No horizontal ground movement
5	175.87	-18.327	176.07	61.064	No vertical ground movement	No horizontal ground movement
6	176.07	61.064	167.21	84.375	No vertical ground movement	No horizontal ground movement

Ref.
Excavation Name: 10
Surface level [m]: PLOT A - 18.00mAOD - EXC (+ve)
Contribution: 21.700
Surface movement curves which are
selected are applied between
surface and [m]: 18.000

Corner	x	y	Base Level	Arc Enabled	Stiffened	Prev. Side: d	Prev. Side: p1	Prev. Side: p2*	Next Side: d	Next Side: p1	Next Side: p2*
	[m]	[m]	[m]			[m]	[%]	[%]	[m]	[%]	[%]
1	7.3100	46.290	18.000	Yes	Yes	9.5000	67.000	25.000	9.5000	67.000	25.000
2	18.390	46.290	18.000	Yes	No	-	-	-	-	-	-
3	42.430	45.000	18.000	Yes	No	-	-	-	-	-	-
4	51.340	44.430	18.000	No	Yes	9.5000	67.000	25.000	9.5000	67.000	25.000
5	52.350	22.880	18.000	No	No	-	-	-	-	-	-
6	52.350	14.320	18.000	Yes	Yes	9.5000	67.000	25.000	9.5000	67.000	25.000
7	42.430	14.320	18.000	No	No	-	-	-	-	-	-
8	7.9800	14.740	18.000	Yes	Yes	9.5000	67.000	25.000	9.5000	67.000	25.000

Side	x1	y1	x2	y2	G.M. Curve: Vertical	G.M. Curve: Horizontal

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	[m]	[m]	[m]			
1	7.3100	46.290	18.390	46.290	No	vertical ground movement
2	18.390	46.290	46.290	46.290	No	horizontal ground movement
3	42.430	45.000	51.340	44.430	No	vertical ground movement
4	51.340	44.430	52.350	22.880	No	vertical ground movement
5	52.350	22.880	52.350	14.320	No	vertical ground movement
6	52.350	14.320	7.980	46.290	No	vertical ground movement
7	42.430	14.320	7.980	14.740	No	vertical ground movement
8	7.9800	14.740	7.3100	46.290	No	vertical ground movement

Ref.	11
Excavation Name:	Proposed Contig Wall South 1
Surface level [m]:	21.700
Contribution:	Positive
Surface movement curves which are selected are applied between surface and [m]:	13.575

Corner	x	y	Base Level	Arc Enabled	Stiffened	Prev. Side: d	Prev. p1 [%]	Prev. Side: p2* [%]	Next: d	Next: p1 [%]	Next: Side: p2* [%]
	[m]	[m]	[m]			[m]			[m]		
1	52.345	22.880	13.575	No	No	-	-	-	-	-	-
2	52.345	14.320	13.575	No	No	-	-	-	-	-	-
3	52.350	14.320	13.575	No	No	-	-	-	Yes	No	-
4	52.350	22.880	13.575	Yes	No	-	-	-	-	-	-

Side	x1 [m]	y1 [m]	x2 [m]	y2 [m]	G.M. Curve: Vertical	G.M. Curve: Horizontal
1	52.345	22.880	52.345	14.320	No vertical ground movement	No horizontal ground movement
2	52.345	14.320	52.350	14.320	No vertical ground movement	No horizontal ground movement
3	52.350	14.320	52.350	22.880	No vertical ground movement	No horizontal ground movement
4	52.350	22.880	52.345	22.880	No vertical ground movement	No horizontal ground movement

Circular Excavations

Vertical Ground Movement Curves

Curve Name: No vertical ground movement
Coordinates: [Distance from wall / wall depth or max. excavation depth (x), Depth / wall depth or max. excavation depth (y), Settlement / wall depth or max. excavation depth (z) (%)]
[0.000,0.000,0.000] [1.000,0.000,0.000] [0.000,1.000,0.000] [1.000,1.000,0.000]

```
Curve Fitting Method: Polynomial
x Order: 1
y Order: 0
Polynomial: z = 0.0x + 0.0
Coeff. of Determination:
```

Horizontal Ground Movement Curves

Curve Name:	No horizontal ground movement
Coordinates:	[Distance from wall / wall depth or max. excavation depth (x), Depth / wall depth or max. excavation depth (y), Horizontal movement / wall depth or max. excavation depth (z)]
Curve Fitting Method:	Polynomial
x Order:	0
y Order:	0
Polynomial: z =	0.0
Coeff. of Determination:	

Utility Dimensions

Ref.	Name	Internal Diameter [mm]	Wall Thickness [mm]
1	TWS(1)_1_2134mm Dia	2134.0	200.00
2	TWS(2)_1_1219mm Dia	1219.0	200.00
3	TWS(2)_2_1219mm Dia	1219.0	200.00
4	TWS(2)_3_1219mm Dia	1219.0	200.00
5	TWS(2)_4_1093mm Dia	1093.0	200.00
6	TW Fresh Water (a) - St Pancras	100.00	5.0000
7	TW Fresh Water (b) - St Pancras	100.00	5.0000
8	TW Fresh Water (c) - St Pancras	100.00	5.0000
9	TW Fresh Water (d) - St Pancras	100.00	5.0000
10	Assumed FW400 connection to TW2_1	400.00	5.0000

Acceptance Criteria/Parameters

[illegible]

Utility Strain Calculation Options

Neglect beneficial contribution of axial strains : Yes

Utilities

Ref.	Utility Name		Sub-Utility	Jointed	Dimension	Acceptance	Displacement	Displacement Line	Displacement	Line	Poly segs
Poly segs	Start	End	Pipe	Name		Criteria/Parameters	Data Type		Polyline	Length	continuous
continuous Distance Distance Segment											
: Strain	Along	Along	Length								: Pullout
Line	Line									[m]	
[m]	[m]	[m]									
1	TWS(1)_1	-	1	No TWS(1)_1_2134mm Dia	Brick	Line	TWS(1)_1	-	100.02	-	
-	0.0	100.02	-								
2	TWS(2)_1	-	1	No TWS(2)_1_1219mm Dia	Brick	Line	TWS(2)_1	-	70.112	-	
-	0.0	70.111	-								
3	TWS(2)_2	-	1	No TWS(2)_2_1219mm Dia	Brick	Line	TWS(2)_2	-	30.101	-	
-	0.0	30.101	-								
4	TWS(2)_3	-	1	No TWS(2)_3_1219mm Dia	Brick	Line	TWS(2)_3	-	25.321	-	
-	0.0	25.321	-								
5	TWS(2)_4	-	1	No TWS(2)_4_1093mm Dia	Brick	Line	TWS(2)_4	-	94.377	-	



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Made by MK	Date 09-Dec-2020	Checked Date

Ref. Poly segs	Utility Name Start End Pipe	Sub-Utility Jointed Name	Dimension	Acceptance Criteria/Parameters	Displacement Data Type	Displacement Line	Displacement Polyline	Line Length continuous	Poly segs	
continuous Distance Segment										
-	0.0 94.377								-	
6	TW Fresh Water (a) - St Pancras	1	Yes	TW Fresh Water (a) - St Pancras	Cast Iron	Line	TW Fresh Water (a) - St Pancras	-	85.061	-
-	0.0 85.060 3.6000								-	
7	TW Fresh Water (b) - St Pancras	1	Yes	TW Fresh Water (b) - St Pancras	Cast Iron	Line	TW Fresh Water (b) - St Pancras	-	43.979	-
-	0.0 43.978 3.6000								-	
8	TW Fresh Water (c) - St Pancras	1	Yes	TW Fresh Water (c) - St Pancras	Cast Iron	Line	TW Fresh Water (c) - St Pancras	-	65.904	-
-	0.0 65.904 3.6000								-	
9	TW Fresh Water (d) - St Pancras	1	Yes	TW Fresh Water (d) - St Pancras	Cast Iron	Line	TW Fresh Water (d) - St Pancras	-	35.423	-
-	0.0 35.423 3.6000								-	
10	Assumed FW400 connection to TW2_1	1	Yes	Assumed FW400 connection to TW2_1	Ductile Iron	Line	Assumed FW400 connection to TW2_1	-	7.2418	-
-	0.0 7.2410 3.6000								-	

Warnings

- Multiple excavations have been specified. Displacements resulting from each excavation are summed with no account taken of the interactions between excavations (e.g. overlapping zones of influence or 'shielding' of one excavation by another).
- Embedded Wall Excavation PE1 : PLOT A - 17.2m AOD Basement Wall Install intersects PE10 : PLOT A - 18.00mAD - EXC (+ve).
- Embedded Wall Excavation PE2 : PLOT A - 17.2m AOD Excavation (+ve) intersects PE10 : PLOT A - 18.00mAD - EXC (+ve).
- Embedded Wall Excavation PE3 : Proposed Contig Wall south_2 intersects PE4 : PLOT B NEW WALL 1, , PE5 : PLOT B & C ALL EXC - 19.10mAD (+ve), , PE10 : PLOT A - 18.00mAD - EXC (+ve), and PE11 : Proposed Contig Wall South 1.
- Embedded Wall Excavation PE4 : PLOT B NEW WALL 1 intersects PE3 : Proposed Contig Wall south_2, , PE5 : PLOT B & C ALL EXC - 19.10mAD (+ve), PE6 : PLOT B WALL INST - 2, , PE7 : PLOT B EXC - 16.3mAD (+ve), , PE8 : PLOT C - WALL INST, , PE9 : PLOT C - EXC (+ve), and PE10 : PLOT A - 18.00mAD - EXC (+ve).
- Embedded Wall Excavation PE5 : PLOT B & C ALL EXC - 19.10mAD (+ve) intersects PE3 : Proposed Contig Wall south_2, , PE4 : PLOT B NEW WALL 1, , PE5 : PLOT C - WALL INST, , PE9 : PLOT C - EXC (+ve), and PE10 : PLOT A - 18.00mAD - EXC (+ve).
- Embedded Wall Excavation PE6 : PLOT B WALL INST - 2 intersects PE4 : PLOT B NEW WALL 1, , PE8 : PLOT C - WALL INST, and PE9 : PLOT C - EXC (+ve).
- Embedded Wall Excavation PE7 : PLOT B EXC - 16.3mAD (+ve) intersects PE4 : PLOT B NEW WALL 1, , PE5 : PLOT B & C ALL EXC - 19.10mAD (+ve), , PE6 : PLOT B WALL INST - 2, and PE7 : PLOT B EXC - 16.3mAD (+ve).
- Embedded Wall Excavation PE8 : PLOT C - WALL INST intersects PE4 : PLOT B NEW WALL 1, , PE5 : PLOT B & C ALL EXC - 19.10mAD (+ve), , PE6 : PLOT B WALL INST - 2, and PE7 : PLOT B EXC - 16.3mAD (+ve).
- Embedded Wall Excavation PE9 : PLOT C - EXC (+ve) intersects PE4 : PLOT B NEW WALL 1, , PE5 : PLOT B & C ALL EXC - 19.10mAD (+ve), , PE6 : PLOT B WALL INST - 2, and PE7 : PLOT B EXC - 16.3mAD (+ve).
- Embedded Wall Excavation PE10 : PLOT A - 18.00mAD - EXC (+ve) intersects PE1 : PLOT A - 17.2m AOD Basement Wall Install, , PE2 : PLOT A - 17.2m AOD Excavation (+ve), , PE3 : Proposed Contig Wall south_2, , PE4 : PLOT B NEW WALL 1, , PE5 : PLOT B & C ALL EXC - 19.10mAD (+ve), and PE11 : Proposed Contig Wall South 1.
- Embedded Wall Excavation PE11 : Proposed Contig Wall South 1 intersects PE3 : Proposed Contig Wall south_2, and PE10 : PLOT A - 18.00mAD - EXC (+ve).
- If an embedded wall excavation is assigned a 'sub-surface' ground movement curve then displacements induced by it can only be calculated for those points that are level with or below the embedded wall excavation's 'surface level'. Others are ignored. An example of such a combination, for which displacements will not be calculated is Excavation XP2/Side 1/Line 6/Vertical. This is an example only. There are 111 others.

Errors

None

Displacement Results - Displacement Lines

Stage: Ref.	Stage: Name	Disp. Line: Ref.	Disp. Line: Name	Chainage	x	y	z	Δx	Δy	Δz	Δs//	ΔsPerp.	Angle
					[m]	[m]	[m]	[mm]	[mm]	[mm]	[mm]	[mm]	[°]
0	Base Model 1		TWS(1)_1	0.0	48.00000	60.00000	14.64700	0.0	0.0	0.28768	0.0	0.0	271.15 *
				2.0004	48.04000	58.00000	14.64700	0.020000	-0.20000	1.7000	0.20036	0.015997	271.15 *
				4.0008	48.08000	56.00000	14.64700	0.080000	-0.46000	2.7000	0.46151	0.070786	271.15 *
				6.0012	48.12000	54.00000	14.64700	0.10897	-0.52581	3.7000	0.52788	0.098432	271.15 *
				8.0016	48.16000	52.00000	14.64700	0.080000	-0.50000	4.4000	0.50150	0.069986	271.15 *
				10.002	48.20000	50.00000	14.64700	0.030000	-0.42418	4.9000	0.42470	0.021512	271.15 *
				12.002	48.24000	48.00000	14.64700	0.0010000	-0.35000	5.1183	0.34995	-0.005998	271.15 *
				14.003	48.28000	46.00000	14.64700	-0.0077840	-0.22000	4.2000	0.21980	-0.012182	271.15 *
				16.003	48.32000	44.00000	14.64700	0.0	-0.10000	2.8000	0.099980	-0.0019996	271.15 *
				18.004	48.36000	42.00000	14.64700	0.0	-0.035000	0.50000	0.034993	-699.86E-6	271.15 *
				20.004	48.40000	40.00000	14.64700	0.0	-0.010000	-2.5000	0.0099980	-199.96E-6	271.15 *
				22.004	48.44000	38.00000	14.64700	0.0	0.0	-4.8000	0.0	0.0	271.15 *
				24.005	48.48000	36.00000	14.64700	0.0	0.0	-6.4851	0.0	0.0	271.15 *
				26.005	48.52000	34.00000	14.64700	0.0	0.0	-7.6000	0.0	0.0	271.15 *
				28.006	48.56000	32.00000	14.64700	0.0	0.0	-8.1501	0.0	0.0	271.15 *
				30.006	48.60000	30.00000	14.64700	0.0	0.0	-7.8306	0.0	0.0	271.15 *
				32.006	48.64000	28.00000	14.64700	0.0	0.0	-6.9034	0.0	0.0	271.15 *
				34.007	48.68000	26.00000	14.64700	0.0	0.0	-5.1761	0.0	0.0	271.15 *
				36.007	48.72000	24.00000	14.64700	0.010000	0.020000	-3.3088	-0.019796	0.010398	271.15 *
				38.008	48.76000	22.00000	14.64700	0.025000	0.10000	-1.5234	-0.099480	0.026995	271.15 *
				40.008	48.80000	20.00000	14.64700	0.060000	0.25000	0.037135	-0.24875	0.064987	271.15 *
				42.008	48.84000	18.00000	14.64700	0.12000	0.40000	1.3897	-0.39752	0.12797	271.15 *
				44.009	48.88000	16.00000	14.64700	0.16500	0.52500	2.7460	-0.52160	0.17546	271.15 *
				46.009	48.92000	14.00000	14.64700	0.17780	0.57349	3.7090	-0.56982	0.18923	271.15 *
				48.010	48.96000	12.00000	14.64700	0.16500	0.52500	4.0074	-0.52160	0.17546	271.15 *
				50.010	49.00000	10.00000	14.64700	0.12000	0.40000	3.9512	-0.39752	0.12797	271.15 *
				52.010	49.04000	8.00000	14.64700	0.060000	0.28000	3.4565	-0.27974	0.065587	271.15 *
				54.011	49.08000	6.00000	14.64700	0.025000	0.13651	2.7745	-0.13598	0.027725	271.15 *
				56.011	49.12000	4.00000	14.64700	0.010000	0.050000	2.0207	-0.049790	0.010998	271.15 *
				58.012	49.16000	2.00000	14.64700	0.0	0.020000	1.2279	-0.019996	399.92E-6	271.15 *
				60.012	49.20000	0.00000	14.64700	0.0	0.0	0.73533	0.0	0.0	271.15 *
				62.012	49.24000	-2.00000	14.64700	0.0	0.0	0.55915	0.0	0.0	271.15 *
				64.013	49.28000	-4.00000	14.64700	0.0	0.0	0.49733	0.0	0.0	271.15 *
				66.013	49.32000	-6.00000	14.64700	0.0	0.0	0.52118	0.0	0.0	271.15 *
				68.014	49.36000	-8.00000	14.64700	0.0	0.0	0.57344	0.0	0.0	271.15 *
				70.014	49.40000	-10.00000	14.64700	0.0	0.0	0.64202	0.0	0.0	271.15 *
				72.014	49.44000	-12.00000	14.64700	0.0	0.0	0.71851	0.0	0.0	271.15 *
				74.015	49.48000	-14.00000	14.64700	0.0	0.0	0.79709	0.0	0.0	271.15 *
				76.015	49.52000	-16.00000	14.64700	0.0	0.0	0.87384	0.0	0.0	271.15 *
				78.016	49.56000	-18.00000	14.64700	0.0	0.0	0.94618	0.0	0.0	271.15 *
				80.016	49.60000	-20.00000	14.64700	0.0	0.0	1.0125	0.0	0.0	271.15 *
				82.016	49.64000	-22.00000	14.64700	0.0	0.0	1.0719	0.0	0.0	271.15 *
				84.017	49.68000	-24.00000	14.64700	0.0	0.0	1.1239	0.0	0.0	271.15 *
				86.017	49.72000	-26.00000	14.64700	0.0	0.0	1.1686	0.0	0.0	271.15 *
				88.018	49.76000	-28.00000	14.64700	0.0	0.0	1.2059	0.0	0.0	271.15 *
				90.018	49.80000	-30.00000	14.64700	0.0	0.0	1.2363	0.0	0.0	271.15 *
				92.018	49.84000	-32.00000	14.64700	0.0	0.0	1.2602	0.0	0.0	271.15 *
				94.019	49.88000	-34.00000	14.64700	0.0	0.0	1.2781	0.0	0.0	271.15 *
				96.019	49.92000	-36.00000	14.64700	0.0	0.0	1.2904	0.0	0.0	271.15 *
				98.020	49.96000	-38.00000	14.64700	0.0	0.0	1.2977	0.0	0.0	271.15 *
				100.02	50.00000	-40.00000	14.64700	0.0	0.0	1.3005	0.0	0.0	271.15 *
2			TWS(2)_1	0.0	-33.43100	6.49300	17.09950	0.0	0.0	-0.89484	0.0	0.0	0.39226 *
				2.0032	-31.42786	6.50671	17.09950	0.0	0.0	-0.94567	0.0	0.0	0.39226 *
				4.0064	-29.42471	6.52043	17.09950	0.0	0.0	-0.99714	0.0	0.0	0.39226 *
				6.0096	-27.42157	6.53414	17.09950	0.0	0.0	-1.0484	0.0	0.0	0.39226 *
				8.0128	-25.41843	6.54786	17.09950	0.0	0.0	-1.0982	0.0	0.0	0.39226 *
				10.016	-23.41529	6.56157	17.09950	0.0	0.0	-1.1450	0.0	0.0	0.39226 *
				12.019	-21.41214	6.57529	17.09950	0.0	0.0	-1.1865	0.0	0.0	0.39226 *
				14.022	-19.40900	6.58900	17.09950	0.0	0.0	-1.2199	0.0	0.0	0.39226 *
				16.026	-17.40586	6.60271	17.09950	0.0	0.0	-1.2413	0.0	0.0	0.39226 *
				18.029	-15.40271	6.61643	17.09950	0.0	0.0	-1.2455	0.0	0.0	0.39226 *
				20.032	-13.39957	6.63014	17.09950	0.0	0.0	-1.2258	0.0	0.0	0.39226 *
				22.035	-11.39643	6.64386	17.09950	0.0	0.0	-1.1731	0.0	0.0	0.39226 *
				24.038	-9.39329	6.65757	17.09950	0.0	0.0	-1.0756	0.0	0.0	0.39226 *
				26.041	-7.39014	6.67129	17.09950	0.0	0.0	-0.91805	0.0	0.0	0.39226 *
				28.045	-5.38700	6.68500	17.09950	0.0	0.0	-0.60159	0.0	0.0	0.39226 *
				30.048	-3.38386	6.69871	17.09950	0.0	0.0	0.078487	0.0	0.0	0.39226 *
				32.051	-1.38071	6.71243	17.09950	0.0	0.0	0.87463	0.0	0.0	0.39226 *
				34.054	0.62243	6.72614	17.09950	0.096394	0.10709	1.8093	0.097125	0.10642	0.39226 *
				36.057	2.62557	6.73986	17.09950	0.16426	0.27097	2.8906	0.16611	0.26984	0.39226 *
				38.061	4.62871	6.75357	17.09950	0.15947	0.46368	4.0890	0.16264	0.46258	0.39226 *



RSK ENVIRONMENT LIMITED

UBB, London

TW Sewer Assessment

FULL DEVELOPMENT LONG TERM (S) + Structural Solution-Smoothed

Stage: Ref.	Stage: Name	Disp. Line: Ref.	Disp. Line: Name	Chainage	x	y	z	δx	δy	δz	δH//	δHperp.	Angle		
					[m]	[m]	[m]	[mm]	[mm]	[mm]	[mm]	[mm]	[°]		
					40.064	6.63186	6.76729	17.09950	0.081803	0.65832	5.3122	0.086308	0.65774	0.39226	*
					42.067	8.63500	6.78100	17.09950	0.0092490	0.75866	6.4211	0.014443	0.75858	0.39226	*
					44.070	10.63814	6.79471	17.09950	0.0093460	0.76663	7.3483	0.014594	0.76655	0.39226	*
					46.073	12.64129	6.80843	17.09950	0.0094440	0.77462	8.0401	0.014747	0.77453	0.39226	*
					48.077	14.64443	6.82214	17.09950	0.0095410	0.78263	8.5046	0.014899	0.78254	0.39226	*
					50.080	16.64757	6.83586	17.09950	0.0096390	0.79066	8.7927	0.015052	0.79058	0.39226	*
					52.083	18.65071	6.84957	17.09950	0.0097380	0.79872	8.9564	0.015206	0.79863	0.39226	*
					54.086	20.65386	6.86329	17.09950	0.0098360	0.80680	9.0337	0.015359	0.80672	0.39226	*
					56.089	22.65700	6.87700	17.09950	0.0099350	0.81491	9.0497	0.015514	0.81482	0.39226	*
					58.093	24.66014	6.89071	17.09950	0.010034	0.82305	9.0207	0.015669	0.82296	0.39226	*
					60.096	26.66329	6.90443	17.09950	0.010134	0.83120	8.9575	0.015824	0.83112	0.39226	*
					62.099	28.66643	6.91814	17.09950	0.010233	0.83939	8.8647	0.015979	0.83930	0.39226	*
					64.102	30.66957	6.93186	17.09950	0.010334	0.84760	8.7402	0.016137	0.84751	0.39226	*
					66.105	32.67271	6.94557	17.09950	0.010434	0.85583	8.5731	0.016293	0.85574	0.39226	*
					68.108	34.67586	6.95929	17.09950	0.010535	0.86409	8.3414	0.016451	0.86400	0.39226	*
					70.112	36.67900	6.97300	17.09950	0.010636	0.87238	8.0091	0.016608	0.87229	0.39226	*
					0.0	36.67900	6.97300	17.09950	0.010636	0.87238	8.0091	-0.090900	0.86770	353.32	*
					2.0068	38.67213	6.73200	17.09950	0.010086	0.87266	7.0137	0.010086	0.86199	353.32	*
					4.0135	40.66527	6.50620	17.09950	0.0095450	0.78290	5.8909	-0.081577	0.77869	353.32	*
					6.0203	42.65840	6.27280	17.09950	0.0087650	0.71898	4.6179	-0.074917	0.71512	353.32	*
					8.0270	44.65153	6.03940	17.09950	0.0063670	0.52225	3.0887	-0.054417	0.51944	353.32	*
					10.034	46.64467	5.80600	17.09950	0.0038710	0.31751	1.6760	-0.033084	0.31580	353.32	*
					12.041	48.63780	5.57260	17.09950	0.0016710	0.13707	0.49880	-0.014282	0.13633	353.32	*
					14.047	50.63093	5.33920	17.09950	-5.5168E-12	-452.13E-12	-0.44170	47.107E-12	-449.70E-12	353.32	*
					16.054	52.62407	5.10580	17.09950	0.0	0.0	-1.2123	0.0	0.0	353.32	*
					18.061	54.61720	4.87240	17.09950	0.0	0.0	-1.8040	0.0	0.0	353.32	*
					20.068	56.61033	4.63900	17.09950	0.0	0.0	-2.1770	0.0	0.0	353.32	*
					22.074	58.60347	4.40560	17.09950	0.0	0.0	-2.4440	0.0	0.0	353.32	*
					24.081	60.59660	4.17220	17.09950	0.074691	0.17400	-1.8594	0.053947	0.18151	353.32	*
					26.088	62.58973	3.93880	17.09950	0.11492	0.26772	-2.0359	0.083003	0.27927	353.32	*
					28.095	64.58287	3.70540	17.09950	0.15568	0.36268	-2.1878	0.11244	0.37832	353.32	*
					30.101	66.57600	3.47200	17.09950	0.19716	0.45931	-2.3263	0.14240	0.47912	353.32	*
					0.0	66.57600	3.47200	17.09950	0.19716	0.45931	-2.3263	0.14240	0.47912	353.32	*
					1.9478	68.56338	2.96400	17.09950	0.21742	0.50650	-2.5544	0.077794	0.54567	344.88	*
					3.8956	70.55677	2.45600	17.09950	0.23790	0.55422	-2.7614	0.085124	0.59709	344.88	*
					5.8434	72.55015	1.94800	17.09950	0.25864	0.60253	-2.9458	0.092545	0.64913	344.88	*
					7.7912	74.09754	1.44000	17.09950	0.30146	0.70228	-3.0923	0.10786	0.75660	344.88	*
					9.7390	75.97792	0.93200	17.09950	0.40409	0.94137	-3.2027	0.14459	1.0142	344.88	*
					11.687	77.85831	0.42400	17.09950	0.50703	1.1812	-3.3102	0.18142	1.2725	344.88	*
					13.635	79.73869	-0.08400	17.09950	0.63083	1.4729	-3.4105	0.22486	1.5864	344.88	*
					15.582	81.61908	-0.59200	17.09950	0.77704	1.8203	-3.5139	0.27540	1.9599	344.88	*
					17.530	83.49946	-1.10000	17.09950	0.94679	2.2262	-3.6185	0.33340	2.3961	344.88	*
					19.478	85.37985	-1.60800	17.09950	1.1470	2.7079	-3.7197	0.40104	2.9133	344.88	*
					21.426	87.26023	-2.11600	17.09950	1.3870	3.2887	-3.8172	0.48129	3.5366	344.88	*
					23.374	89.14062	-2.62400	17.09950	1.6646	3.9653	-3.9213	0.57280	4.2622	344.88	*
					25.321	91.02100	-3.13200	17.09950	1.9482	4.6670	-4.0611	0.66359	5.0136	344.88	*
					0.0	91.02100	-3.13200	16.23650	1.2884	3.1299	-4.3610	-0.0068741	3.3847	337.51	*
					2.0080	92.87630	-3.90013	16.23650	1.7988	4.1154	-4.4905	0.087766	4.4905	337.51	*
					4.0160	94.73160	-4.66826	16.23650	2.4059	5.6496	-4.3175	0.061780	6.1402	337.51	*
					6.0241	96.58689	-5.43638	16.23650	3.1596	7.6355	-4.0207	-0.0015531	8.2634	337.51	*
					8.0321	98.44219	-6.20451	16.23650	3.6563	8.9497	-3.9994	-0.045324	9.6677	337.51	*
					10.040	100.29749	-6.97264	16.23650	3.7939	9.3434	-4.6205	-0.068753	10.084	337.51	*
					12.048	102.15279	-7.74077	16.23650	3.9014	9.6367	-5.2238	-0.081645	10.396	337.51	*
					14.056	104.00809	-8.50889	16.23650	4.0073	9.8797	-5.7405	-0.076727	10.661	337.51	*
					16.064	105.86338	-9.27702	16.23650	4.0798	10.122	-6.1428	-0.10263	10.913	337.51	*
					18.072	107.71868	-10.04515	16.23650	4.1520	10.336	-6.4332	-0.11756	11.138	337.51	*
					20.080	109.57398	-10.81328	16.23650	4.2240	10.515	-6.5181	-0.11959	11.331	337.51	*
					22.088	111.42928	-11.58140	16.23650	4.2957	10.694	-6.4088	-0.12163	11.524	337.51	*
					24.096	113.28457	-12.34953	16.23650	4.3673	10.872	-6.1633	-0.12365	11.715	337.51	*
					26.104	115.13987	-13.11766	16.23650	4.4385	11.049	-5.8507	-0.12567	11.907	337.51	*
					28.112	116.99517	-13.88579	16.23650	4.5096	11.226	-5.5285	-0.12768	12.097	337.51	*
					30.120	118.85047	-14.65391	16.23650	4.5804	11.402	-5.2341	-0.12968	12.287	337.51	*
					32.128	120.70577	-15.42204	16.23650	4.6510	11.578	-4.9782	-0.13168	12.477	337.51	*
					34.136	122.56106	-16.19017	16.23650	4.6516	11.580	-4.8403	-0.13170	12.478	337.51	*
					36.144	124.41636	-16.95830	16.23650	4.6437	11.560	-4.6618	-0.13148	12.457	337.51	*
					38.152	126.27166	-17.72643	16.23650	4.6357	11.540	-4.3590	-0.13125	12.436	337.51	*
					40.160	128.12696	-18.49455	16.236							



RSK ENVIRONMENT LIMITED

UBB, London

TW Sewer Assessment

FULL DEVELOPMENT LONG TERM (S) + Structural Solution-Smoothed

Job No.	Sheet No.	Rev.
371654		
Drg. Ref.		
Made by MK	Date 09-Dec-2020	Checked Date

Stage Ref.	Stage Name	Disp. Line Ref.	Disp. Line Name	Chainage	x	y	z	δx	δy	δz	δH //	δH perp.	Angle
				[m]	[m]	[m]	[m]	[mm]	[mm]	[mm]	[mm]	[mm]	[°]
				5.9971	54.34338	2.35750	20.34000	-0.052675	0.5546	-2.1884	-0.44618	1.4902	345.27
				7.9961	56.27674	1.84928	20.34000	-0.062832	0.87469	-2.9288	-0.28314	0.82998	345.27
				9.9952	58.21009	1.34107	20.34000	-0.028322	0.24795	-3.2400	-0.090428	0.23260	345.27
				11.994	60.14344	0.83286	20.34000	76.752E-12	-671.77E-12	-2.9483	245.01E-12	-630.18E-12	345.27
				13.993	62.07679	0.32464	20.34000	0.0	0.0	-3.1218	0.0	0.0	345.27
				15.992	64.01014	-0.18357	20.34000	0.0	0.0	-3.2707	0.0	0.0	345.27
				17.991	65.94349	-0.69178	20.34000	0.0	0.0	-3.4010	0.0	0.0	345.27
				19.990	67.87684	-1.20000	20.34000	0.0	0.0	-3.5165	0.0	0.0	345.27
				21.989	69.81019	-1.70821	20.34000	0.0	0.0	-3.6198	0.0	0.0	345.27
				23.988	71.74354	-2.21642	20.34000	0.0	0.0	-3.7131	0.0	0.0	345.27
				25.987	73.67689	-2.72463	20.34000	0.0	0.0	-3.7992	0.0	0.0	345.27
				27.986	75.61025	-3.23285	20.34000	0.013196	0.030742	-3.8819	0.0049469	0.033087	345.27
				29.985	77.54360	-3.74106	20.34000	0.033747	0.078617	-3.9662	0.012651	0.084613	345.27
				31.985	79.47695	-4.24927	20.34000	0.070367	0.16649	-4.0493	0.025729	0.17891	345.27
				33.984	81.41030	-4.75749	20.34000	0.17587	0.42582	-4.1311	0.061834	0.45654	345.27
				35.983	83.34365	-5.26570	20.34000	0.30729	0.74866	-4.2229	0.10661	0.80315	345.27
				37.982	85.27700	-5.77391	20.34000	0.46968	1.1506	-4.3357	0.16174	1.2322	345.27
				39.981	87.21035	-6.28213	20.34000	0.66846	1.6421	-4.4252	0.22904	1.7581	345.27
				41.980	89.14370	-6.79034	20.34000	0.92983	2.2893	-4.4760	0.31727	2.4505	345.27
				43.979	91.07705	-7.29855	20.34000	1.2811	3.1604	-4.4566	0.43556	3.3822	345.27
				0.0	91.07705	-7.29855	19.73000	1.2811	3.1604	-4.4566	0.43556	3.3822	345.27
8			TW Fresh Water (c) - St Pancras	1.9971	92.94433	-8.00684	19.73000	1.6555	4.1164	-4.3925	0.097368	4.4395	339.23
				3.9942	94.81160	-8.71513	19.73000	2.0740	5.1322	-4.3337	0.11901	5.5342	339.23
				5.9913	96.67888	-9.42342	19.73000	2.6868	6.6885	-3.3975	0.14003	7.2066	339.23
				7.9884	98.54615	-10.13170	19.73000	2.7573	6.8639	-3.7947	0.14371	7.3357	339.23
				9.9855	100.41343	-10.83999	19.73000	2.8282	7.0480	-4.1570	0.14740	7.5859	339.23
				11.983	102.28070	-11.54828	19.73000	2.8996	7.2181	-4.4700	0.15112	7.7773	339.23
				13.980	104.14798	-12.25657	19.73000	2.9714	7.3969	-4.7210	0.15486	7.9699	339.23
				15.977	106.01525	-12.96486	19.73000	3.0436	7.5767	-4.8979	0.15863	8.1636	339.23
				17.974	107.88253	-13.67314	19.73000	3.1163	7.7576	-4.9915	0.16242	8.3586	339.23
				19.971	109.74980	-14.38143	19.73000	3.1894	7.9396	-5.0011	0.16623	8.5547	339.23
				21.968	111.61707	-15.08972	19.73000	3.2630	8.1227	-4.9374	0.17006	8.7520	339.23
				23.965	113.48435	-15.79801	19.73000	3.3370	8.3070	-4.8194	0.17392	8.9505	339.23
				25.962	115.35162	-16.50630	19.73000	3.4114	8.4922	-4.6676	0.17780	9.1501	339.23
				27.959	117.21890	-17.21459	19.73000	3.4863	8.6786	-4.4985	0.18170	9.3509	339.23
				29.956	119.08617	-17.92287	19.73000	3.5616	8.8661	-4.3192	0.18563	9.5529	339.23
				31.954	120.95345	-18.63116	19.73000	3.6000	8.9617	-4.1688	0.18763	9.6559	339.23
				33.951	122.82072	-19.33945	19.73000	3.6140	8.9965	-4.0169	0.18836	9.6934	339.23
				35.948	124.68800	-20.04774	19.73000	3.6279	9.0313	-3.8135	0.18908	9.7309	339.23
				37.945	126.55527	-20.75603	19.73000	3.6419	9.0661	-3.5429	0.18981	9.7684	339.23
				39.942	128.42255	-21.46431	19.73000	3.6559	9.1010	-3.2028	0.19054	9.8060	339.23
				41.939	130.28982	-22.17260	19.73000	3.6699	9.1358	-2.8056	0.19127	9.8435	339.23
				43.936	132.15710	-22.88089	19.73000	3.6840	9.1707	-2.3749	0.19200	9.8811	339.23
				45.933	134.02437	-23.58918	19.73000	3.6980	9.2056	-1.9394	0.19273	9.9187	339.23
				47.930	135.89165	-24.29747	19.73000	3.7120	9.2405	-1.5239	0.19346	9.9563	339.23
				49.927	137.75892	-25.00575	19.73000	3.7260	9.2755	-1.1390	0.19420	9.9940	339.23
				51.924	139.62619	-25.71404	19.73000	3.7401	9.3104	-0.77681	0.19493	10.032	339.23
				53.922	141.49347	-26.42233	19.73000	3.7541	9.3454	-0.41768	0.19566	10.069	339.23
				55.919	143.36074	-27.13062	19.73000	3.7682	9.3803	-0.043414	0.19639	10.107	339.23
				57.916	145.22802	-27.83891	19.73000	3.7822	9.4153	0.35283	0.19712	10.145	339.23
				59.913	147.09529	-28.54720	19.73000	3.7963	9.4504	0.76675	0.19786	10.182	339.23
				61.910	148.96257	-29.25548	19.73000	3.8104	9.4854	1.1883	0.19859	10.220	339.23
				63.907	150.82984	-29.96377	19.73000	3.8244	9.5204	1.6057	0.19932	10.258	339.23
				65.904	152.69712	-30.67206	19.73000	3.7961	9.4498	1.9535	0.19785	10.182	339.23
				0.0	152.69712	-30.67206	19.73000	3.7961	9.4498	1.9477	-0.58772	10.167	334.81
				1.9680	154.47786	-31.50979	19.20000	3.6361	9.0516	2.0575	-0.56296	9.7384	334.81
				3.9359	156.25860	-32.34753	19.20000	3.4785	8.6593	2.1339	-0.53856	9.3163	334.81
				5.9039	158.03934	-33.18526	19.20000	3.3233	8.2730	2.1806	-0.51453	8.9007	334.81
				7.8718	159.82008	-34.02299	19.20000	3.1705	7.8926	2.2078	-0.49087	8.4914	334.81
				9.8398	161.60084	-34.86073	19.20000	2.3282	7.4554	2.1871	-1.0670	7.7373	334.81
				11.808	163.38155	-35.69846	19.20000	1.0021	6.8128	1.9557	-1.9934	6.5913	334.81
				13.776	165.16229	-36.53619	19.20000	-0.094898	6.0251	1.5655	-2.6507	5.4116	334.81
				15.744	166.94303	-37.37393	19.20000	-0.88676	5.4421	1.2027	-3.1190	4.5469	334.81
				17.712	168.72377	-38.21166	19.20000	-1.3413	4.7335	0.77763	-3.2286	3.7122	334.81
				19.680	170.50451	-39.04940	19.20000	-1.4793	3.8802	0.35315	-2.9903	2.8814	334.81
				21.647	172.28525	-39.88713	19.20000	-1.3410	2.9101	-0.0070569	-2.4522	2.0624	334.81
				23.615	174.06599	-40.72486	19.20000	-0.96582	1.9759	-0.27225	-1.7151	1.3768	334.81
				25.583	175.84673	-41.56260	19.20000	-0.56123	1.1482	-0.47132	-0.99662	0.80007	334.81
				27.551	177.62747	-42.40033	19.20000	-0.12072	0.24698	-0.70407	-0.21437	0.17209	334.81
				29.519	179.40821	-43.23806	19.20000	3.8773E-9	-7.9235E-9	-0.89370	6.8814E-9	-5.5192E-9	334.81
				31.487	181.18895	-44.07580	19.20000	0.0	0.0	-0.94649	0.0	0.0	334.81
				33.455	182.96969	-44.91353	19.20000	0.0	0.0	-0.80313	0.0	0.0	334.81
				35.423	184.75043	-45.75126	19.20000	0.0	0.0	-0.67574	0.0	0.0	334.81
				0.0	52.86515	12.18589	16.51600	0.16949	0.42492	14.536	-0.34484	0.30062	289.34
				1.8105	53.46458	10.47755	16.51600	0.073504	0.18316	4.8204	-0.14849	0.13000	289.34
				3.6209	54.06400	8.76921	16.51600	0.0	0.0	1.6913	0.0	0.0	289.34
				5.4314	54.66343	7.06086	16.51600	0.0	0.0	-0.25091	0.0	0.0	289.34
				7.2418	55.26286	5.35252	16.51600	0.0	0.0	-1.6391	0.0	0.0	289.34

* Result includes imported displacement(s).

Displacement Results - Displacement Grids

Stage Ref.	Stage Name	Disp. Grid Ref.	Disp. Grid Name	x	y	z	δx	δy	δz
				[m]	[m]	[m]	[mm]	[mm]	[mm]

Specific Utility Damage Results - Coordinates & Displacements

Stage Ref.	Stage Name	Specific Utility Ref.	Specific Utility Name	Sub-utility Name	Iteration	Distance	x	y	z	δx (n)	δy (n)	δz (n)	δH/(n)	δHperp. (n)	δx (n-Lp)	δy (n-Lp)
						from start of utility	[m]	[m]	[m]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
0	Base Model	1	TWS(1)_1	1	Unjointed											
		2	TWS(2)_1	1	Unjointed											
		3	TWS(2)_2	1	Unjointed											
		4	TWS(2)_3	1	Unjointed											
		5	TWS(2)_4	1	Unjointed											
		6	TW Fresh Water (a) - St Pancras	1	Unjointed											
0.00000	-0.79041	0.00000	0.00000	0.00000	0.00000	-0.96325	0.00000	3.95632	-32.55421	2.82127	20.65500	0.00000	0.00000	-0.87485	0.00000	0.00000
								7.91263	-28.59823	2.87302	20.65500	0.00000	0.00000	-0.97206	0.00000	0.00000
0.00000	-0.88355	0.00000	0.00000	0.00000	0.00000	-1.06023	0.00000	11.86895	-24.64226	2.92477	20.65500	0.00000	0.00000	-1.06886	0.00000	0.00000
0.00000	-0.98087	0.00000	0.00000	0.00000	0.00000	-1.14867	0.00000	0.00000								
								15.82526	-20.68628	2.97652	20.65500	0.00000	0.00000	-1.15617	0.00000	0.00000
0.00000	-1.07708	0.00000	0.00000	0.00000	0.00000	-1.21363	0.00000	0.00000								
								19.78158	-16.73030	3.02827	20.65500	0.00000	0.00000	-1.21844	0.00000	0.00000
0.00000	-1.16258	0.00000	0.00000	0.00000	0.00000	-1.23051	0.00000	0.00000								
								23.73790	-12.77432	3.08002	20.65500	0.00000	0.00000	-1.23003	0.00000	0.00000
0.00000	-1.22101	0.00000	0.00000	0.00000	0.00000	-1.16040	0.00000	0.00000								
								27.69421	-8.81834	3.13177	20.65500	0.00000	0.00000	-1.15062	0.00000	0.00000
0.00000	-1.22551	0.00000	0.00000	0.00000	0.00000	-0.94612	0.00000	0.00000								
								31.65053	-4.86237	3.18352	20.65500	0.00000	0.00000	-0.92130	0.00000	0.00000
0.00000	-1.13413	0.00000	0.00000	0.01765	0.02647	-0.26181	0.01799	0.00000								
								35.60684	-0.90639	3.23527	20.65500	0.02152	0.03228	-0.16634	0.02194	0.03200
0.00000	-0.88078	0.00000	0.00000	0.11497	0.36908	0.90940	0.11979	0.03200								
								39.56316	3.04959	3.28701	20.65500	0.11936	0.40508	0.10180	0.12465	0.40348
0.06344	-0.06145	0.03558	0.06298	0.05654	0.85248	2.07860	0.06769	0.40348								
								43.51948	7.00557	3.33876	20.65500	0.04624	0.89793	2.17882	0.05799	0.89725
0.44840	1.12671	0.12235	0.44684	0.01375	1.12748	2.97954	0.02849	0.89725								
								47.47579	10.96154	3.39051	20.65500	0.01399	1.14732	3.05276	0.02899	1.14704
0.92301	2.26301	0.05226	0.92240	0.01651	1.35452	3.58526	0.03423	1.14704								
								51.43211	14.91752	3.44226	20.65500	0.01677	1.37528	3.62984	0.03475	1.37494
1.16763	3.11213	0.02951	1.16734	0.01869	1.53271	3.88416	0.03873	1.37494								
								55.38843	18.87350	3.49401	20.65500	0.01879	1.54143	3.90202	0.03895	1.54105
1.39649	3.66101	0.03529	1.39615	0.01941	1.59171	3.95559	0.04022	1.54105								
								59.34474	22.82948	3.54576	20.65500	0.01947	1.59669	3.95713	0.04035	1.59630
1.54641	3.91040	0.03908	1.54603	0.02008	1.64701	3.89717	0.04162	1.59630								
								63.30106	26.78545	3.59751	20.65500	0.02014	1.65199	3.88873	0.04175	1.65159
1.60167	3.95325	0.04048	1.60128	0.02075	1.70235	3.73881	0.04302	1.65159								
								67.25737	30.74143	3.64926	20.65500	0.02081	1.70734	3.72140	0.04315	1.70692
1.65697	3.87600	0.04187	1.65657	0.02143	1.75774	3.45216	0.04442	1.70692								
								71.21369	34.69741	3.70101	20.65500	0.02149	1.76273	3.42130	0.04454	1.76229
1.71232	3.69820	0.04327	1.71190	0.02211	1.81317	2.94769	0.04582	1.76229								



RSK ENVIRONMENT LIMITED

UBB, London

TW Sewer Assessment

FULL DEVELOPMENT LONG TERM (S) + Structural Solution-Smoothed

Job No.	Sheet No.	Rev.
371654		
Drg. Ref.		
Made by MK	Date 09-Dec-2020	Checked Date

										US Dec 2020									
Stage: (n-Lp)	Stage: (n-Lp)	Specific Utility: Ref.	Specific Utility: (n-Lp)	Specific Utility: (n-Lp)	Specific Utility: (n-Lp)	Sub-utility Iteration Name	Distance from start of utility	x	y	z	δx (n)	δy (n)	δz (n)	δx/(n)	δy/(n)	δz/(n)	δx (n-Lp)	δy (n-Lp)	
1.76772	3.38026	0.04467	1.76728	0.00666	4.05864	3.35325	0.05974	75.17001	38.65339	3.75276	20.65500	0.02217	1.81817	2.89370	0.04595	1.81772	0.02155		
1.82316	2.82475	0.04607	1.82272	0.00145	4.45040	2.25768	0.05966	79.12632	42.60936	3.80451	20.65500	0.00317	4.54478	3.53830	0.06262	4.54435	0.02223		
0.00000	-0.83624	0.00000	0.00000	0.00000	0.00000	-1.01215	0.00000	5.93447	-30.57622	2.84714	20.65500	0.00000	0.00000	-0.92312	0.00000	0.00000	0.00000		
0.00000	-0.93194	0.00000	0.00000	0.00000	0.00000	-1.10627	0.00000	9.89079	-26.62024	2.89889	20.65500	0.00000	0.00000	-1.02096	0.00000	0.00000	0.00000		
0.00000	-1.02959	0.00000	0.00000	0.00000	0.00000	-1.18535	0.00000	13.84711	-22.66427	2.95064	20.65500	0.00000	0.00000	-1.11449	0.00000	0.00000	0.00000		
0.00000	-1.12200	0.00000	0.00000	0.00000	0.00000	-1.23012	0.00000	17.80342	-18.70829	3.00239	20.65500	0.00000	0.00000	-1.19175	0.00000	0.00000	0.00000		
0.00000	-1.19656	0.00000	0.00000	0.00000	0.00000	-1.20945	0.00000	21.75974	-14.75231	3.05414	20.65500	0.00000	0.00000	-1.23269	0.00000	0.00000	0.00000		
0.00000	-1.23221	0.00000	0.00000	0.00000	0.00000	-1.07558	0.00000	25.71605	-10.79633	3.10589	20.65500	0.00000	0.00000	-1.20493	0.00000	0.00000	0.00000		
0.00000	-1.19515	0.00000	0.00000	0.00000	0.00000	-0.73689	0.00000	29.67237	-6.84036	3.15764	20.65500	0.00000	0.00000	-1.05909	0.00000	0.00000	0.00000		
0.00000	-1.03427	0.00000	0.00000	0.08175	0.17408	0.31109	0.08402	33.62869	-2.88438	3.20939	20.65500	0.00000	0.00000	-0.69637	0.00000	0.00000	0.00000		
0.00581	-0.60090	0.00395	0.00576	0.10630	0.60227	1.51354	0.11416	37.58500	1.07160	3.26114	20.65500	0.09498	0.20524	0.41598	0.09765	0.20398	0.00388		
0.24123	0.52438	0.10252	0.23991	0.01870	1.01206	2.56203	0.03193	41.54132	5.02758	3.31289	20.65500	0.10342	0.64559	1.62246	0.11186	0.64419	0.09937		
0.69105	1.72267	0.10216	0.68977	0.01511	1.23974	3.32296	0.03133	45.49764	8.98355	3.36464	20.65500	0.01264	1.03714	2.64622	0.02621	1.03688	0.09312		
1.05698	2.71945	0.02671	1.05673	0.01794	1.47183	3.77172	0.03719	49.45395	12.93953	3.41639	20.65500	0.01536	1.26004	3.38232	0.03184	1.25973	0.01289		
1.28080	3.42691	0.03237	1.28048	0.01907	1.56408	3.94019	0.03953	53.41027	16.89551	3.46814	20.65500	0.01820	1.49305	3.80290	0.03773	1.49268	0.01562		
1.50176	3.82075	0.03795	1.50139	0.01974	1.61936	3.93946	0.04092	57.36658	20.85149	3.51989	20.65500	0.01913	1.56906	3.94858	0.03965	1.56867	0.01831		
1.57403	3.95012	0.03978	1.57365	0.02042	1.67467	3.83078	0.04232	61.32290	24.80747	3.57164	20.65500	0.01980	1.62434	3.93558	0.04105	1.62394	0.01919		
1.62932	3.92714	0.04117	1.62892	0.02109	1.73004	3.61581	0.04372	65.27922	28.76344	3.62339	20.65500	0.02048	1.67966	3.81805	0.04245	1.67925	0.01986		
1.68464	3.80064	0.04257	1.68423	0.02177	1.78545	3.23450	0.04512	69.23553	32.71942	3.67514	20.65500	0.02115	1.73502	3.59261	0.04385	1.73460	0.02054		
1.74001	3.56175	0.04397	1.73959	0.02244	1.84091	2.57989	0.04652	73.19185	36.67540	3.72689	20.65500	0.02183	1.79044	3.19345	0.04525	1.79000	0.02121		
1.79543	3.13946	0.04537	1.79499	0.00256	4.51599	2.97892	0.06163	77.14816	40.63138	3.77864	20.65500	0.02251	1.84591	2.51095	0.04665	1.84545	0.02189		
2.33204	2.69600	0.04952	2.33159	0.00022	4.10126	1.43253	0.05387	81.10448	44.58735	3.83038	20.65500	0.00243	4.50966	2.85603	0.06142	4.50925	0.01902		
3.83526	1.00167	-0.97504	3.70925	-0.06081	1.01009	-2.78134	-0.31561	9.39806	52.41003	2.86571	20.34000	-0.00209	2.23214	-1.27881	-0.56950	2.15827	0.00000		
2.09723	-1.45994	-0.54494	2.02523	-0.00564	0.04937	-3.00635	-0.01801	11.99613	56.27674	1.84928	20.34000	-0.06284	0.87469	-2.92876	-0.28314	0.82998	-0.01217		
0.74989	-2.99074	-0.24477	0.71103	0.00000	0.00000	-3.24108	0.00000	15.99225	64.01014	-0.18357	20.34000	0.00000	0.00000	-3.27073	0.00000	0.00000	0.00000		
0.00000	-2.98282	0.00000	-0.00000	0.00000	0.00000	-3.49346	0.00000	19.99031	67.87684	-1.20000	20.34000	0.00000	0.00000	-3.51645	0.00000	0.00000	0.00000		
0.00000	-3.29667	0.00000	0.00000	0.00000	0.00000	-3.69452	0.00000	23.98838	71.74354	-2.21642	20.34000	0.00000	0.00000	-3.71311	0.00000	0.00000	0.00000		
0.00000	-3.53703	0.00000	0.00000	0.01057	0.02462	-3.86542	0.00396	27.98644	75.61025	-3.32385	20.34000	0.01320	0.03074	-3.88188	0.00495	0.03309	0.00000		
0.00000	-3.73026	0.00000	0.00000	0.06307	0.14899	-4.03277	0.02312	31.98450	79.47695	-4.24927	20.34000	0.07037	0.16649	-4.04933	0.02573	0.17891	0.01729		
0.04028	-3.89867	0.00648	0.04335	0.28112	0.68518	-4.21235	0.09769	35.98257	83.34365	-5.26570	20.34000	0.30729	0.74966	-4.23255	0.10661	0.80315	0.09138		
0.21813	-4.06561	0.03292	0.23419	0.62888	1.54419	-4.40737	0.21564	39.80315	87.21035	-6.28213	20.34000	0.66846	1.64206	-4.42518	0.22904	1.75805	0.33963		
0.82949	-4.25310	0.11759	0.88858	1.21116	2.98691	-4.46045	0.41200	43.75805	94.11030	-7.26213	20.34000	0.66846	1.64206	-4.42518	0.22904	1.75805	0.33963		
2.89712	-0.34935	-0.73694	2.80183	-0.03519	0.37275	-3.17801	-0.12880	47.99709	54.34338	2.35750	20.34000	-0.05267	1.55462	-2.18841	-0.44618	1.49015	-0.00042		
1.41923	-2.33583	-0.41371	1.35869	0.00000	-0.00000	-3.08725	0.00000	51.99516	58.21009	1.34107	20.34000	-0.02832	0.24795	-3.23998	-0.09043	0.23260	-0.05470		
0.19858	-3.18189	-0.07242	0.18629	0.00000	0.00000	-3.37504	0.00000	55.93922	62.07679	0.32464	20.34000	0.00000	0.00000	-3.12181	0.00000	0.00000	-0.02268		
0.00000	-3.15146	0.00000	0.00000	0.00000	0.00000	-3.59919	0.00000	59.99128	65.94349	-0.69178	20.34000	0.00000	0.00000	-3.40097	0.00000	0.00000	0.00000		
0.00000	-3.42397	0.00000	0.00000	0.00000	0.00000	-3.78208	0.00000	63.98935	69.81019	-1.70821	20.34000	0.00000	0.00000	-3.61976	0.00000	0.00000	0.00000		
0.00000	-3.63835	0.00000	0.00000	0.02965	0.06908	-3.94939	0.01112	67.98841	73.67689	-2.72463	20.34000	0.00000	0.00000	-3.79923	0.00000	0.00000	0.00000		
0.00612	-3.81569	0.00099	0.00659	0.15486	0.37418	-4.11481	0.05464	71.98547	77.54360	-3.74106	20.34000	0.03375	0.07862	-3.96618	0.01265	0.08461	0.00263		
0.09611	-3.98274	0.01526	0.10339	0.43734	1.07073	-4.31518	0.15076	75.98353	81.41030	-4.75749	20.34000	0.17587	0.42582	-4.13110	0.06183	0.45654	0.04104		
0.49031	-4.15130	0.07075	0.52556	0.87779	2.16043	-4.46586	0.29970	79.98160	85.27700	-5.77391	20.34000	0.46968	1.15056	-4.33573	0.16174	1.23217	0.02024		
3.34906	-4.44312	0.08100	3.61263	2.74339	6.82930	-3.71632	0.14298	83.99419	94.81160	-8.71513	19.73000	2.07402	5.13223	-4.33371	0.11901	5.53418	1.35699		
5.																			



FULL DEVELOPMENT LONG TERM (S) + Structural Solution-Smoothed

Job No.	Sheet No.	Rev.
371654		
Drg. Ref.		
Made by MK	Date 09-Dec-2020	Checked Date

Specific Utility Damage Results - Pullouts & Rotations

[illegible]



RSK ENVIRONMENT LIMITED

UBB, London

TW Sewer Assessment

FULL DEVELOPMENT LONG TERM (S) + Structural Solution-Smoothed

Job No.	Sheet No.	Rev.
371654		
Drg. Ref.		
Made by MK	Date 09-Dec-2020	Checked Date

Stage: Ref.	Stage: Name	Specific Pullout: Pullout:	Specific Utility: Utility:	Specific Utility: Name			Sub-utility Name	Iteration	Distance	x	y	z	Pullout: Check:	Pullout: Vertical Left Seg.:	Pullout: Horizontal Left	Pullout: Left Seg.:	Pullout: Left	Pullout: Right	Pullout: Right	Pullout: Right
				Pullout:	Pullout:	Pullout:														
0.00100	-0.00000	-0.00000	0.00199	0.00199	0.00199	0.00199	-	OK	15.99225	64.01014	-0.18357	20.34000	0.00000	0.00000	0.00100	0.00100	0.00000	0.00000	0.00100	
0.00064	0.00000	0.00000	0.00127	0.00127	0.00127	0.00127	-	OK	19.99031	67.87684	-1.20000	20.34000	0.00000	0.00000	0.00064	0.00064	0.00000	0.00000	0.00064	
0.00054	0.00198	0.00198	0.00109	0.00109	0.00307	0.00307	-	OK	23.98838	71.74354	-2.21642	20.34000	0.00000	0.00000	0.00054	0.00054	0.00198	0.00198	0.00054	
0.00144	0.01156	0.01156	0.00287	0.00287	0.01443	0.01443	-	OK	27.98644	75.61025	-3.23285	20.34000	0.00247	0.00247	0.00144	0.00144	0.01404	0.01404	0.00144	
0.00641	0.04561	0.04561	0.01283	0.01283	0.05843	0.05843	-	OK	31.98450	79.47695	-4.24927	20.34000	0.01610	0.01610	0.00641	0.00641	0.06171	0.06171	0.00641	
0.00430	0.09136	0.09136	0.00860	0.00860	0.09996	0.09996	-	OK	35.98257	83.34365	-5.26570	20.34000	0.06976	0.06976	0.00430	0.00430	0.16112	0.16112	0.00430	
0.00894	0.14721	0.14721	0.01789	0.01789	0.16510	0.16510	-	OK	39.98063	87.21035	-6.28213	20.34000	0.17331	0.17331	0.00894	0.00894	0.32052	0.32052	0.00894	
0.01324	0.30407	0.30407	0.02649	0.02649	0.33056	0.33056	-	2	OK	43.97870	91.08100	-7.35750	20.34000	0.01324	0.01324	-0.28749	-0.28749	0.01324		
0.02114	0.20686	0.20686	0.04229	0.04229	0.24914	0.24914	-	OK	47.97676	94.94100	-8.42927	20.34000	0.02114	0.02114	-0.04521	-0.04521	0.02114			
0.00557	0.03621	0.03621	0.01114	0.01114	0.04735	0.04735	-	OK	51.97482	98.80100	-9.50000	20.34000	0.00557	0.00557	0.00000	0.00000	0.00557			
0.00078	0.00000	0.00000	0.00157	0.00157	0.00157	0.00157	-	OK	55.97288	102.66100	-10.57142	20.34000	0.00078	0.00078	0.00000	0.00000	0.00078			
0.00051	0.00000	0.00000	0.00102	0.00102	0.00102	0.00102	-	OK	59.97094	106.52100	-11.64285	20.34000	0.00051	0.00051	0.00000	0.00000	0.00051			
0.00115	0.00556	0.00556	0.00230	0.00230	0.00785	0.00785	-	OK	63.96900	110.38100	-12.71428	20.34000	0.00115	0.00115	0.00556	0.00556	0.00115			
0.00365	0.02683	0.02683	0.00729	0.00729	0.03412	0.03412	-	OK	67.96706	114.24100	-13.78571	20.34000	0.00365	0.00365	0.0365	0.0365	0.00365			
0.00518	0.06775	0.06775	0.01036	0.01036	0.07811	0.07811	-	OK	71.96512	118.10100	-14.85714	20.34000	0.00518	0.00518	0.06775	0.06775	0.00518			
0.00577	0.11447	0.11447	0.01154	0.01154	0.12602	0.12602	-	OK	75.96318	121.96100	-15.92857	20.34000	0.00577	0.00577	0.11447	0.11447	0.00577			
0.00790	0.03099	0.03099	0.01580	0.01580	0.04679	0.04679	-	1	OK	79.96124	125.82100	-17.00000	20.34000	0.00790	0.00790	0.03099	0.03099	0.00790		
0.02340	0.01361	0.01361	0.04681	0.04681	0.06042	0.06042	-	OK	83.95930	129.68100	-18.07142	20.34000	0.02340	0.02340	0.01361	0.01361	0.02340			
0.00322	0.00672	0.00672	0.00644	0.00644	0.01317	0.01317	-	OK	87.95736	133.54100	-19.14285	20.34000	0.00322	0.00322	0.00672	0.00672	0.00322			
0.00423	0.00681	0.00681	0.00847	0.00847	0.01527	0.01527	-	OK	91.95542	137.40100	-20.21428	20.34000	0.00423	0.00423	0.00681	0.00681	0.00423			
0.00372	0.00689	0.00689	0.00743	0.00743	0.01432	0.01432	-	OK	95.95348	141.26100	-21.28571	20.34000	0.00372	0.00372	0.00689	0.00689	0.00372			
0.00181	0.00697	0.00697	0.00362	0.00362	0.01059	0.01059	-	OK	99.95154	145.12100	-22.35714	20.34000	0.00181	0.00181	0.00697	0.00697	0.00181			
0.00118	0.00627	0.00627	0.00235	0.00235	0.00862	0.00862	-	OK	103.94960	148.98100	-23.42857	20.34000	0.00118	0.00118	0.00627	0.00627	0.00118			
0.00303	0.00323	0.00323	0.00607	0.00607	0.00930	0.00930	-	OK	107.94766	152.84100	-24.50000	20.34000	0.00303	0.00303	0.00323	0.00323	0.00303			
0.00333	0.00131	0.00131	0.00667	0.00667	0.00798	0.00798	-	OK	111.94572	156.70100	-25.57142	20.34000	0.00333	0.00333	0.00131	0.00131	0.00333			
0.00284	0.00132	0.00132	0.00567	0.00567	0.00699	0.00699	-	OK	115.94378	160.56100	-26.64285	20.34000	0.00284	0.00284	0.00132	0.00132	0.00284			
0.00030	0.00132	0.00132	0.00059	0.00059	0.00191	0.00191	-	OK	119.94184	164.42100	-27.71428	20.34000	0.00030	0.00030	0.00132	0.00132	0.00030			
0.00137	0.00132	0.00132	0.00273	0.00273	0.00405	0.00405	-	OK	123.93990	168.28100	-28.78571	20.34000	0.00137	0.00137	0.00132	0.00132	0.00137			
0.00018	0.00132	0.00132	0.00035	0.00035	0.00167	0.00167	-	OK	127.93796	172.14100	-29.85714	20.34000	0.00018	0.00018	0.00132	0.00132	0.00018			
0.00101	0.00132	0.00132	0.00202	0.00202	0.00334	0.00334	-	OK	131.93602	176.00100	-30.92857	20.34000	0.00101	0.00101	0.00132	0.00132	0.00101			
0.00038	0.00132	0.00132	0.00075	0.00075	0.00207	0.00207	-	OK	135.93408	179.86100	-32.00000	20.34000	0.00038	0.00038	0.00132	0.00132	0.00038			
0.04232	0.02252	0.02252	0.08465	0.08465	0.10717	0.10717	-	2	OK	139.93214	183.72100	-33.07142	20.34000	0.04232	0.04232	0.02252	0.02252	0.04232		
0.00255	0.00668	0.00668	0.00510	0.00510	0.01179	0.01179	-	OK	143.93020	187.58100	-34.14285	20.34000	0.00255	0.00255	0.00668	0.00668	0.00255			
0.00382	0.00677	0.00677	0.00764	0.00764	0.01441	0.01441	-	OK	147.92826	191.44100	-35.21428	20.34000	0.00382	0.00382	0.00677	0.00677	0.00382			
0.00423	0.00685	0.00685	0.00847	0.00847	0.01532	0.01532	-	OK	151.92632	195.30100	-36.28571	20.34000	0.00423	0.00423	0.00685	0.00685	0.00423			
0.00281	0.00693	0.00693	0.00562	0.00562	0.01255	0.01255	-	OK	155.92438	199.16100	-37.35714	20.34000	0.00281	0.00281	0.00693	0.00693	0.00281			
0.00102	0.00701	0.00701	0.00204	0.00204	0.00905	0.00905	-	OK	159.92244	203.02100	-38.42857	20.34000	0.00102	0.00102	0.00701	0.00701	0.00102			
0.00358	0.00482	0.00482	0.00715	0.00715	0.01197	0.01197	-	OK	163.92050	206.88100	-39.50000	20.34000	0.00358	0.00358	0.00482	0.00482	0.00358			
0.00240	0.00182	0.00182	0.00480	0.00480	0.00662	0.00662	-	OK	167.91856	210.74100	-40.57142	20.34000	0.00240	0.00240	0.00182	0.00182	0.00240			
0.00344	0.00131	0.00131	0.00687	0.00687	0.00819	0.00819	-	OK	171.91662	214.60100	-41.64285	20.34000	0.00344	0.00344	0.00131	0.00131	0.00344			
0.00168	0.00132	0.00132	0.00336	0.00336	0.00468	0.00468	-	OK	175.91468	218.46100	-42.71428	20.34000	0.00168	0.00168	0.00132	0.00132	0.00168			
0.00087	0.00132	0.00132	0.00173	0.00173	0.00305	0.00305	-	OK	179.91274	222.32100	-43.78571	20.34000	0.00087	0.00087	0.00132	0.00132	0.00087			
0.00104	0.00132	0.00132	0.00208	0.00208	0.00340	0.00340	-	OK	183.91080	226.18100	-44.85714	20.34000	0.00104	0.00104	0.00132	0.00132	0.00104			
0.00065	0.00132	0.00132	0.00130	0.00130	0.00262	0.00262	-	OK	187.90886	230.04100	-45.92857	20.34000	0.00065	0.00065	0.00132	0.00132	0.00065			
0.00085	0.00132	0.00132	0.00170	0.00170	0.00302	0.00302	-	OK	191.90692	233.90100	-47.00000	20.34000	0.00085	0.00085	0.00132	0.00132	0.00085			
0.00165	0.00043	0.00043	0.00329	0.00329	0.00373	0.00373	-	OK	195.90498	237.76100	-48.07142	20.34000	0.00165	0.00165	0.00043	0.00043	0.00165			
0.00154	0.04429	0.04429	0.00307	0.00307	0.04736	0.04736	-	1	OK	199.90304	241.62100	-49.14285	20.34000	0.00154	0.00154	0.04429	0.04429	0.00154		
0.01513	-0.65040	-0.65040	0.03027	0.03027	0.03027	0.03027	-	OK	203.90110	245.48100	-50.21428	20.34000	0.01513	0.01513	-0.65040	-0.65040	0.01513			
0.00703	-1.22494	-1.22494	0.01406	0.01406	0.01406	0.01406	-	OK	207.89916	249.34100	-51.28571	20.34000	0.00703	0.00703	-1.22494	-1.22494	0.00703			
0.00507	-0.46272	-0.46272	0.01014	0.01014	0.01014	0.01014	-	OK	211.89722	253.20100	-52.35714	20.34000	0.00507	0.00507	-0.46272	-0.46272	0.00507			
0.00365	0.64842	0.64842	0.00730	0.00730	0.65572	0.65572	-	OK	215.89528	257.06100	-53.42857	20.34000	0.00365	0.00365	0.64842	0.64842	0.00365			
0.00485	1.27530	1.27530	0.00971	0.00971	1.28501	1.28501	-	OK	219.89334	260.92100	-54.50000	20.34000	0.00485	0.00485	1.27530	1.27530	0.00485			
0.01449	0.79623	0.79623	0.02898	0.02898	0.82521	0.82521	-	OK	223.89140	264.78100	-55.57142	20.34000	0.01449	0.01449	0.79623					

Note: Total pullout ignores the axial component where this is negative (i.e. compression).

Specific Utility Damage Results - Strains

Stage: Ref.	Stage: Name	Specific Compn.: Utility: Total:	Specific Utility: Compn.: Check:	Sub-utility Iteration Distance	x	y	z	Ax.	Flexural:	Flexural:	Flexural:	Flexural:	Tension:
Total:	Tension	Total:	Compn.	Curv.	Rad. of	Rad. of	Rad. of	Strain:	Strain:	Tension:	Tension:	Compn.:	Total:
Factored	Unfactored	Factored	Unfactored	Curv.	Curv.	Curv.	Curv.	Unfactored	Factored	Unfactored	Factored	Unfactored	Unfactored
Threshold	Limit	(w.r.t. Global											
Axis)													
[µε]	[µε]	[m]	[Deg]	[m]	[m]	[m]	[m]	[µε]	[µε]	[µε]	[µε]	[µε]	[µε]



RSK ENVIRONMENT LIMITED

UBB, London

TW Sewer Assessment

FULL DEVELOPMENT LONG TERM (S) + Structural Solution-Smoothed

Job No.	Sheet No.	Rev.
371654		
Drg. Ref.		
Made by MK	Date 09-Dec-2020	Checked Date

377.78789	Base Model OK	1	TWS(1)_1	1	1	2.00040	48.04000	58.00000	14.64700	115.54	115.54	131.13	262.25	-131.13	-131.13	246.66183
99.17729	OK	-8.59402	-8.59402	OK	1.4743E+5	-	4.00080	48.08000	56.00000	14.64700	81.989	81.989	8.5940	17.188	-8.5940	90.58327
203.35247	OK	-96.63310	-96.63310	OK	1.3111E+4	-	6.00120	48.12000	54.00000	14.64700	10.086	10.086	96.633	193.27	-96.633	106.71937
127.28277	OK	-89.38699	-89.38699	OK	1.9908E+4	-	8.00160	48.16000	52.00000	14.64700	-25.746	-25.746	63.641	127.28	-63.641	63.64138
178.86771	OK	-127.29740	-127.29740	OK	1.4167E+4	-	10.00200	48.20000	50.00000	14.64700	-37.864	-37.864	89.434	178.87	-89.434	89.43386
719.89718	Failed	-411.14743	-411.14743	OK	3.5199E+3	-	12.00240	48.24000	48.00000	14.64700	-51.199	-51.199	359.95	719.90	-359.95	359.94859
305.19975	OK	-214.91198	-214.91198	OK	8.3028E+3	-	14.00280	48.28000	46.00000	14.64700	-62.312	-62.312	152.60	305.20	-152.60	152.59988
569.94976	Failed	-330.73982	-330.73982	OK	4.4460E+3	-	16.00320	48.32000	44.00000	14.64700	-45.765	-45.765	284.97	569.95	-284.97	284.97488
443.27297	OK	-243.25001	-243.25001	OK	5.7166E+3	-	18.00360	48.36000	42.00000	14.64700	-21.614	-21.614	221.64	443.27	-221.64	221.63648
443.27272	OK	-229.50539	-229.50539	OK	5.7166E+3	-	20.00400	48.40000	40.00000	14.64700	-7.8690	-7.8690	221.64	443.27	-221.64	221.63636
389.39899	OK	-196.70242	-196.70242	OK	6.5075E+3	-	22.00440	48.44000	38.00000	14.64700	-2.0029	-2.0029	194.70	389.40	-194.70	194.69949
361.29100	OK	-180.52305	-180.52305	OK	7.0185E+3	-	24.00480	48.48000	36.00000	14.64700	0.24490	0.24490	180.52	361.05	-180.52	180.76795
357.73588	OK	-178.82464	-178.82464	OK	7.0852E+3	-	26.00520	48.52000	34.00000	14.64700	0.086604	0.086604	178.82	357.65	-178.82	178.91124
550.75217	Failed	-275.37525	-275.37525	OK	4.6010E+3	-	28.00560	48.56000	32.00000	14.64700	0.0016604	0.0016604	275.38	550.75	-275.38	275.37691
384.81332	OK	-192.38238	-192.38238	OK	6.5858E+3	-	30.00600	48.60000	30.00000	14.64700	0.048558	0.048558	192.38	384.76	-192.38	192.43094
506.84474	Failed	-253.31232	-253.31232	OK	5.0017E+3	-	32.00640	48.64000	28.00000	14.64700	0.22010	0.22010	253.31	506.62	-253.31	253.53242
88.94048	OK	-49.01465	-49.01465	OK	2.8491E+4	-	34.00680	48.68000	26.00000	14.64700	-4.5444	-4.5444	44.470	88.940	-44.470	44.47024
51.98743	OK	-50.44195	-50.44195	OK	4.8743E+4	-	36.00720	48.72000	24.00000	14.64700	-24.448	-24.448	25.994	51.987	-25.994	25.99371
143.07778	OK	-128.41617	-128.41617	OK	1.7711E+4	-	38.00760	48.76000	22.00000	14.64700	-56.877	-56.877	71.539	143.08	-71.539	71.53889
132.61980	OK	-140.53968	-140.53968	OK	1.9107E+4	-	40.00800	48.80000	20.00000	14.64700	-74.230	-74.230	66.310	132.62	-66.310	66.30990
10.09306	OK	-73.01463	-73.01463	OK	2.5106E+5	-	42.00840	48.84000	18.00000	14.64700	-67.968	-67.968	5.0465	10.093	-5.0465	5.04653
249.97825	OK	-167.88799	-167.88799	OK	1.0137E+4	-	44.00880	48.88000	16.00000	14.64700	-42.899	-42.899	124.99	249.98	-124.99	124.98912
421.27274	OK	-210.61152	-210.61152	OK	6.0158E+3	-	46.00920	48.92000	14.00000	14.64700	0.049701	0.049701	210.61	421.22	-210.61	210.66122
268.61362	OK	-112.77233	-112.77233	OK	1.1235E+4	-	48.00960	48.96000	12.00000	14.64700	43.069	43.069	112.77	225.54	-112.77	155.84130
338.57026	OK	-138.92984	-138.92984	OK	9.1197E+3	-	50.01000	49.00000	10.00000	14.64700	60.711	60.711	138.93	277.86	-138.93	199.64042
185.00881	OK	-59.79657	-59.79657	OK	2.1189E+4	-	52.01040	49.04000	8.00000	14.64700	65.416	65.416	59.797	119.59	-59.797	125.21224
104.68233	OK	-23.69537	-23.69537	OK	5.3470E+4	-	54.01080	49.08000	6.00000	14.64700	57.292	57.292	23.695	47.391	-23.695	80.98696
54.12598	OK	-12.53054	-12.53054	OK	1.0111E+5	-	56.01120	49.12000	4.00000	14.64700	29.065	29.065	12.531	25.061	-12.531	41.59544
202.78431	OK	-95.14384	-95.14384	OK	1.3317E+4	-	58.01160	49.16000	2.00000	14.64700	12.497	12.497	95.144	190.29	-95.144	107.64048
205.34702	OK	-100.16752	-100.16752	OK	1.2649E+4	-	60.01200	49.20000	0.00000	14.64700	5.0120	5.0120	100.17	200.34	-100.17	105.17949
72.42637	OK	-36.21230	-36.21230	OK	3.4988E+4	-	62.01240	49.24000	-2.00000	14.64700	0.0017694	0.0017694	36.212	72.425	-36.212	36.21407
54.24478	OK	-27.12237	-27.12237	OK	4.6714E+4	-	64.01280	49.28000	-4.00000	14.64700	45.027E-6	45.027E-6	27.122	54.245	-27.122	27.12241
17.98909	OK	-8.99445	-8.99445	OK	1.4086E+5	-	66.01320	49.32000	-6.00000	14.64700	180.91E-6	180.91E-6	8.9945	17.989	-8.9945	8.99463
10.34112	OK	-5.17033	-5.17033	OK	2.4505E+5	-	68.01360	49.36000	-8.00000	14.64700	456.14E-6	456.14E-6	5.1703	10.341	-5.1703	5.17079
5.00580	OK	-2.50257	-2.50257	OK	5.0628E+5	-	70.01400	49.40000	-10.00000	14.64700	657.43E-6	657.43E-6	2.5026	5.0051	-2.5026	2.50323
1.32762	OK	-0.66343	-0.66343	OK	1.9098E+6	-	72.01440	49.44000	-12.00000	14.64700	751.18E-6	751.18E-6	0.66343	1.3269	-0.66343	0.66419
1.16189	OK	-0.58057	-0.58057	OK	2.1823E+6	-	74.01480	49.48000	-14.00000	14.64700	753.72E-6	753.72E-6	0.58057	1.1611	-0.58057	0.58132
2.79396	OK	-1.39663	-1.39663	OK	9.0718E+5	-	76.01520	49.52000	-16.00000	14.64700	694.34E-6	694.34E-6	1.3966	2.7933	-1.3966	1.39733
3.81120	OK	-1.90530	-1.90530	OK	6.6499E+5	-	78.01560	49.56000	-18.00000	14.64700	600.60E-6	600.60E-6	1.9053	3.8106	-1.9053	1.90590
4.38861	OK	-2.19406	-2.19406	OK	5.7747E+5	-	80.01600	49.60000	-20.00000	14.64700	493.67E-6	493.67E-6	2.1941	4.3881	-2.1941	2.19455
4.65392	OK	-2.32677	-2.32677	OK	5.4453E+5	-	82.01640	49.64000	-22.00000	14.64700	387.90E-6	387.90E-6	2.3268	4.6535	-2.3268	2.32716
4.70062	OK	-2.35017	-2.35017	OK	5.3911E+5	-	84.01680	49.68000	-24.00000	14.64700	291.88E-6	291.88E-6	2.3502	4.7003	-2.3502	2.35046
4.59731	OK	-2.29855	-2.29855	OK	5.5122E+5	-	86.01720	49.72000	-26.00000	14.64700	209.95E-6	209.95E-6	2.2986	4.5971	-2.2986	2.29876
4.39421	OK	-2.19703	-2.19703	OK	5.7669E+5	-	88.01760	49.76000	-28.00000	14.64700	143.52E-6	143.52E-6	2.1970	4.3941	-2.1970	2.19718
4.12802	OK	-2.06397	-2.06397	OK	6.1387E+5	-	90.01800	49.80000	-30.00000	14.64700	92.191E-6	92.191E-6	2.0640	4.1279	-2.0640	2.06406
3.82538	OK	-1.91266	-1.91266	OK	6.6243E+5	-	92.01840	49.84000	-32.00000	14.64700	54.492E-6	54.492E-6	1.9127	3.8253	-1.9127	1.91272
3.50542	OK	-1.75270	-1.75270	OK	7.2289E+5	-	94.01880	49.88000	-34.00000	14.64700	28.471E-6	28.471E-6	1.7527	3.5054	-1.7527	1.75272
3.18173	OK	-1.59086	-1.59086	OK	7.9643E+5	-	96.01920	49.92000	-36.00000	14.64700	12.037E-6	12.037E-6	1.5909	3.1817	-1.5909	1.59087
0.25754	OK	-0.12861	-0.12861	OK	6.2944E+6	1	2.00319	49.96000	-38.00000	14.64700	6.50671	6.50671	0.12861	0.25721	-0.12861	0.12893
0.09177	OK	-0.04572	-0.04572	OK	1.7706E+7	-	4.00638	50.00000	-40.00000	14.64700	328.61E-6	328.61E-6	0.04572	0.09140	-0.04572	0.04605
0.57303	OK	-0.28635	-0.28635	OK	2.8269E+6	-	6.00957	50.04000	-42.00000	14.64700	318.16E-6	318.16E-6	0.28635	0.5		



RSK ENVIRONMENT LIMITED

UBB, London

TW Sewer Assessment

FULL DEVELOPMENT LONG TERM (S) + Structural Solution-Smoothed

Job No.	Sheet No.	Rev.
371654		
Drg. Ref.		
Made by MK	Date 09-Dec-2020	Checked Date

Stage:	Name	Specific Compn.:	Total:	Specific Utility:	Name	Check:	Rad. of Curv.	Sub-utility Name	Distance	x	y	z	Ax.	Ax.	Flexural:	Flexural:	Flexural:	Flexural:	Tension:
91.79740	OK	-45.83987	-45.83987	OK	1.7659E+4	-	-	46.07337	12.64129	6.80843	17.09950	0.11766	0.11766	45.840	91.680	-45.840	-45.840	45.95753	
71.26081	OK	-35.58353	-35.58353	OK	2.2749E+4	-	-	48.07656	14.64443	6.82214	17.09950	0.093743	0.093743	35.584	71.167	-35.584	-35.584	35.67728	
50.26240	OK	-25.08968	-25.08968	OK	3.2264E+4	-	-	50.07975	16.64757	6.83586	17.09950	0.083040	0.083040	25.090	50.179	-25.090	-25.090	25.17272	
34.94173	OK	-17.43158	-17.43158	OK	4.6439E+4	-	-	52.08293	18.65071	6.84957	17.09950	0.078574	0.078574	17.432	34.863	-17.432	-17.432	17.51015	
24.85427	OK	-12.38857	-12.38857	OK	6.5342E+4	-	-	54.08612	20.65386	6.86329	17.09950	0.077119	0.077119	12.389	24.777	-12.389	-12.389	12.46569	
18.17859	OK	-9.05070	-9.05070	OK	8.9441E+4	-	-	56.08931	22.65700	6.87700	17.09950	0.077188	0.077188	9.0507	18.101	-9.0507	-9.0507	9.12789	
13.90353	OK	-6.91287	-6.91287	OK	1.1710E+5	-	-	58.09250	24.66014	6.89071	17.09950	0.077783	0.077783	6.9129	13.826	-6.9129	-6.9129	6.99066	
11.99232	OK	-5.95698	-5.95698	OK	1.3589E+5	-	-	60.09569	26.66329	6.90443	17.09950	0.078361	0.078361	5.9570	11.914	-5.9570	-5.9570	6.03534	
12.89457	OK	-6.40758	-6.40758	OK	1.2633E+5	-	-	62.09888	28.66643	6.91814	17.09950	0.079411	0.079411	6.4076	12.815	-6.4076	-6.4076	6.48699	
17.28427	OK	-8.60167	-8.60167	OK	9.4110E+4	-	-	64.10207	30.66957	6.93186	17.09950	0.080927	0.080927	8.6017	17.203	-8.6017	-8.6017	8.68260	
26.12424	OK	-13.02046	-13.02046	OK	6.2171E+4	-	-	66.10526	32.67271	6.94557	17.09950	0.083323	0.083323	13.020	26.041	-13.020	-13.020	13.10378	
53.72410	OK	-25.63072	-25.63072	OK	3.1583E+4	-	1	2.00675	38.67213	6.73960	17.09950	2.4627	2.4627	25.631	51.261	-25.631	-25.631	28.09338	
63.85486	OK	-30.43266	-30.43266	OK	2.6600E+4	-	-	4.01351	40.66527	6.50620	17.09950	2.9895	2.9895	30.433	60.865	-30.433	-30.433	33.42220	
122.91042	OK	-57.94882	-57.94882	OK	1.3969E+4	-	-	6.02026	42.65840	6.27280	17.09950	7.0128	7.0128	57.949	115.90	-57.949	-57.949	64.96160	
75.65520	OK	-23.47927	-23.47927	OK	3.4477E+4	-	-	8.02701	44.65153	6.03940	17.09950	10.697	10.697	23.479	46.959	-23.479	-23.479	34.17593	
105.41162	OK	-47.59943	-47.59943	OK	1.7007E+4	-	-	10.03376	46.64467	5.80600	17.09950	10.213	10.213	47.599	95.199	-47.599	-47.599	57.81219	
105.09177	OK	-48.35317	-48.35317	OK	1.6741E+4	-	-	12.04052	48.63780	5.57260	17.09950	8.3854	8.3854	48.353	96.706	-48.353	-48.353	56.73860	
91.24234	OK	-43.79617	-43.79617	OK	1.8483E+4	-	-	14.04727	50.63093	5.33920	17.09950	3.6500	3.6500	43.796	87.592	-43.796	-43.796	47.44617	
71.95130	OK	-35.94685	-35.94685	OK	2.2519E+4	-	-	16.05402	52.62407	5.10580	17.09950	0.057604	0.057604	35.947	71.894	-35.947	-35.947	36.00445	
87.95353	OK	-43.96232	-43.96232	OK	1.8413E+4	-	-	18.06077	54.61720	4.87240	17.09950	0.028890	0.028890	43.962	87.925	-43.962	-43.962	43.99121	
42.65702	OK	-21.32215	-21.32215	OK	3.7965E+4	-	-	20.06753	56.61033	4.63900	17.09950	0.012713	0.012713	21.322	42.644	-21.322	-21.322	21.33487	
363.47674	OK	-175.01566	-175.01566	OK	4.6253E+3	-	-	22.07428	58.60347	4.40560	17.09950	13.445	13.445	175.02	350.03	-175.02	-175.02	188.46108	
328.50825	OK	-153.90986	-153.90986	OK	5.2596E+3	-	-	24.08103	60.59660	4.17220	17.09950	20.689	20.689	153.91	307.82	-153.91	-153.91	174.59839	
24.47494	OK	-4.94773	-4.94773	OK	1.6361E+5	-	-	26.08778	62.58973	3.93880	17.09950	14.579	14.579	4.9477	9.8955	-4.9477	-4.9477	19.52722	
13.44994	OK	-4.82903	-4.82903	OK	1.6763E+5	-	-	3.89559	70.33677	2.45600	17.09950	3.7919	3.7919	4.8290	9.6581	-4.8290	-4.8290	8.62092	
34.48765	OK	-14.32291	-14.32291	OK	5.6518E+4	-	-	5.84339	72.21715	1.94800	17.09950	5.8418	5.8418	14.323	28.646	-14.323	-14.323	20.16474	
79.25662	OK	-32.94547	-32.94547	OK	2.4571E+4	-	-	7.79119	74.09754	1.44000	17.09950	13.366	13.366	32.945	65.891	-32.945	-32.945	46.31115	
20.15053	OK	-0.62901	-0.62901	OK	1.2870E+6	-	-	9.73898	75.97792	0.93200	17.09950	18.893	18.893	0.62901	1.2580	-0.62901	-0.62901	19.52153	
44.50728	OK	-11.94391	-11.94391	OK	6.7775E+4	-	-	11.68678	77.85831	0.42400	17.09950	20.619	20.619	11.944	23.888	-11.944	-11.944	32.56337	
49.62658	OK	-12.74203	-12.74203	OK	6.3530E+4	-	-	13.63457	79.73869	-0.08400	17.09950	24.143	24.143	12.742	25.484	-12.742	-12.742	36.88454	
54.62487	OK	-13.36991	-13.36991	OK	6.0546E+4	-	-	15.58237	81.61098	-0.59200	17.09950	27.885	27.885	13.370	26.740	-13.370	-13.370	41.25496	
66.87643	OK	-17.29753	-17.29753	OK	4.6799E+4	-	-	17.53017	83.49946	-1.10000	17.09950	32.281	32.281	17.298	34.595	-17.298	-17.298	49.57890	
83.32800	OK	-22.66008	-22.66008	OK	3.5724E+4	-	-	19.47796	85.37985	-1.60800	17.09950	38.008	38.008	22.660	45.320	-22.660	-22.660	60.66792	
87.89495	OK	-21.87052	-21.87052	OK	3.7013E+4	-	-	21.42576	87.26023	-2.11600	17.09950	44.154	44.154	21.871	43.741	-21.871	-21.871	66.02443	
261.90948	OK	-122.28955	-122.28955	OK	6.1044E+3	-	-	2.00802	92.87630	-3.90013	16.23650	17.330	17.330	122.29	244.58	-122.29	-122.29	139.61993	
178.32022	OK	-110.94244	-110.94244	OK	8.3734E+3	-	-	4.01604	94.73160	-4.66826	16.23650	-21.791	-21.791	89.151	178.30	-89.151	-89.151	89.15101	
285.08492	OK	-168.82262	-168.82262	OK	5.2370E+3	-	-	6.02406	96.58689	-5.43638	16.23650	-26.280	-26.280	142.54	285.08	-142.54	-142.54	142.54246	
436.33428	OK	-234.78611	-234.78611	OK	3.4217E+3	-	-	8.03209	98.44219	-6.20451	16.23650	-16.619	-16.619	218.17	436.33	-218.17	-218.17	218.16714	
39.13201	OK	-28.54702	-28.54702	OK	3.8153E+4	-	-	10.04011	100.29739	-6.97264	16.23650	-8.9810	-8.9810	19.566	39.132	-19.566	-19.566	19.56600	
36.51076	OK	-20.19157	-20.19157	OK	4.0892E+4	-	-	12.04813	102.15279	-7.74077	16.23650	-1.9362	-1.9362	18.255	36.511	-18.255	-18.255	18.25538	
42.65292	OK	-26.51829	-26.51829	OK	3.5003E+4	-	-	14.05615	104.00809	-8.50889	16.23650	-5.1918	-5.1918	21.326	42.653	-21.326	-21.326	21.32646	
42.62645	OK	-31.45786	-31.45786	OK	3.5025E+4	-	-	16.06417	105.86338	-9.27702	16.23650	-10.145	-10.145	21.313	42.626	-21.313	-21.313	21.31322	
76.98544	OK	-42.70599	-42.70599	OK	1.9393E+4	-	-	18.07219	107.71868	-10.04515	16.23650	-4.2133	-4.2133	38.493	76.985	-38.493	-38.493	38.49272	
71.89204	OK	-36.95481	-36.95481	OK	2.0767E+4	-	-	20.08021	109.57398	-10.81328	16.23650	-1.0088	-1.0088	35.946	71.892	-35.946	-35.946	35.94602	
50.42973	OK	-26.21649	-26.21649	OK	2.9606E+4	-	-	22.08824	111.42928	-11.58140	16.23650	-1.0016	-1.0016	25.215	50.430	-25.215	-25.21		



RSK ENVIRONMENT LIMITED

UBB, London

TW Sewer Assessment

FULL DEVELOPMENT LONG TERM (S) + Structural Solution-Smoothed

Job No.	Sheet No.	Rev.
371654		
Drg. Ref.		
Made by MK	Date 09-Dec-2020	Checked Date

Stage: Tension: Ref.			Name: Compn.: Total:			Specific Utility: Compn.: Total:			Name: Rad. of			Sub-utility: Name: Rad. of			Distance: x			y			z			Ax.			Ax.			Flexural: Tension:			Flexural: Tension:			Flexural: Compn.:			Flexural: Compn.:			Tension: Total:		
18.18216	OK	-21.79057	-21.79057	OK	8.2113E+4	-	-	143.20581	-	-	76.30482	161.52232	-32.32085	16.23650	-437.66	-437.66	194.96	389.93	-194.96	-194.96	194.96362																							
389.92724	OK	-632.62802	-632.62802	OK	3.8289E+3	-	-	103.22047	-	-	78.31284	163.37762	-33.08898	16.23650	-762.95	-762.95	52.054	104.11	-52.054	-52.054	52.05375																							
104.10750	OK	-815.00598	-815.00598	OK	1.4341E+4	-	-	158.84629	-	-	80.32086	165.23291	-33.85711	16.23650	-609.08	-609.08	111.02	222.03	-111.02	-111.02	111.01709																							
222.03417	OK	-720.09908	-720.09908	OK	6.7242E+3	-	-	77.54027	-	-	82.32888	167.08821	-34.62523	16.23650	-390.92	-390.92	38.947	77.895	-38.947	-38.947	38.94727																							
77.89454	OK	-429.86649	-429.86649	OK	1.9167E+4	-	-	180.41542	-	-	84.33690	168.94351	-35.39336	16.23650	-109.78	-109.78	18.532	37.063	-18.532	-18.532	18.53152																							
37.06305	OK	-128.31461	-128.31461	OK	4.0283E+4	-	-	188.35476	-	-	86.34492	170.79881	-36.16149	16.23650	181.05	181.05	48.152	96.304	-48.152	-48.152	229.20352																							
277.35552	OK	-48.15201	-48.15201	OK	1.5503E+4	-	-	73.60363	-	-	88.35295	172.65411	-36.92962	16.23650	369.36	369.36	25.684	51.368	-25.684	-25.684	395.04115																							
420.72500	OK	-25.68385	-25.68385	OK	2.9065E+4	-	-	130.28222	-	-	90.36097	174.50940	-37.69774	16.23650	413.72	413.72	27.490	54.980	-27.490	-27.490	441.21215																							
468.70230	OK	-27.49015	-27.49015	OK	2.7155E+4	-	-	20.75445	-	-	3.95632	-32.55421	2.82127	20.65500	290.52E-6	58.104E-6	0.016579	0.016579	-0.016579	-0.016579	0.01687																							
0.01664	OK	-0.01658	-0.01658	OK	3.3175E+6	-	-	180.00000	-	-	5.93447	-10.72333	3.10589	20.65500	201.87E-6	60.375E-6	0.0093669	0.0093669	-0.0093669	-0.0093669	0.00967																							
0.00943	OK	-0.00937	-0.00937	OK	5.8717E+6	-	-	180.00000	-	-	7.91263	-28.59823	2.87302	20.65500	305.77E-6	61.153E-6	587.37E-6	587.37E-6	-587.37E-6	-587.37E-6	0.00809																							
0.00065	OK	-0.00059	-0.00059	OK	9.3638E+7	-	-	0.00000	-	-	9.89079	-26.62024	2.89889	20.65500	299.30E-6	59.859E-6	0.014037	0.014037	-0.014037	-0.014037	0.01434																							
0.01410	OK	-0.01404	-0.01404	OK	3.9181E+6	-	-	0.00000	-	-	11.86895	-24.64226	2.92477	20.65500	279.42E-6	55.884E-6	0.031918	0.031918	-0.031918	-0.031918	0.03220																							
0.03197	OK	-0.03192	-0.03192	OK	1.7232E+6	-	-	0.00000	-	-	13.84711	-22.66427	2.95064	20.65500	243.54E-6	48.708E-6	0.055384	0.055384	-0.055384	-0.055384	0.05563																							
0.05543	OK	-0.05538	-0.05538	OK	9.9306E+5	-	-	0.00000	-	-	15.82526	-20.68629	2.97652	20.65500	190.71E-6	38.142E-6	0.085845	0.085845	-0.085845	-0.085845	0.08604																							
0.08588	OK	-0.08585	-0.08585	OK	6.4069E+5	-	-	0.00000	-	-	17.80342	-18.70829	3.00239	20.65500	123.85E-6	24.770E-6	0.12500	0.12500	-0.12500	-0.12500	0.12512																							
0.12502	OK	-0.12500	-0.12500	OK	4.4001E+5	-	-	0.00000	-	-	19.78158	-16.73030	3.02827	20.65500	53.525E-6	10.705E-6	0.17483	0.17483	-0.17483	-0.17483	0.17488																							
0.17484	OK	-0.17483	-0.17483	OK	3.1459E+5	-	-	0.00000	-	-	21.75974	-14.75231	3.05414	20.65500	4.2929E-6	858.59E-9	0.23757	0.23757	-0.23757	-0.23757	0.23758																							
0.23757	OK	-0.23757	-0.23757	OK	2.3151E+5	-	-	0.00000	-	-	23.73790	-12.77432	3.08002	20.65500	24.613E-6	4.9226E-6	0.31551	0.31551	-0.31551	-0.31551	0.31554																							
0.31552	OK	-0.31551	-0.31551	OK	1.7432E+5	-	-	0.00000	-	-	25.71605	-10.72333	3.10589	20.65500	201.46E-6	40.291E-6	0.41053	0.41053	-0.41053	-0.41053	0.41073																							
0.41057	OK	-0.41053	-0.41053	OK	1.3397E+5	-	-	0.00000	-	-	27.69421	-8.81834	3.13177	20.65500	679.41E-6	135.88E-6	0.52309	0.52309	-0.52309	-0.52309	0.52377																							
0.52322	OK	-0.52309	-0.52309	OK	1.0515E+5	-	-	0.00000	-	-	29.67237	-6.84036	3.15764	20.65500	0.0016799	335.97E-6	0.65029	0.65029	-0.65029	-0.65029	0.65197																							
0.65062	OK	-0.65029	-0.65029	OK	4.8478E+4	-	-	0.00000	-	-	31.65053	-4.86237	3.18352	20.65500	0.0042027	840.53E-6	1.2247	1.2247	-1.2247	-1.2247	1.22885																							
1.22549	OK	-1.22465	-1.22465	OK	4.4911E+4	-	-	0.00000	-	-	33.62869	-2.88438	3.20939	20.65500	5.5644	1.1129	4.3120	4.3120	-4.3120	-4.3120	9.87642																							
5.42489	OK	-4.31201	-4.31201	OK	1.2755E+4	-	-	-5.98678	-	-	35.60684	-0.90639	3.23527	20.65500	24.724	4.9447	2.1002	2.1002	-2.1002	-2.1002	26.82368																							
7.04487	OK	-2.10017	-2.10017	OK	2.6188E+4	-	-	-69.52767	-	-	37.58500	1.07160	3.26114	20.65500	26.010	5.2020	0.47430	0.47430	-0.47430	-0.47430	26.48424																							
5.67629	OK	-0.47430	-0.47430	OK	1.1596E+5	-	-	-54.66740	-	-	39.56316	3.04959	3.28701	20.65500	3.6437	0.72874	0.58036	0.58036	-0.58036	-0.58036	4.22408																							
1.30910	OK	-0.58036	-0.58036	OK	9.4769E+4	-	-	-86.07123	-	-	41.54132	5.01558	3.31289	20.65500	-16.800	-3.3599	0.70069	0.70069	-0.70069	-0.70069	0.70069																							
0.70069	OK	-17.50039	-4.06063	OK	7.8494E+4	-	-	194.36156	-	-	43.51948	7.00557	3.33876	20.65500	-21.611	-4.3221	2.0262	2.0262	-2.0262	-2.0262	2.02617																							
2.02617	OK	-23.63688	-6.34831	OK	2.7145E+4	-	-	128.10275	-	-	45.49764	8.98355	3.36464	20.65500	-7.3014	-1.4603	0.95042	0.95042	-0.95042	-0.95042	0.95042																							
0.95042	OK	-8.25185	-2.41071	OK	5.7869E+4	-	-	154.16766	-	-	47.47579	10.96154	3.39051	20.65500	1.4428	0.28856	1.0826	1.0826	-1.0826	-1.0826	2.52543																							
1.37120	OK	-1.08264	-1.08264	OK	5.0802E+4	-	-	181.87957	-	-	49.45395	12.93953	3.41639	20.65500	1.4683	0.29366	1.1537	1.1537	-1.1537	-1.1537	2.62199																							
1.44734	OK	-1.15367	-1.15367	OK	4.7674E+4	-	-	181.76379	-	-	51.43211	14.74552	3.44226	20.65500	1.4958	0.29916	1.0472	1.0472	-1.0472	-1.0472	2.54295																							
1.34632	OK	-1.04717	-1.04717	OK	5.2523E+4	-	-	181.94402	-	-	53.41027	16.89551	3.46814	20.65500	1.0644	0.21287	1.4250	1.4250	-1.4250	-1.4250	2.48936																							
1.63787	OK	-1.42500	-1.42500	OK	3.8597E+4	-	-	136.82455	-	-	55.38843	18.87350	3.49401	20.65500	0.48619	0.097238	0.79415	0.79415	-0.79415	-0.79415	1.28034																							
0.89139	OK	-0.79415	-0.79415	OK	6.9256E+4	-	-	158.45423	-	-	57.36658	20.85149	3.51989	20.65500	0.35325	0.070649	0.53440	0.53440	-0.53440	-0.53440	0.88765																							
0.60505	OK	-0.53440	-0.53440	OK	1.0292E+5	-	-	180.01507	-	-	59.34474	22.82948	3.54576	20.65500	0.35322	0.070643	0.42295	0.42295	-0.42295	-0.42295	0.77617																							
0.49359	OK	-0.42295	-0.42295	OK	1.3004E+5	-	-	180.01714	-	-	61.32290	24.80747	3.57164	20.65500	0.35342	0.070685	0.35567	0.35567	-0.35567	-0.35567	0.70910																							
0.42636	OK	-0.35567	-0.35567	OK	1.5464E+5	-	-	180.02464	-	-	63.30106	26.78545	3.59751	20.65500	0.35404	0.070808	0.33486	0.33486	-0.33486	-0.33486	0.68890																							
0.40567	OK	-0.33486	-0.33486	OK	1.6425E+5	-	-	180.02642	-	-	65.27922	28.76344	3.62339	20.65500	0.35457	0.070913	0.36509	0.36509	-0.36509	-0.36509	0.71966																							
0.43600	OK	-0.36509	-0.36509	OK	1.5065E+5	-	-	180.02650	-	-	67.25737	30.74143																																



RSK ENVIRONMENT LIMITED

UBB, London

TW Sewer Assessment

FULL DEVELOPMENT LONG TERM (S) + Structural Solution-Smoothed

Job No.	Sheet No.	Rev.
371654		
Drg. Ref.		
Made by MK	Date 09-Dec-2020	Checked Date

Stage: Tension: Ref.	Stage: Check:	Name Compn.:	Specific Compn.:	Utility: Check:	Name Rad. of	Sub-utility Check:	Distance Rad. of	x Peak Flex.	y	z	Ax. Strain:	Ax. Strain:	Flexural: Tension:	Flexural: Tension:	Flexural: Compn.:	Flexural: Compn.:	Tension: Total:
Total:	Tension	Total:	Total:	Compn.	Curv.	Rad. of	Rad. of	Tens. Strain									
1.05876	OK	-0.68370	-0.68370	OK	8.0445E+4	-	-	9.98547 100.41343 -1.36067	-10.83999	19.73000	1.8753	0.37506	0.68370	0.68370	-0.68370	-0.68370	2.55899
1.23011	OK	-0.85360	-0.85360	OK	6.4433E+4	-	-	11.98257 102.28070 -1.08956	-11.54828	19.73000	1.8825	0.37651	0.85360	0.85360	-0.85360	-0.85360	2.73614
1.39890	OK	-1.02091	-1.02091	OK	5.3873E+4	-	-	13.97966 104.14798 -0.81047	-12.25657	19.73000	1.8900	0.37799	1.0209	1.0209	-1.0209	-1.0209	2.91088
1.52889	OK	-1.14932	-1.14932	OK	4.7854E+4	-	-	15.97676 106.01525 -0.80961	-12.96486	19.73000	1.8979	0.37957	1.1493	1.1493	-1.1493	-1.1493	3.04718
1.54022	OK	-1.15868	-1.15868	OK	4.7468E+4	-	-	17.97385 107.88253 -0.80266	-13.67314	19.73000	1.9077	0.38154	1.1587	1.1587	-1.1587	-1.1587	3.06639
1.39444	OK	-1.01063	-1.01063	OK	5.4422E+4	-	-	19.97095 109.74980 -0.92046	-14.38143	19.73000	1.9190	0.38381	1.0106	1.0106	-1.0106	-1.0106	2.92967
1.13613	OK	-0.74988	-0.74988	OK	7.3345E+4	-	-	21.96804 111.61707 -1.24092	-15.08972	19.73000	1.9312	0.38625	0.74988	0.74988	-0.74988	-0.74988	2.68112
0.85374	OK	-0.46494	-0.46494	OK	1.1829E+5	-	-	23.96513 113.48435 -0.81047	-15.79801	19.73000	1.9440	0.38879	0.46494	0.46494	-0.46494	-0.46494	2.40891
0.63144	OK	-0.24016	-0.24016	OK	2.2901E+5	-	-	25.96223 115.35162 -3.87738	-16.50630	19.73000	1.9564	0.39128	0.24016	0.24016	-0.24016	-0.24016	2.19656
0.53433	OK	-0.14062	-0.14062	OK	3.9114E+5	-	-	27.95932 117.21890 -6.62666	-17.21459	19.73000	1.9686	0.39371	0.14062	0.14062	-0.14062	-0.14062	2.10917
1.72041	OK	-1.42241	-1.42241	OK	3.8667E+4	-	-	29.95642 119.08617 106.25107	-17.92287	19.73000	1.4900	0.29800	1.4224	1.4224	-1.4224	-1.4224	2.91241
1.04064	OK	-0.90326	-0.90326	OK	6.0891E+4	-	-	31.95351 120.95345 88.61422	-18.63116	19.73000	0.68691	0.13738	0.90326	0.90326	-0.90326	-0.90326	1.59017
0.78312	OK	-0.70932	-0.70932	OK	7.7539E+4	-	-	33.95061 122.82772 -0.02007	-19.33945	19.73000	0.36899	0.07379	0.70932	0.70932	-0.70932	-0.70932	1.07832
1.00099	OK	-0.92653	-0.92653	OK	5.9361E+4	-	-	35.94770 124.68800 -0.01408	-20.04774	19.73000	0.37228	0.07456	0.92653	0.92653	-0.92653	-0.92653	1.29881
1.03340	OK	-0.95797	-0.95797	OK	5.7413E+4	-	-	37.94480 126.55527 -0.01486	-20.75603	19.73000	0.37713	0.07542	0.95797	0.95797	-0.95797	-0.95797	1.33510
0.86422	OK	-0.78770	-0.78770	OK	6.9823E+4	-	-	39.94189 128.42255 -0.01749	-21.46431	19.73000	0.38259	0.07651	0.78770	0.78770	-0.78770	-0.78770	1.17029
0.53972	OK	-0.46224	-0.46224	OK	1.1898E+5	-	-	41.93899 130.28982 -0.03142	-22.17260	19.73000	0.38738	0.07747	0.46224	0.46224	-0.46224	-0.46224	0.84963
0.14347	OK	-0.06556	-0.06556	OK	8.3887E+5	-	-	43.93608 132.15710 -0.20592	-22.88089	19.73000	0.38953	0.07790	0.06556	0.06556	-0.06556	-0.06556	0.45509
0.35276	OK	-0.27505	-0.27505	OK	1.9997E+5	-	-	45.93317 134.02437 180.05176	-23.58918	19.73000	0.38859	0.07771	0.27505	0.27505	-0.27505	-0.27505	0.66363
0.49870	OK	-0.42144	-0.42144	OK	1.3051E+5	-	-	47.93027 135.89165 180.03337	-24.29747	19.73000	0.38632	0.07726	0.42144	0.42144	-0.42144	-0.42144	0.80776
0.39120	OK	-0.31438	-0.31438	OK	1.7495E+5	-	-	49.92736 137.75892 180.04530	-25.00575	19.73000	0.38408	0.07681	0.31438	0.31438	-0.31438	-0.31438	0.69846
0.11840	OK	-0.04184	-0.04184	OK	1.3147E+6	-	-	51.92446 139.62619 180.36467	-25.71404	19.73000	0.38283	0.07656	0.04183	0.04183	-0.04183	-0.04183	0.42466
0.28556	OK	-0.20883	-0.20883	OK	2.6337E+5	-	-	53.92155 141.44947 -0.06600	-26.42233	19.73000	0.38364	0.07672	0.20883	0.20883	-0.20883	-0.20883	0.59247
0.38024	OK	-0.30309	-0.30309	OK	1.8146E+5	-	-	55.91865 143.36074 -0.04790	-27.13062	19.73000	0.38574	0.07714	0.30309	0.30309	-0.30309	-0.30309	0.68883
0.32118	OK	-0.24364	-0.24364	OK	2.2574E+5	-	-	57.91574 145.22802 -0.05058	-27.83891	19.73000	0.38772	0.07754	0.24364	0.24364	-0.24364	-0.24364	0.63136
0.18256	OK	-0.10472	-0.10472	OK	5.2522E+5	-	-	59.91284 147.09529 -0.14838	-28.54720	19.73000	0.38920	0.07783	0.10472	0.10472	-0.10472	-0.10472	0.49391
0.13444	OK	-0.05653	-0.05653	OK	9.7299E+5	-	-	61.90993 148.96257 180.25188	-29.25548	19.73000	0.38955	0.07791	0.05652	0.05652	-0.05652	-0.05652	0.44608
2.98625	OK	-0.48322	-0.48322	OK	1.1382E+5	-	-	63.90990 150.83155 190.82151	-30.00575	19.73000	12.515	2.5030	0.48322	0.48322	-0.48322	-0.48322	12.99838
2.89497	OK	-0.42966	-0.42966	OK	1.2801E+5	-	-	65.90990 152.70303 192.18129	-30.71404	19.73000	12.327	2.4653	0.42966	0.42966	-0.42966	-0.42966	12.75622
2.72022	OK	-0.29259	-0.29259	OK	1.8798E+5	-	-	67.90990 154.57476 194.04892	-31.42233	19.73000	12.138	2.4276	0.29259	0.29259	-0.29259	-0.29259	12.43072
4.94525	OK	-145.25950	-145.25950	OK	1.1122E+4	-	-	69.90990 156.44623 196.00381	-32.13062	19.73000	-140.31	-28.063	4.9453	4.9453	-4.9453	-4.9453	4.94525
6.31671	OK	-387.94203	-387.94203	OK	8.7071E+3	-	-	71.90990 158.31771 198.00381	-32.83891	19.73000	-381.63	-76.325	6.3167	6.3167	-6.3167	-6.3167	6.31671
2.30766	OK	-404.49979	-404.49979	OK	2.3834E+4	-	-	73.90990 160.18918 199.00381	-33.54720	19.73000	-402.19	-80.438	2.3077	2.3077	-2.3077	-2.3077	2.30766
4.49157	OK	-290.33428	-290.33428	OK	1.2245E+4	-	-	75.90990 162.06067 -85.01133	-34.25548	19.73000	-285.84	-57.169	4.4916	4.4916	-4.4916	-4.4916	4.49157
0.98234	OK	-147.71127	-147.71127	OK	5.5989E+4	-	-	77.90990 163.93215 -80.92593	-34.96431	19.73000	-146.73	-29.346	0.98234	0.98234	-0.98234	-0.98234	0.98234
6.61650	OK	-0.05449	-0.05449	OK	1.0094E+6	-	-	79.90990 165.80362 -10.50740	-35.67314	19.73000	32.810	6.5620	0.05448	0.05448	-0.05448	-0.05448	32.86455
40.40194	OK	-0.92828	-0.92828	OK	5.9249E+4	-	-	81.90990 167.67509 123.2762	-36.38143	19.73000	197.37	39.474	0.92828	0.92828	-0.92828	-0.92828	198.29657
67.14354	OK	-2.32511	-2.32511	OK	2.3655E+4	-	-	83.90990 169.54659 -54.52575	-37.09072	19.73000	324.09	64.818	2.3251	2.3251	-2.3251	-2.3251	326.41722
75.78691	OK	-1.80865	-1.80865	OK	3.0409E+4	-	-	85.90990 171.41806 -84.59790	-37.80001	19.73000	369.89	73.978	1.8086	1.8086	-1.8086	-1.8086	371.69996
77.13838	OK	-0.87043	-0.87043	OK	6.3187E+4	-	-	87.90990 173.28953 -51.50888	-38.50929	19.73000	381.34	76.268	0.87043	0.87043	-0.87043	-0.87043	382.21019
57.15105	OK	-6.50306	-6.50306	OK	8.4576E+3	-	-	89.90990 175.16101 -84.59790	-39.21858	19.73000	253.24	50.648	6.5031	6.5031	-6.5031	-6.5031	259.74303
14.01628	OK	-3.12250	-3.12250	OK	1.7614E+4	-	-	91.90990 177.03247 -51.50888	-40.00000	19.73000	54.469	10.894	3.1225	3.1225	-3.1225	-3.1225	57.59137
2.78567	OK	-2.78561	-2.78561	OK	1.9744E+4	-	-	93.90990 178.90394 0.00000	-40.70850	19.73000	263.02E-6	52.604E-6	2.7856	2.7856	-2.7856	-2.7856	2.78588
83.07156	OK	-74.67332	-74.67332	OK	2.7453E+3	-	-	95.90990 180.77541 -6.25093	-41.41774	19.73000	41.991	8.3982	74.673	74.673	-74.673	-74.673	116.66455

Summary: There is failure at one (or many) location(s). e.g. Stage 0, Specific Utility 1, location (48.640000|28.000000|14.647000)
Note: Tensile strains are +ve, compressive strains are -ve.
Note: The peak flexural tensile strain orientation angle is measured with respect to the global z-axis by looking at the end point of the utility from the start point. Anti-clockwise is positive.

Specific Utility Damage Results - Maximum Values

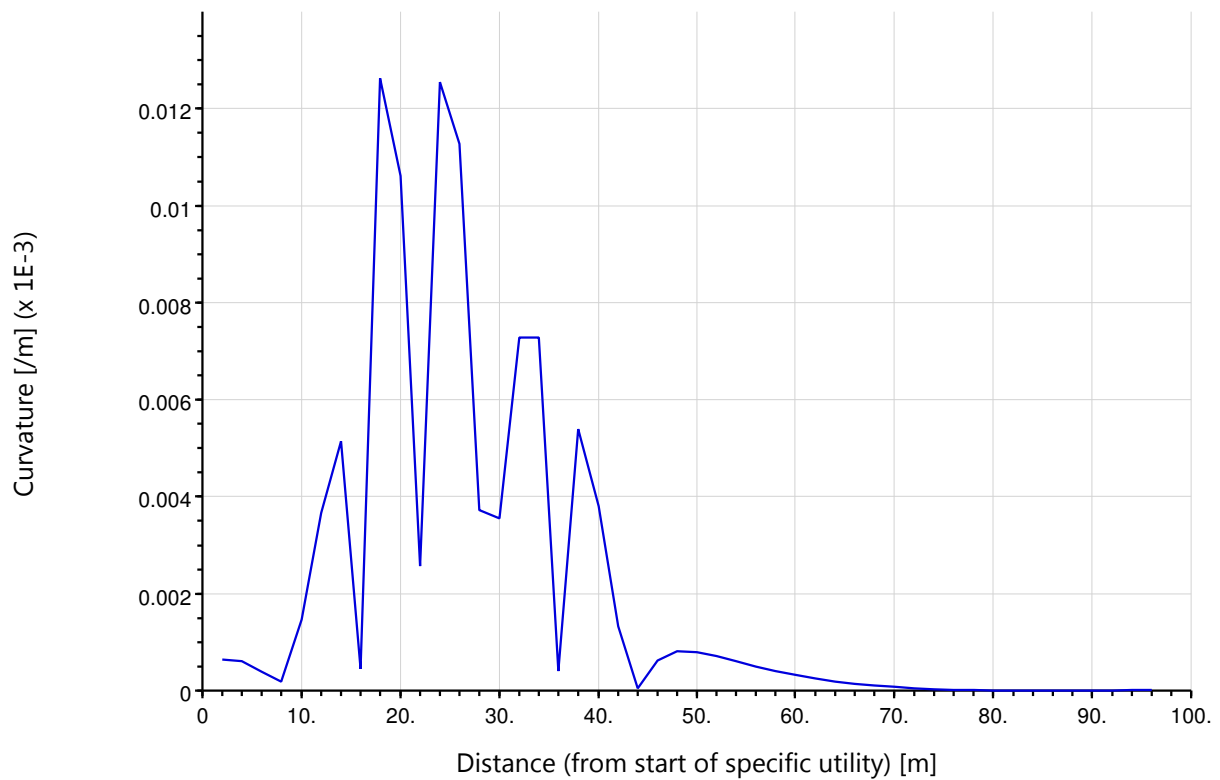
Stage:	Stage:	Name	Specific	Specific Utility:	Name	Jointed	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.
Ref.	Max.	Max.	Utility:	Max.	Max.		Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.
Disp:	Disp:	Disp:	Disp:	Disp:	Disp:		Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.
Horiz.	Horiz.	Ref.	Horiz.	Horiz.	Horiz.		Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.
x:	x:	y:	y:				Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.
Location	Location	Location	Location	Location	Location	Location	Location	Location	Location	Location	Location	Location	Location	Location	Location	Location	Location	Location
[m]	[mm]	[m]	[mm]	[m]	[mm]	[m]	[m]	[mm]	[m]	[Deg]	[m]	[µm]	[m]	[µm]	[m]	[µm]	[m]	[mm]
0	Base Model	1	TWS(1)_1	No	-	-	-	-	-	-	12.00240	719.89718*	12.00240	-411.14743	12.002	3.5199E+3	28.006	-8.1501
46.009	-0.56982	2	TWS(2)_1	No	-	-	-	-	-	-	28.04466	146.73644	28.04466	-73.35275	28.045	1.1036E+4	56.089	9.0497
36.057	0.16611	3	TWS(2)_2	No	-	-	-	-	-	-	22.07428	363.47674	22.07428	-175.01566	22.074	4.6253E+3	0.0	8.0091
30.101	0.14240	4	TWS(2)_3	No	-	-	-	-	-	-	21.42576	87.89495	7.79119	-32.94547	7.7912	2.4571E+4	25.321	-4.0611
25.321	0.66357	5	TWS(2)_4	No	-	-	-	-	-	-	90.36097	468.70230	78.31284	-815.00598	8.0321	3.4217E+3	20.080	-6.5181
84.337	-4.8033	6	TW Fresh Water (a) - St Pancras	Yes	79.126	0.11223	79.126	0.05492	79.12632	46.11435	79.12632	-45.32163	79.126	1.2135E+3	59.345	3.9571		
39.563	0.12465	7	TW Fresh Water (b) - St Pancras	Yes	3.9981	0.35583	7.9961	0.02309	9.99516	23.86745	9.99516	-9.69904	9.9952	5.6707E+3	41.980	-4.4760		
0.0	-1.0239	8	TW Fresh Water (c) - St Pancras	Yes	5.9913	0.10717	5.9913	0.04409	5.99128	28.76582	5.99128	-27.50568	5.9913	1.9996E+3	19.971	-5.0011		
63.907	0.19932	9	TW Fresh Water (d) - St Pancras	Yes	23.615	1.2850	9.8398	0.01865	25.58336	77.13838	11.80771	-82.74608	27.551	8.4576E+3	7.8718	2.2078		
17.712	-3.2286	10	Assumed FW400 connection to TW2_1	Yes	3.6209	1.2445	3.6209	0.14997	3.62091	83.07156	3.62091	-74.67332	-	-	0.0	14.536		
0.0	-0.34484	0.0	0.30062															

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Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 1: TWS(1)_1/1

— Curvature

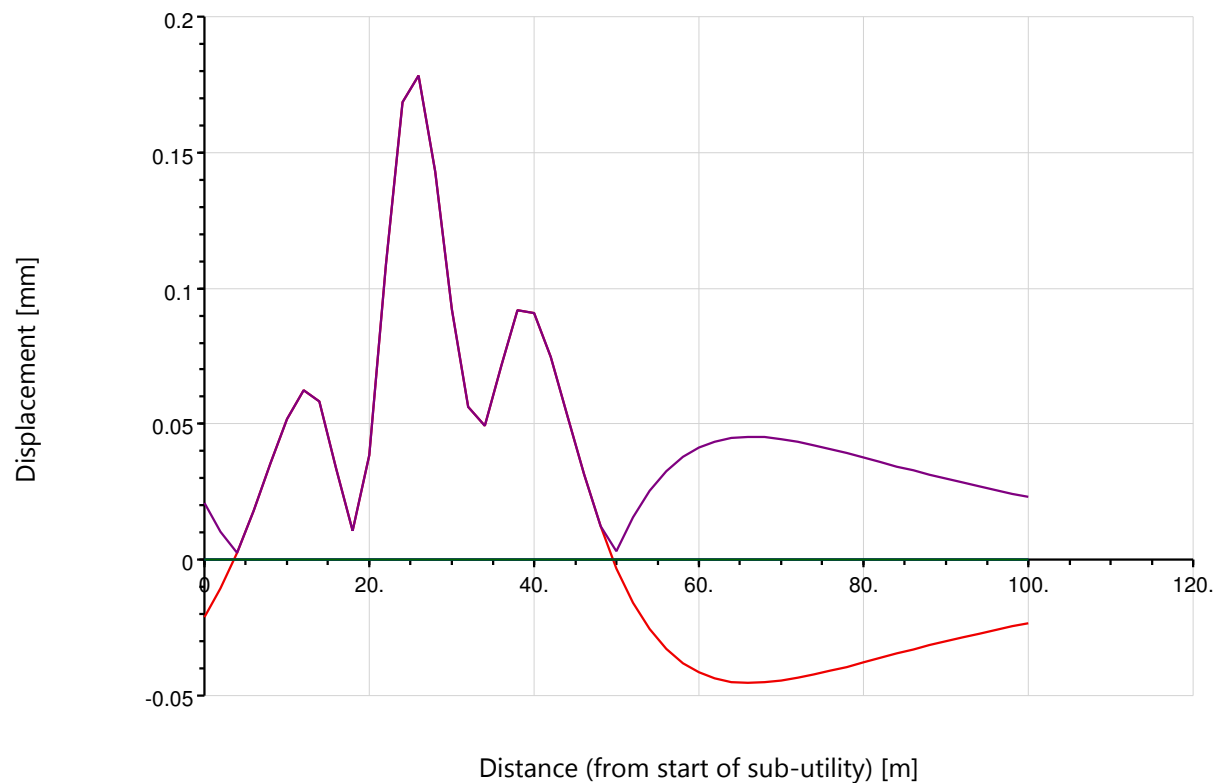


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Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 1: TWS(1)_1/1

- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)

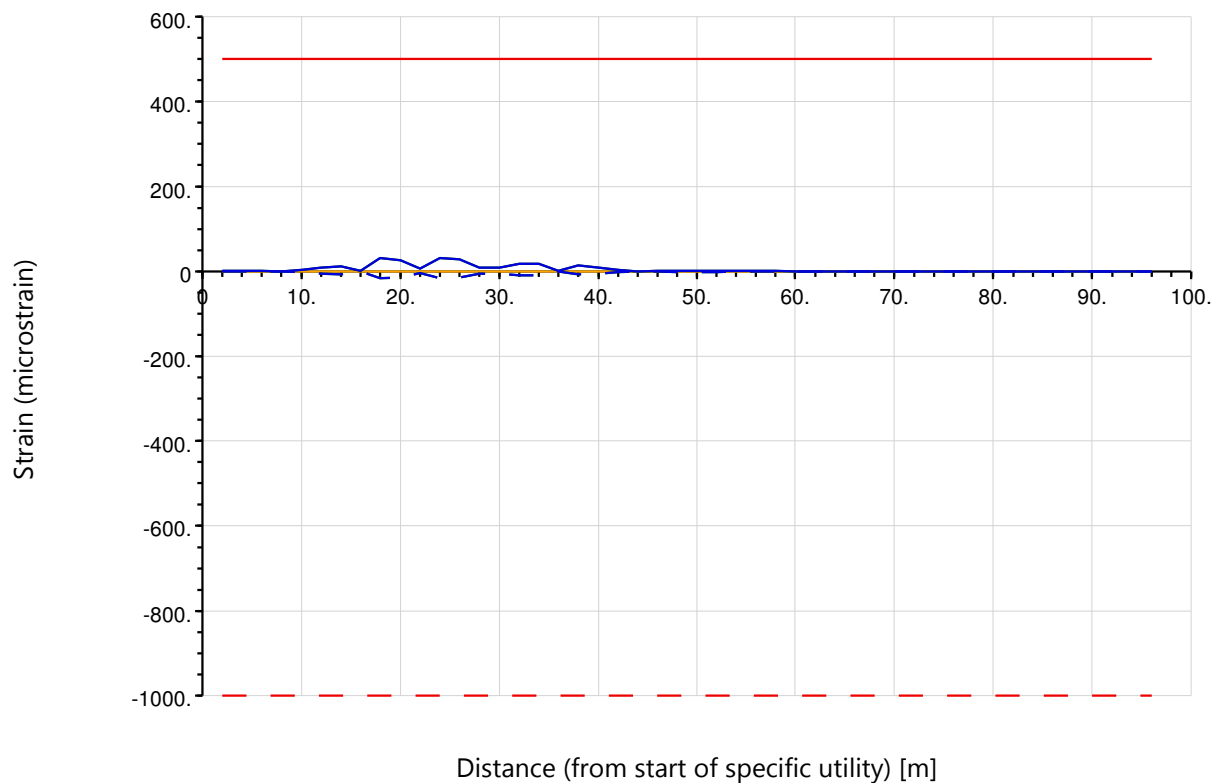


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Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 1: TWS(1)_1/1

- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain

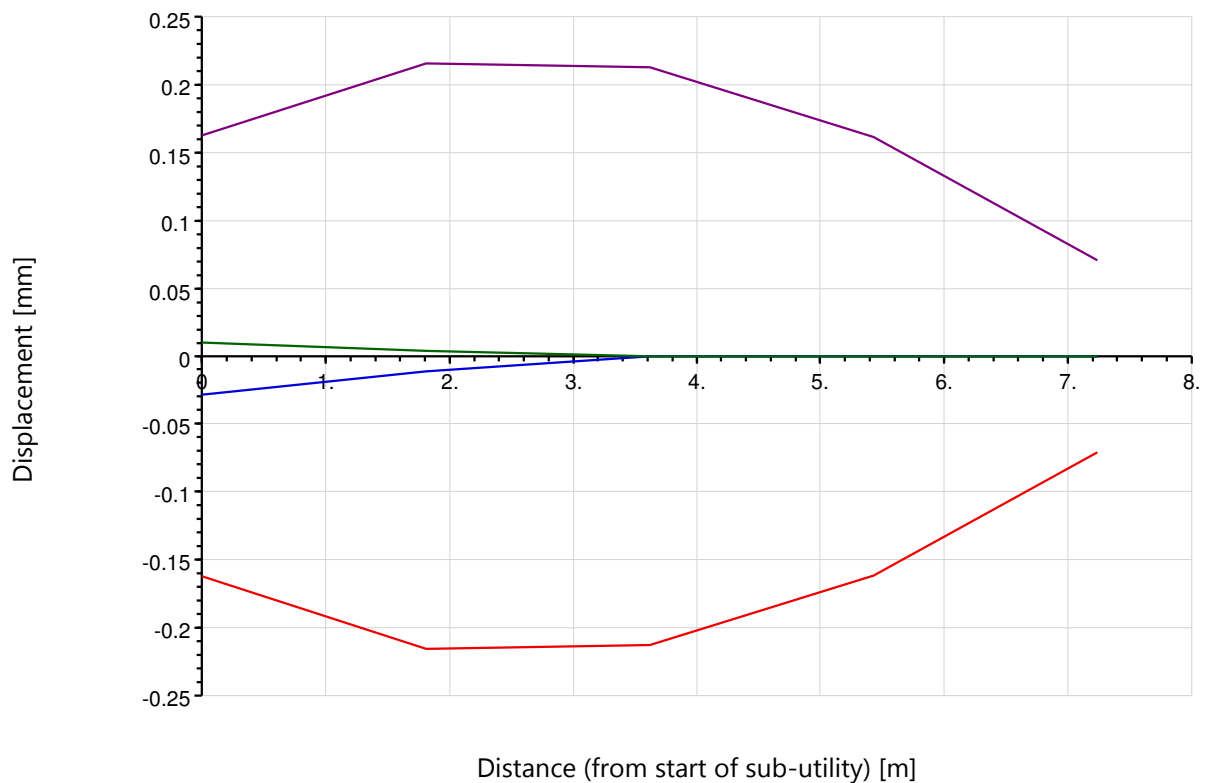


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Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 10: Assumed FW400 connection to TW2_1/1

- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)

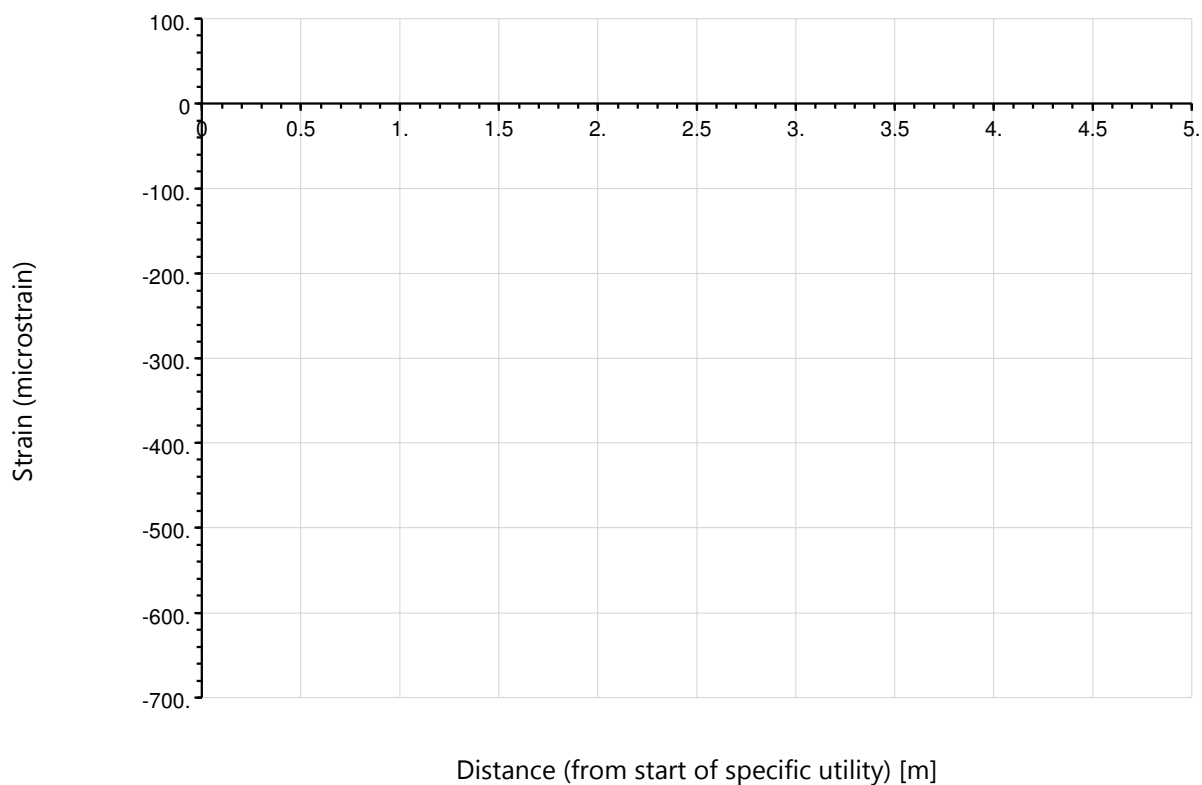


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Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 10: Assumed FW400 connection to TW2, 1/1

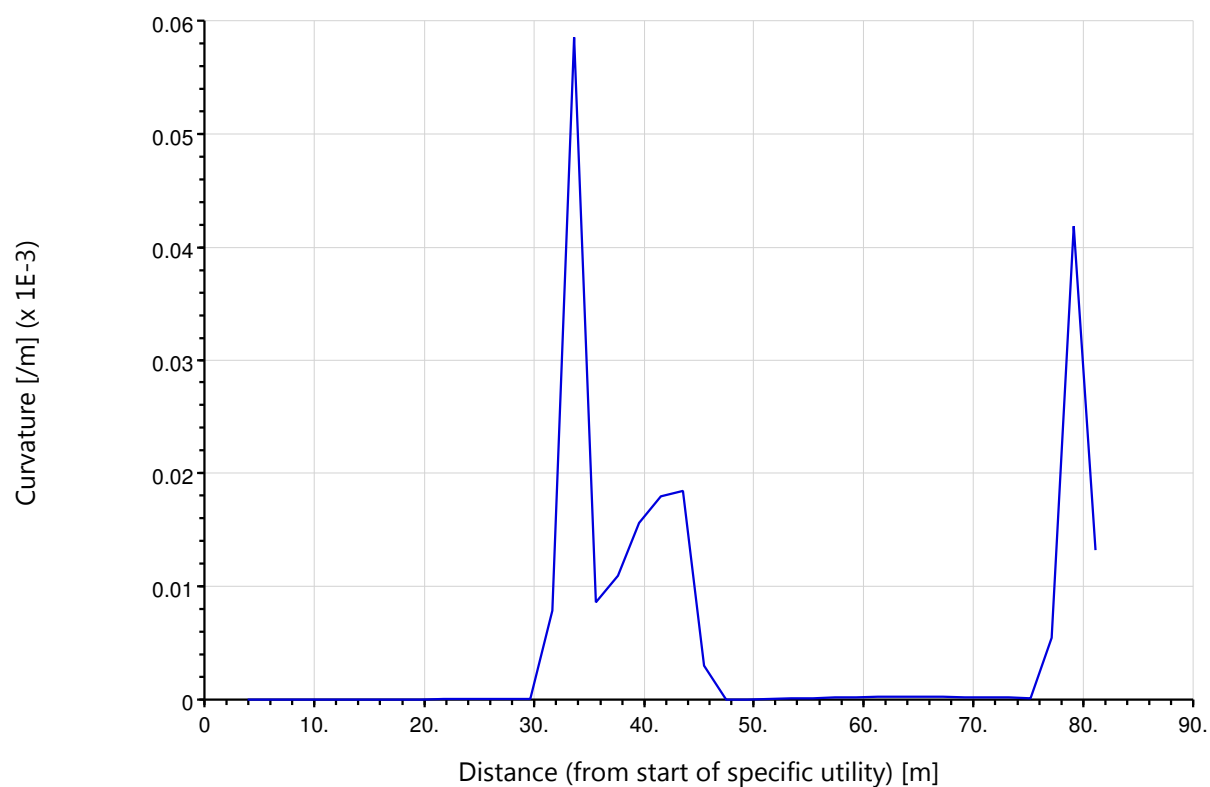
- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- Combined Compressive Strain (factored)
- Allowable Tensile Strain
- Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 6: TW Fresh Water (a) - St Pancras/1

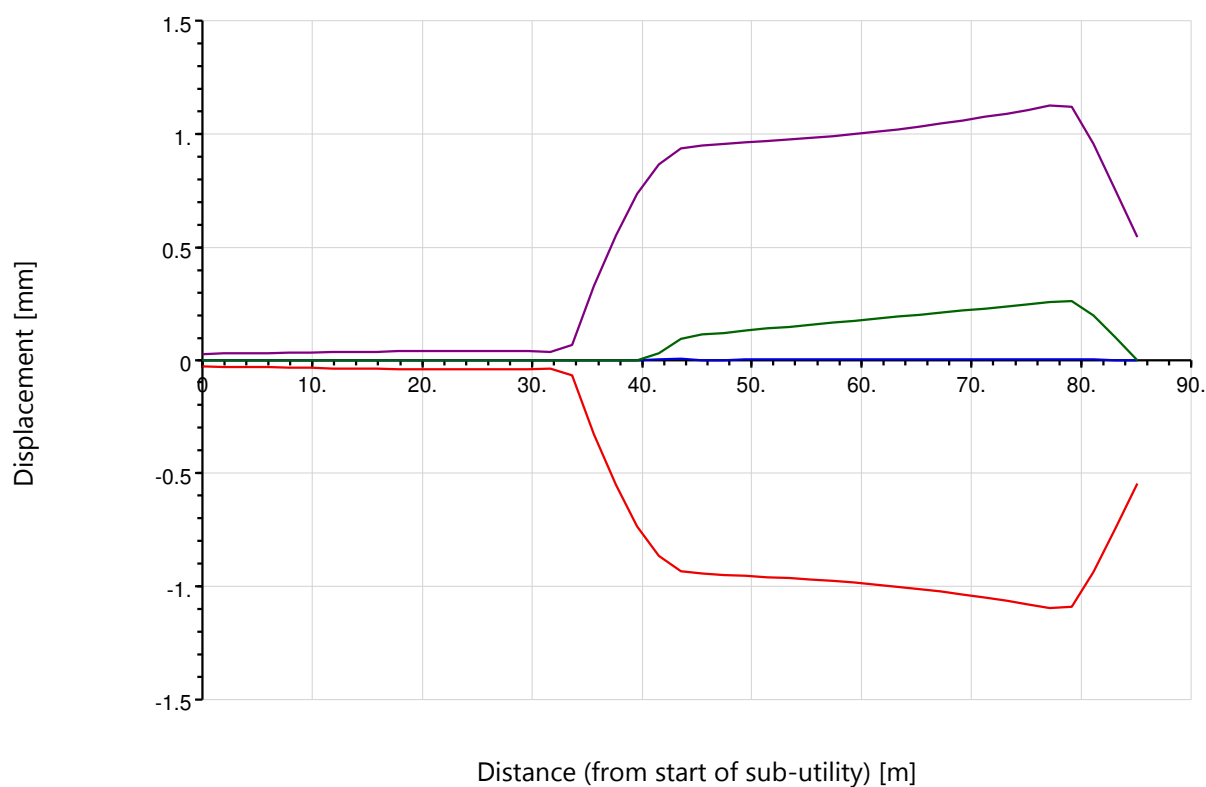
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 6: TW Fresh Water (a) - St Pancras/1

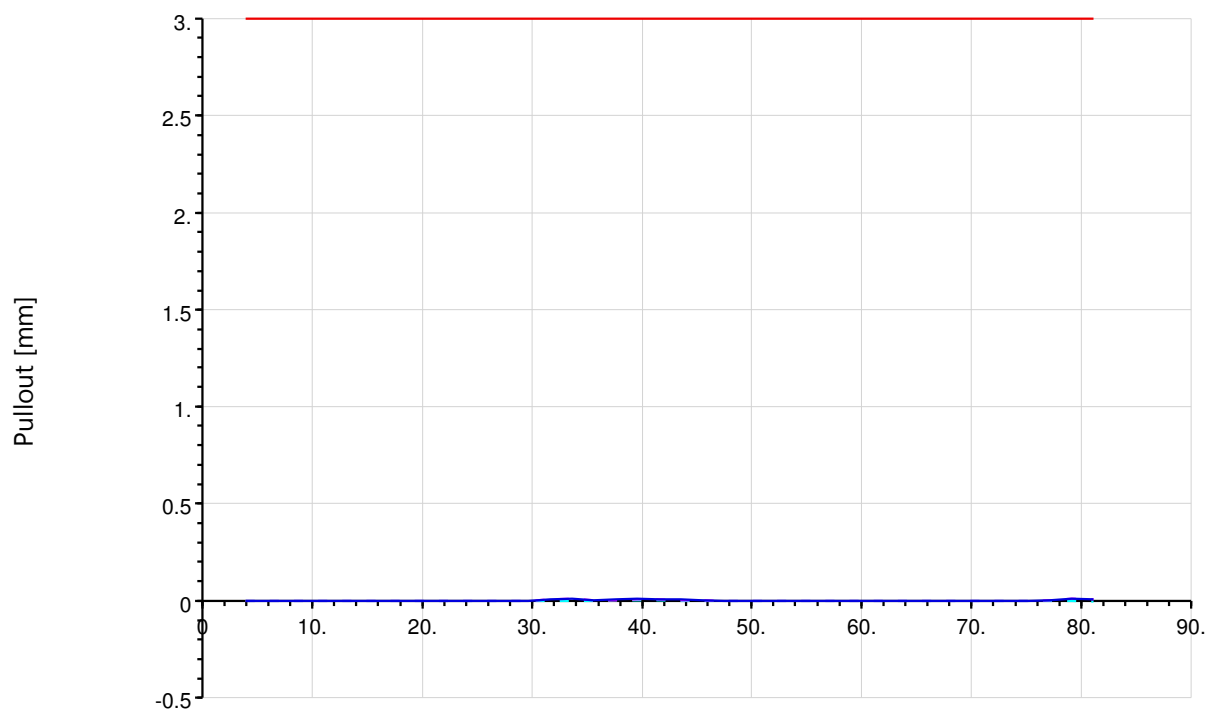
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - Pullout Chart

Stage: Base model, Specific Utility 6: TW Fresh Water (a) - St Pancras/1

- - - Axial Pullout (factored)
- - - Flexural Pullout (factored)
- Total Pullout (factored)
- Total Pullout Limit

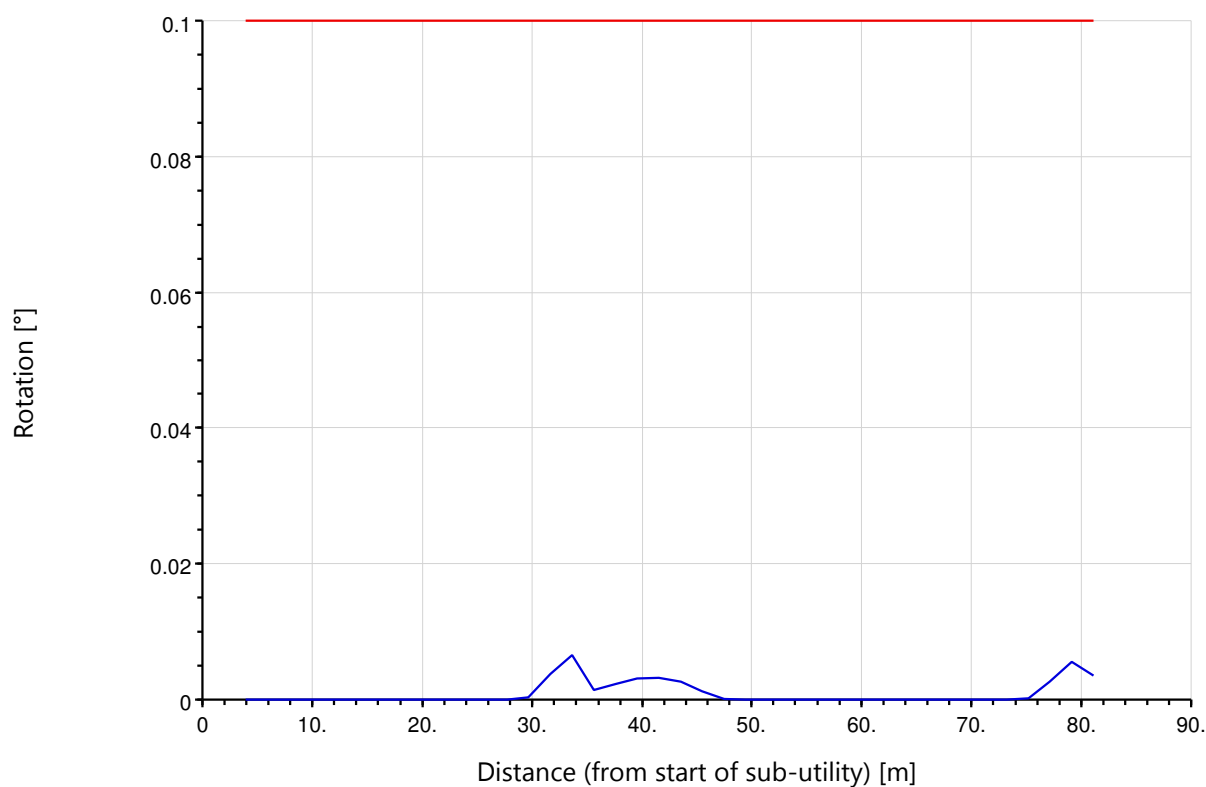


Distance (from start of sub-utility) [m] Note: Total pullout ignores the axial component where this is negative (i.e. comp

Specific Utility - Rotation Chart

Stage: Base model, Specific Utility 6: TW Fresh Water (a) - St Pancras/1

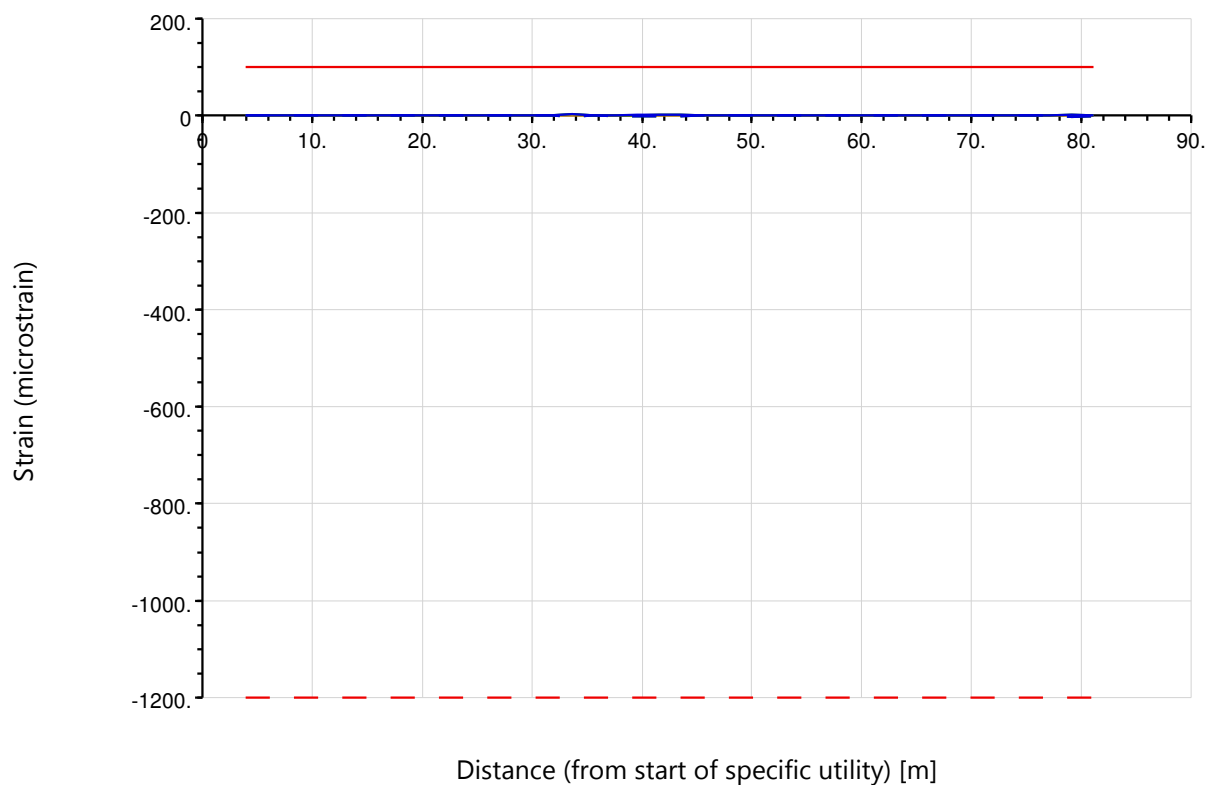
— Rotation (factored)
— Rotation Limit



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 6: TW Fresh Water (a) - St Pancras/1

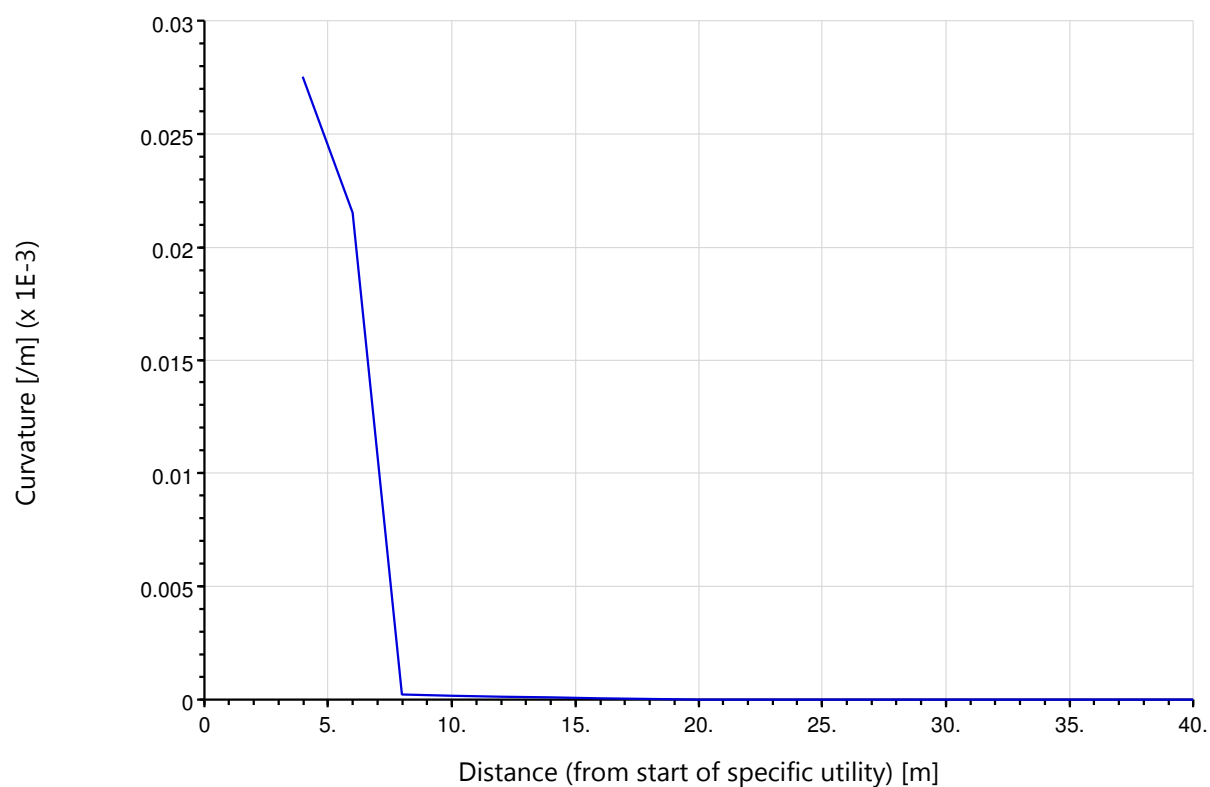
- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 7: TW Fresh Water (b) - St Pancras/1

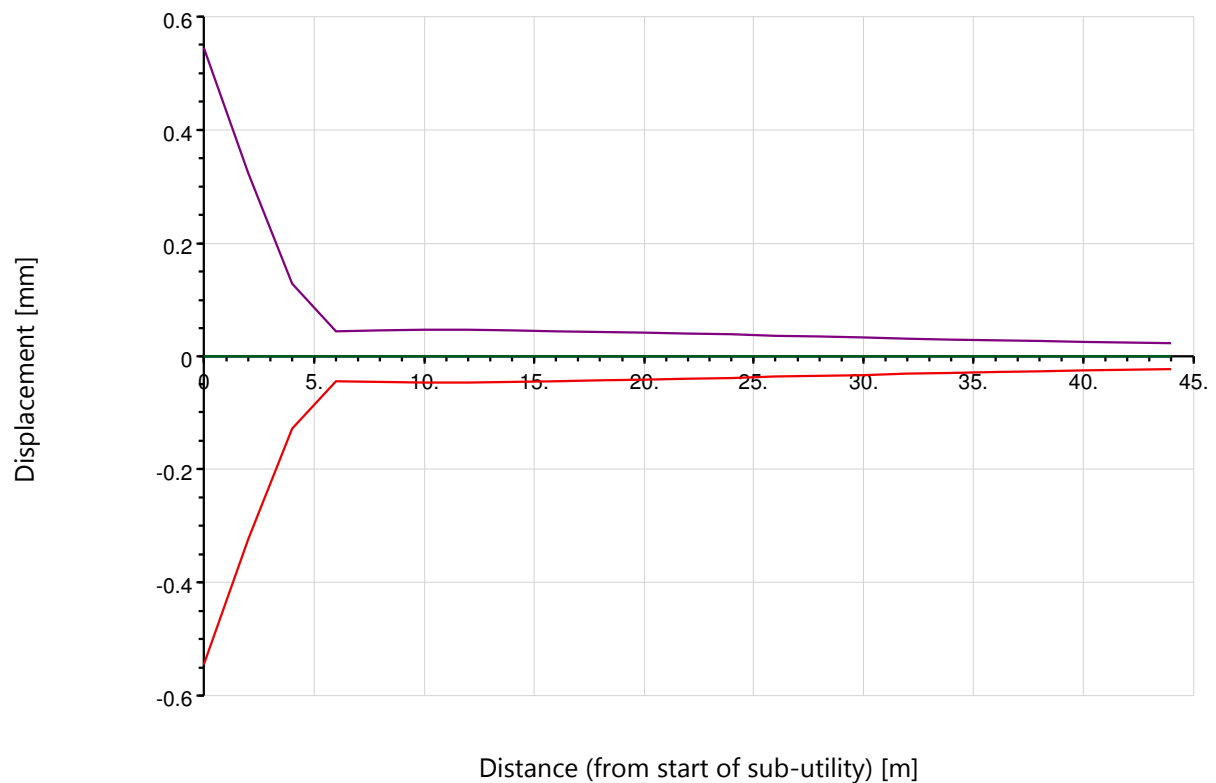
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 7: TW Fresh Water (b) - St Pancras/1

- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - Pullout Chart

Stage: Base model, Specific Utility 7: TW Fresh Water (b) - St Pancras/1

- - - Axial Pullout (factored)
- - - Flexural Pullout (factored)
- Total Pullout (factored)
- Total Pullout Limit

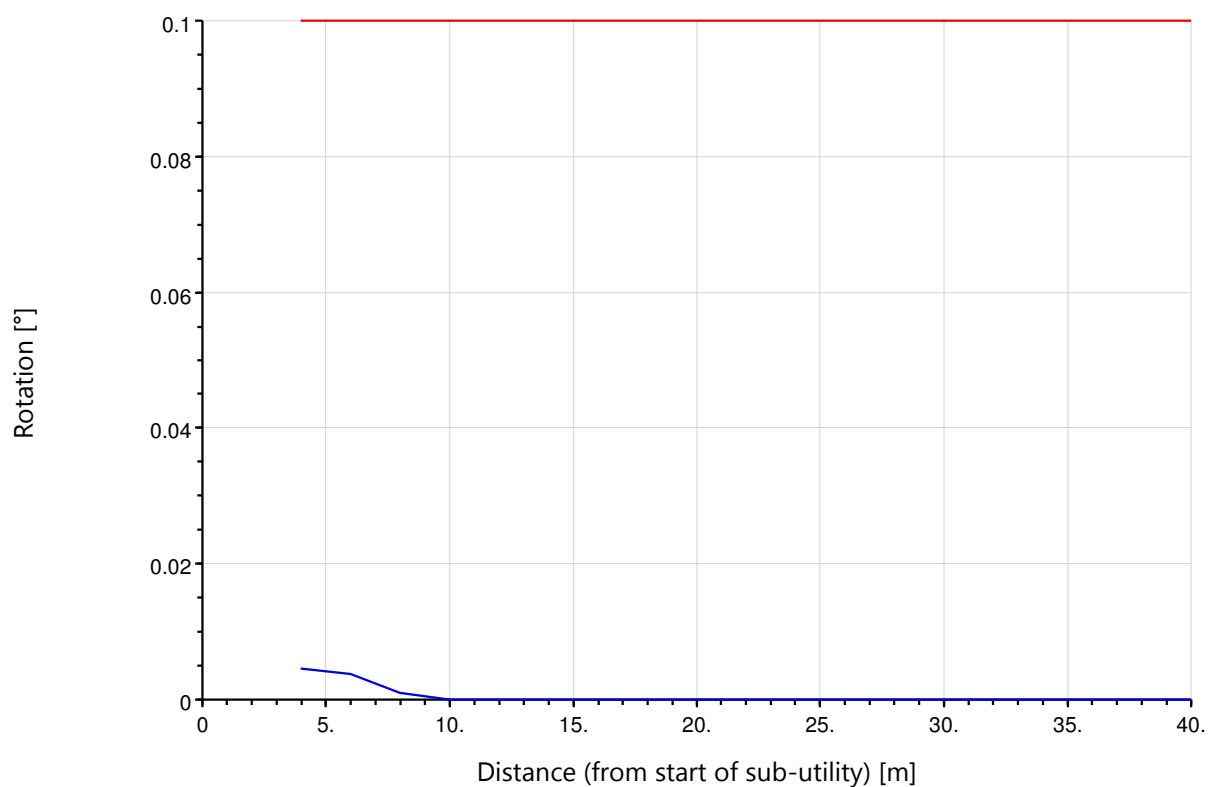


Distance (from start of sub-utility) [m]Note: Total pullout ignores the axial component where this is negative (i.e. comp

Specific Utility - Rotation Chart

Stage: Base model, Specific Utility 7: TW Fresh Water (b) - St Pancras/1

— Rotation (factored)
— Rotation Limit

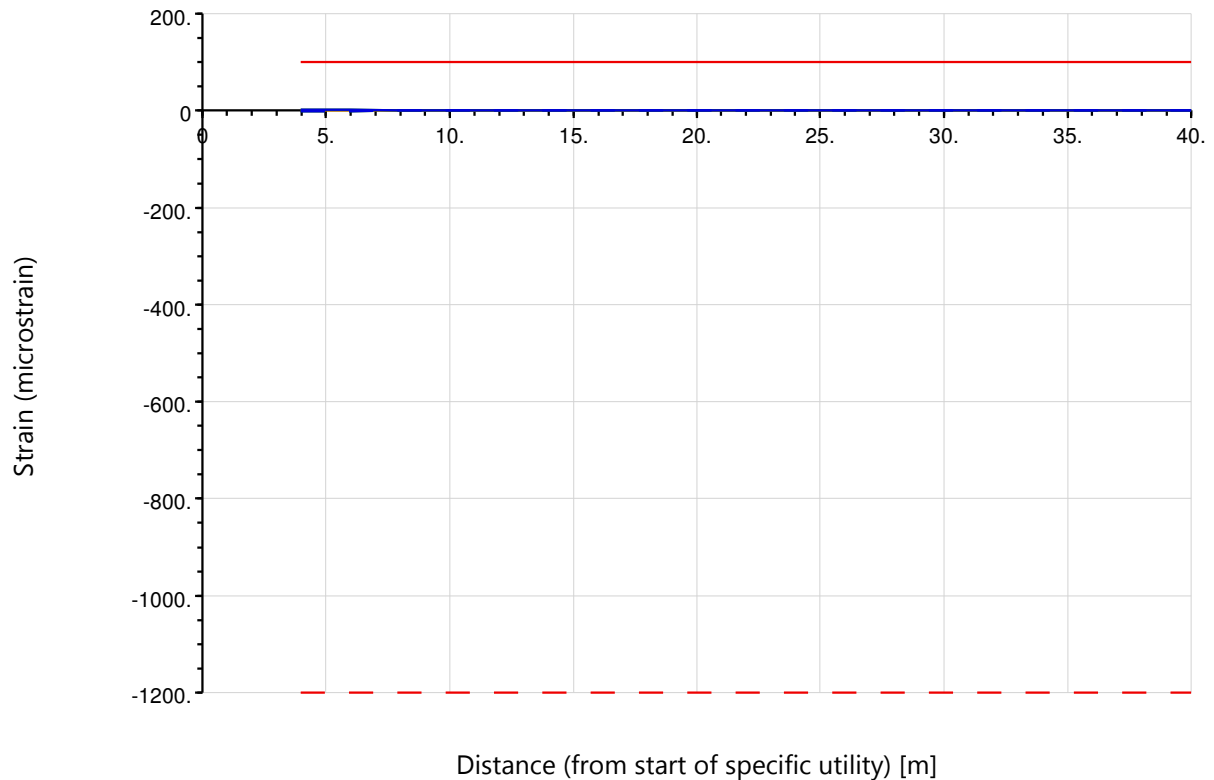


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Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 7: TW Fresh Water (b) - St Pancras/1

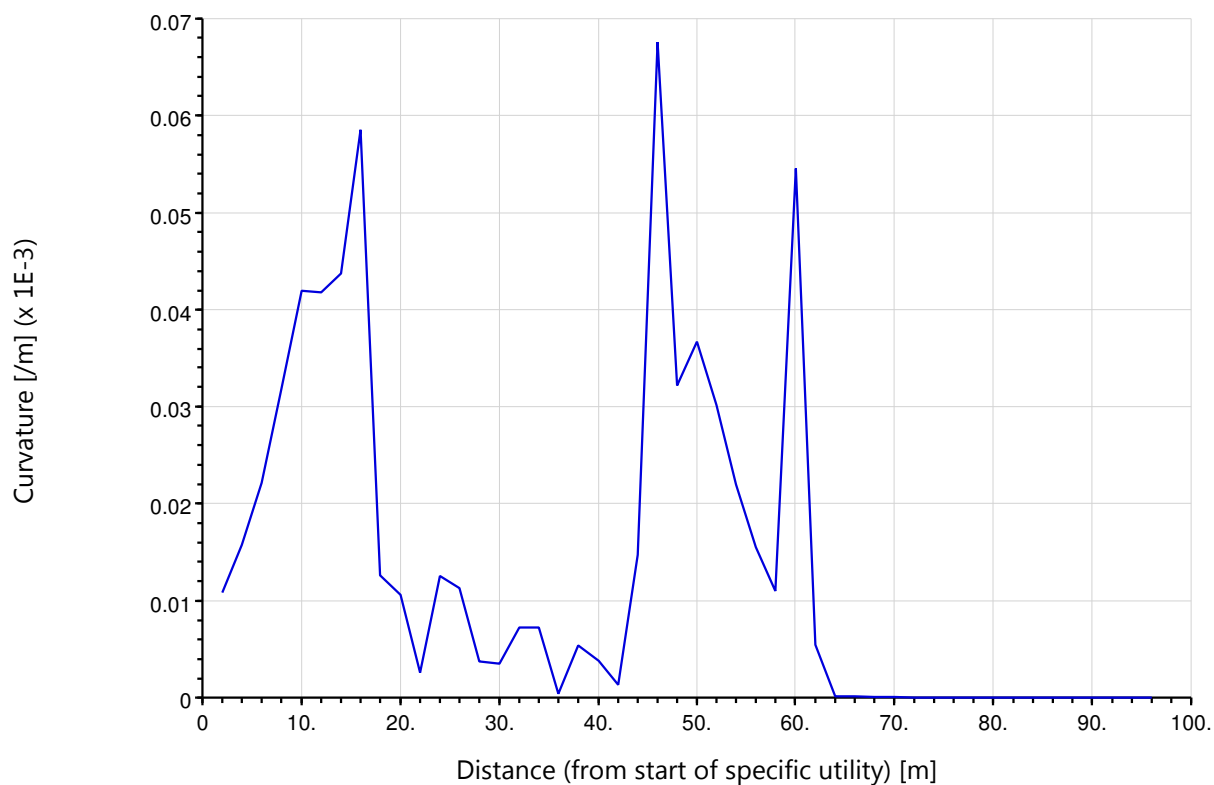
- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 1: TWS(1)_1/1

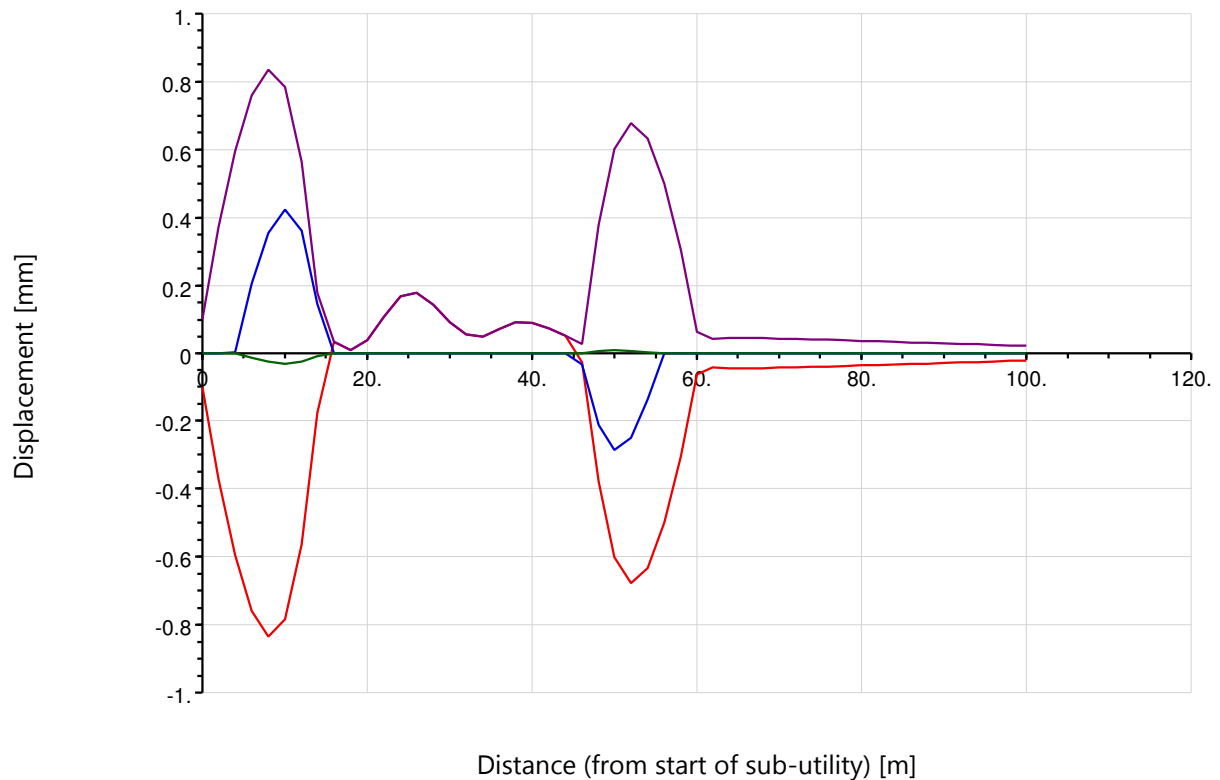
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 1: TWS(1)_1/1

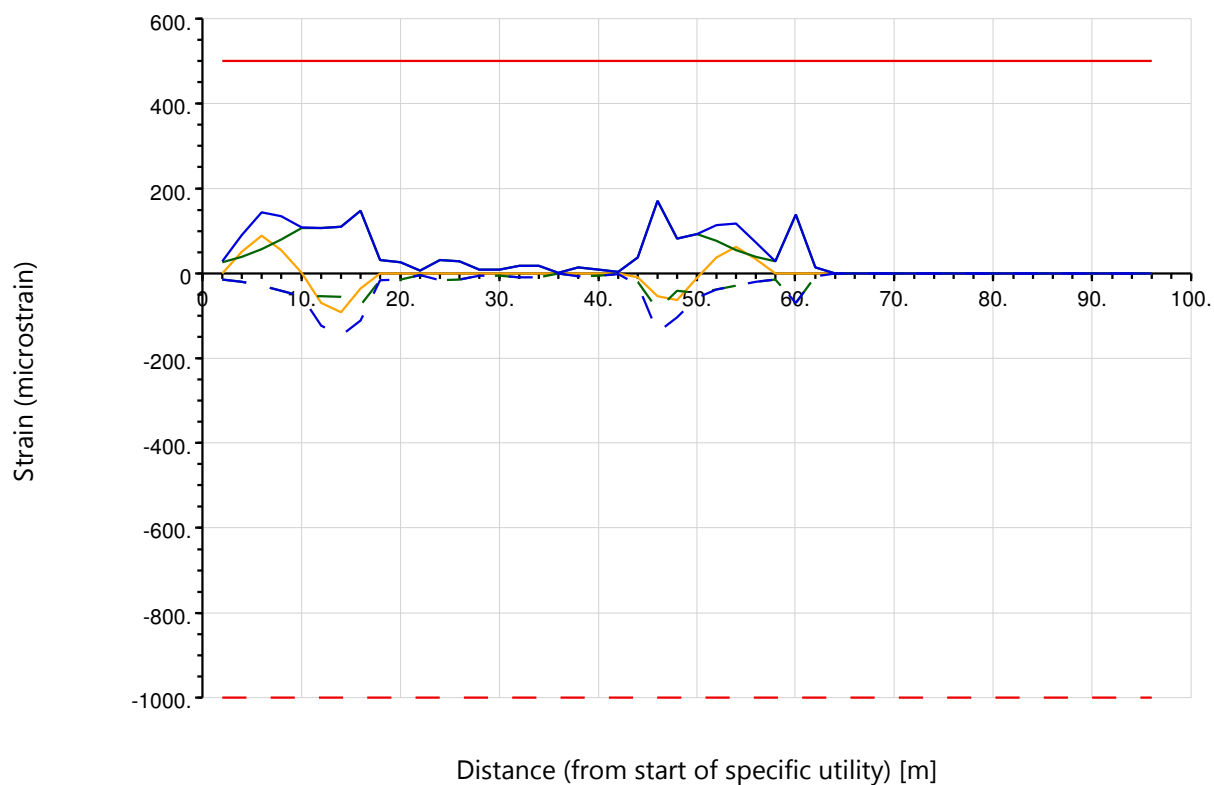
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 1: TWS(1)_1/1

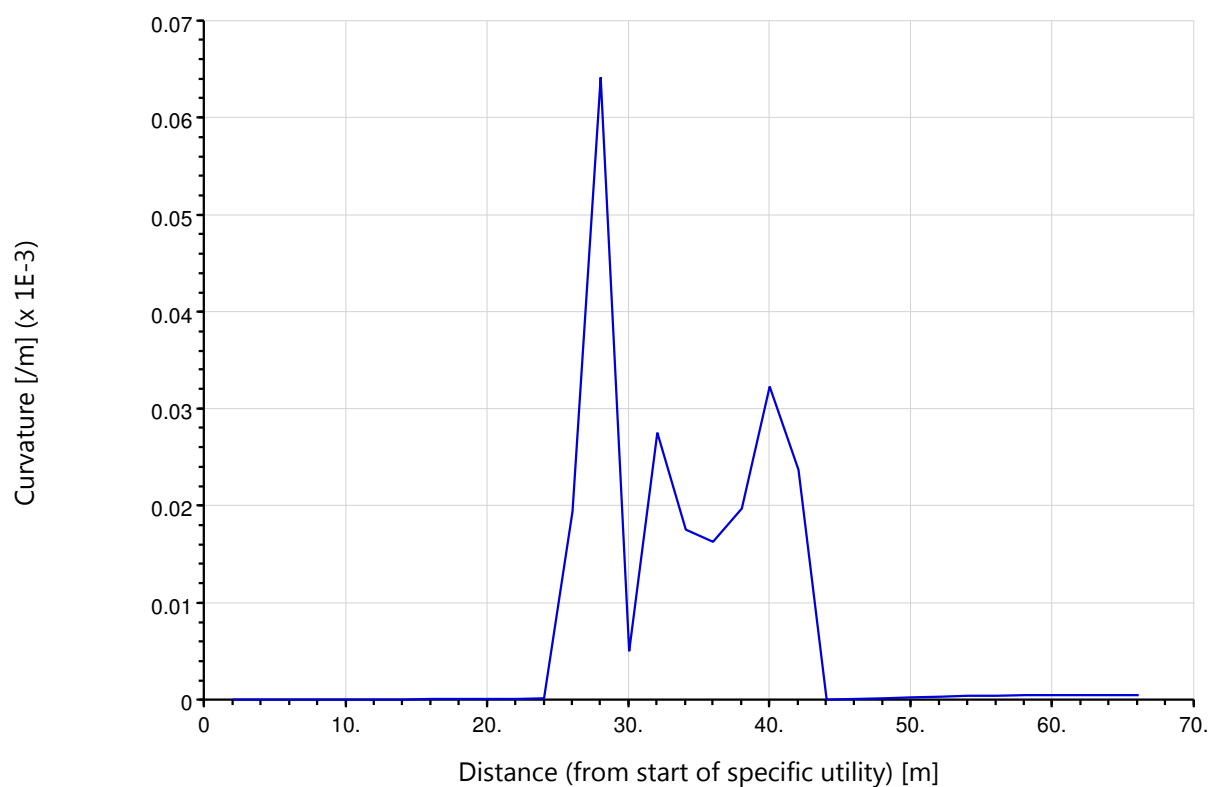
- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- Combined Compressive Strain (factored)
- Allowable Tensile Strain
- Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 2: TWS(2)_1/1

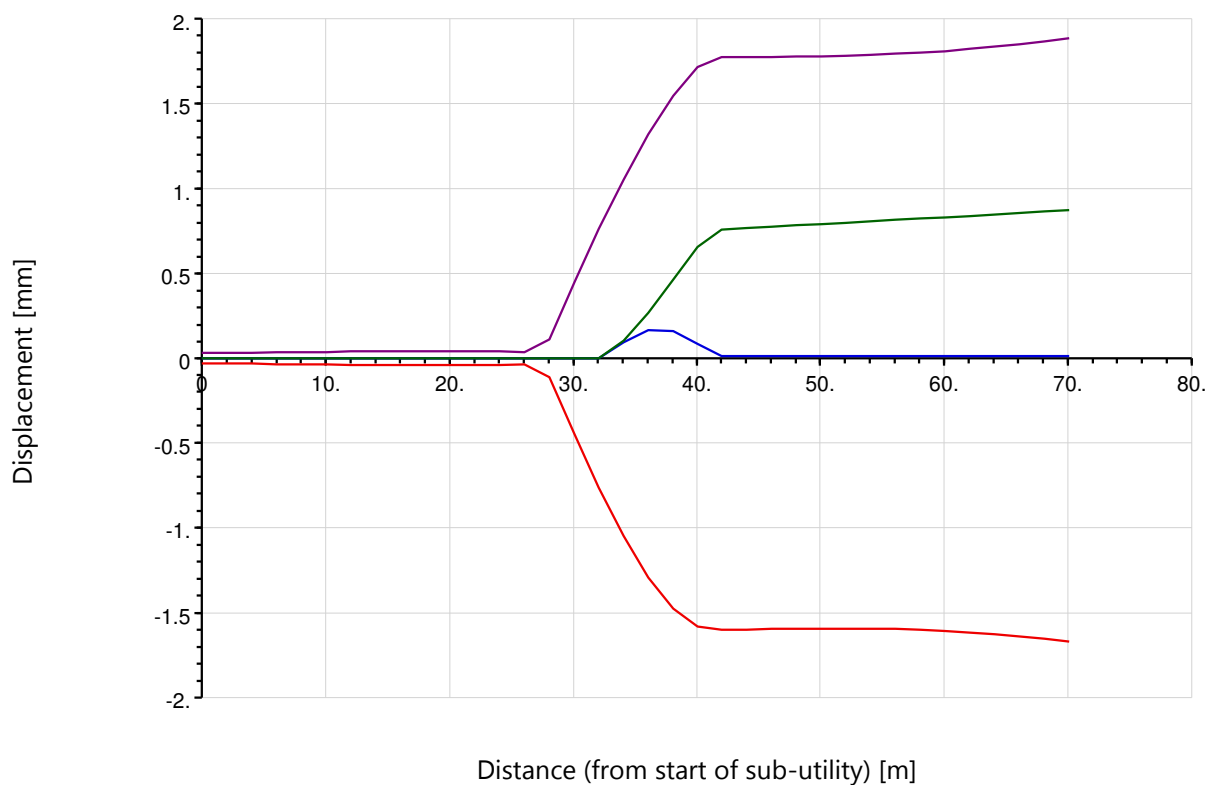
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 2: TWS(2)_1/1

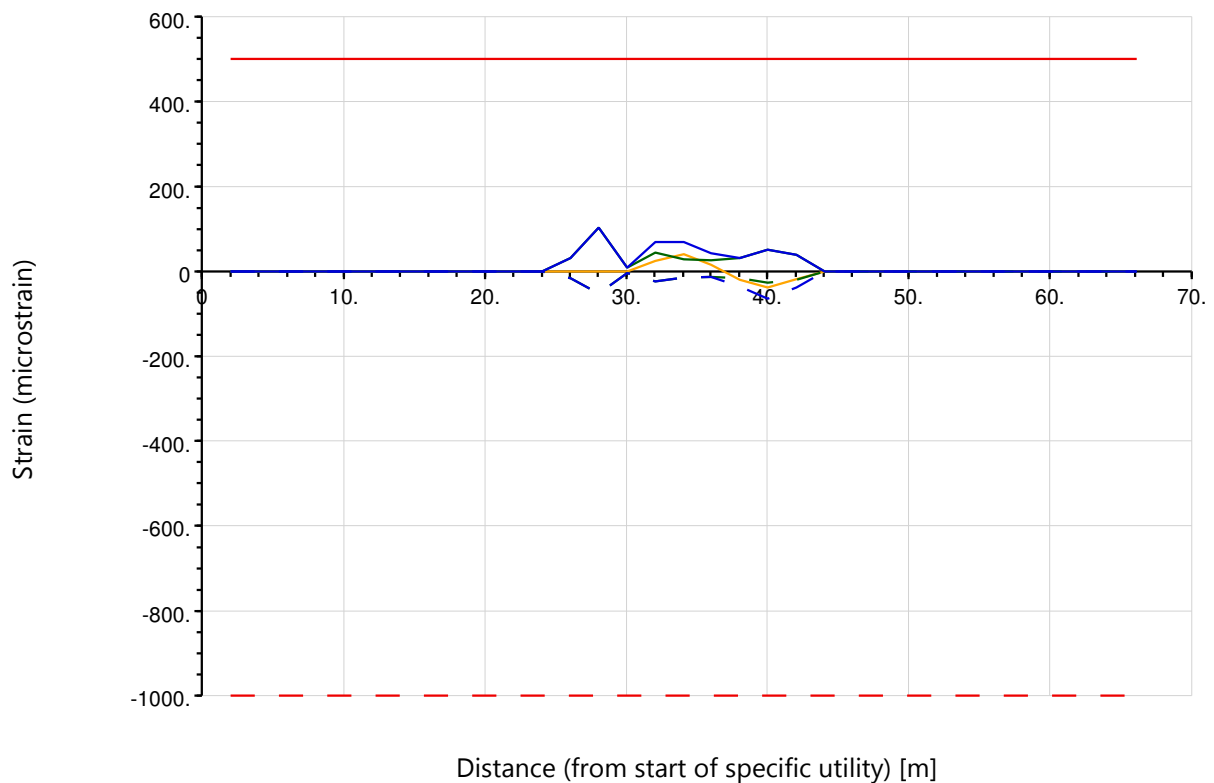
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 2: TWS(2)_1/1

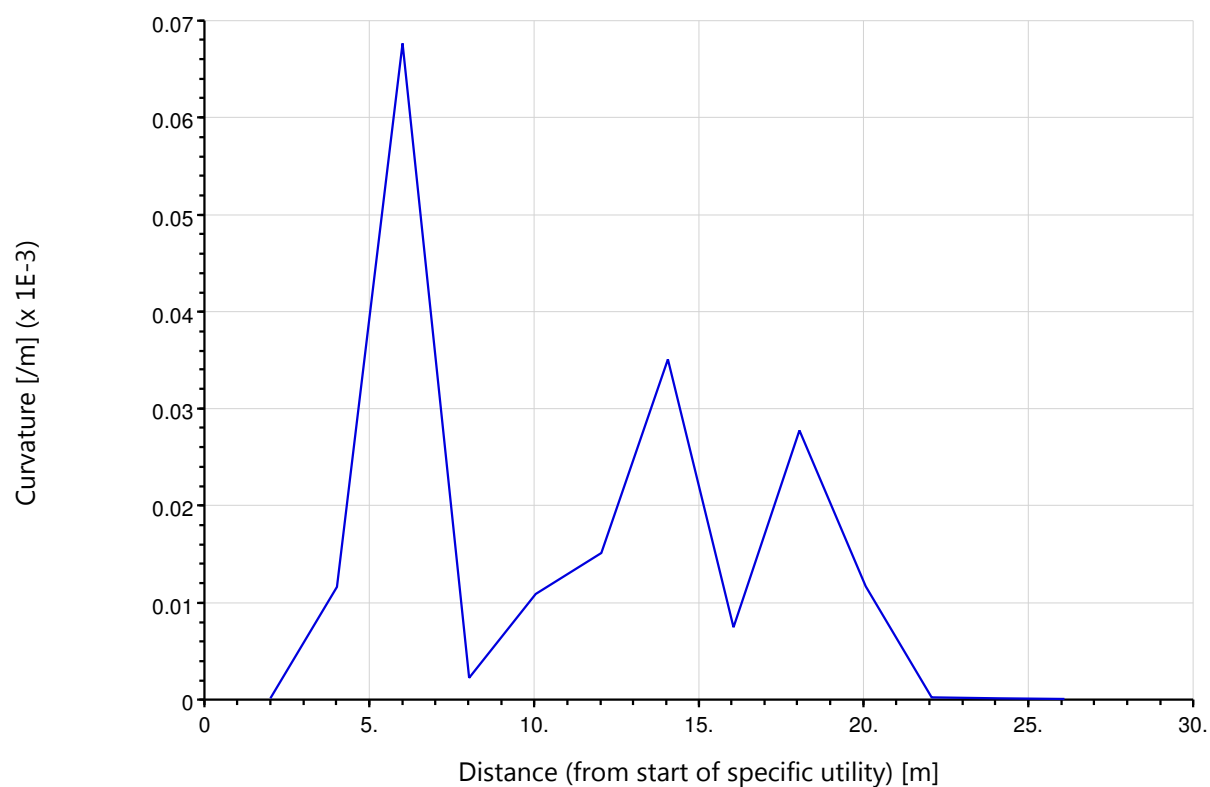
- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 3: TWS(2)_2/1

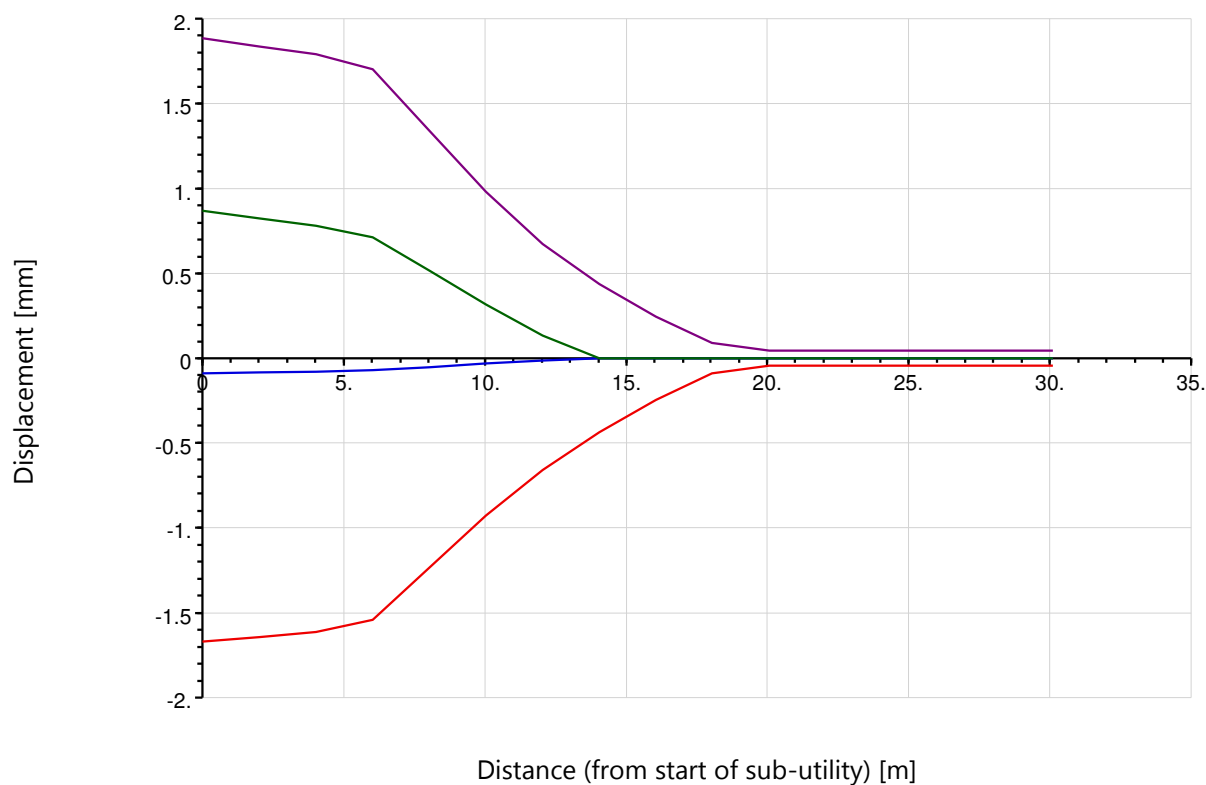
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 3: TWS(2)_2/1

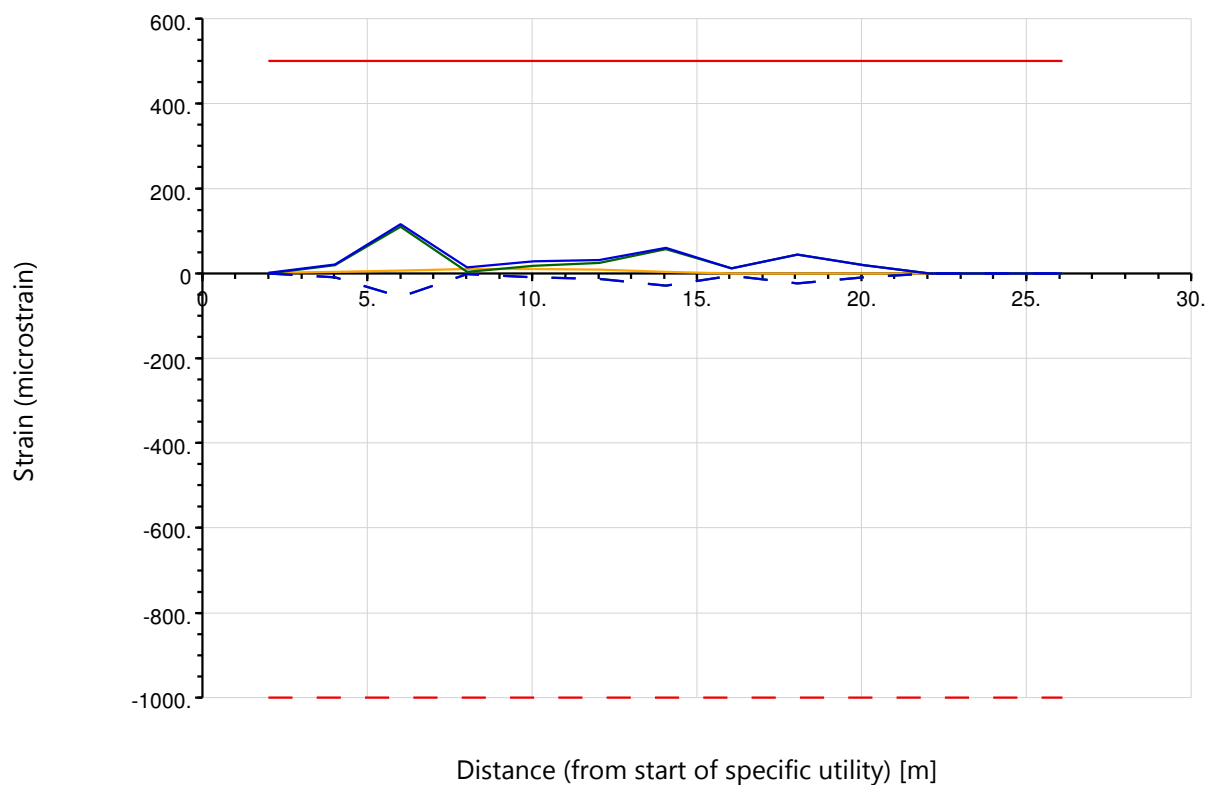
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 3: TWS(2)_2/1

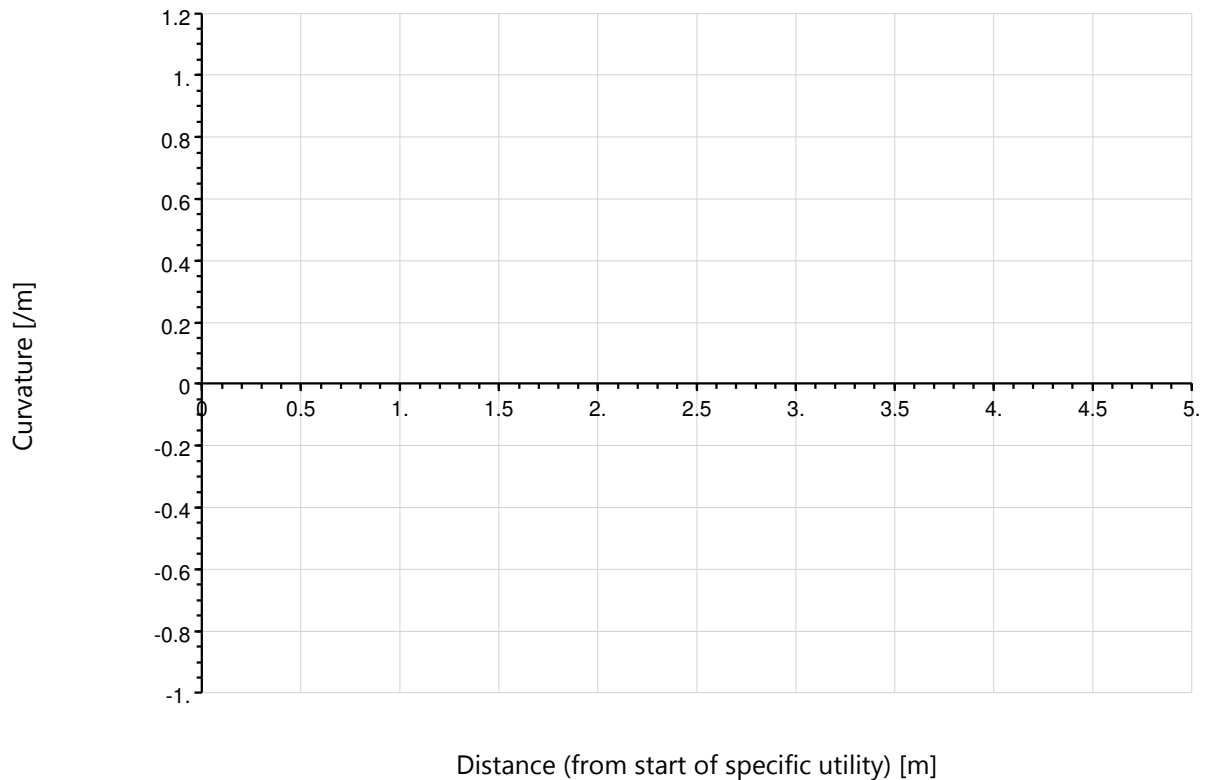
- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 10: Assumed FW400 connection to TW2_1/1

— Curvature

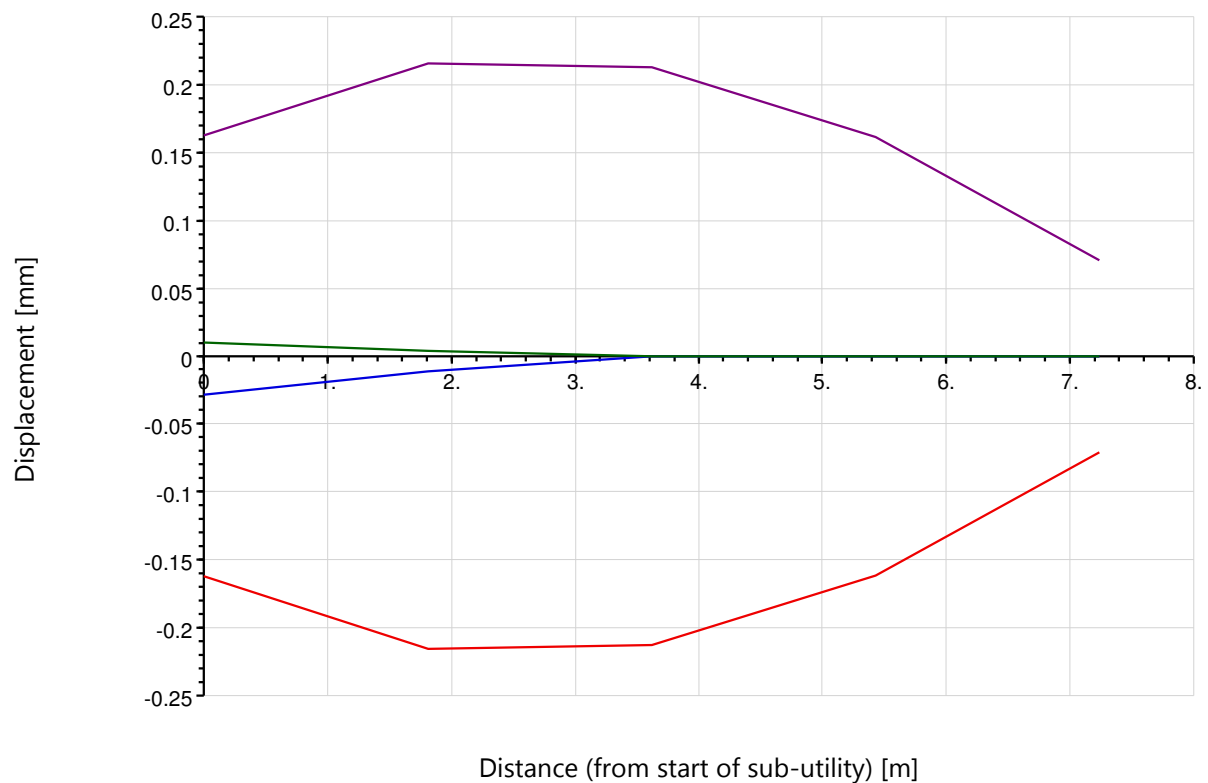


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Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 10: Assumed FW400 connection to TW2_1/1

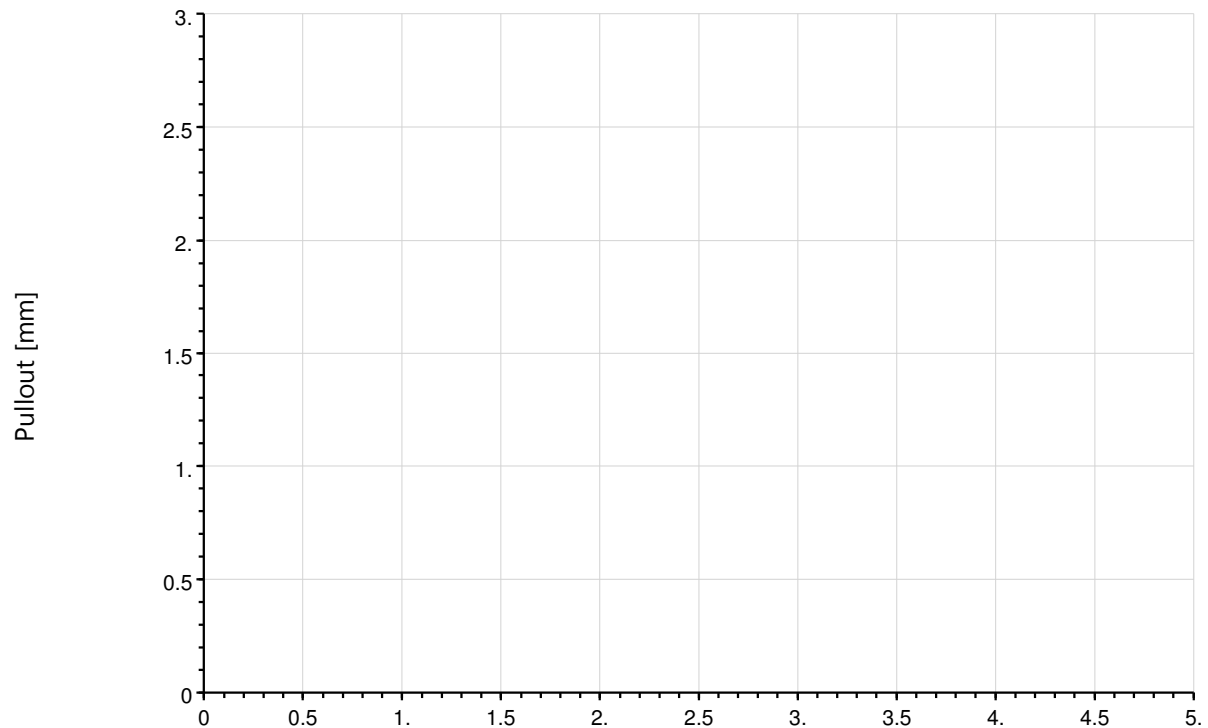
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - Pullout Chart

Stage: Base model, Specific Utility 10: Assumed FW400 connection to TW2_1/1

- - - Axial Pullout (factored)
- - - Flexural Pullout (factored)
- Total Pullout (factored)
- Total Pullout Limit

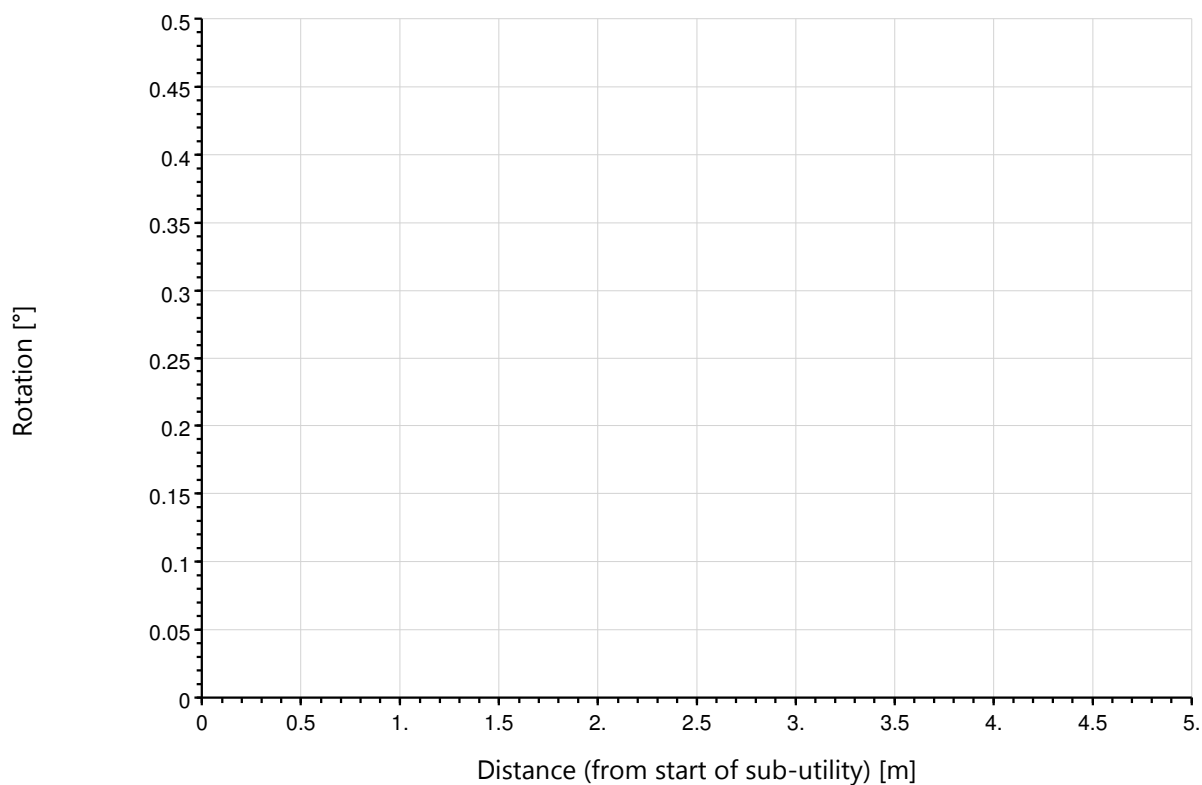


Distance (from start of sub-utility) [m] Note: Total pullout ignores the axial component where this is negative (i.e. comp

Specific Utility - Rotation Chart

Stage: Base model, Specific Utility 10: Assumed FW400 connection to TW2_1/1

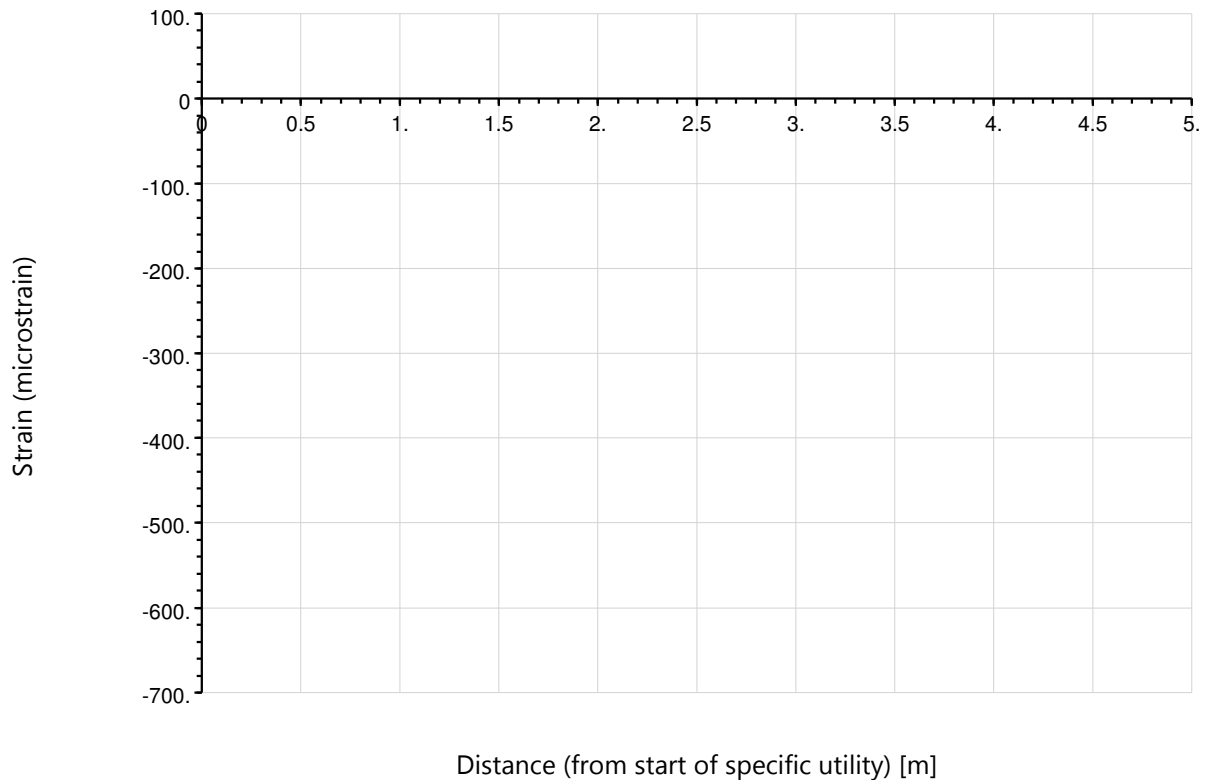
— Rotation (factored)
— Rotation Limit



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 10: Assumed FW400 connection to TW2, 1/1

- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- Combined Compressive Strain (factored)
- Allowable Tensile Strain
- Allowable Compressive Strain

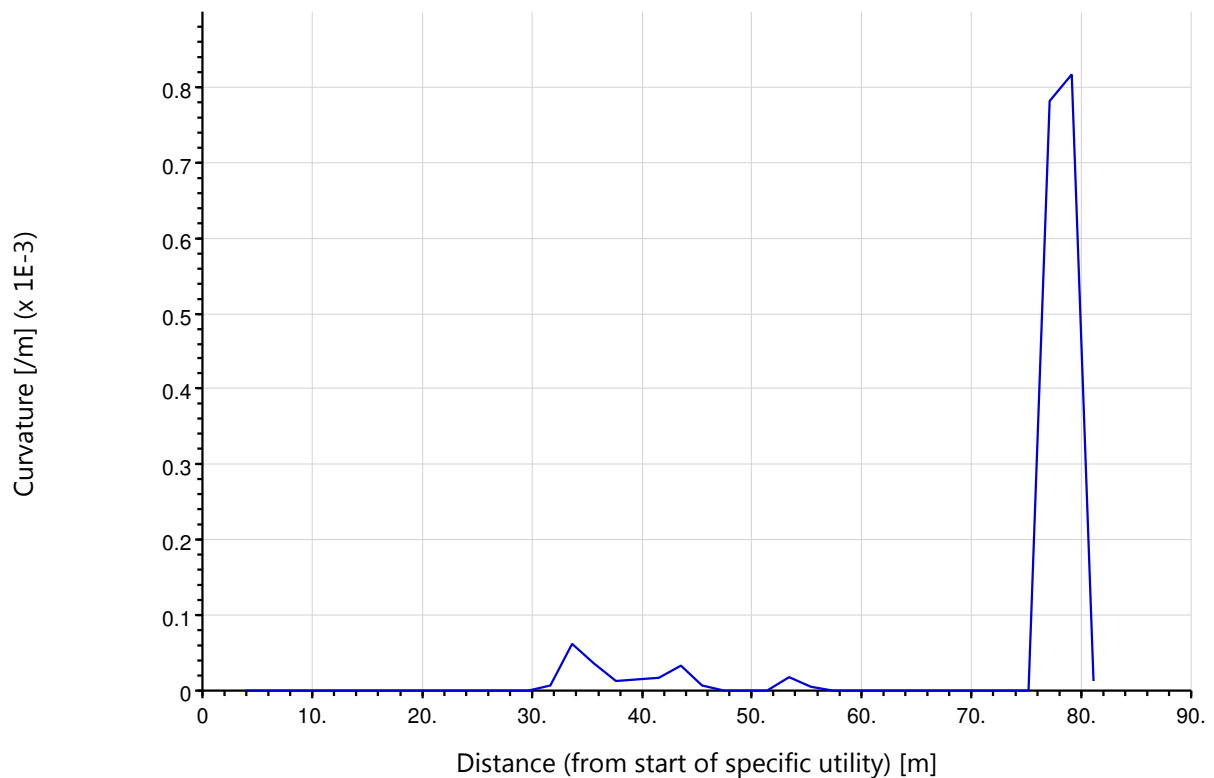


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Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 6: TW Fresh Water (a) - St Pancras/1

— Curvature

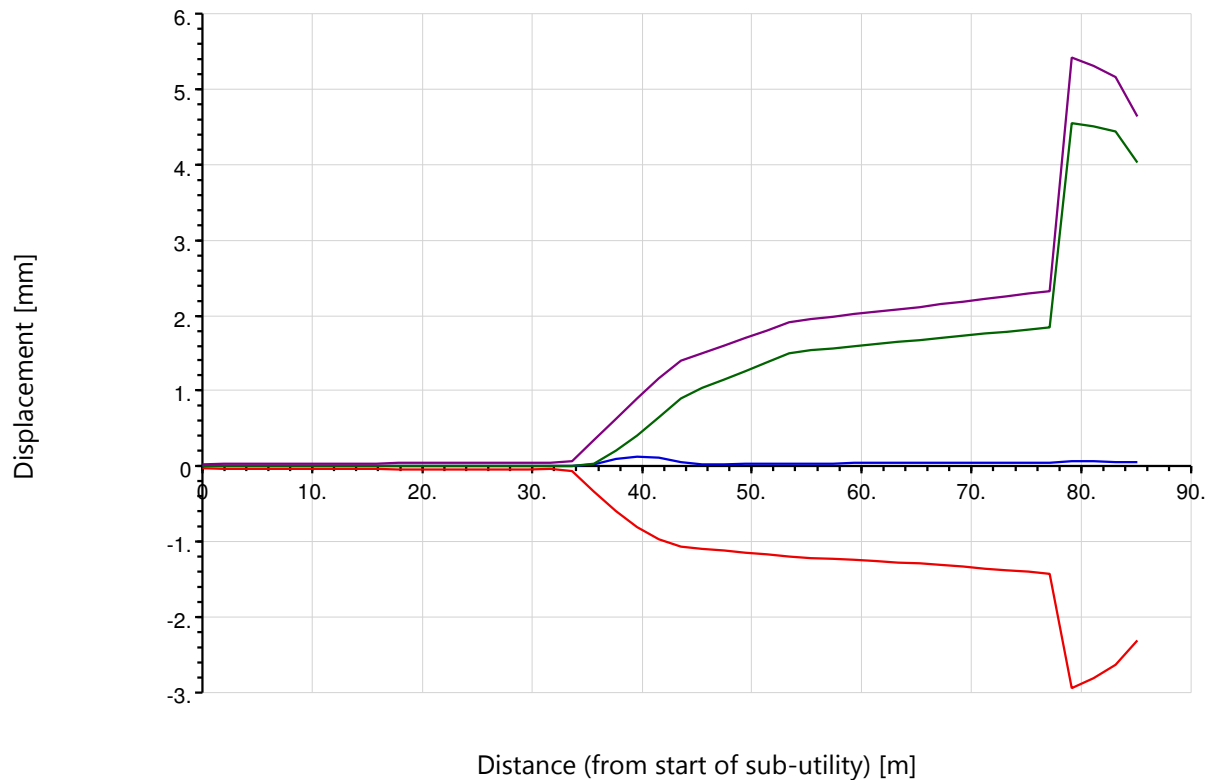


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Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 6: TW Fresh Water (a) - St Pancras/1

- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)

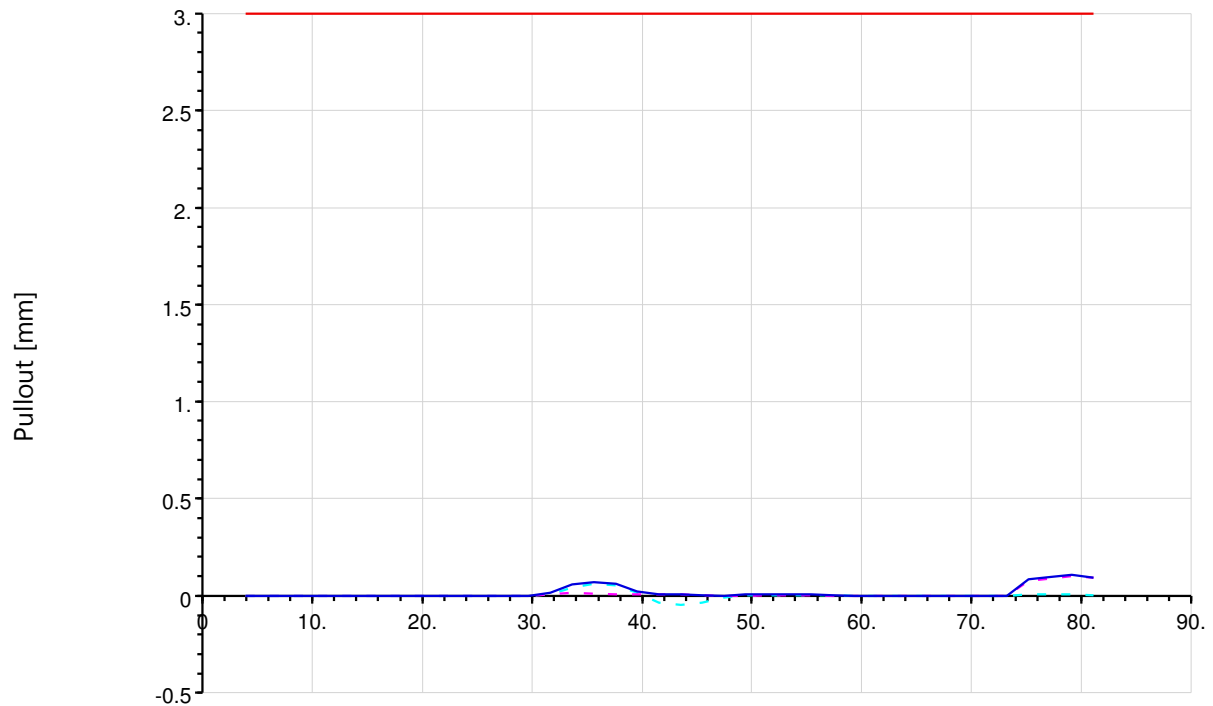


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Specific Utility - Pullout Chart

Stage: Base model, Specific Utility 6: TW Fresh Water (a) - St Pancras/1

- - - Axial Pullout (factored)
- - - Flexural Pullout (factored)
- Total Pullout (factored)
- Total Pullout Limit

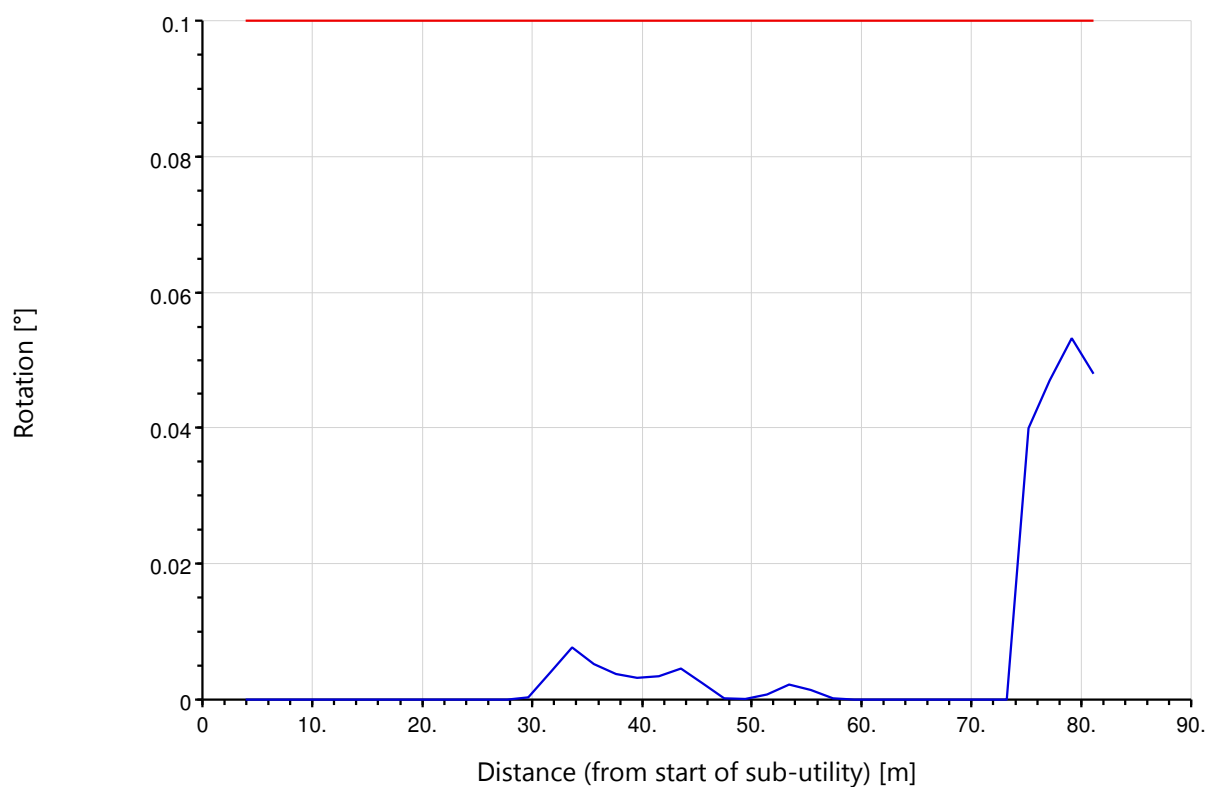


Distance (from start of sub-utility) [m] Note: Total pullout ignores the axial component where this is negative (i.e. comp

Specific Utility - Rotation Chart

Stage: Base model, Specific Utility 6: TW Fresh Water (a) - St Pancras/1

— Rotation (factored)
— Rotation Limit

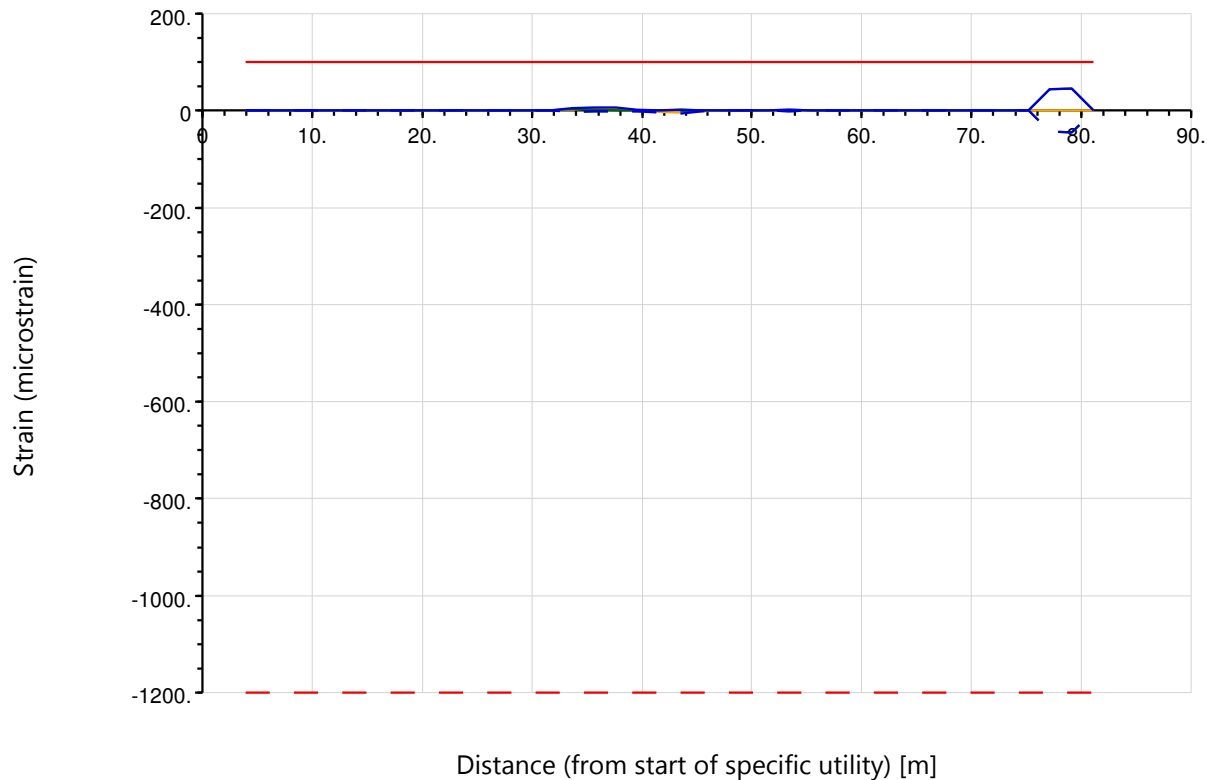


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Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 6: TW Fresh Water (a) - St Pancras/1

- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain

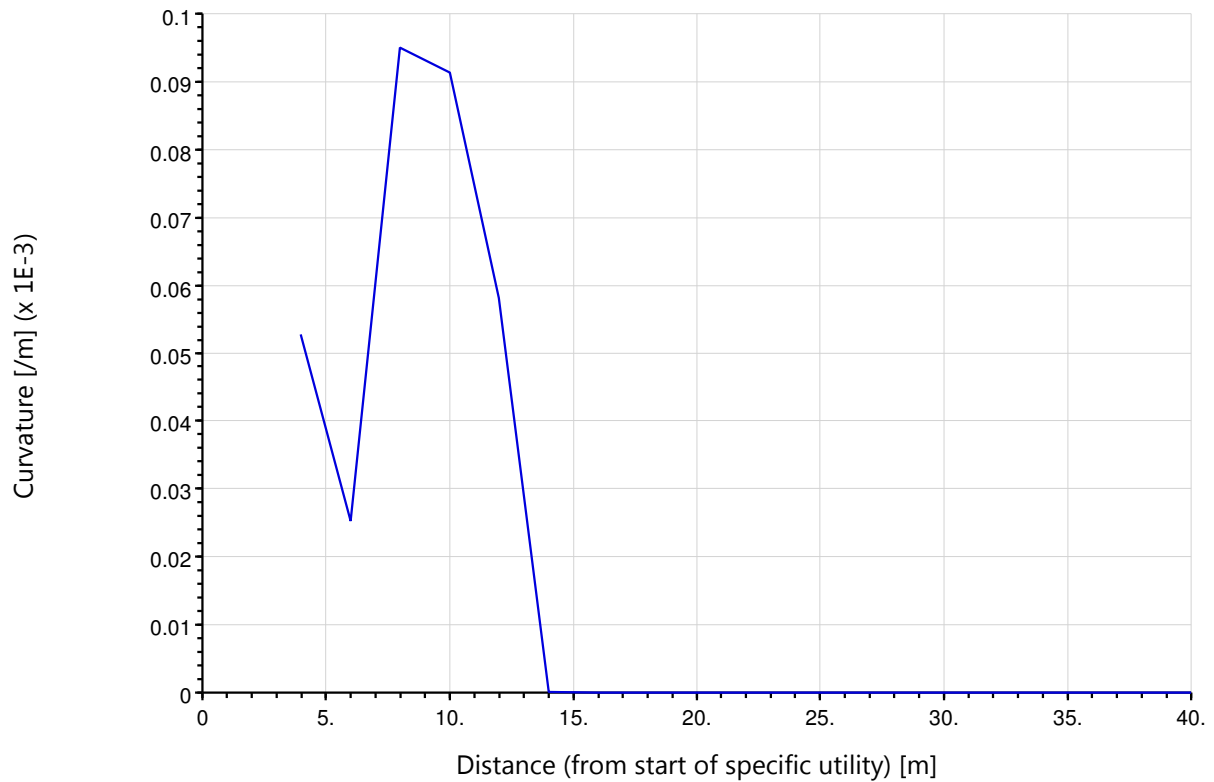


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Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 7: TW Fresh Water (b) - St Pancras/1

— Curvature

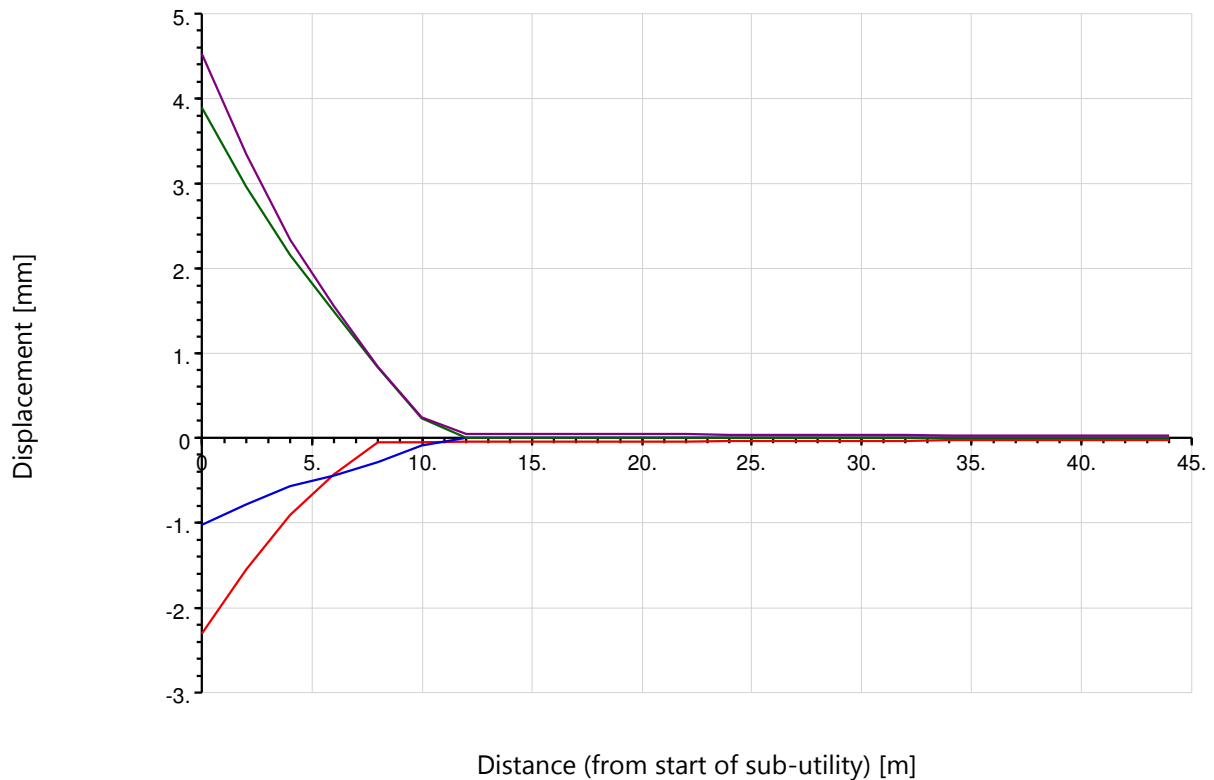


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Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 7: TW Fresh Water (b) - St Pancras/1

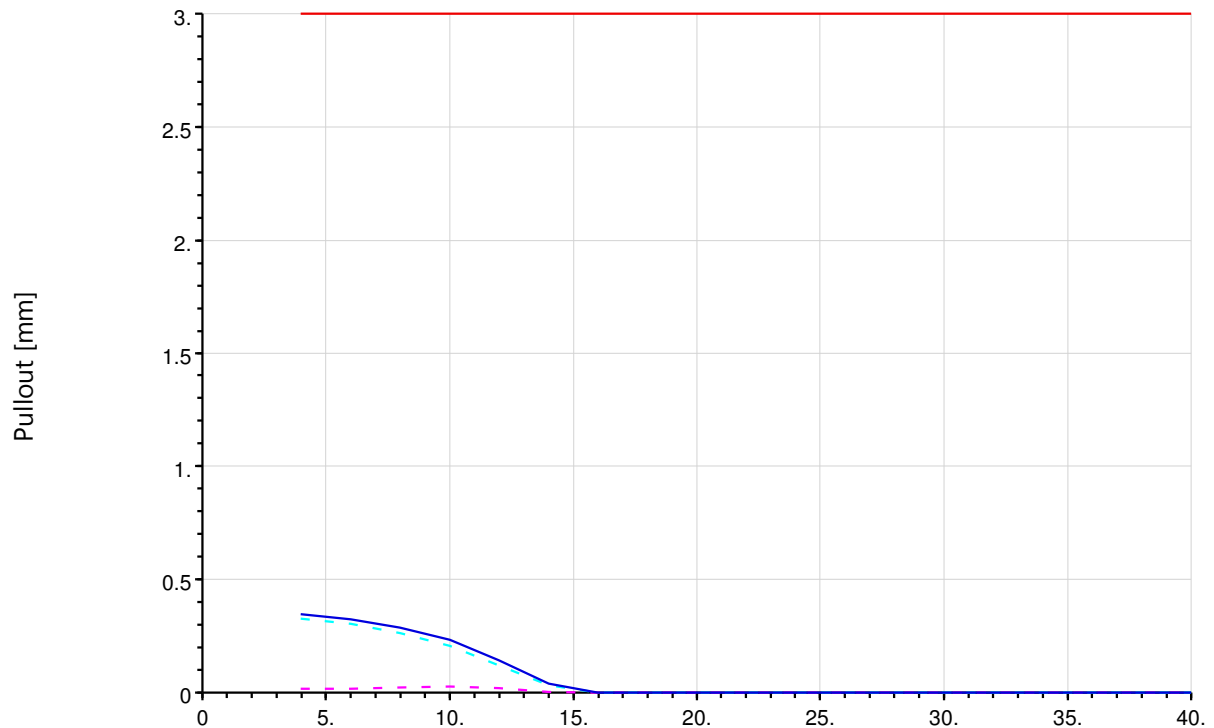
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - Pullout Chart

Stage: Base model, Specific Utility 7: TW Fresh Water (b) - St Pancras/1

- - - Axial Pullout (factored)
- - - Flexural Pullout (factored)
- Total Pullout (factored)
- Total Pullout Limit



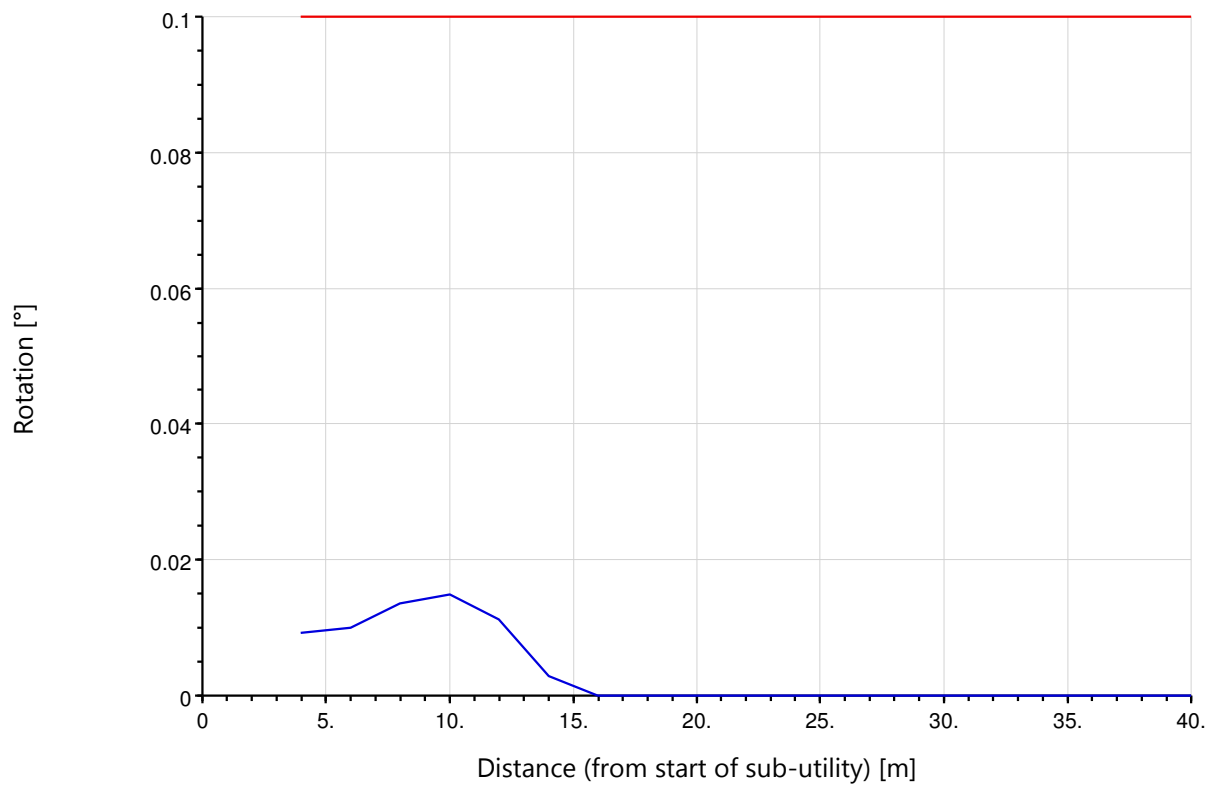
Distance (from start of sub-utility) [m] Note: Total pullout ignores the axial component where this is negative (i.e. comp

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Specific Utility - Rotation Chart

Stage: Base model, Specific Utility 7: TW Fresh Water (b) - St Pancras/1

— Rotation (factored)
— Rotation Limit

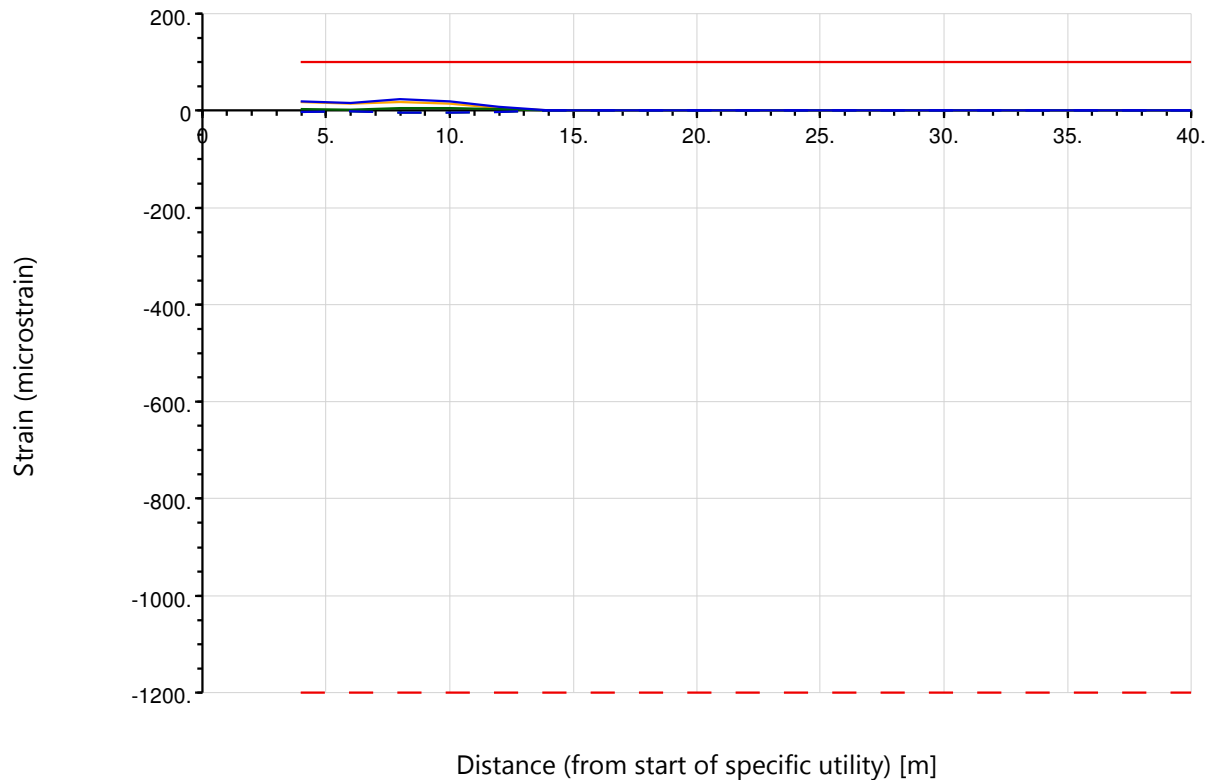


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Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 7: TW Fresh Water (b) - St Pancras/1

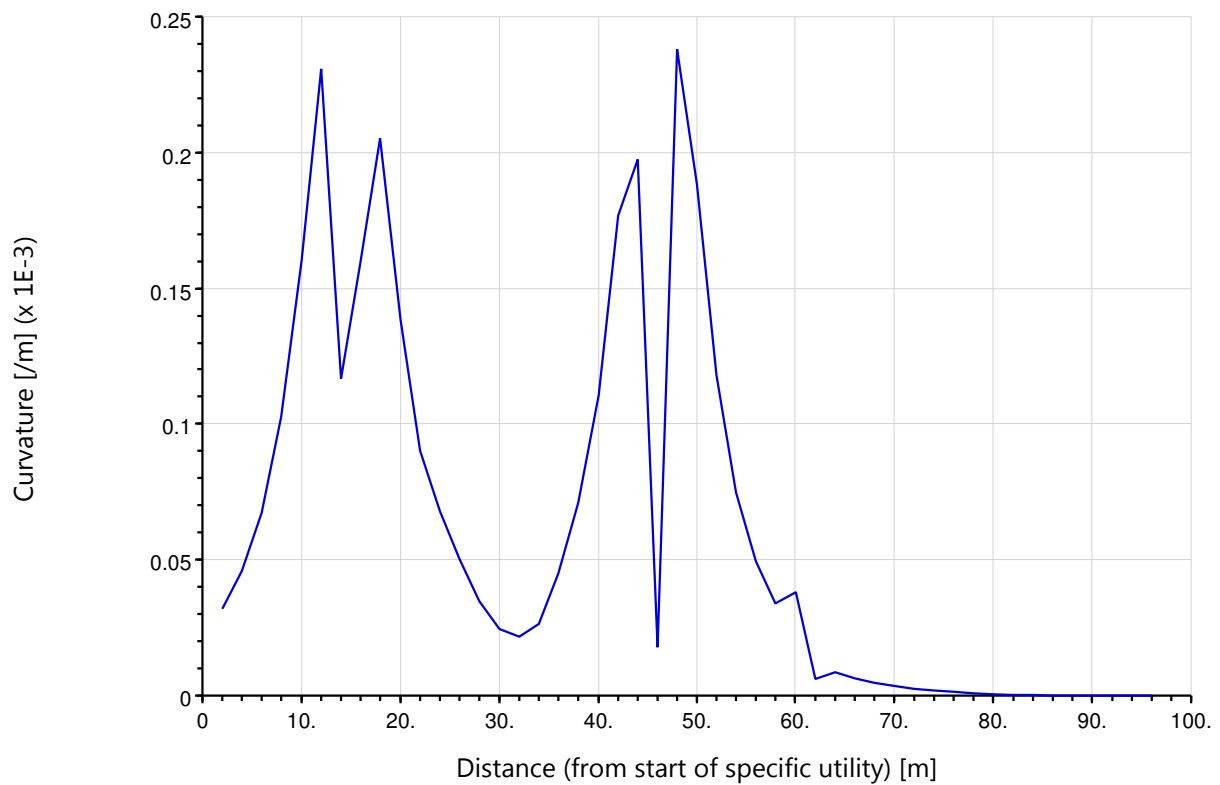
- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- Combined Compressive Strain (factored)
- Allowable Tensile Strain
- Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 1: TWS(1)_1/1

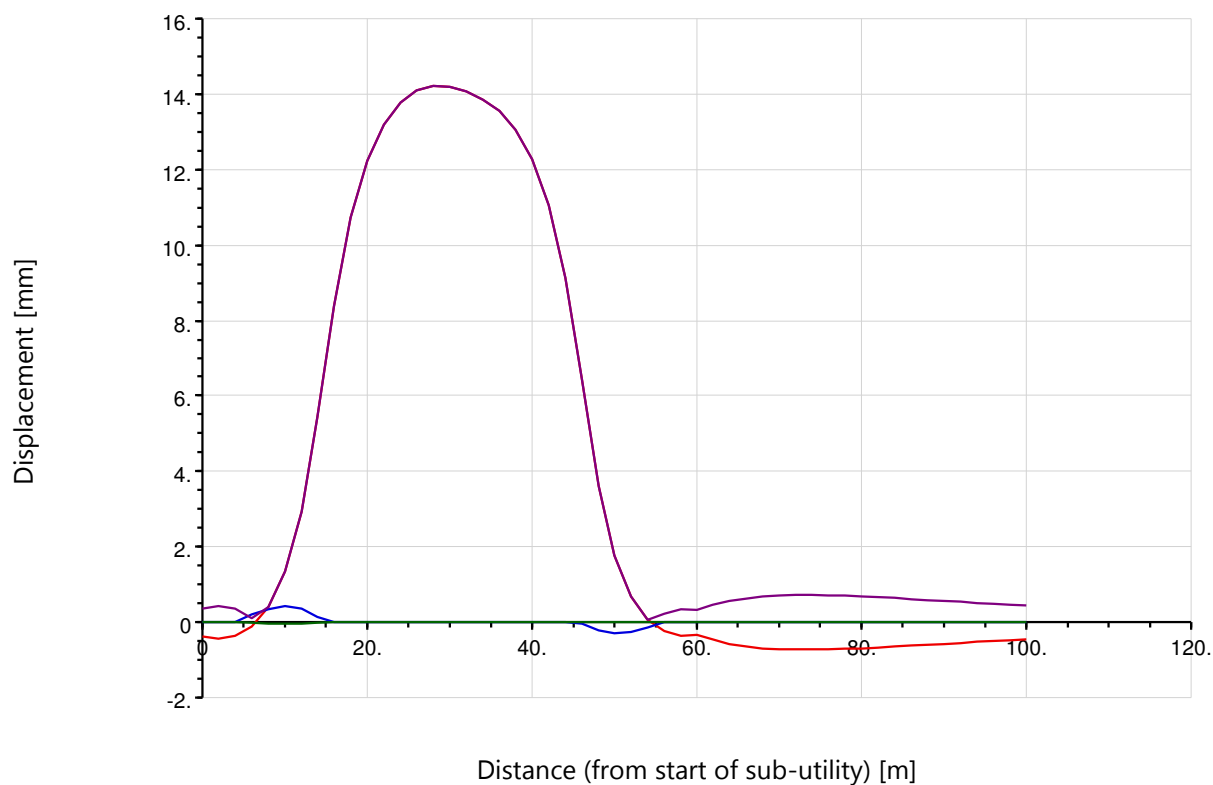
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 1: TWS(1)_1/1

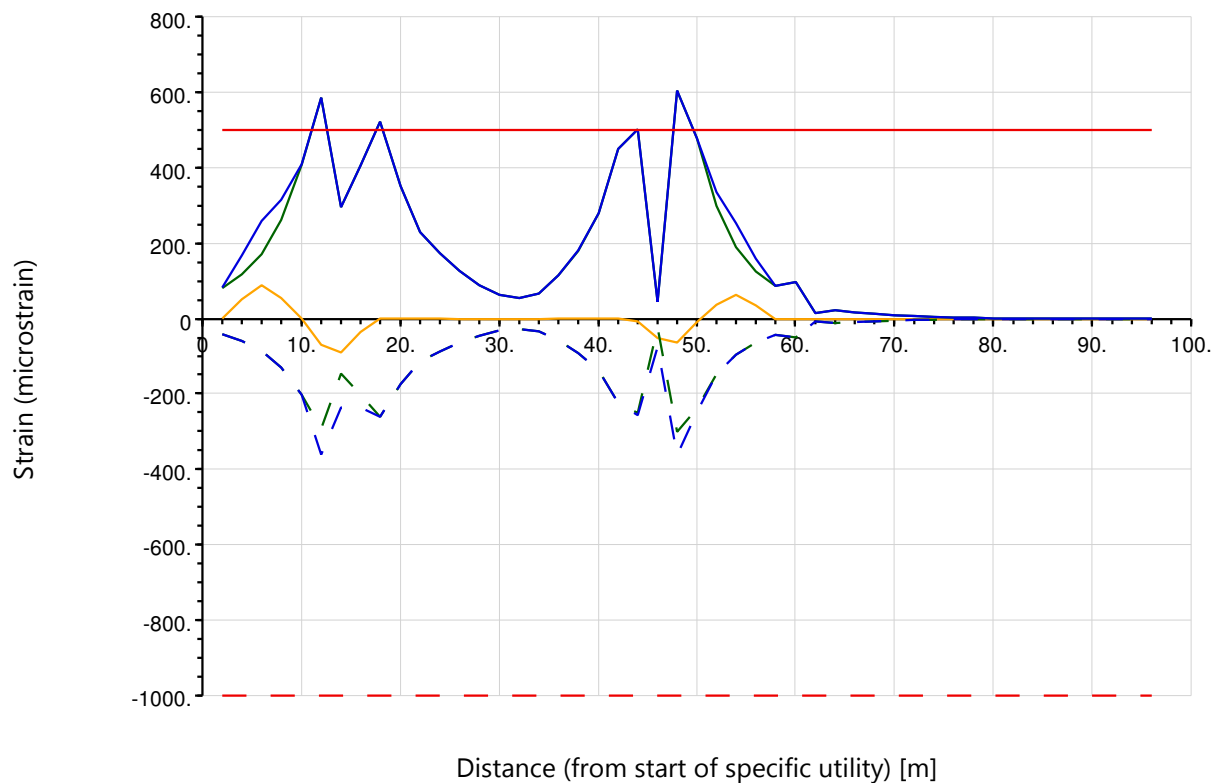
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 1: TWS(1)_1/1

- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain

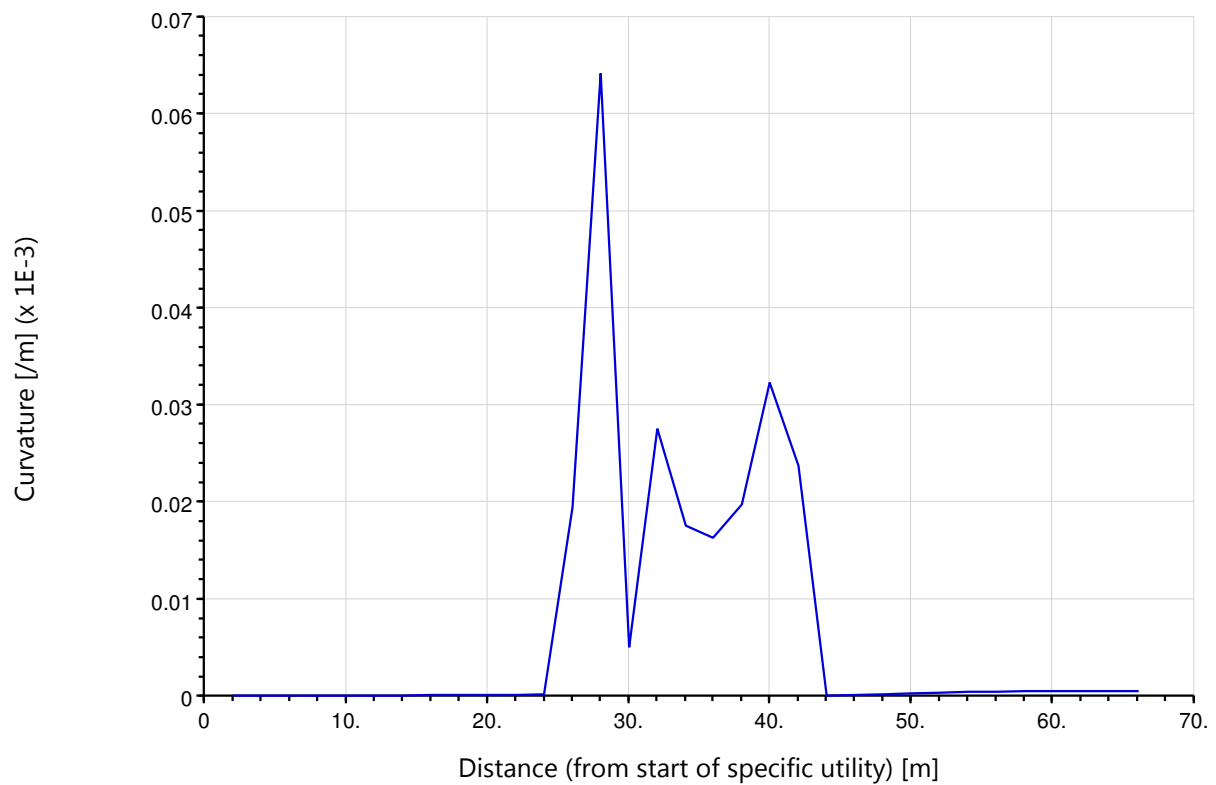


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Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 2: TWS(2)_1/1

— Curvature

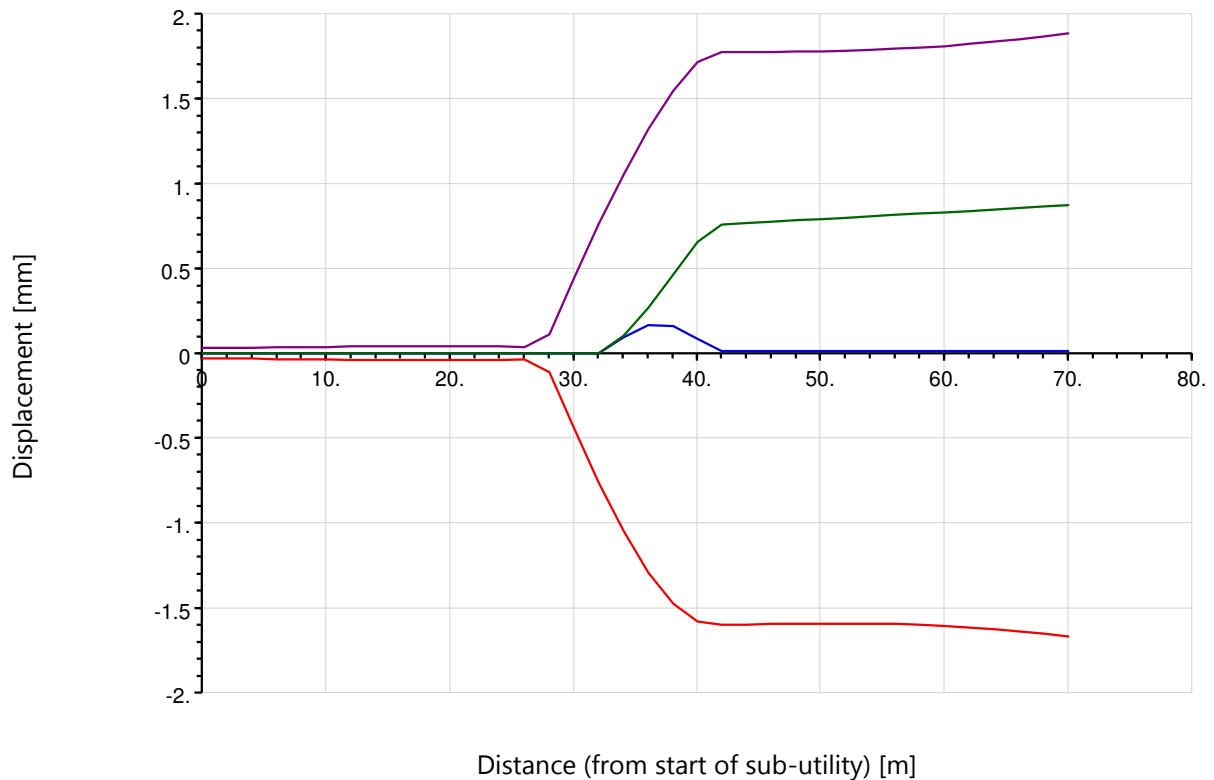


Job No.	Sheet No.	Rev.
371654		
Drg. Ref.		
Made by MK	Date 03-Dec-2020	Checked Date

Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 2: TWS(2)_1/1

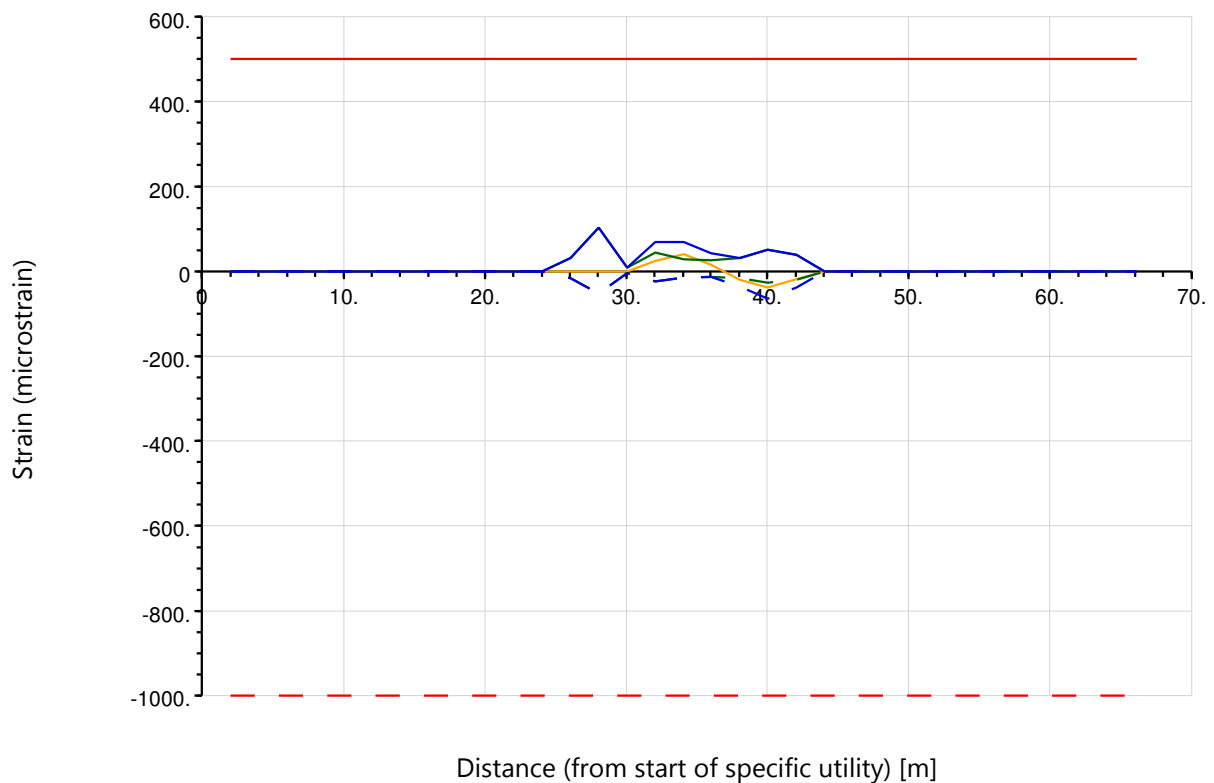
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 2: TWS(2)_1/1

- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain

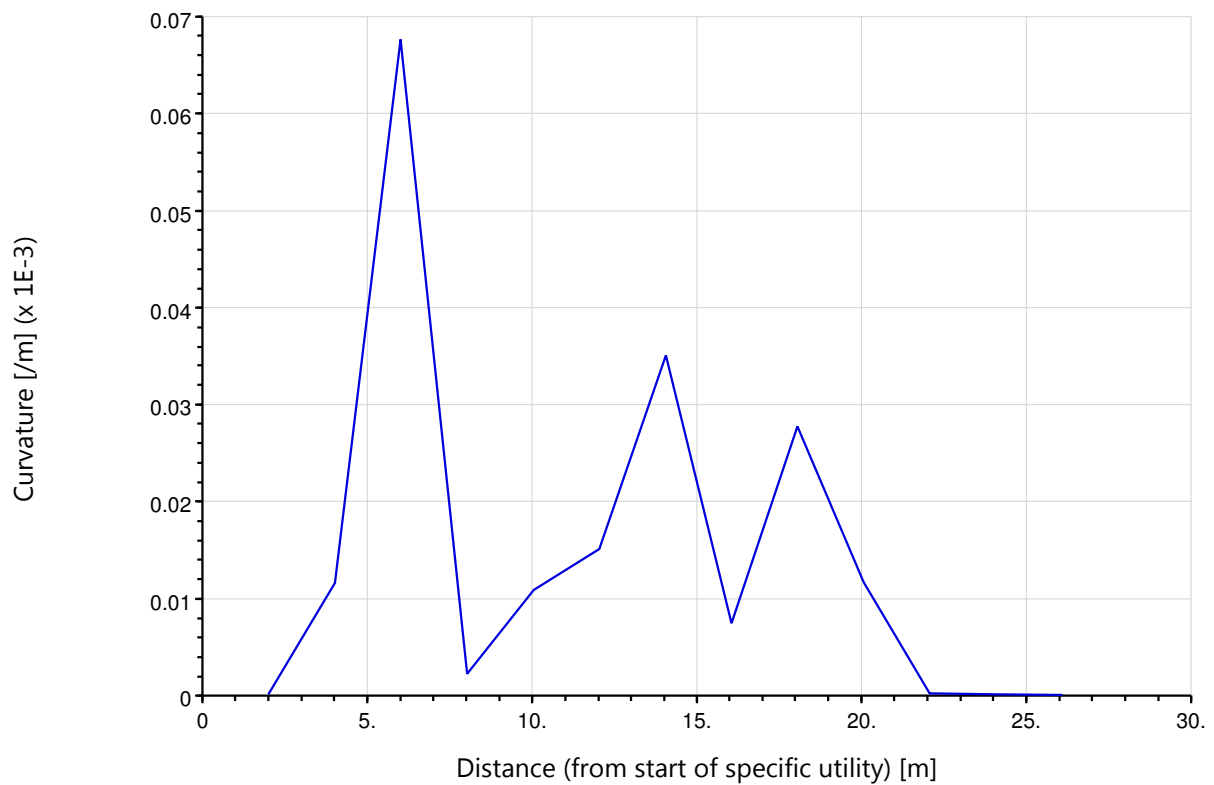


Job No.	Sheet No.	Rev.
371654		
Drg. Ref.		
Made by MK	Date 03-Dec-2020	Checked Date

Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 3: TWS(2)_2/1

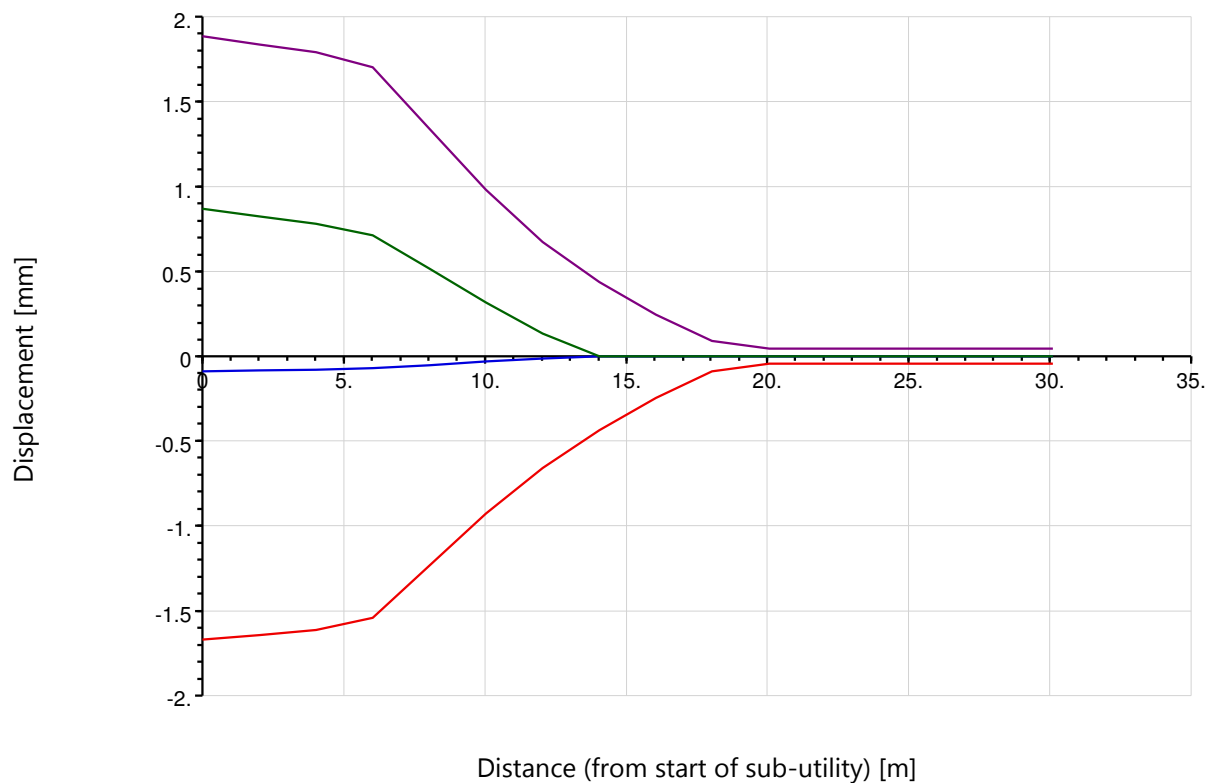
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 3: TWS(2)_2/1

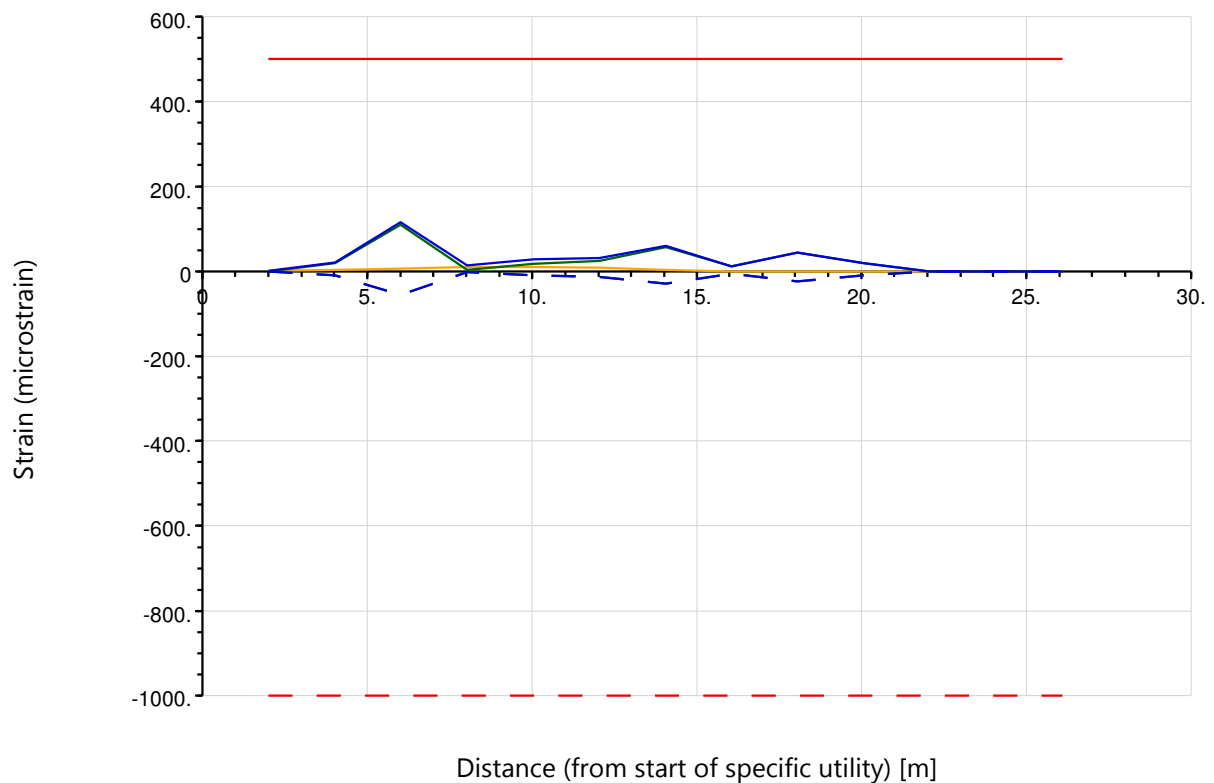
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 3: TWS(2)_2/1

- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain

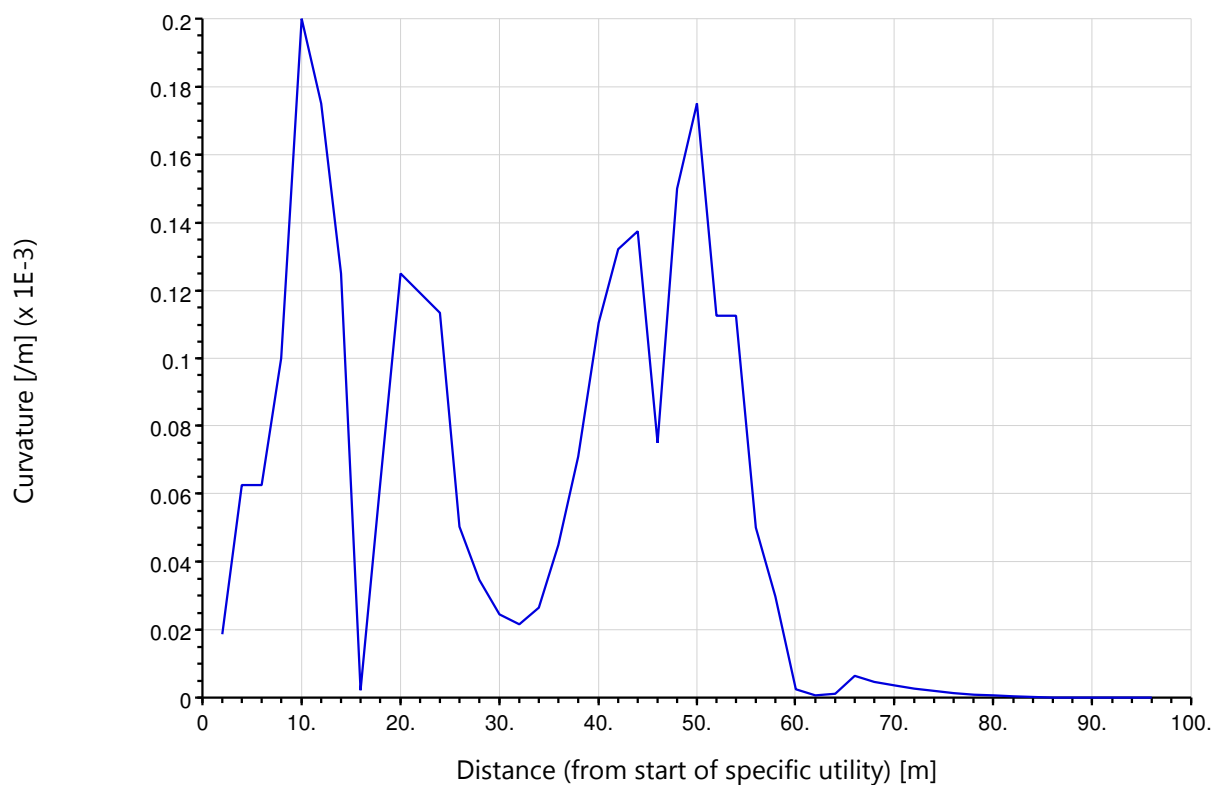


Job No.	Sheet No.	Rev.
371654		
Drg. Ref.		
Made by MK	Date 07-Dec-2020	Checked Date

Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 1: TWS(1)_1/1

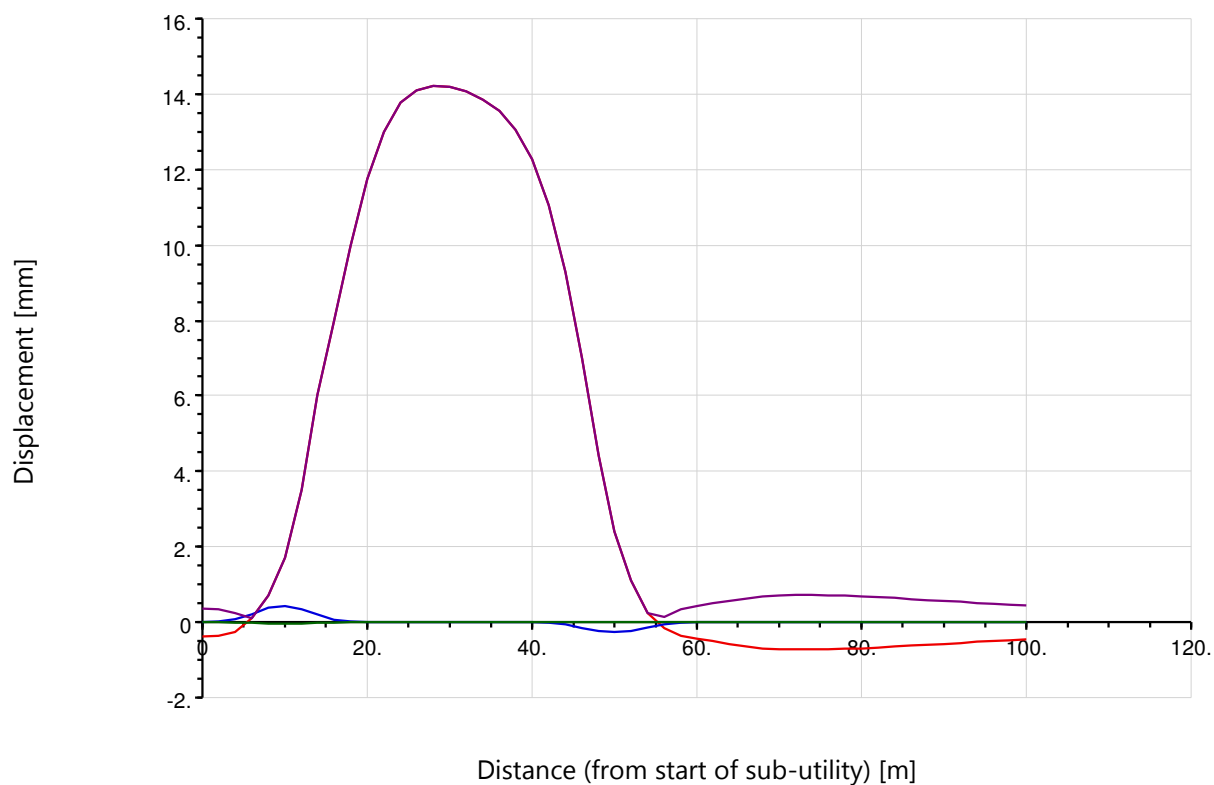
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 1: TWS(1)_1/1

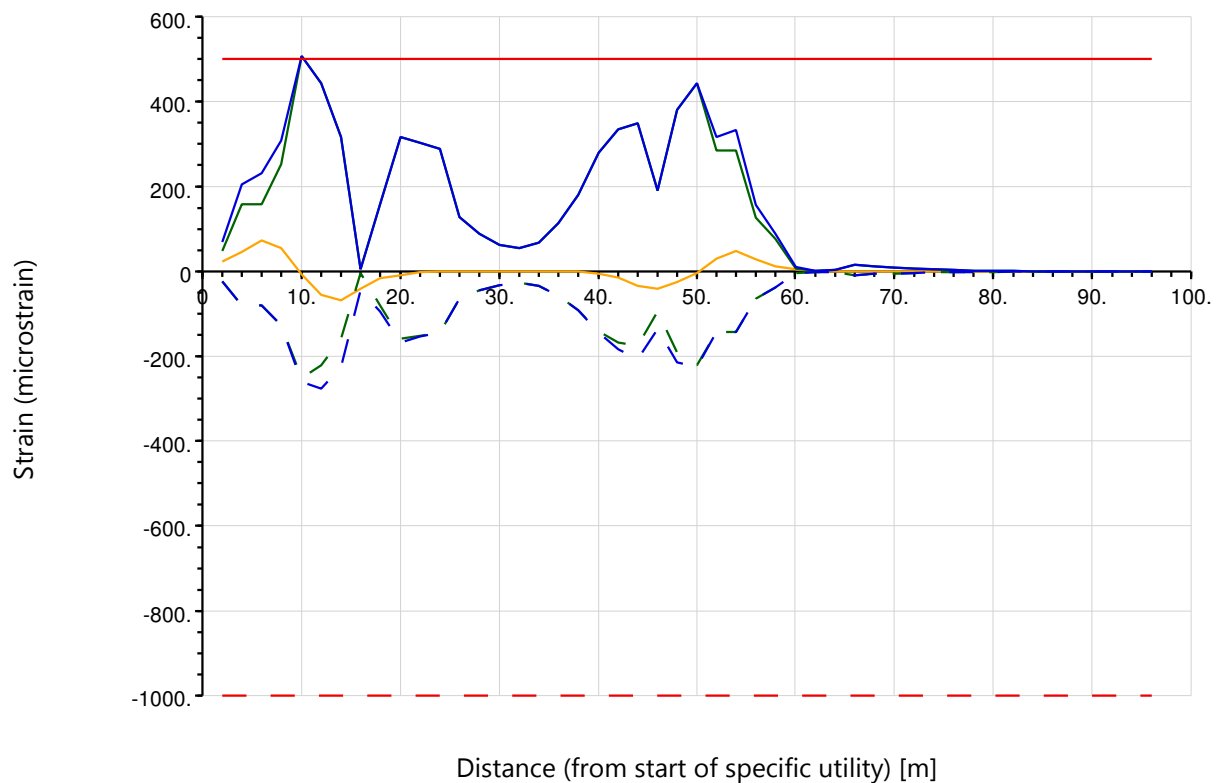
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 1: TWS(1)_1/1

- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



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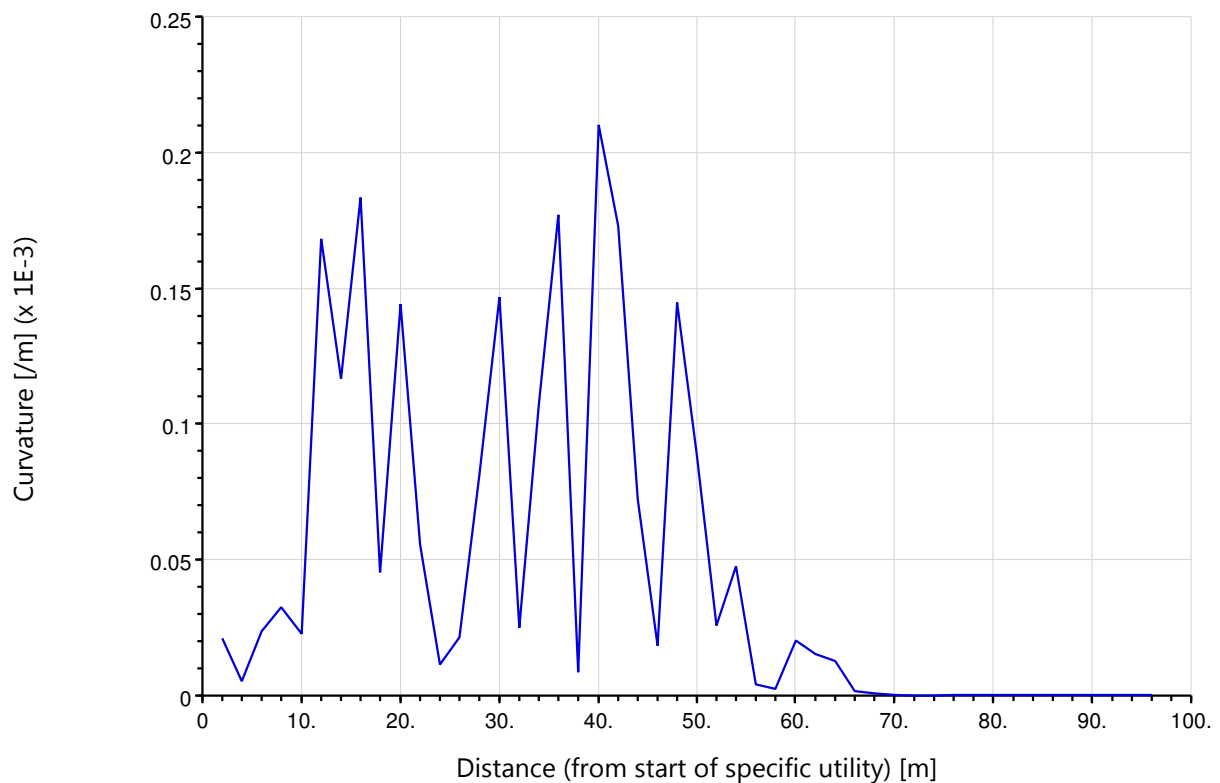
TW Sewer Assessment

Plot A - (Demo+Wall Inst+Exc-Smoothed)+New Load (ST)

Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 1: TWS(1)_1/1

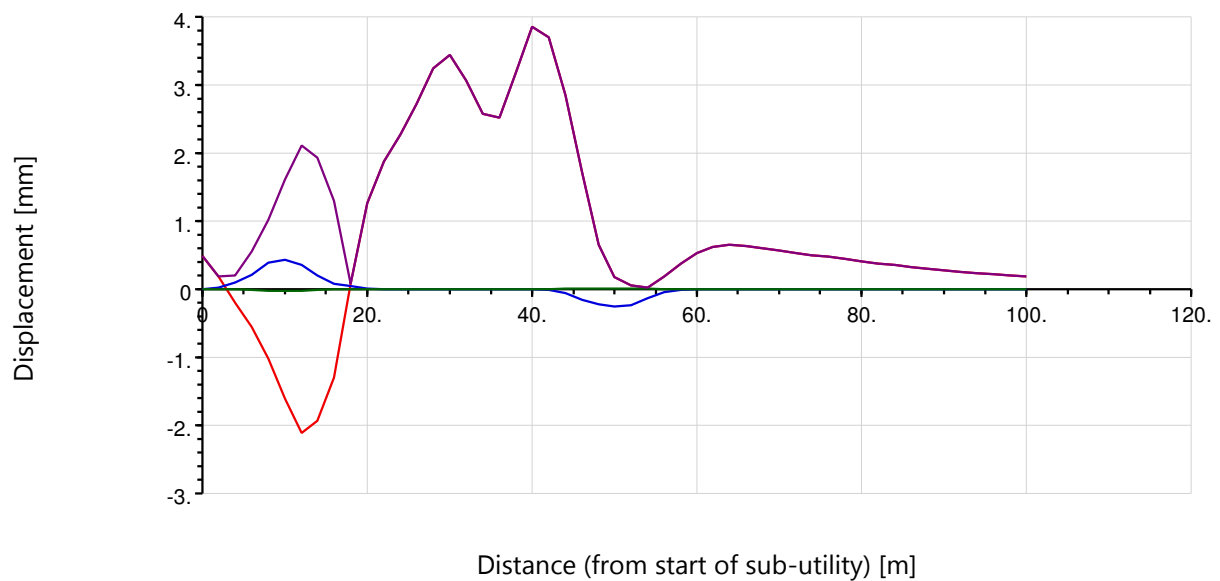
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 1: TWS(1)_1/1

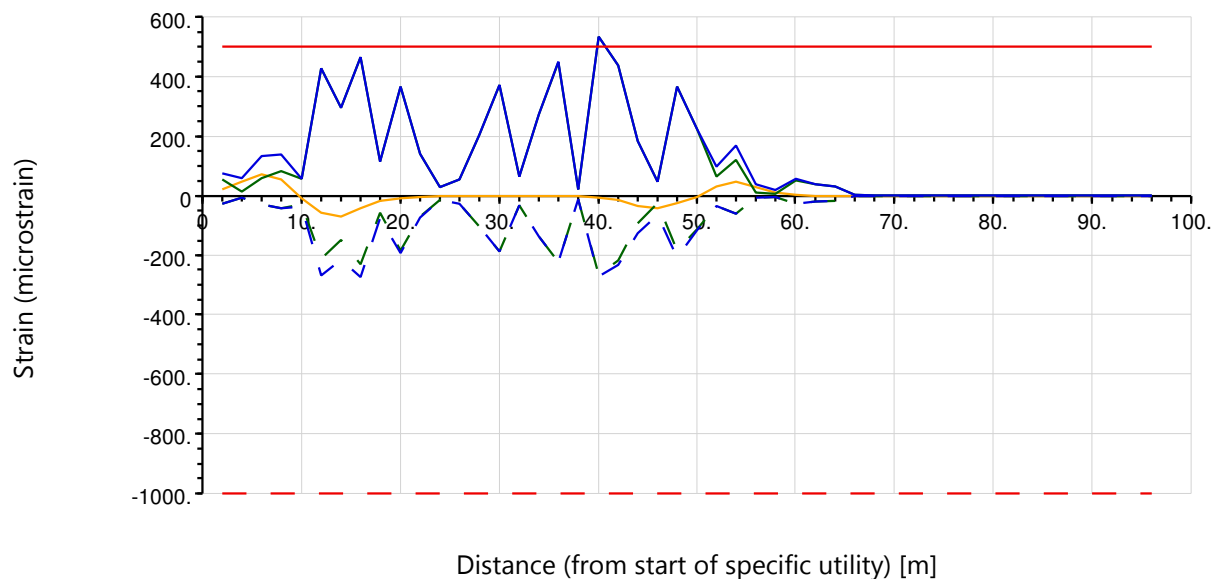
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 1: TWS(1)_1/1

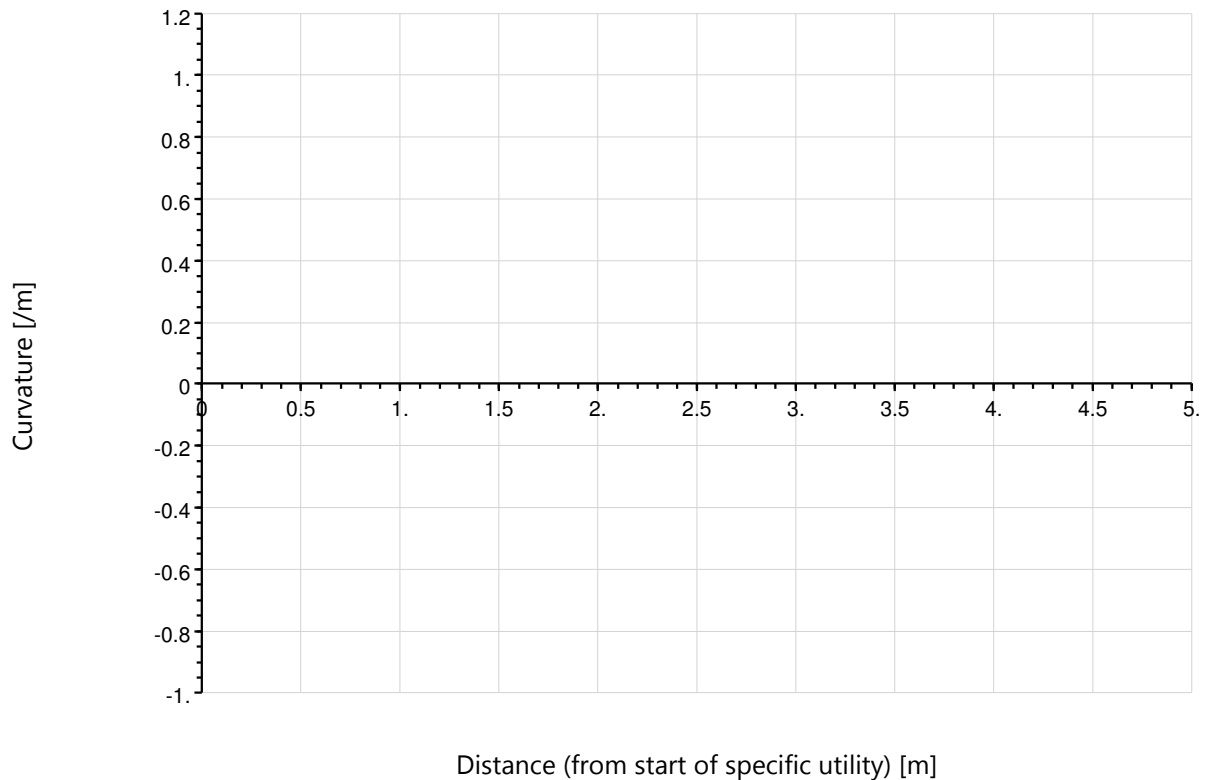
- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 10: Assumed FW400 connection to TW2_1/1

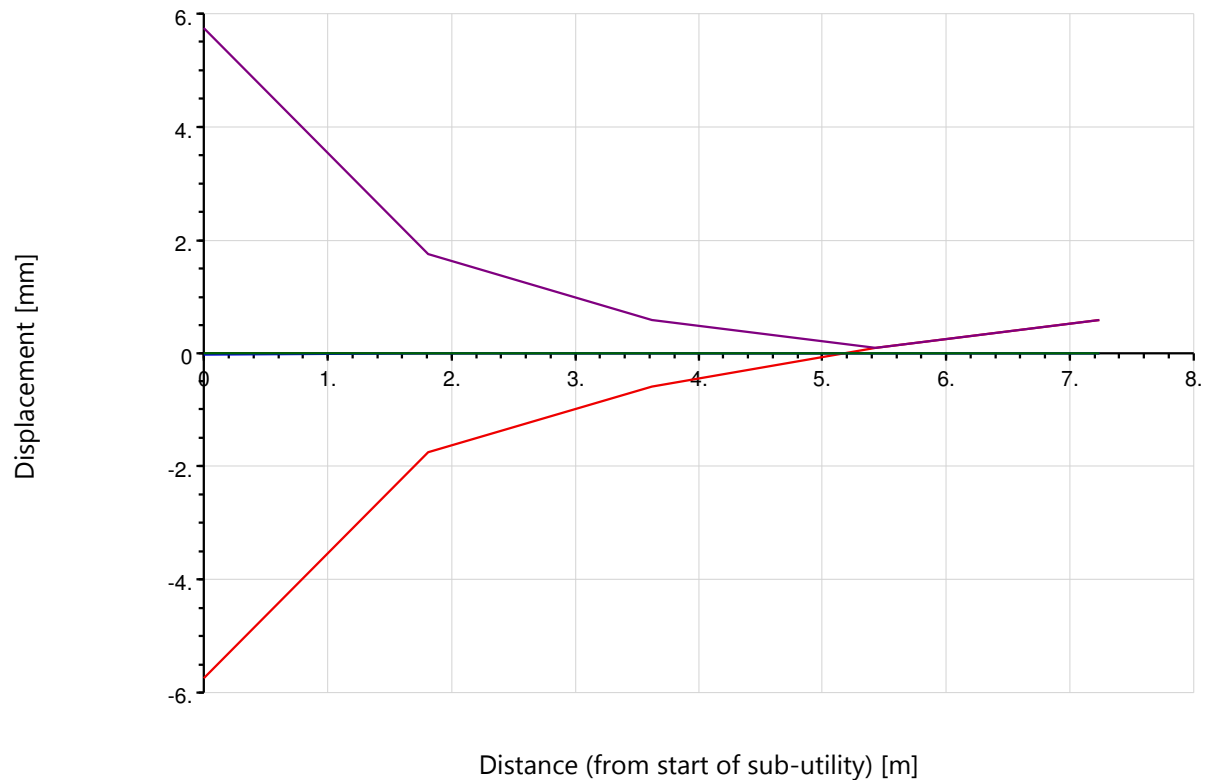
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 10: Assumed FW400 connection to TW2_1/1

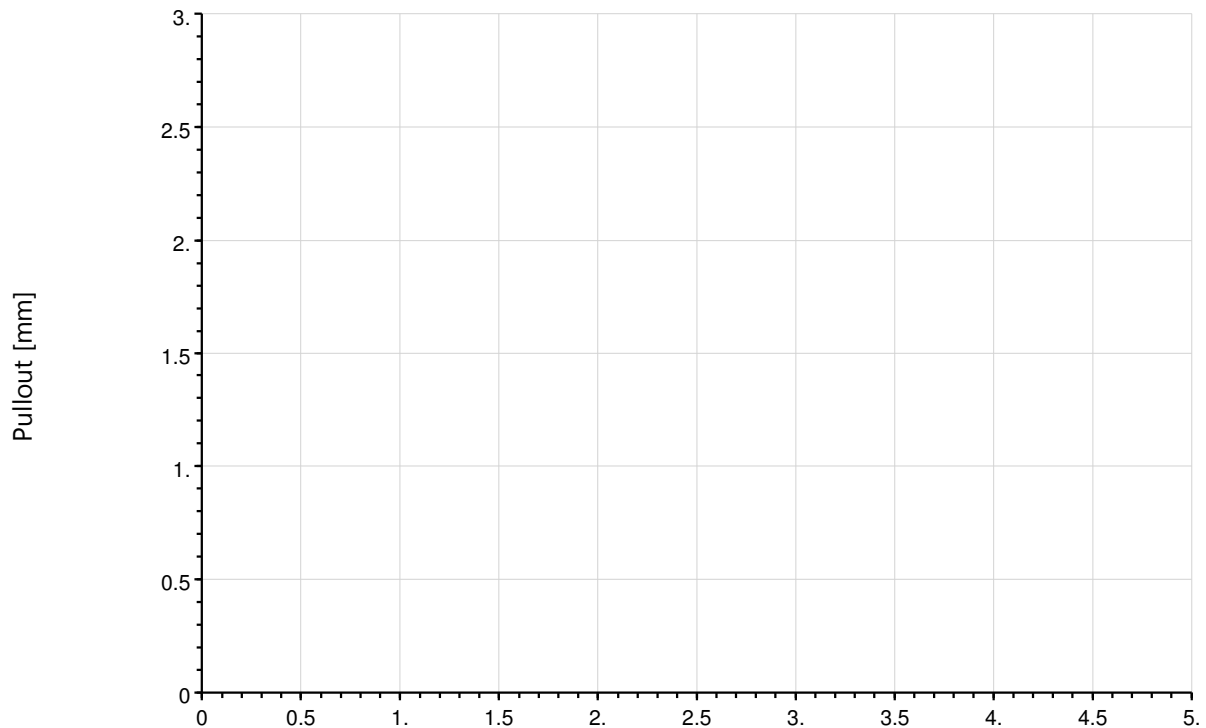
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - Pullout Chart

Stage: Base model, Specific Utility 10: Assumed FW400 connection to TW2_1/1

- - - Axial Pullout (factored)
- - - Flexural Pullout (factored)
- Total Pullout (factored)
- Total Pullout Limit

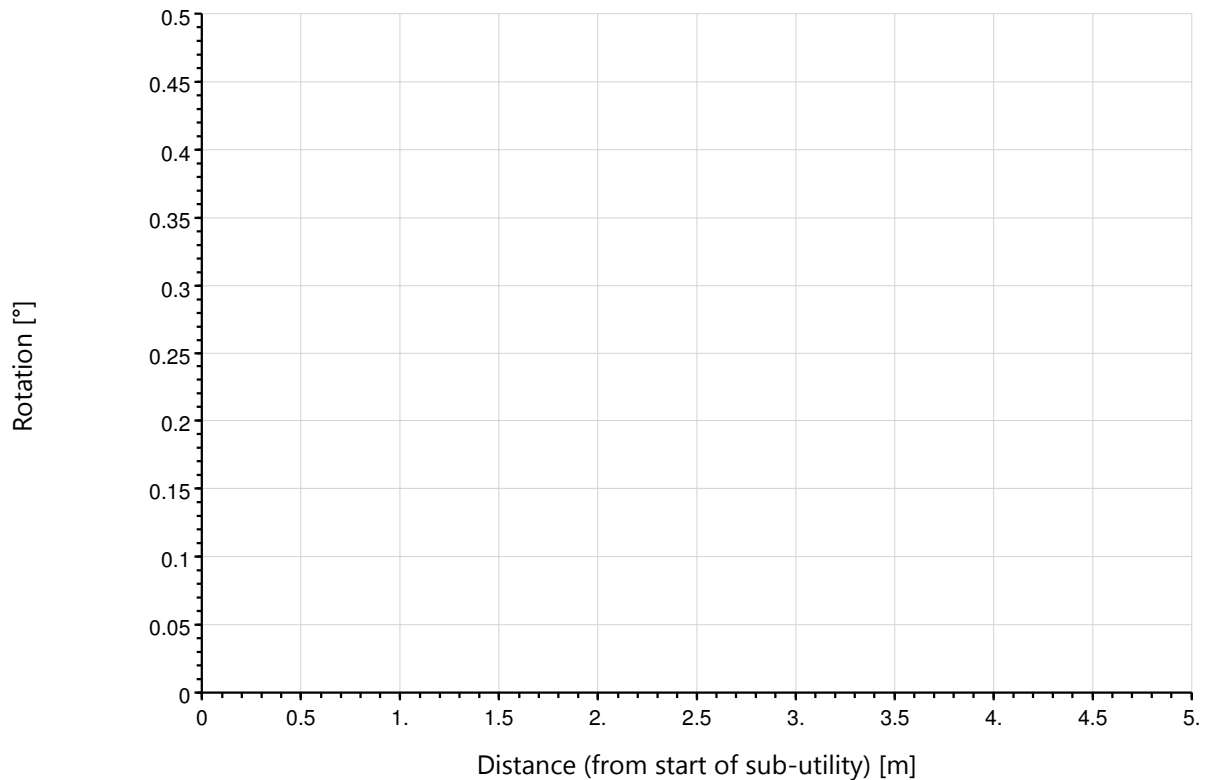


Distance (from start of sub-utility) [m]Note: Total pullout ignores the axial component where this is negative (i.e. comp

Specific Utility - Rotation Chart

Stage: Base model, Specific Utility 10: Assumed FW400 connection to TW2_1/1

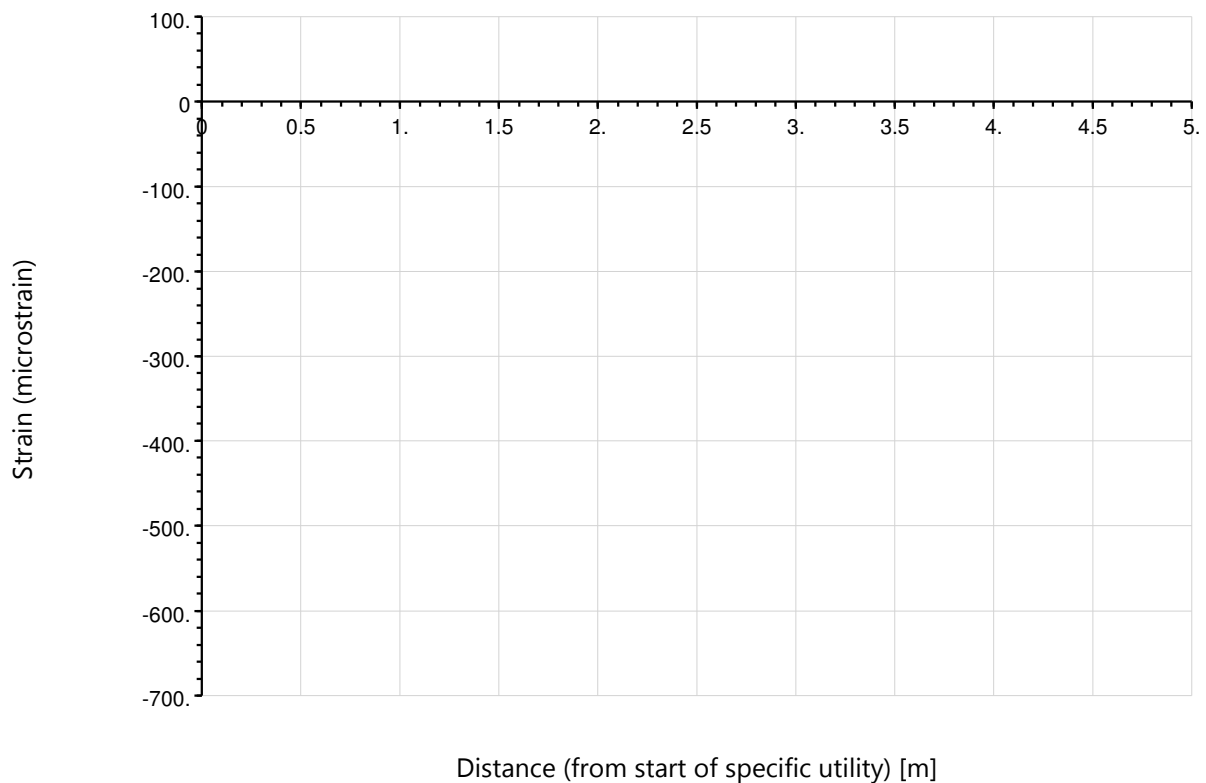
— Rotation (factored)
— Rotation Limit



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 10: Assumed FW400 connection to TW2, 1/1

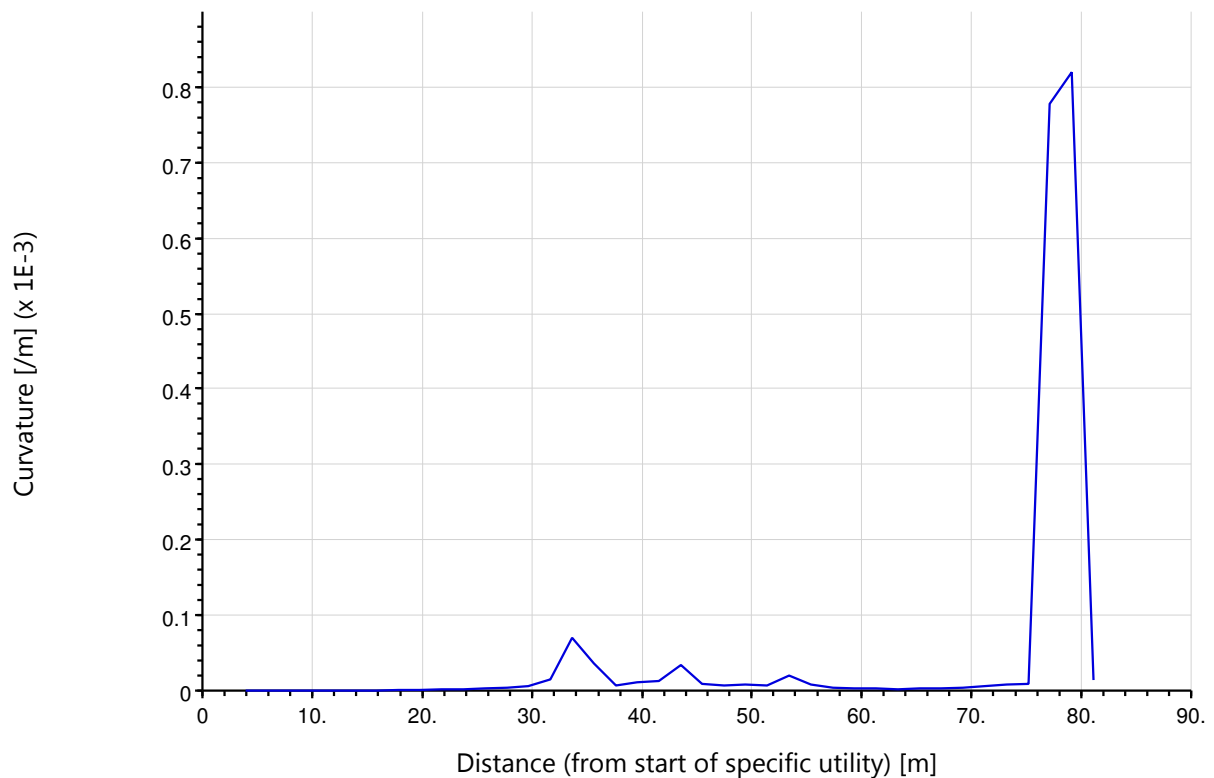
- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- Combined Compressive Strain (factored)
- Allowable Tensile Strain
- Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 6: TW Fresh Water (a) - St Pancras/1

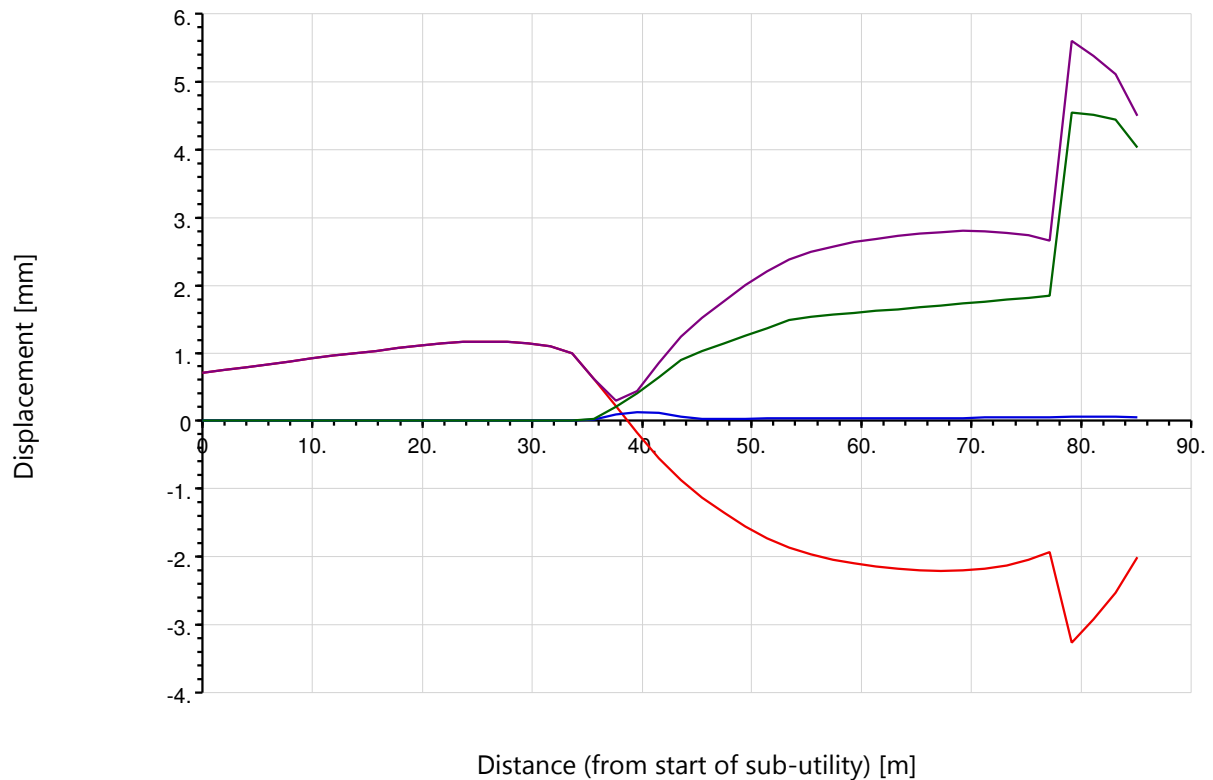
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 6: TW Fresh Water (a) - St Pancras/1

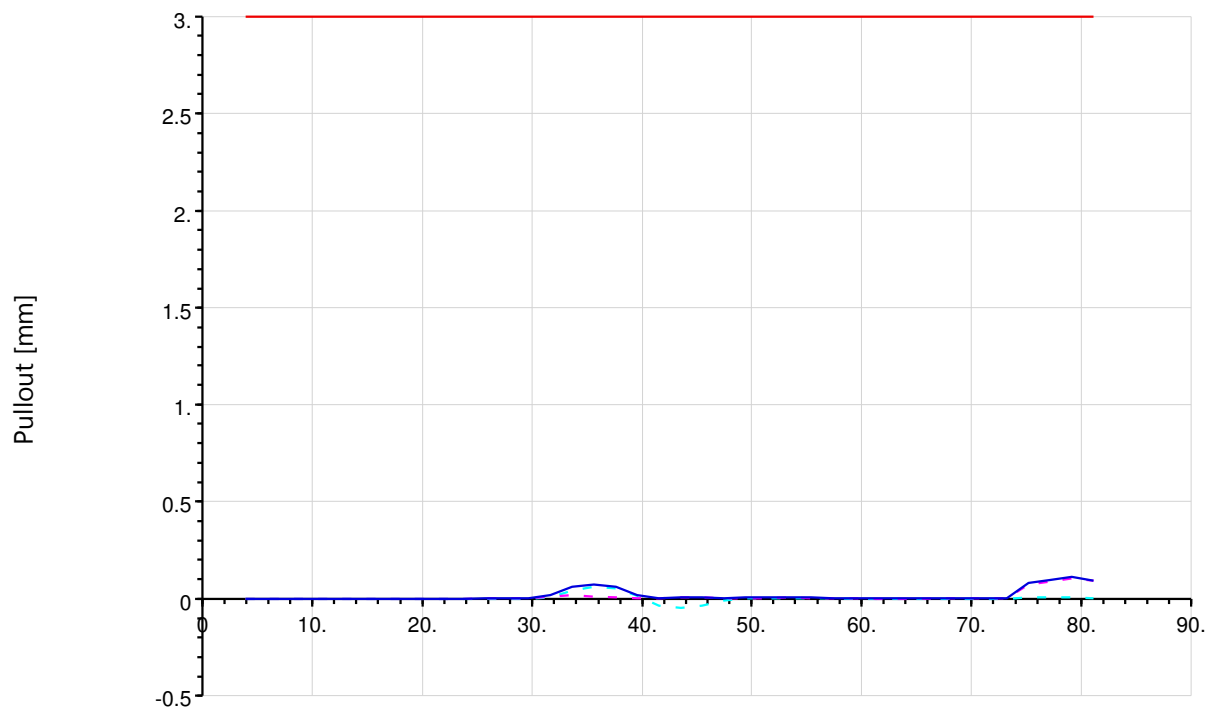
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - Pullout Chart

Stage: Base model, Specific Utility 6: TW Fresh Water (a) - St Pancras/1

- - - Axial Pullout (factored)
- - - Flexural Pullout (factored)
- Total Pullout (factored)
- Total Pullout Limit



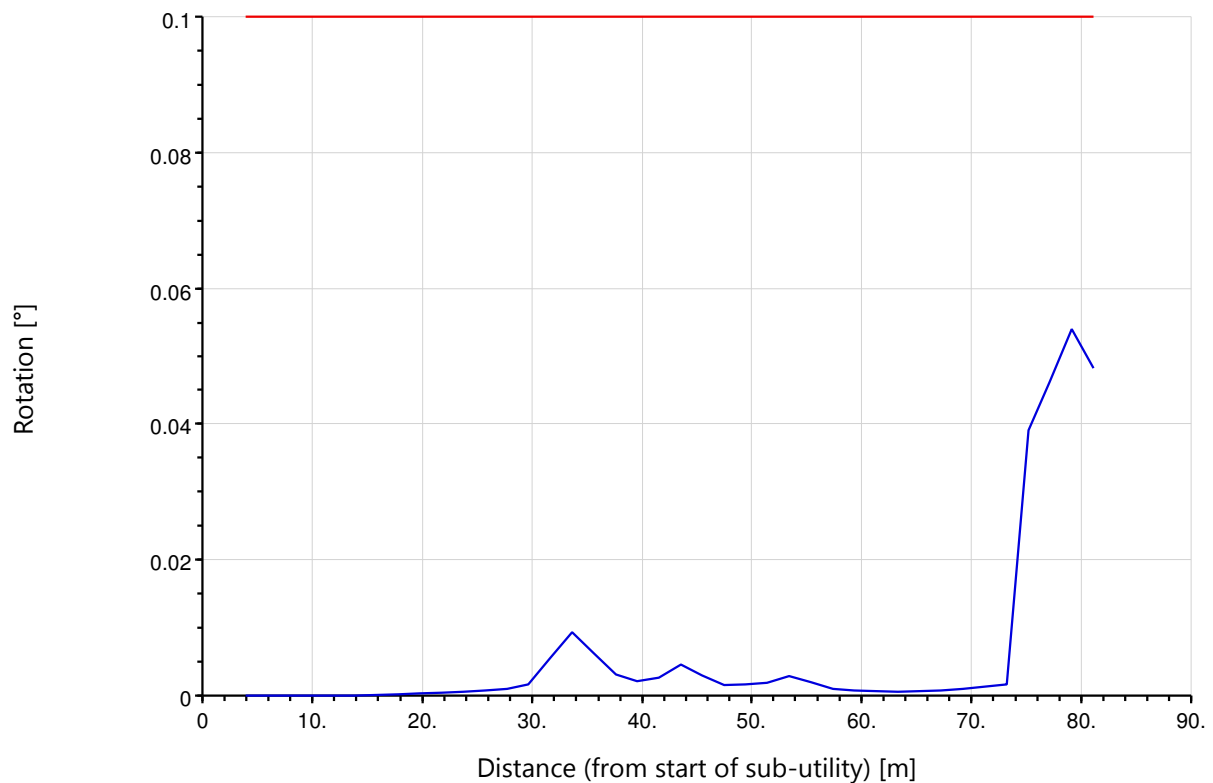
Distance (from start of sub-utility) [m] Note: Total pullout ignores the axial component where this is negative (i.e. comp

Specific Utility - Rotation Chart

Stage: Base model, Specific Utility 6: TW Fresh Water (a) - St Pancras/1

— Rotation (factored)

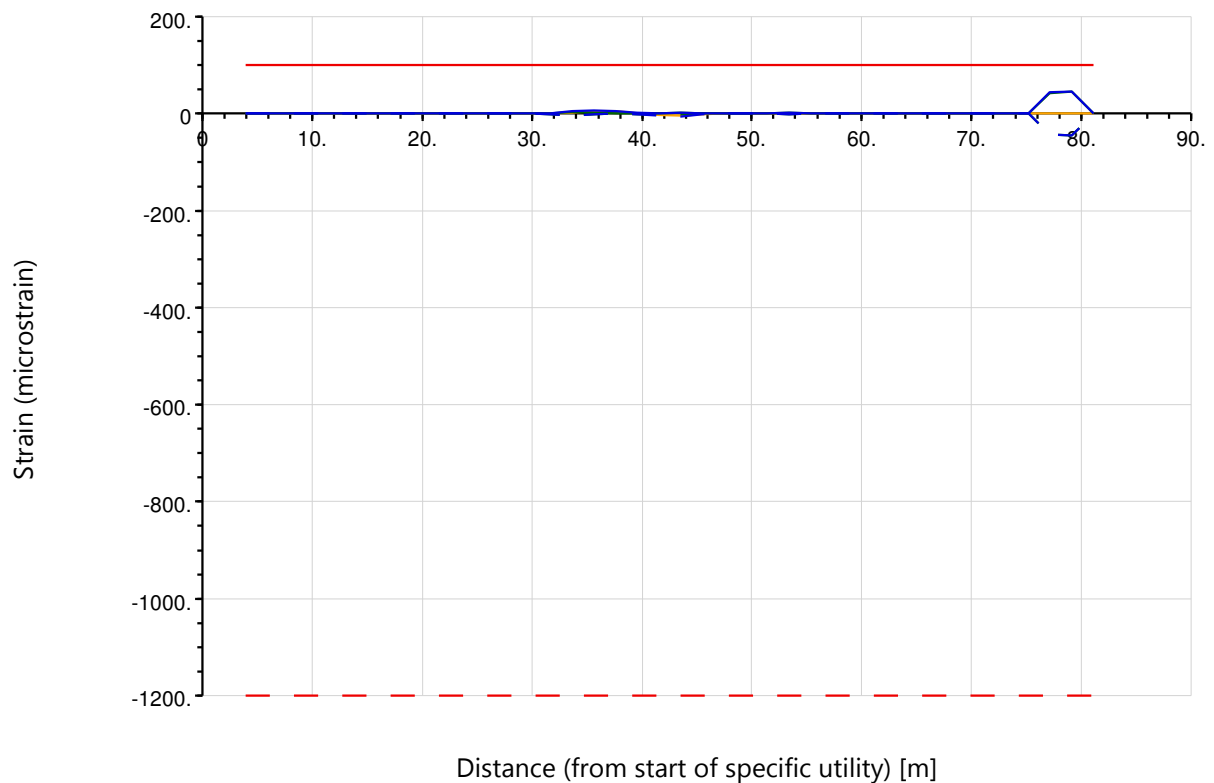
— Rotation Limit



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 6: TW Fresh Water (a) - St Pancras/1

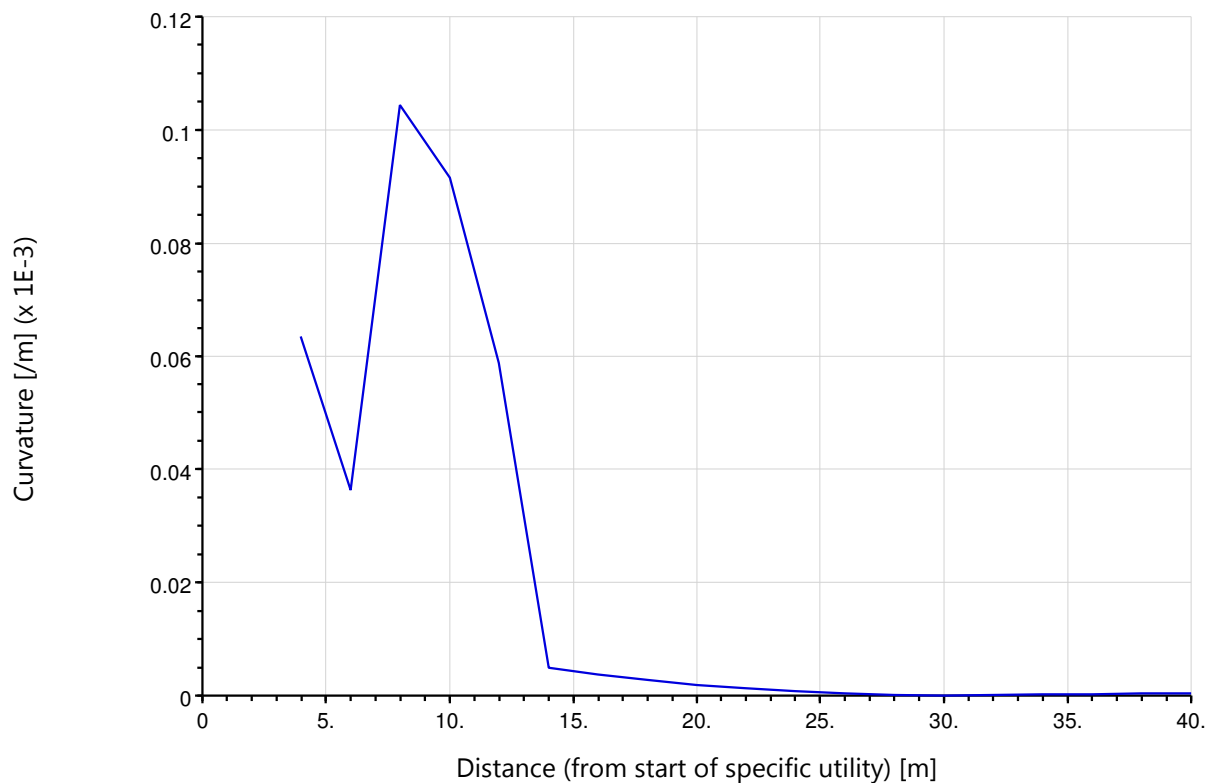
- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 7: TW Fresh Water (b) - St Pancras/1

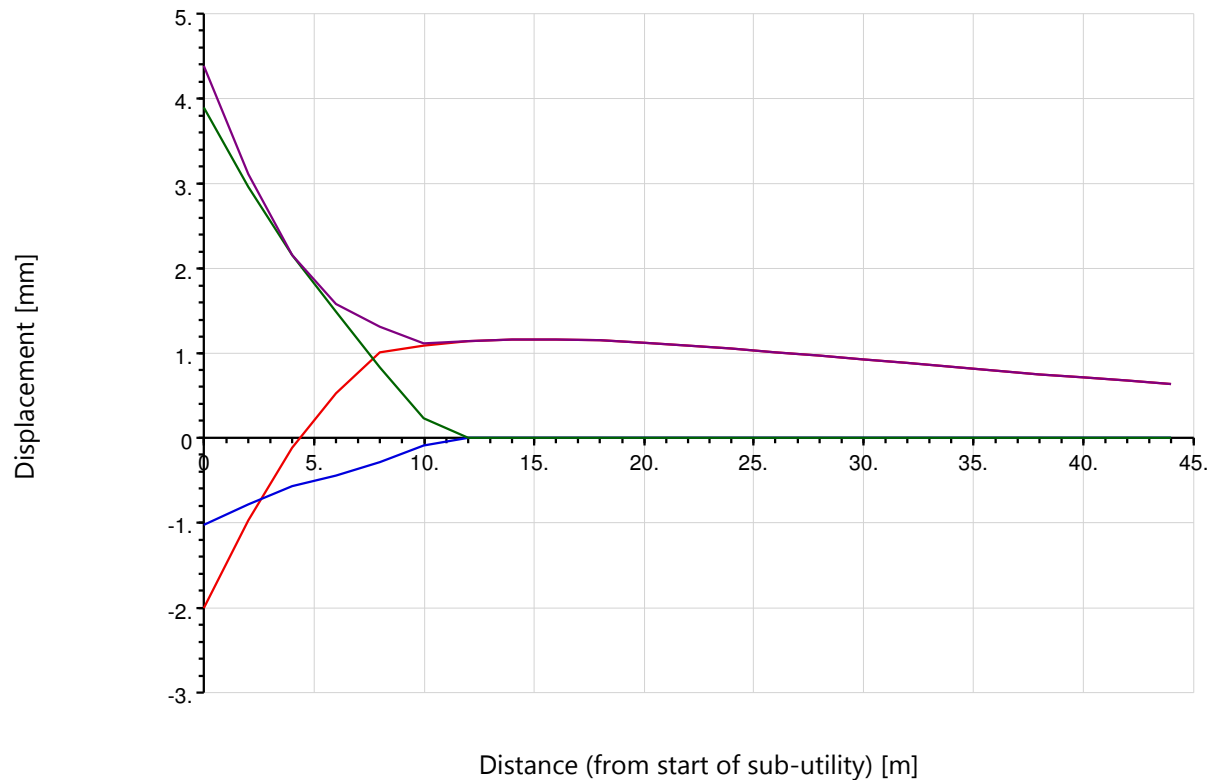
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 7: TW Fresh Water (b) - St Pancras/1

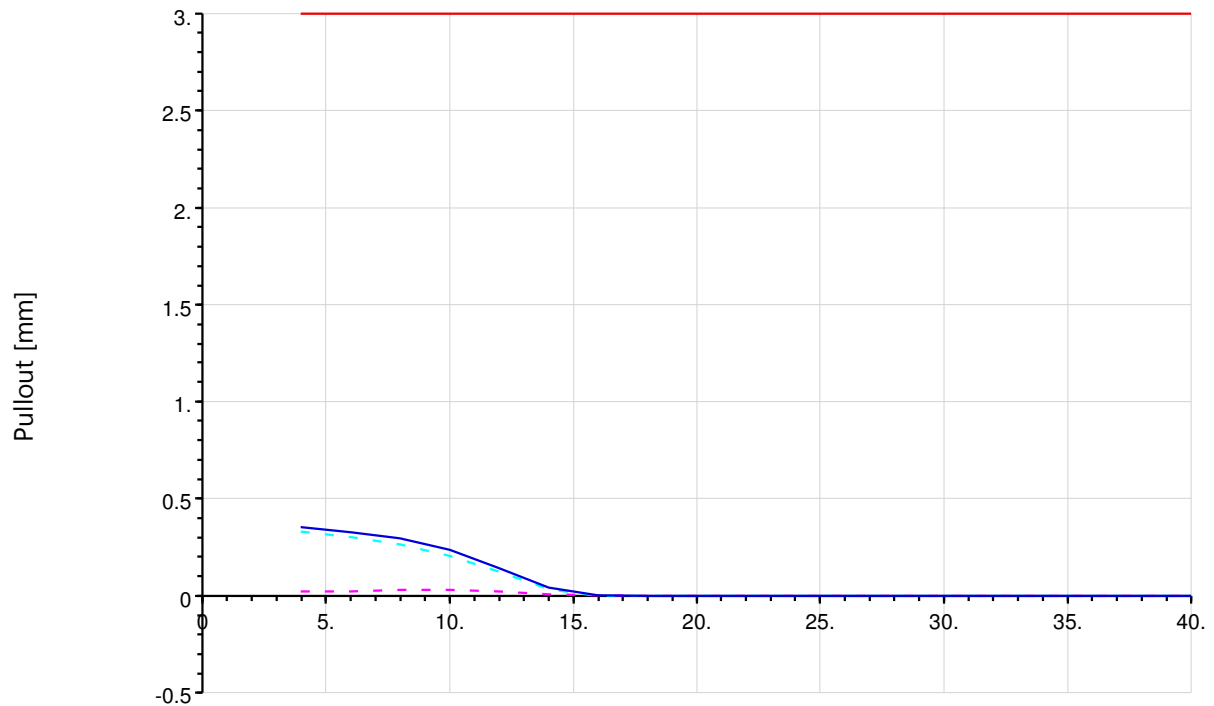
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - Pullout Chart

Stage: Base model, Specific Utility 7: TW Fresh Water (b) - St Pancras/1

- - - Axial Pullout (factored)
- - - Flexural Pullout (factored)
- Total Pullout (factored)
- Total Pullout Limit



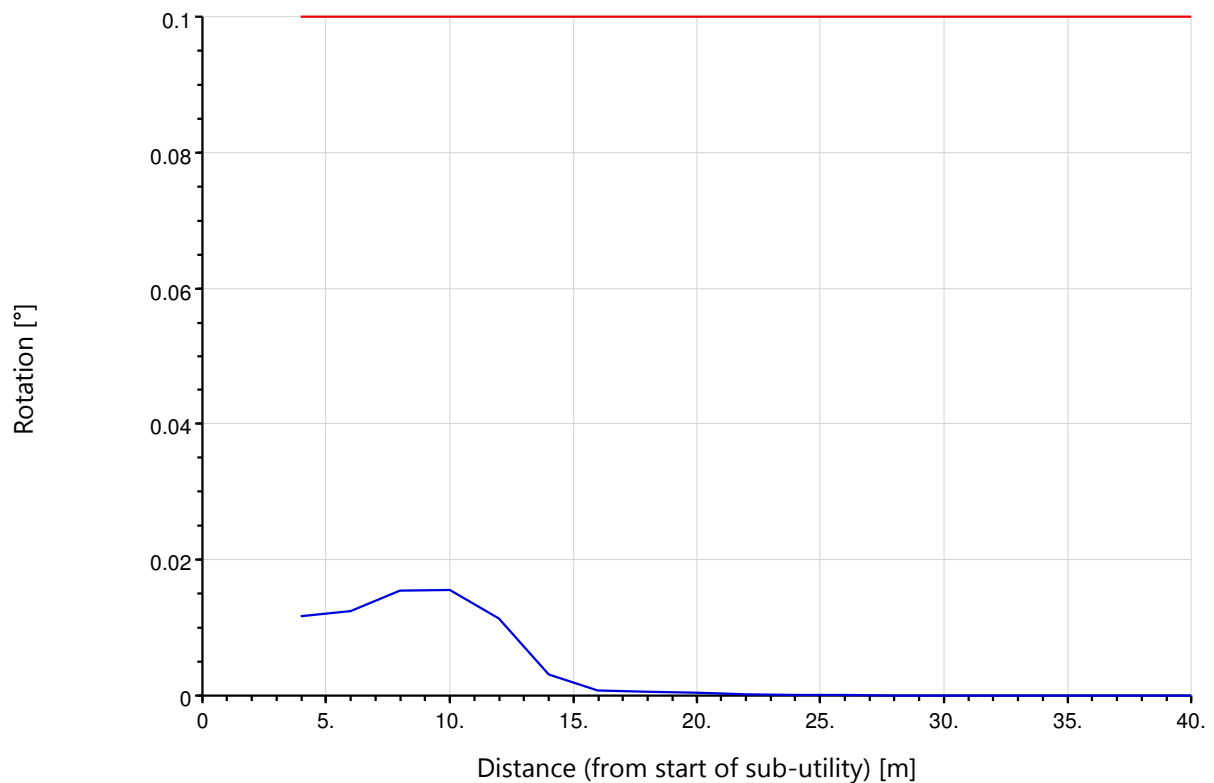
Distance (from start of sub-utility) [m] Note: Total pullout ignores the axial component where this is negative (i.e. comp

Specific Utility - Rotation Chart

Stage: Base model, Specific Utility 7: TW Fresh Water (b) - St Pancras/1

— Rotation (factored)

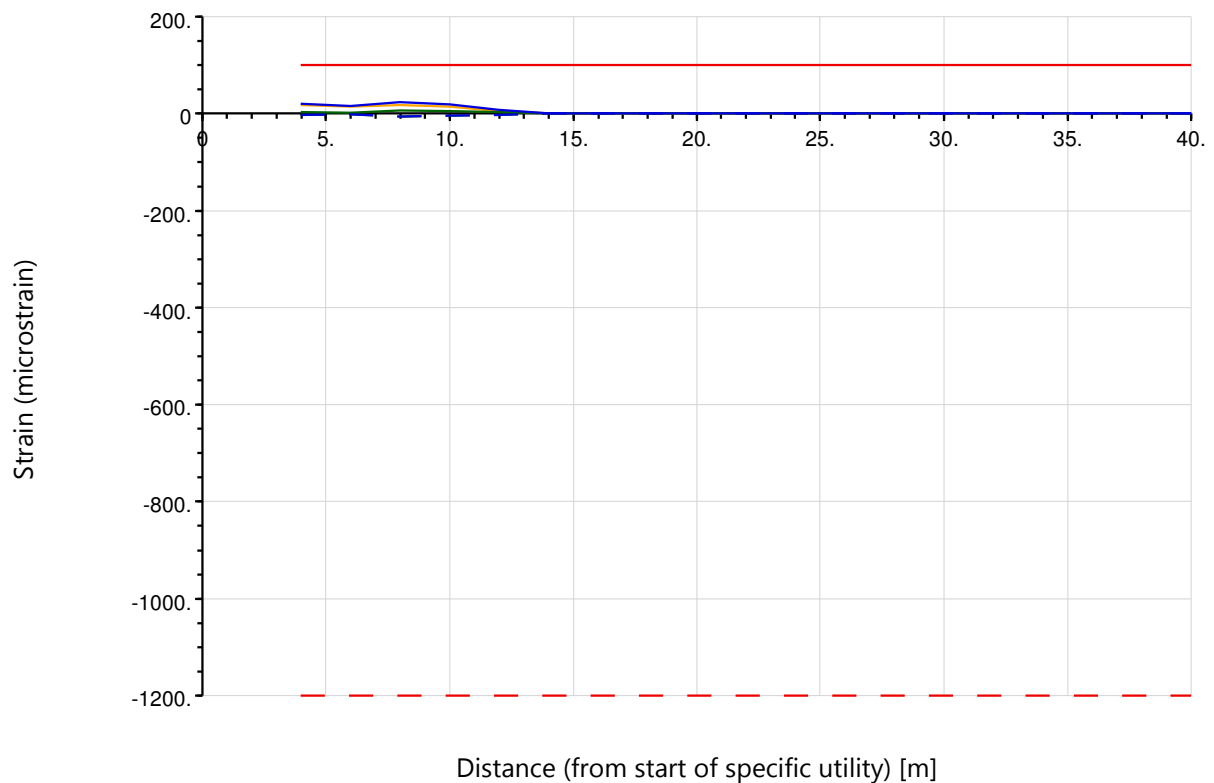
— Rotation Limit



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 7: TW Fresh Water (b) - St Pancras/1

- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



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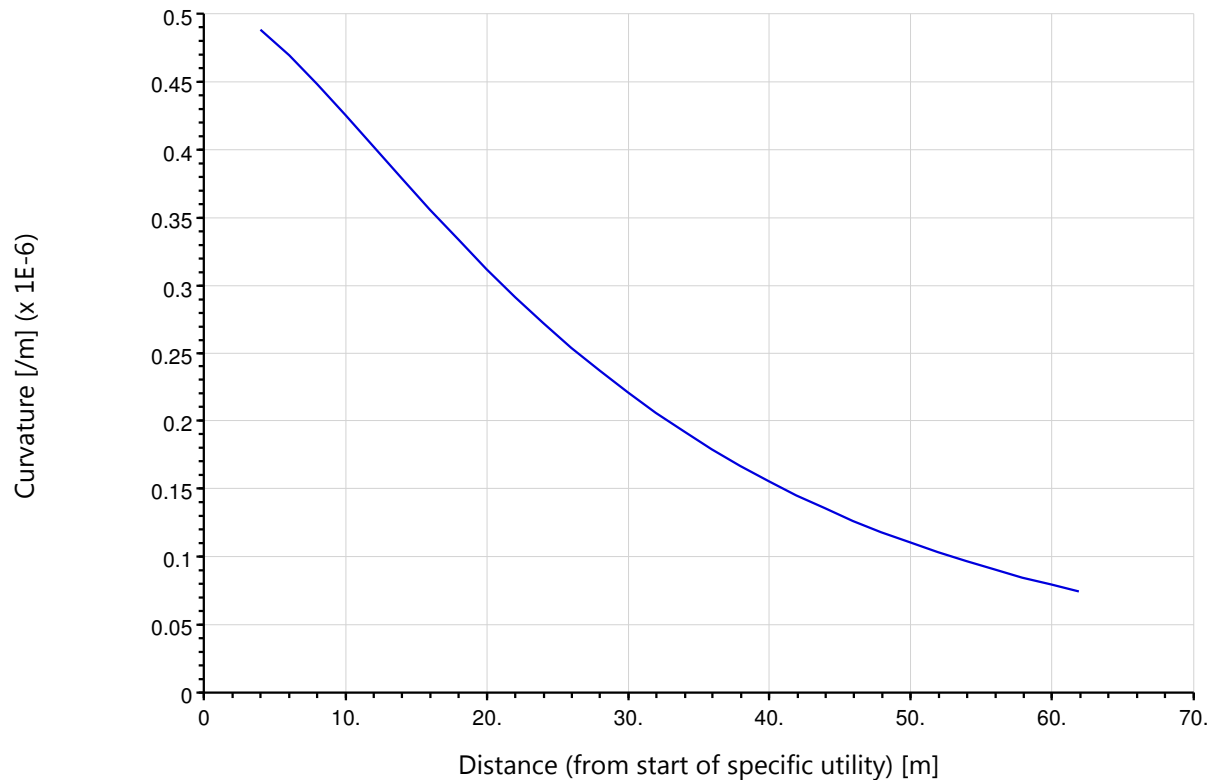
TW Sewer Assessment

Plot A - (Demo+Wall Inst+Exc-Smoothed)+New Load (ST)

Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 8: TW Fresh Water (c) - St Pancras/1

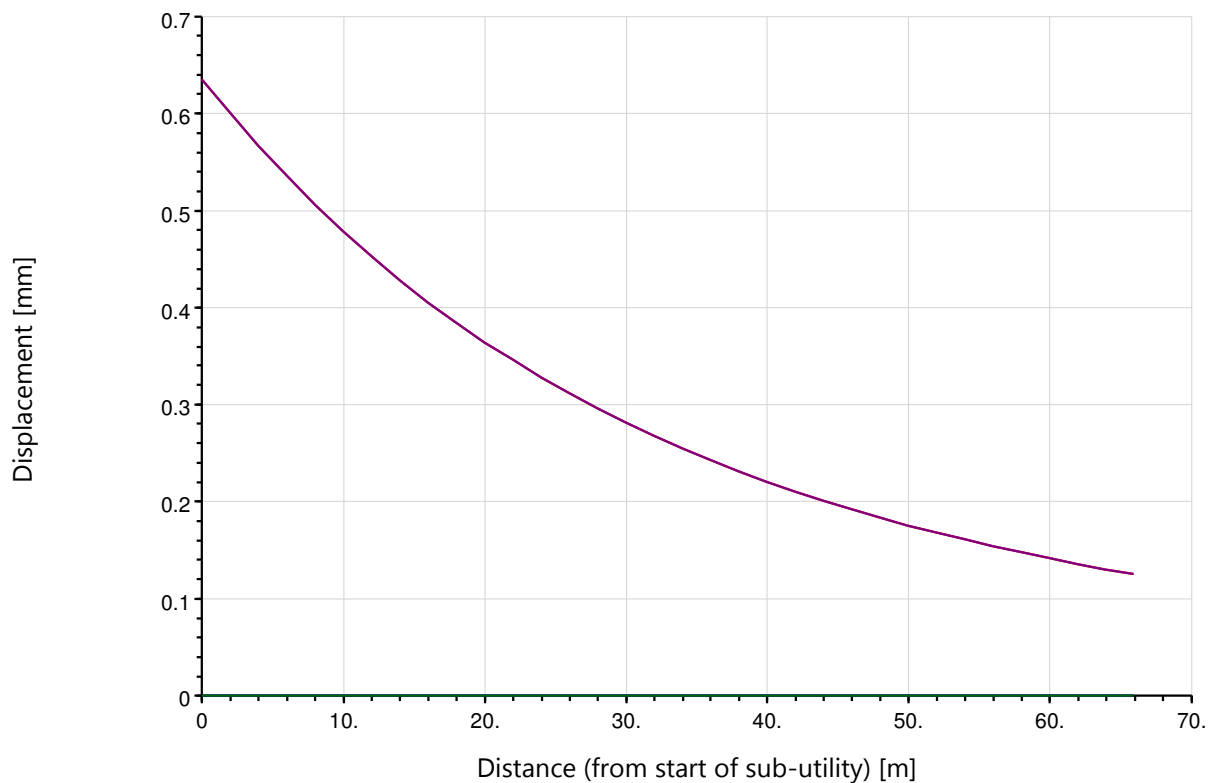
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 8: TW Fresh Water (c) - St Pancras/1

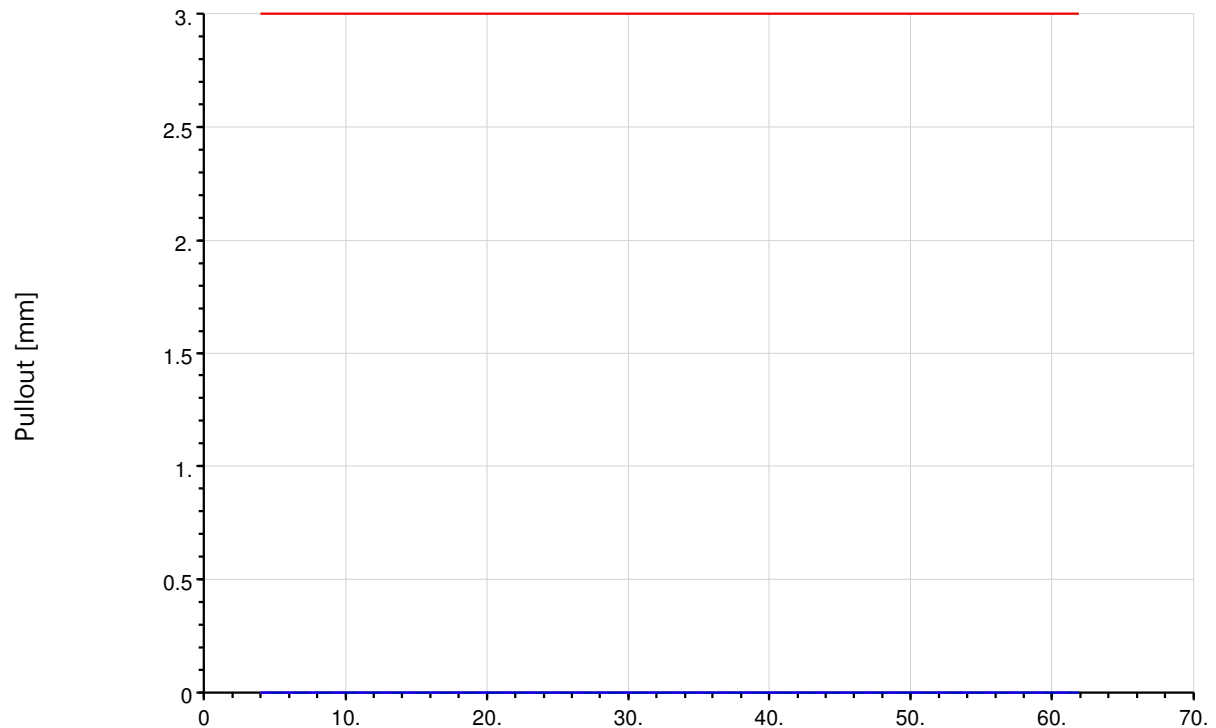
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - Pullout Chart

Stage: Base model, Specific Utility 8: TW Fresh Water (c) - St Pancras/1

- - - Axial Pullout (factored)
- - - Flexural Pullout (factored)
- Total Pullout (factored)
- Total Pullout Limit



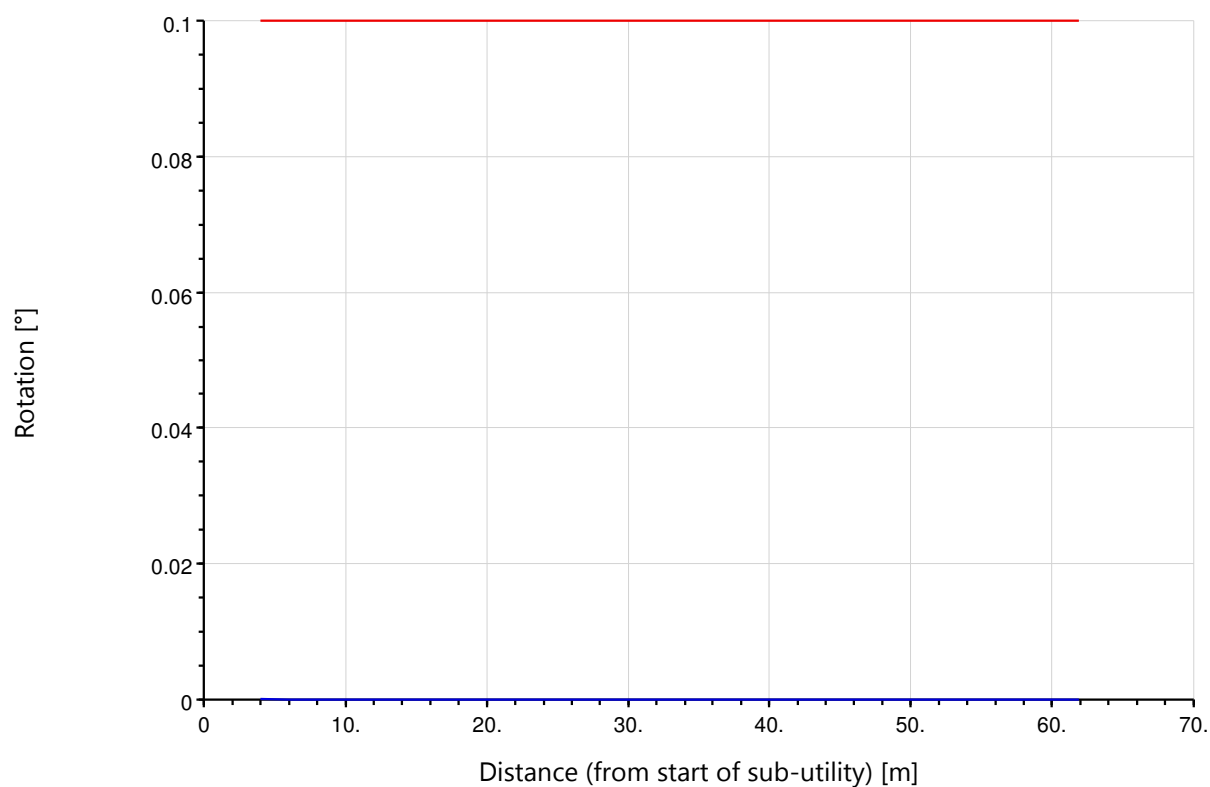
Distance (from start of sub-utility) [m] Note: Total pullout ignores the axial component where this is negative (i.e. comp

Specific Utility - Rotation Chart

Stage: Base model, Specific Utility 8: TW Fresh Water (c) - St Pancras/1

— Rotation (factored)

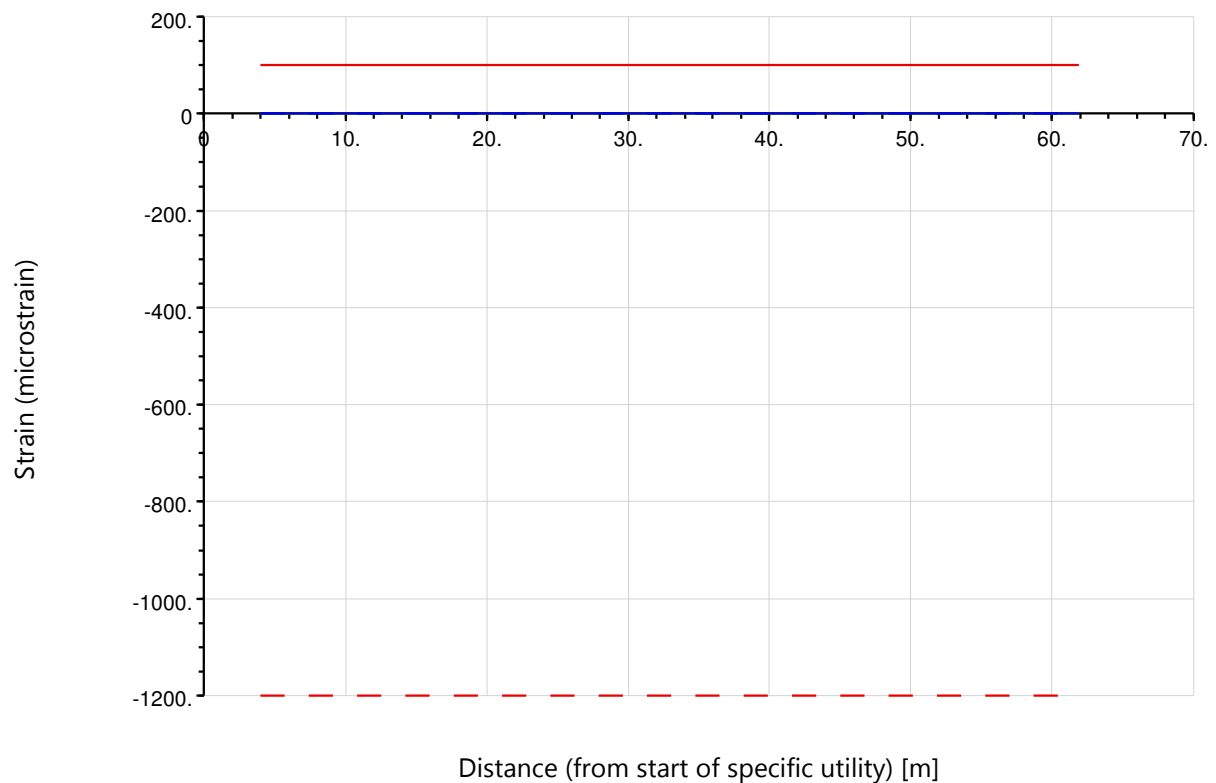
— Rotation Limit



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 8: TW Fresh Water (c) - St Pancras/1

- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



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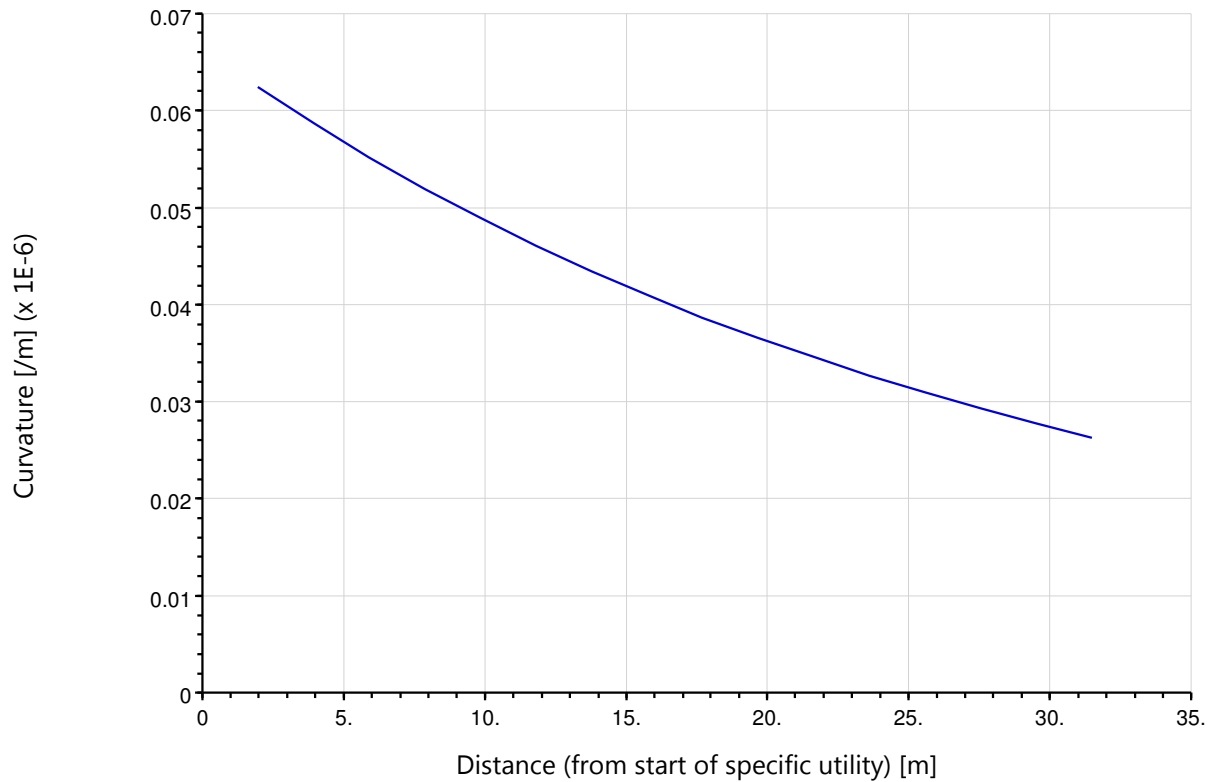
TW Sewer Assessment

Plot A - (Demo+Wall Inst+Exc-Smoothed)+New Load (ST)

Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 9: TW Fresh Water (d) - St Pancras/1

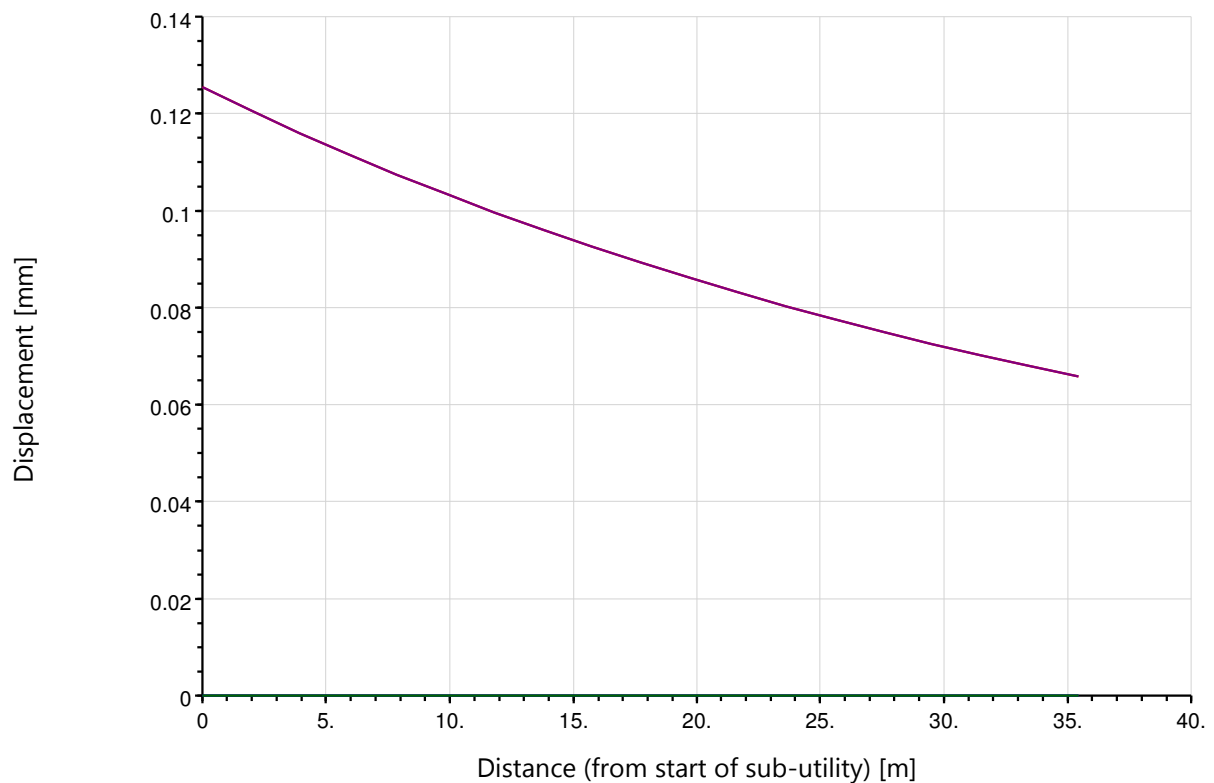
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 9: TW Fresh Water (d) - St Pancras/1

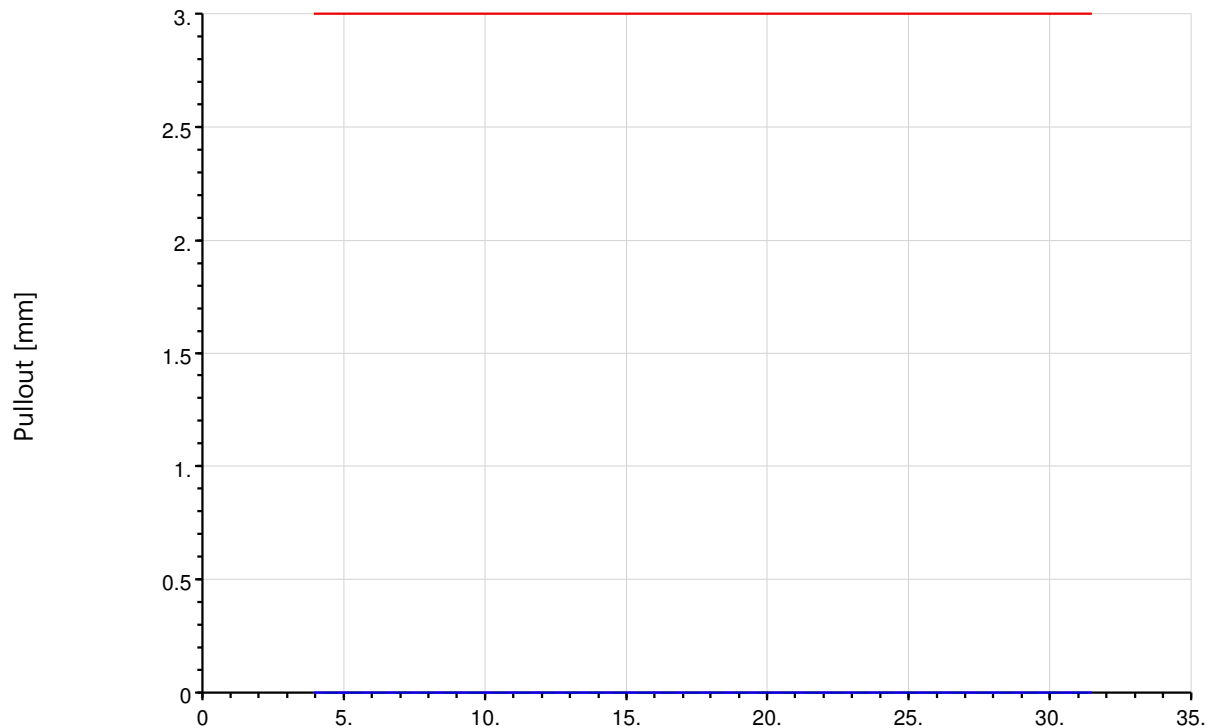
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - Pullout Chart

Stage: Base model, Specific Utility 9: TW Fresh Water (d) - St Pancras/1

- - - Axial Pullout (factored)
- - - Flexural Pullout (factored)
- Total Pullout (factored)
- Total Pullout Limit



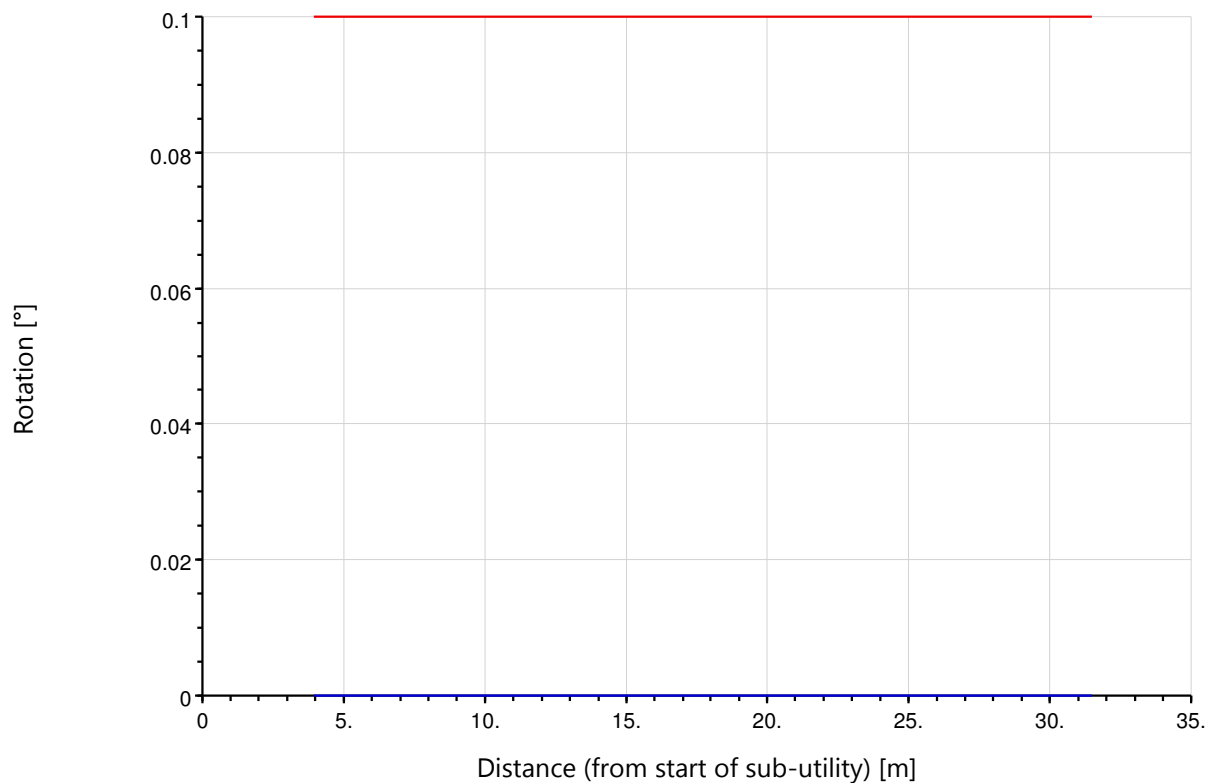
Distance (from start of sub-utility) [m] Note: Total pullout ignores the axial component where this is negative (i.e. comp

Specific Utility - Rotation Chart

Stage: Base model, Specific Utility 9: TW Fresh Water (d) - St Pancras/1

— Rotation (factored)

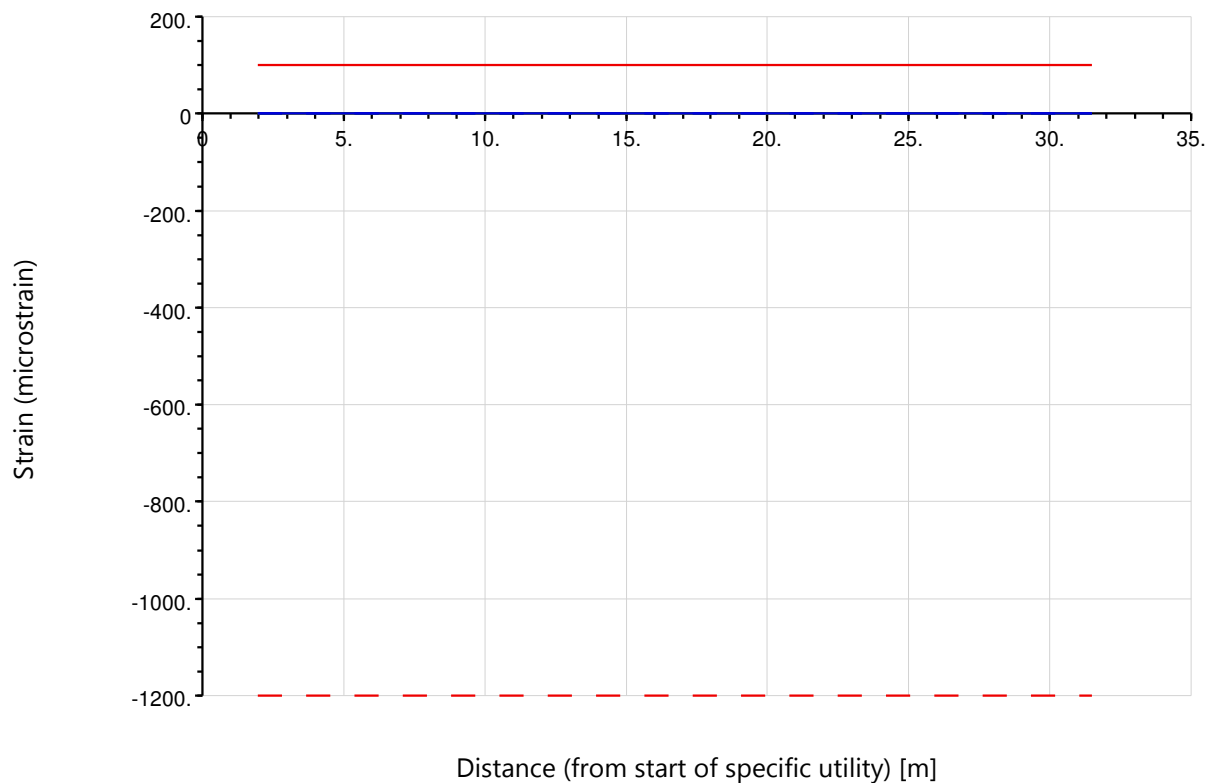
— Rotation Limit



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 9: TW Fresh Water (d) - St Pancras/1

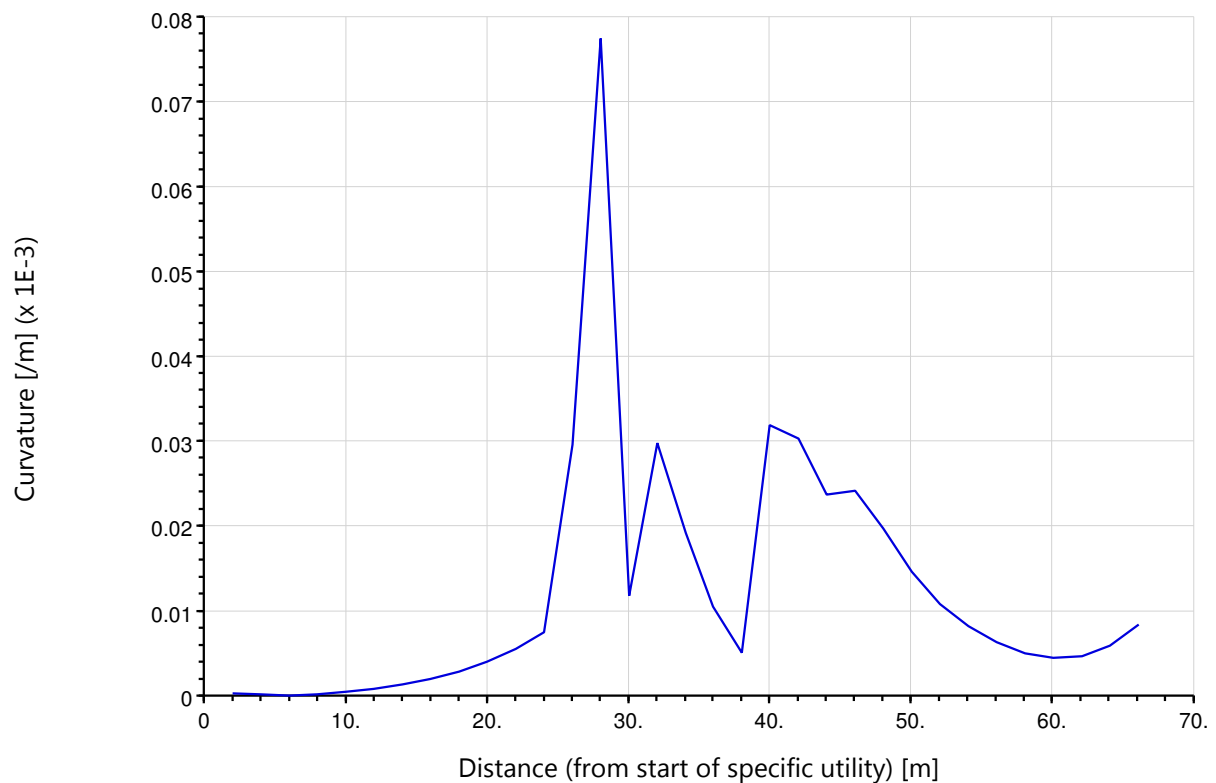
- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 2: TWS(2)_1/1

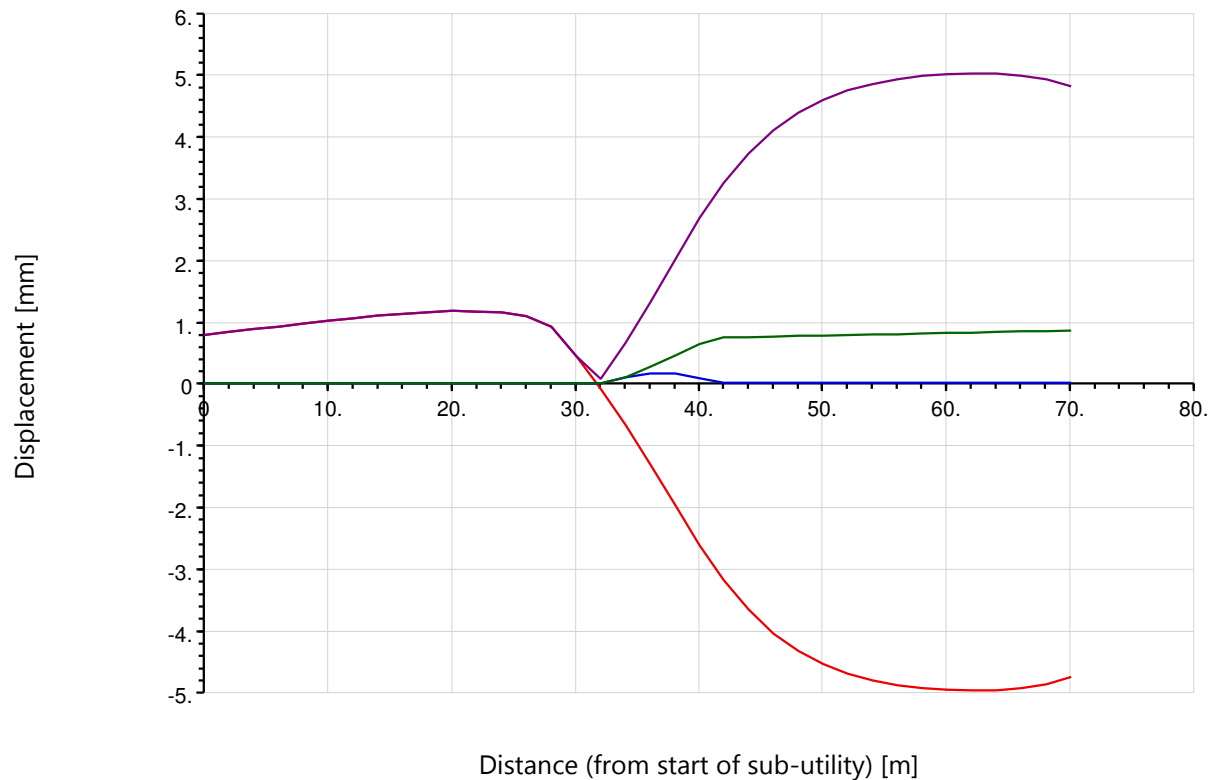
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 2: TWS(2)_1/1

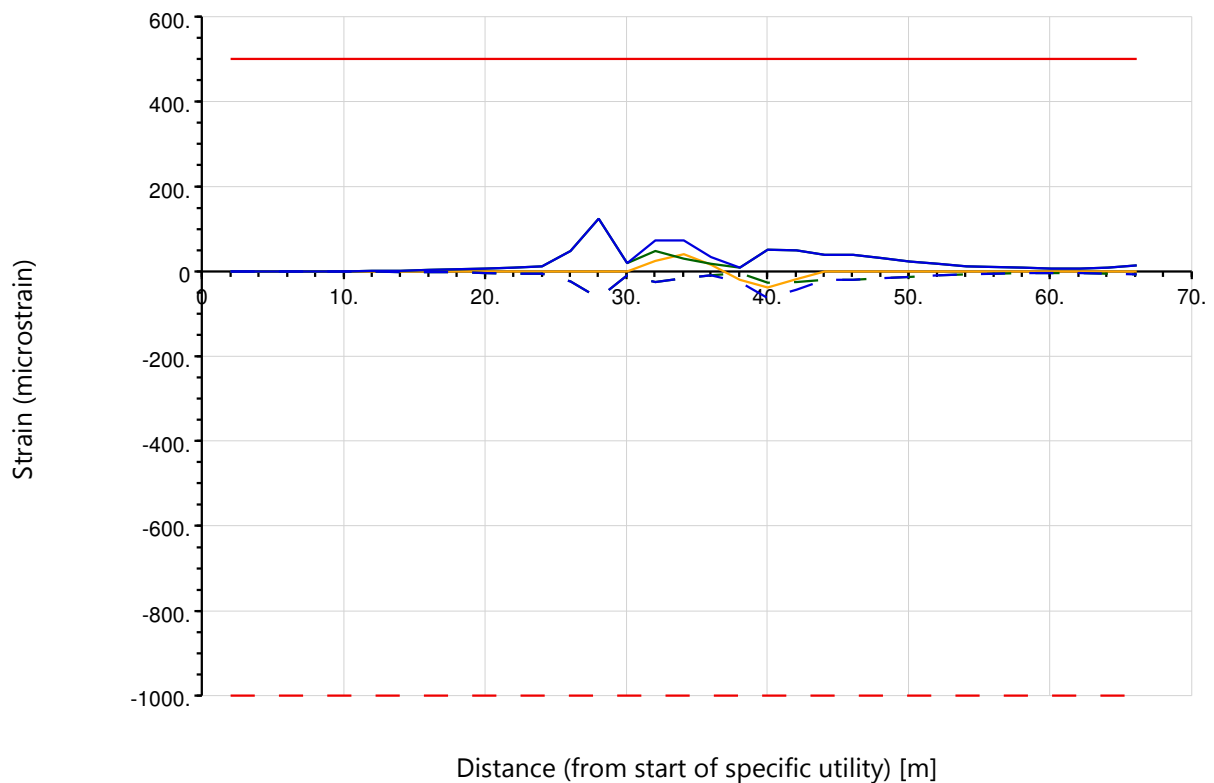
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 2: TWS(2)_1/1

- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



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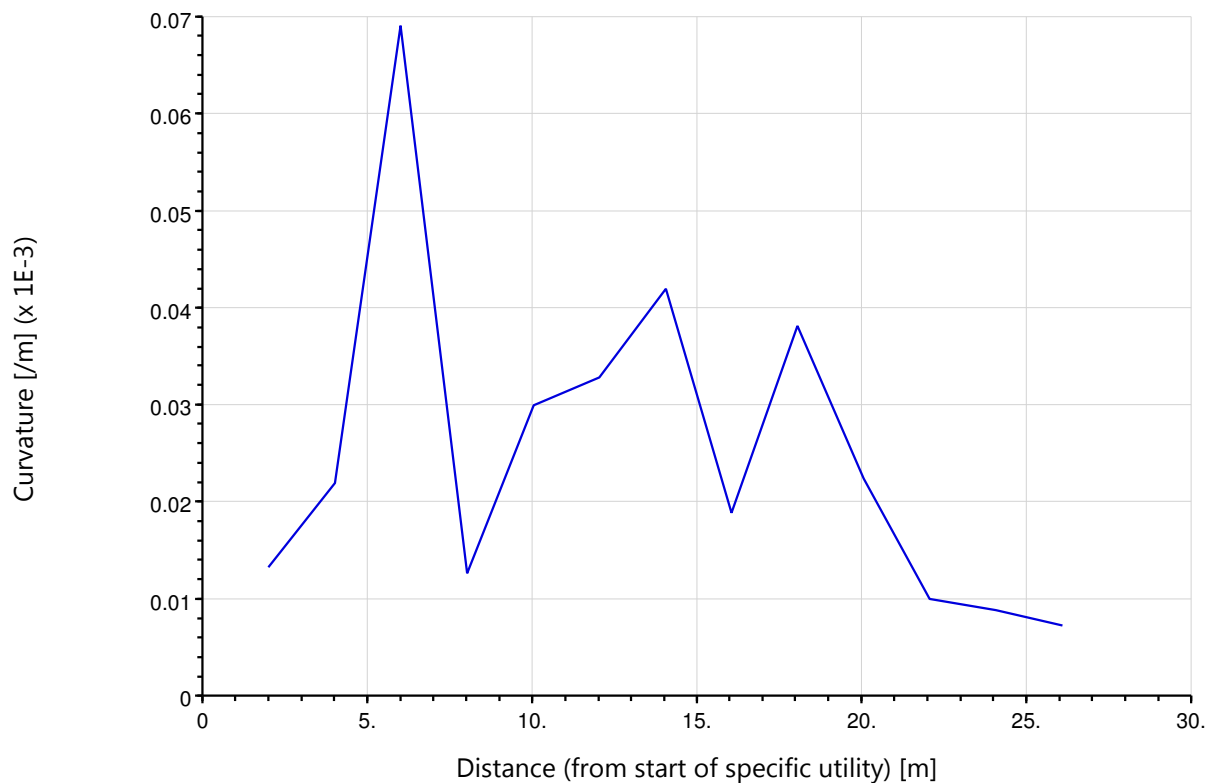
TW Sewer Assessment

Plot A - (Demo+Wall Inst+Exc-Smoothed)+New Load (ST)

Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 3: TWS(2)_2/1

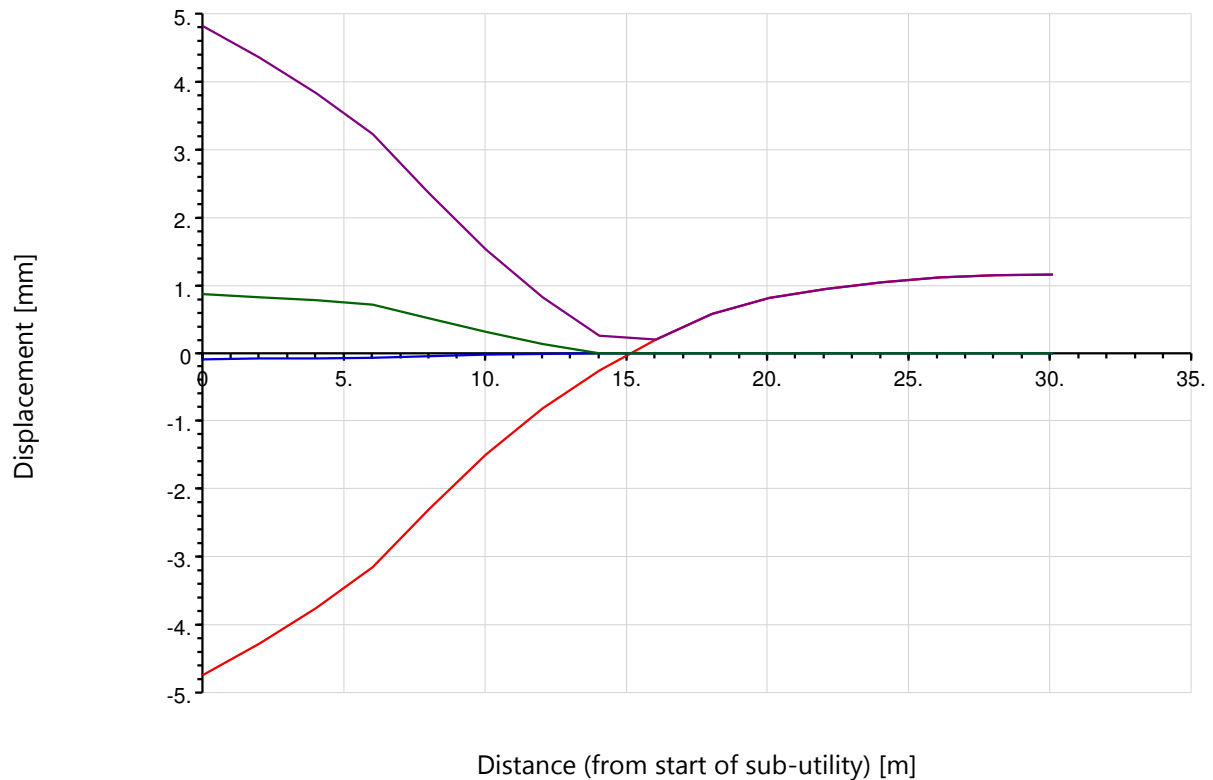
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 3: TWS(2)_2/1

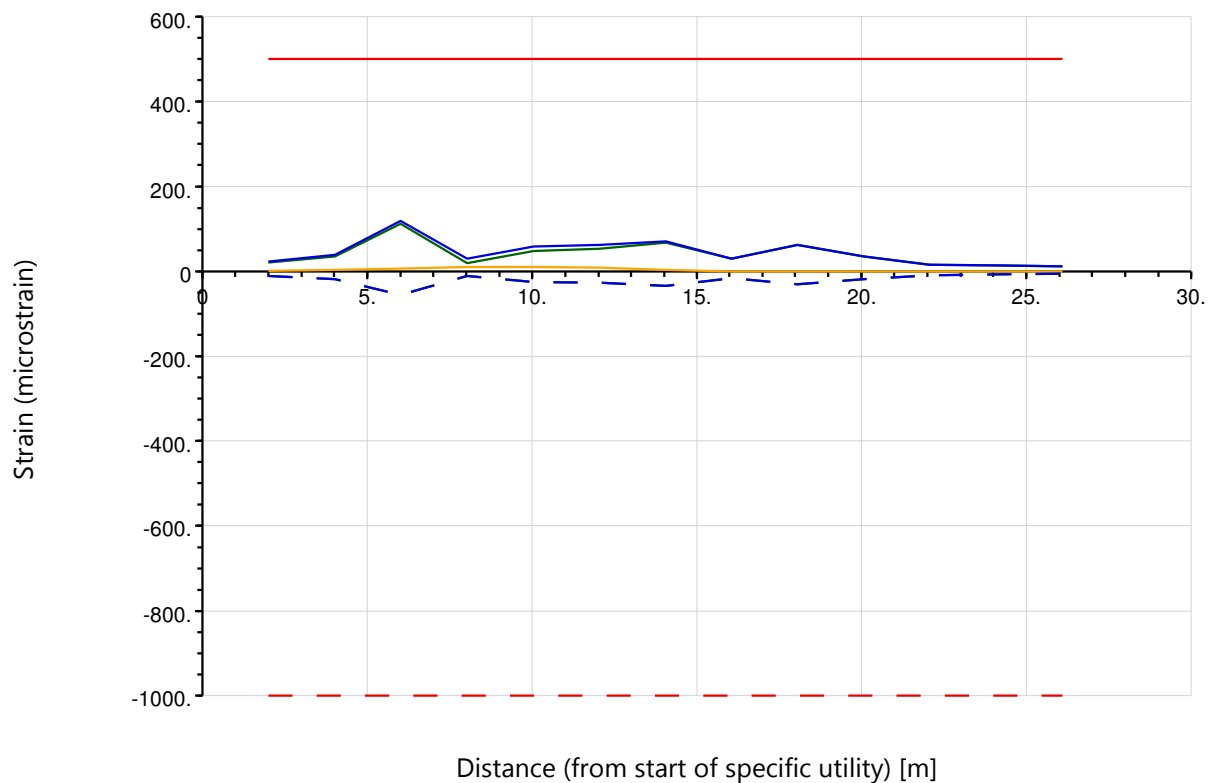
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 3: TWS(2)_2/1

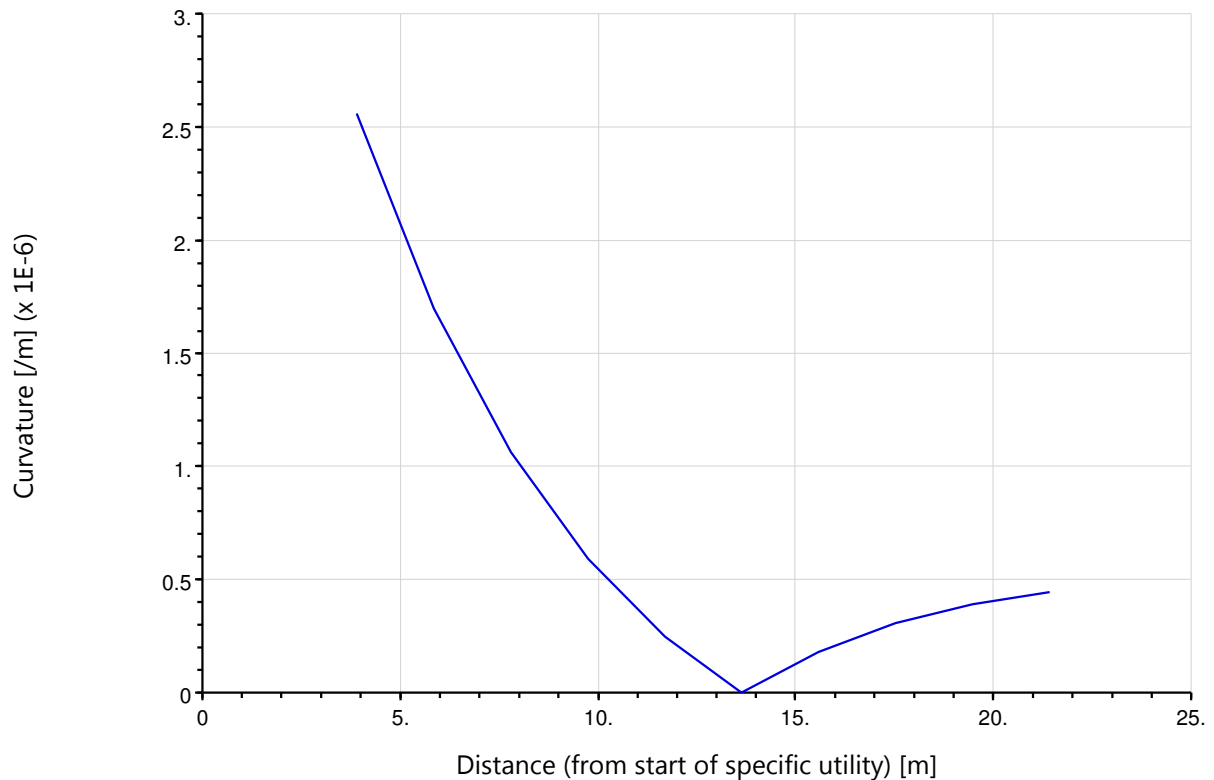
- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 4: TWS(2)_3/1

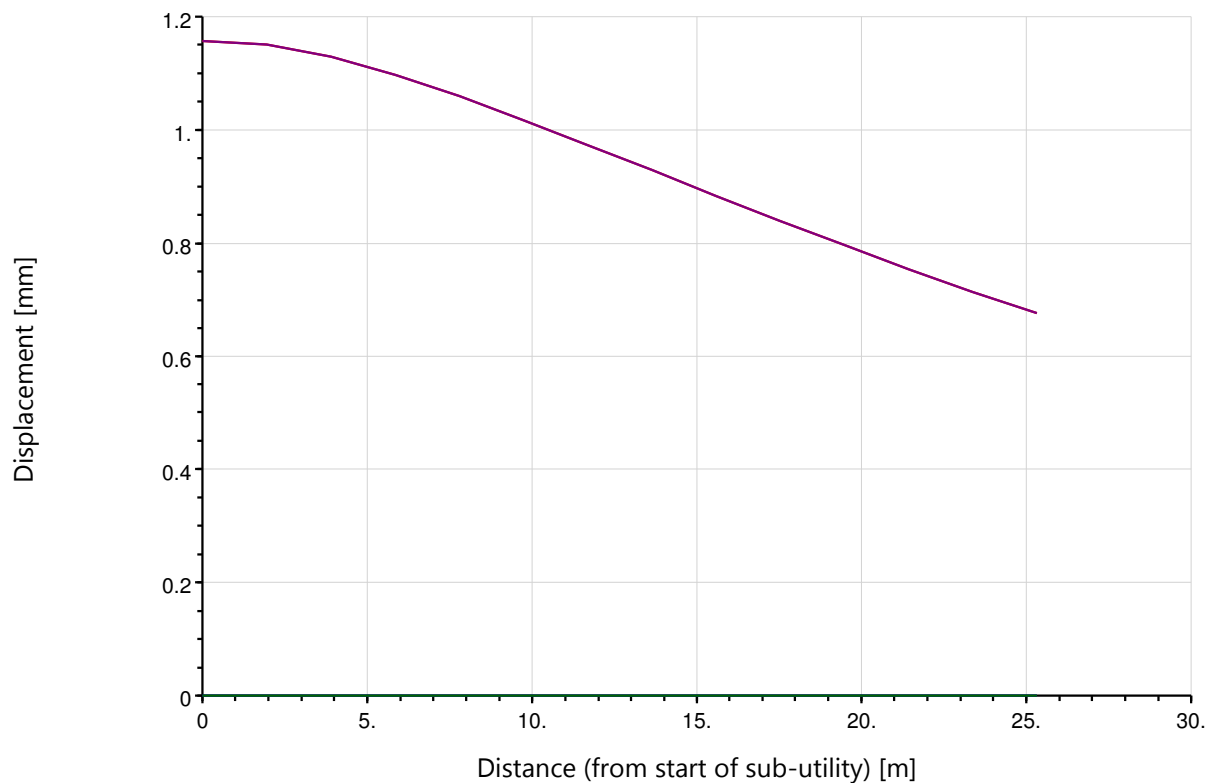
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 4: TWS(2)_3/1

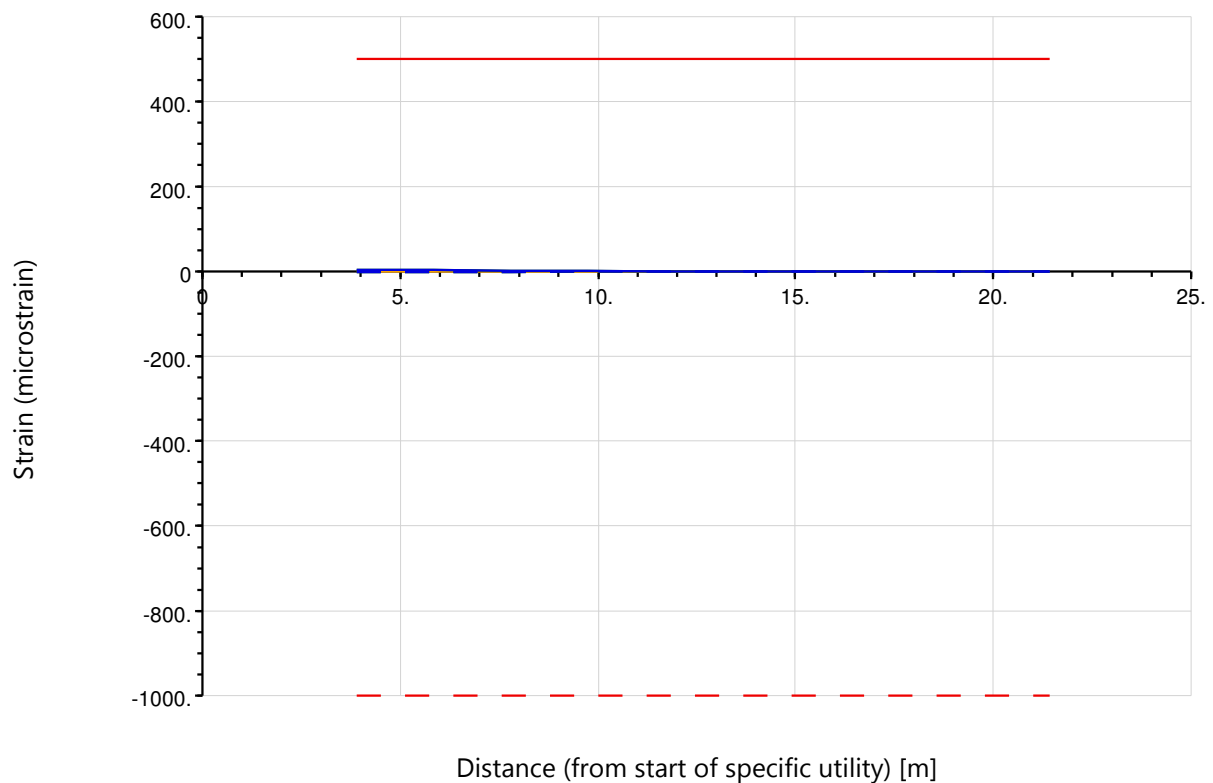
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 4: TWS(2)_3/1

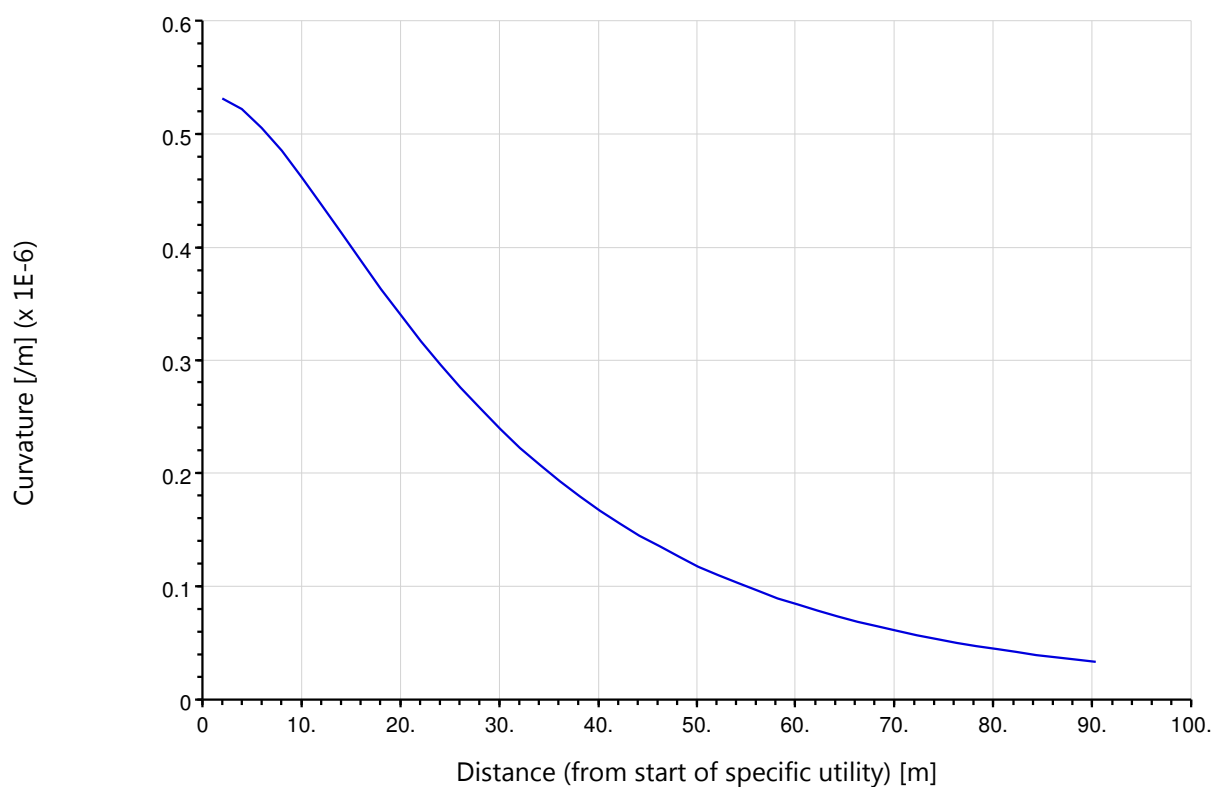
- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 5: TWS(2)_4/1

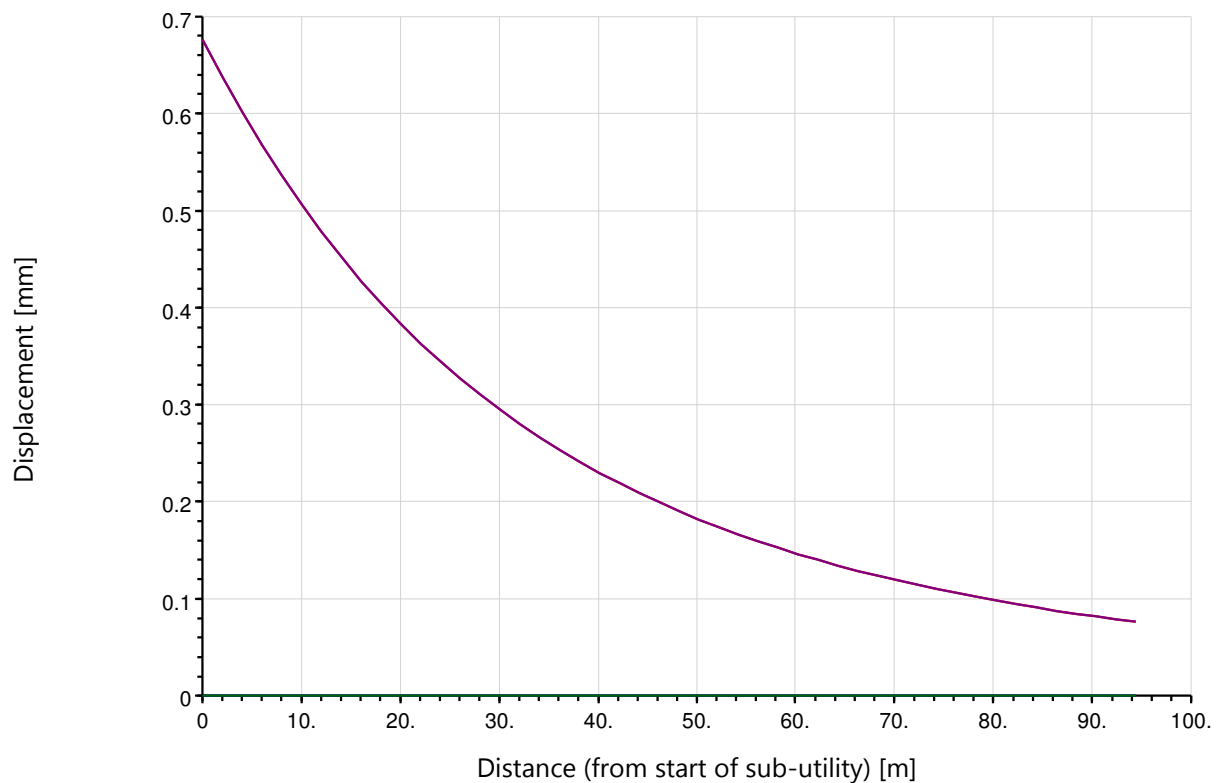
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 5: TWS(2)_4/1

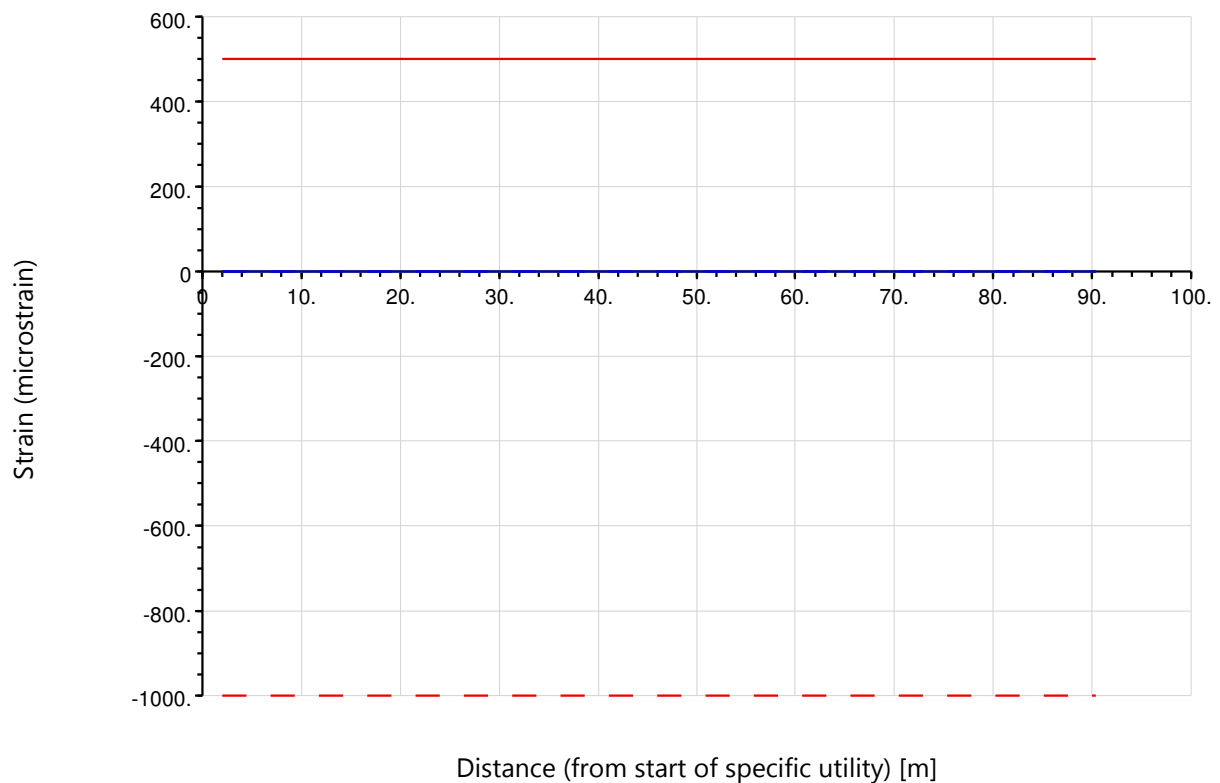
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 5: TWS(2)_4/1

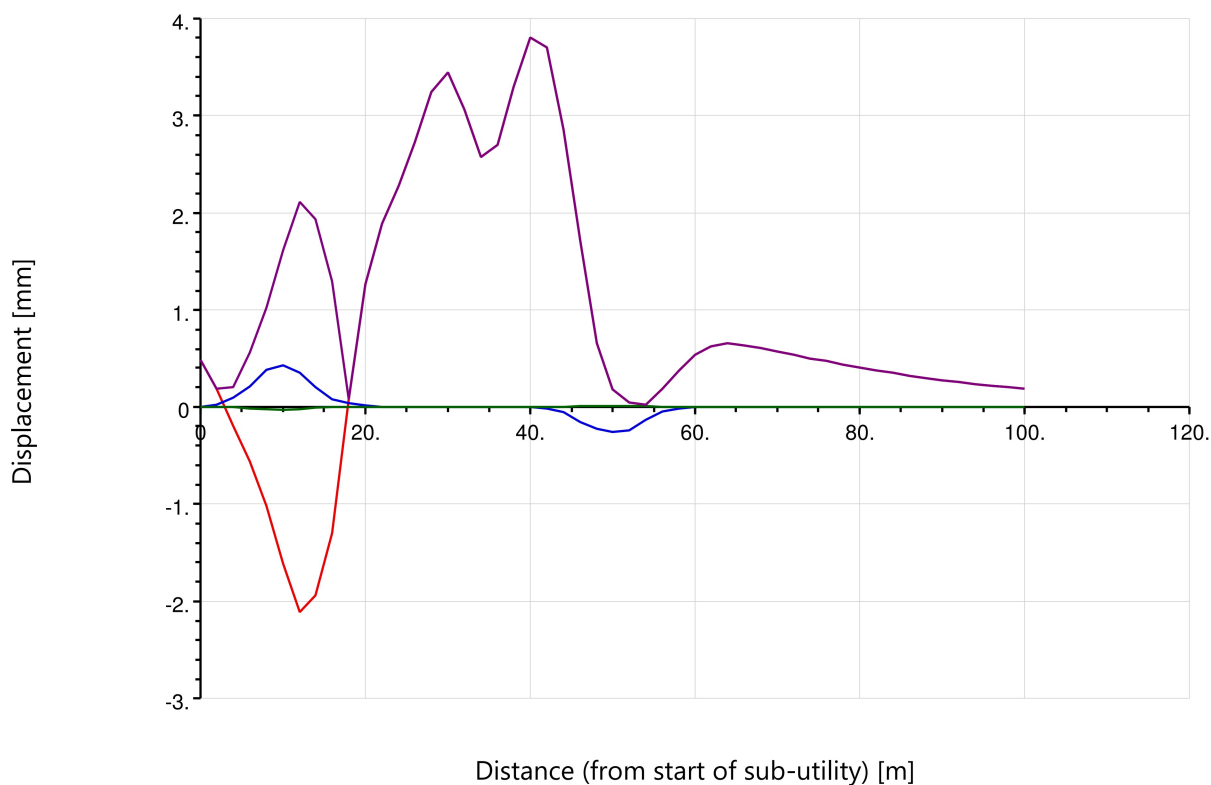
- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 1: TWS(1)_1/1

- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



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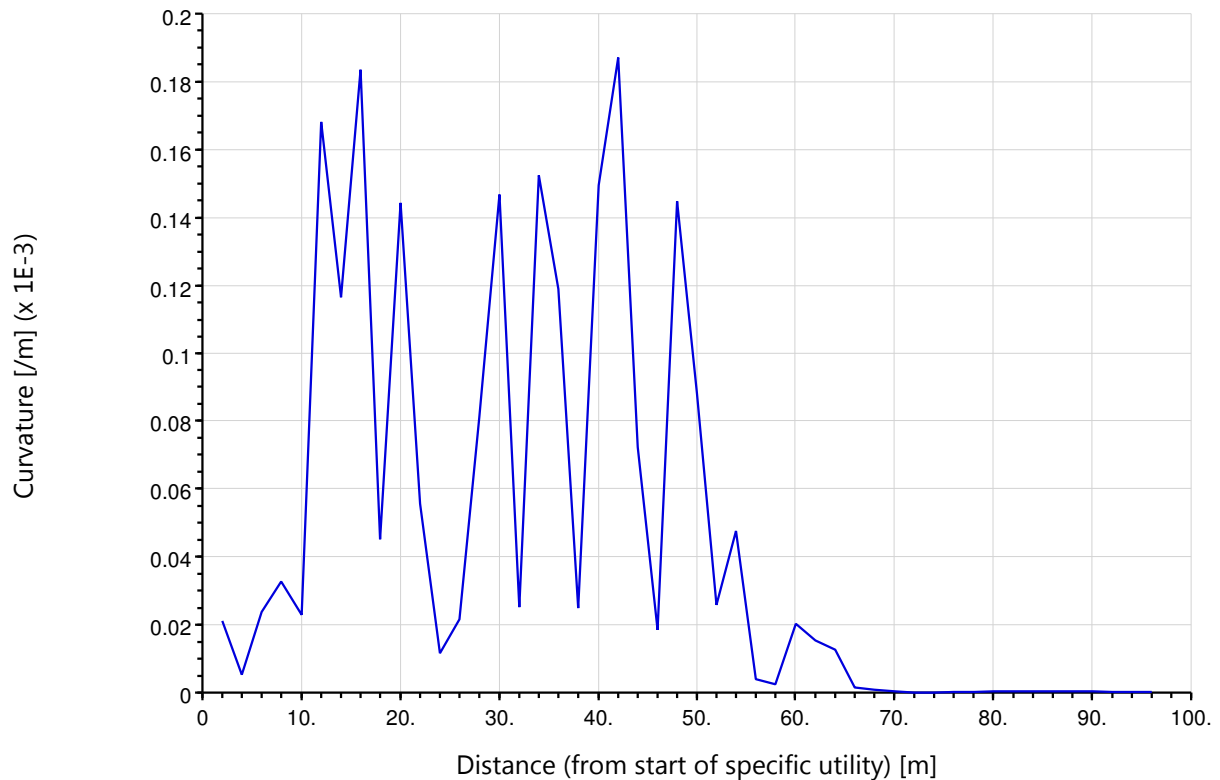
TW Sewer Assessment

Plot A - {(Demo+Wall+Exc-(S))+New Load (ST)_Smoothed

Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 1: TWS(1)_1/1

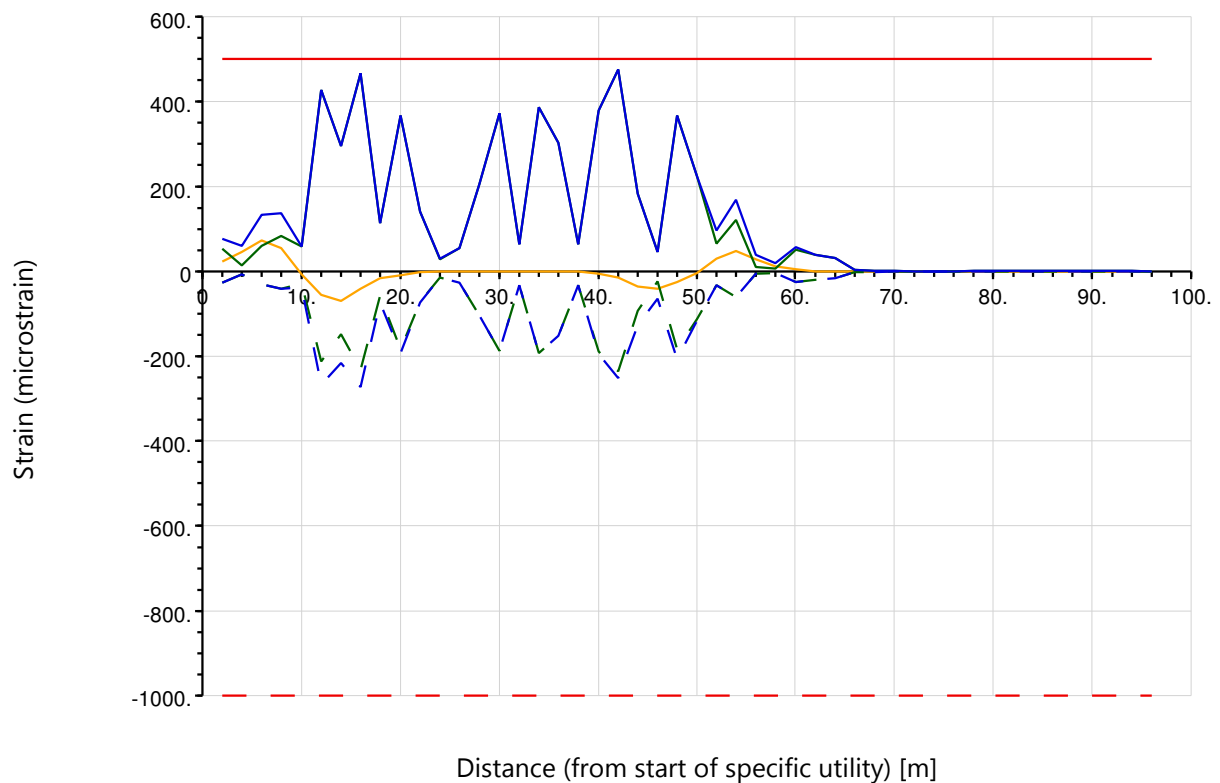
— Curvature



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 1: TWS(1)_1/1

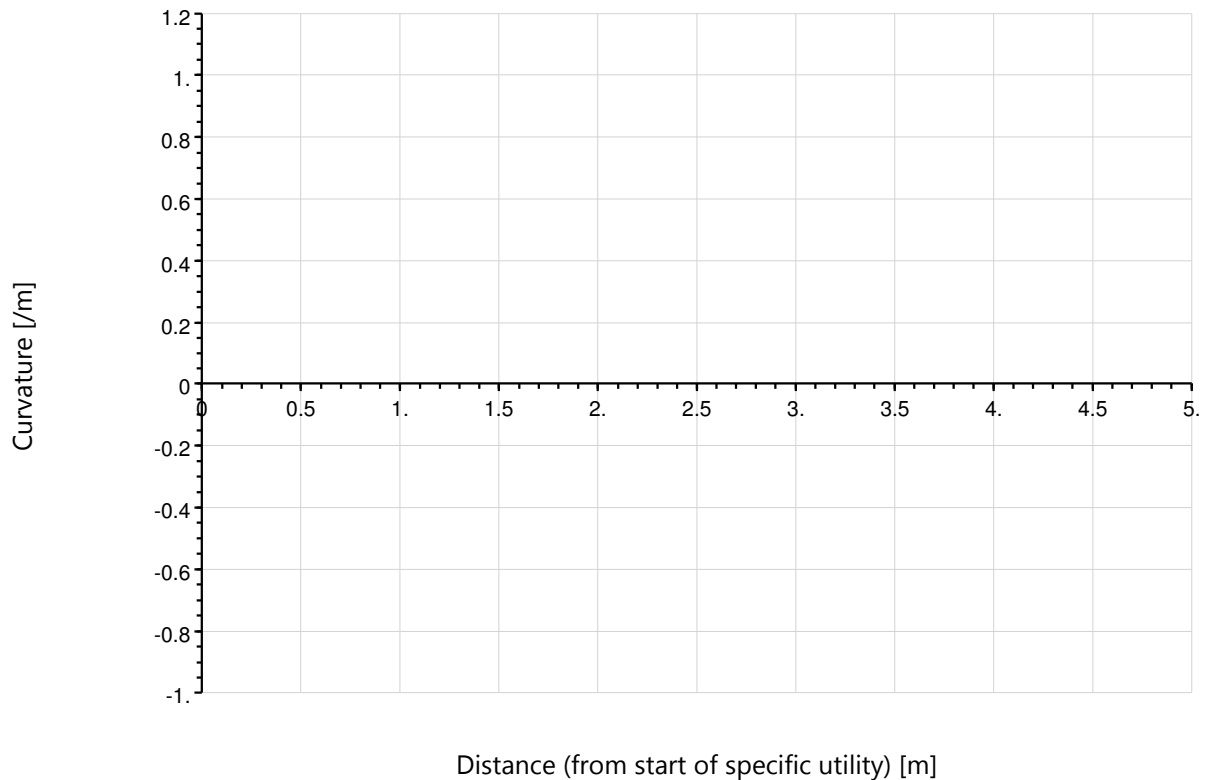
- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 10: Assumed FW400 connection to TW2_1/1

— Curvature

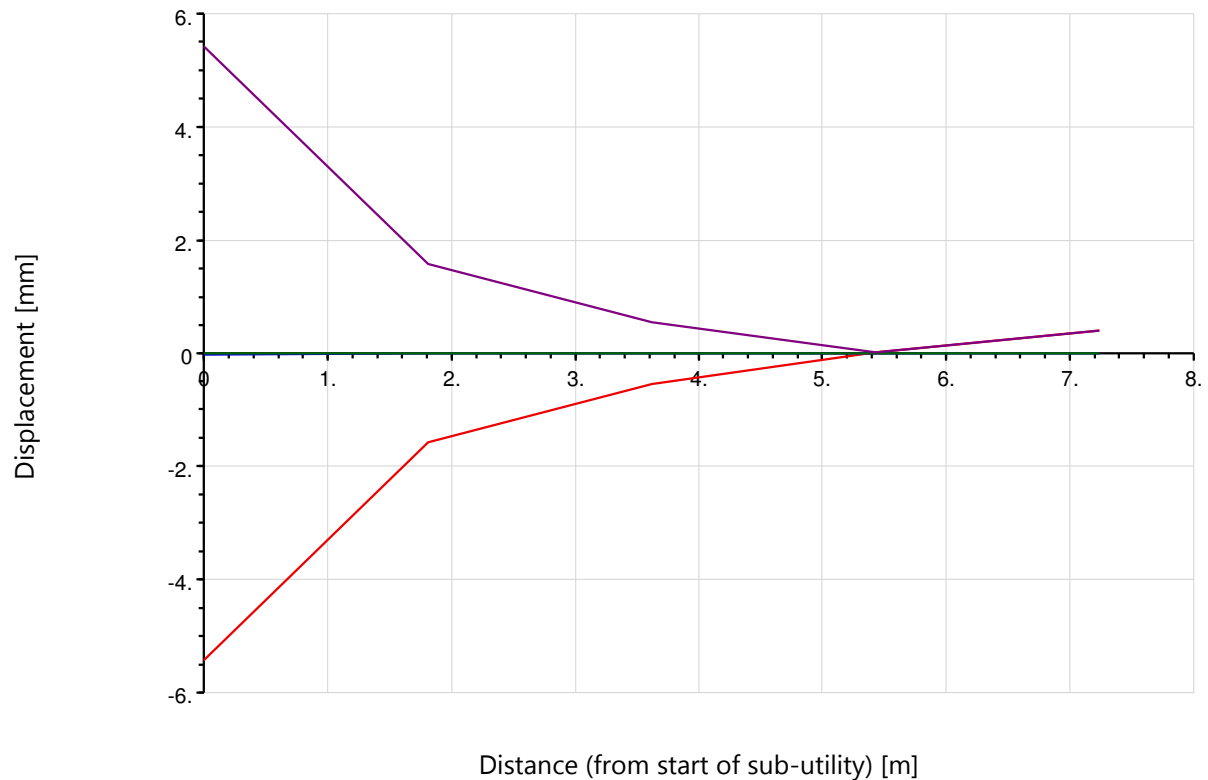


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Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 10: Assumed FW400 connection to TW2_1/1

- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)

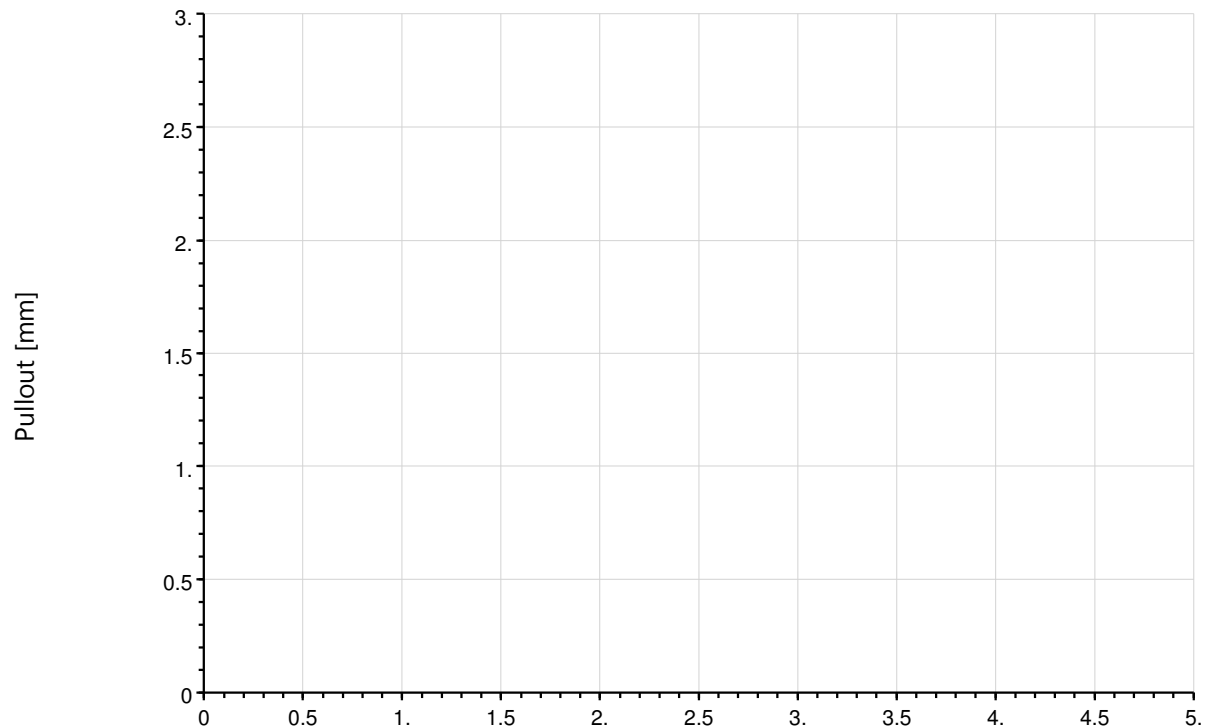


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371654		
Drg. Ref.		
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Specific Utility - Pullout Chart

Stage: Base model, Specific Utility 10: Assumed FW400 connection to TW2_1/1

- - - Axial Pullout (factored)
- - - Flexural Pullout (factored)
- Total Pullout (factored)
- Total Pullout Limit



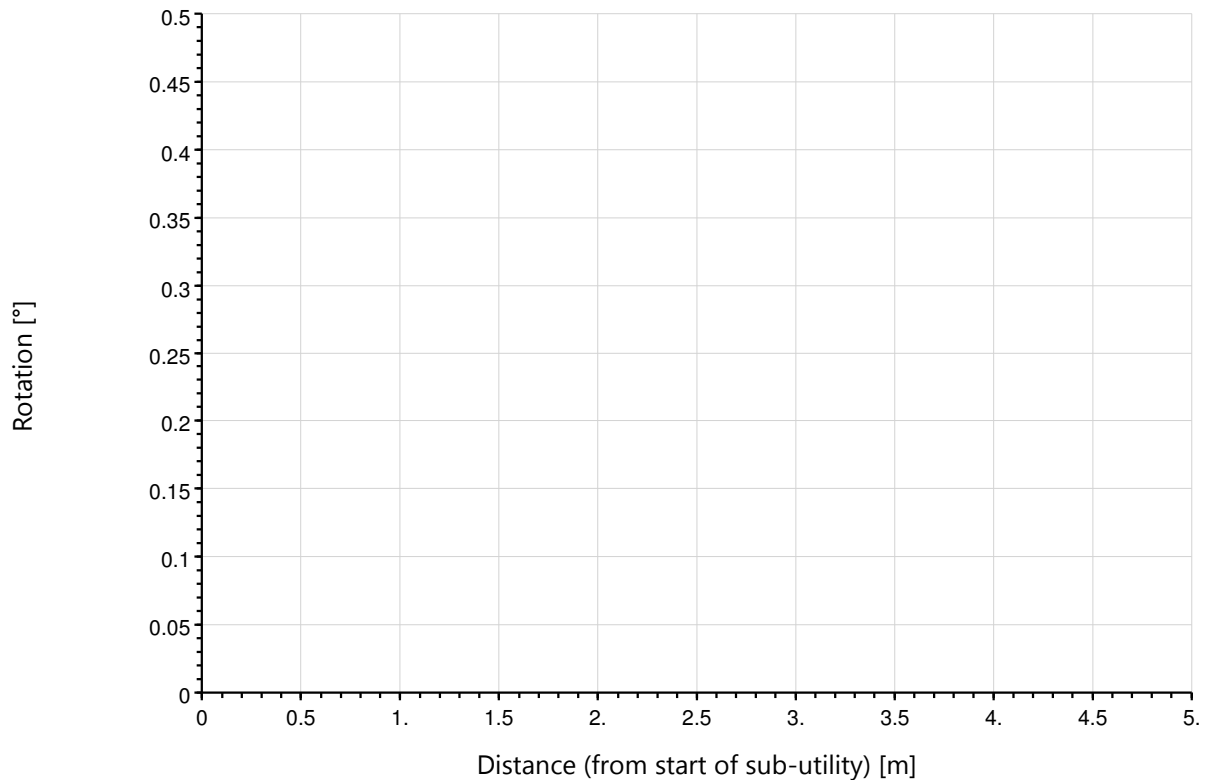
Distance (from start of sub-utility) [m] Note: Total pullout ignores the axial component where this is negative (i.e. comp

Specific Utility - Rotation Chart

Stage: Base model, Specific Utility 10: Assumed FW400 connection to TW2_1/1

— Rotation (factored)

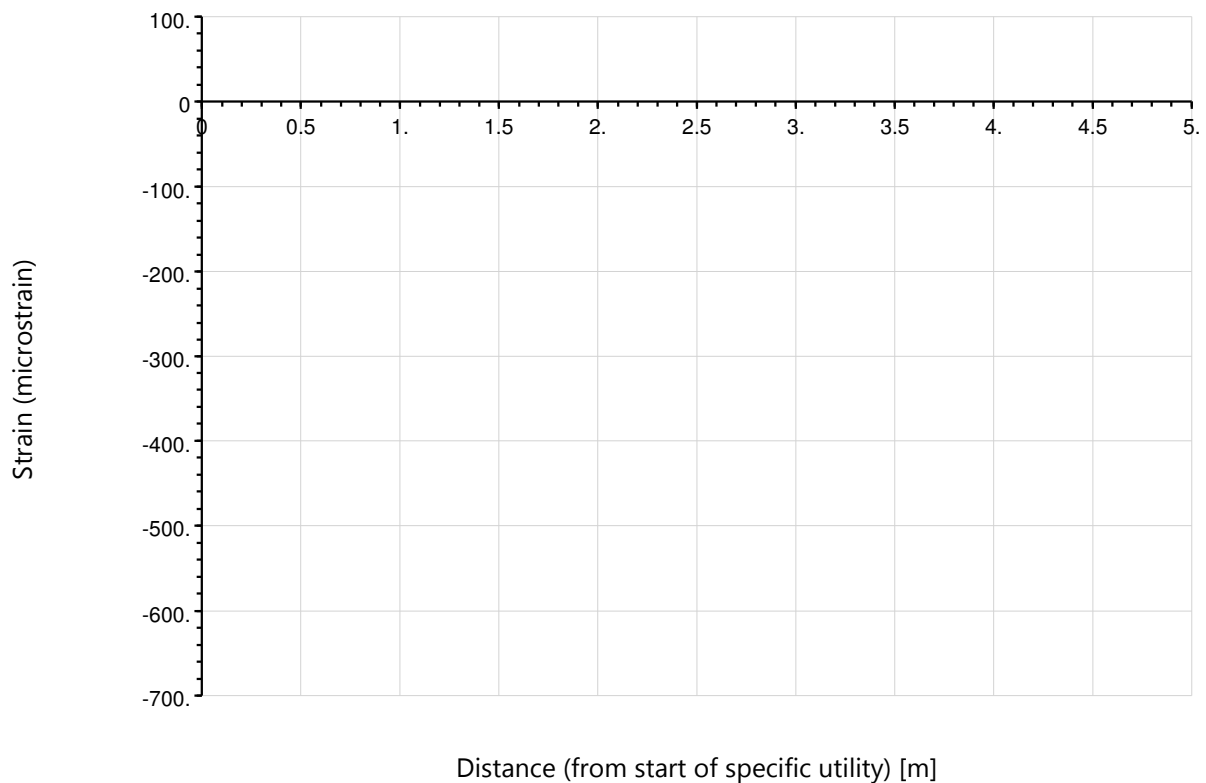
— Rotation Limit



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 10: Assumed FW400 connection to TW2, 1/1

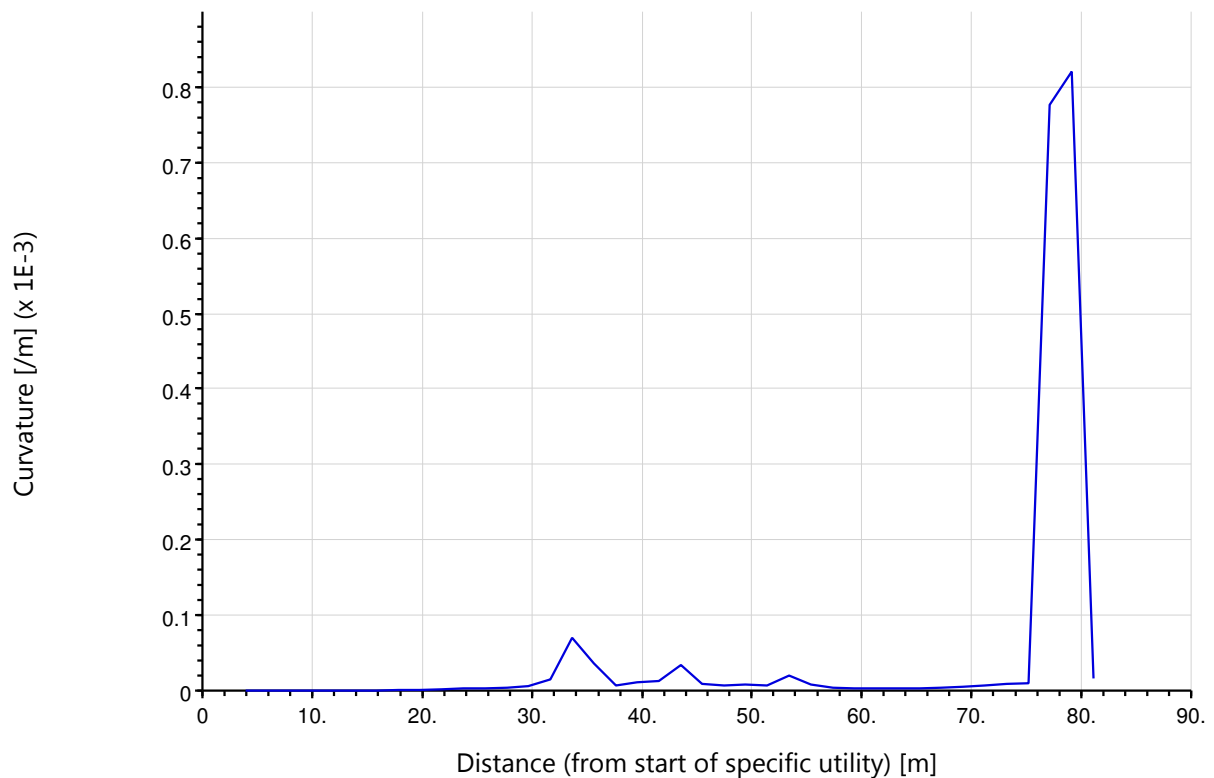
- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- Combined Compressive Strain (factored)
- Allowable Tensile Strain
- Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 6: TW Fresh Water (a) - St Pancras/1

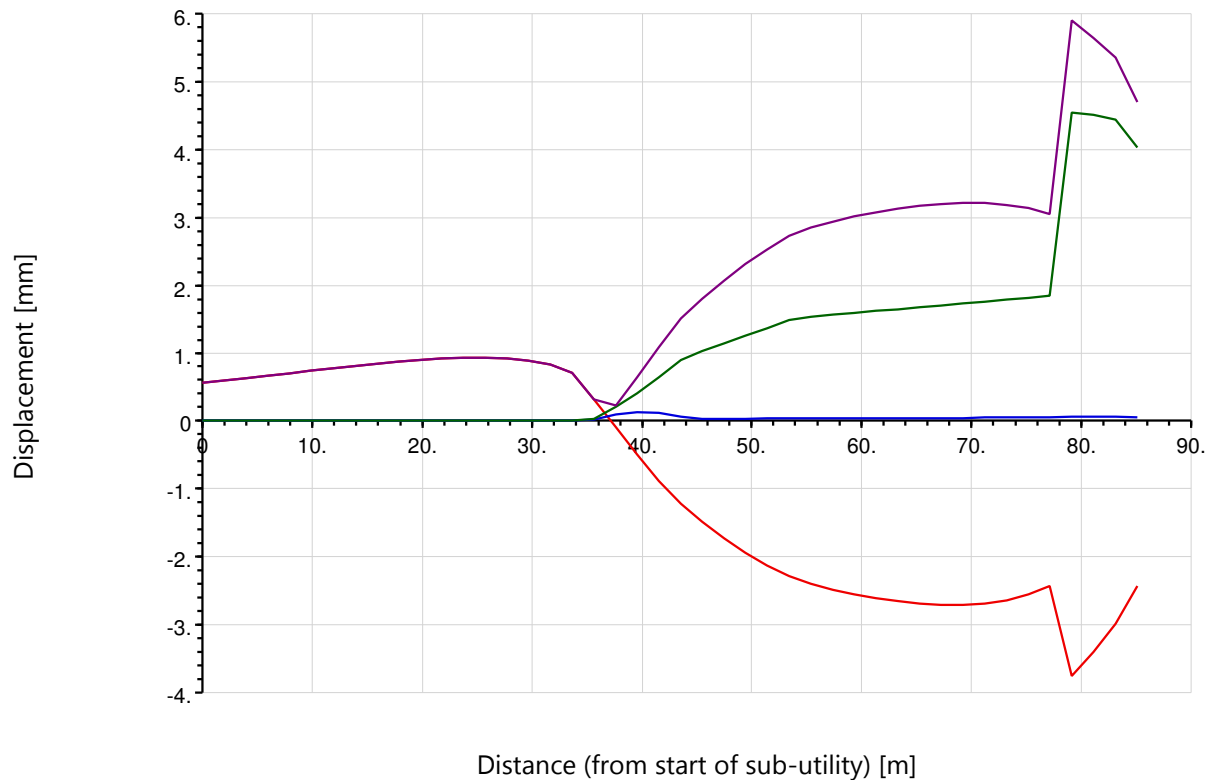
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 6: TW Fresh Water (a) - St Pancras/1

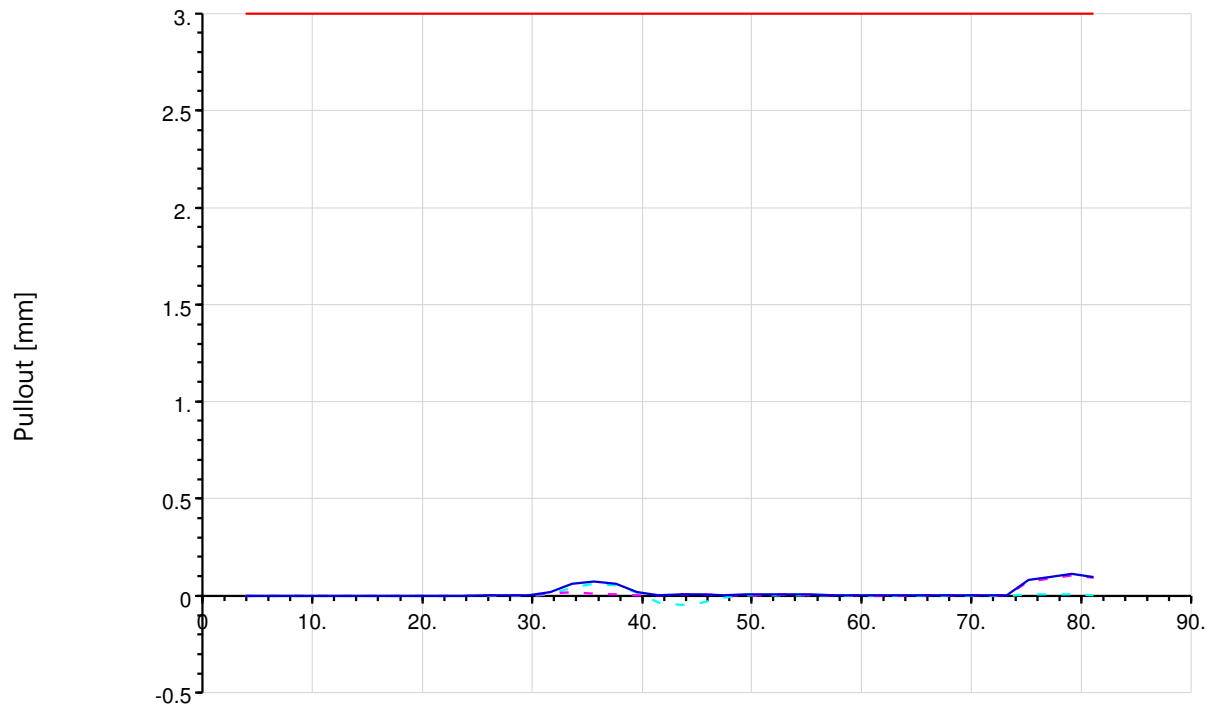
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - Pullout Chart

Stage: Base model, Specific Utility 6: TW Fresh Water (a) - St Pancras/1

- - - Axial Pullout (factored)
- - - Flexural Pullout (factored)
- Total Pullout (factored)
- Total Pullout Limit



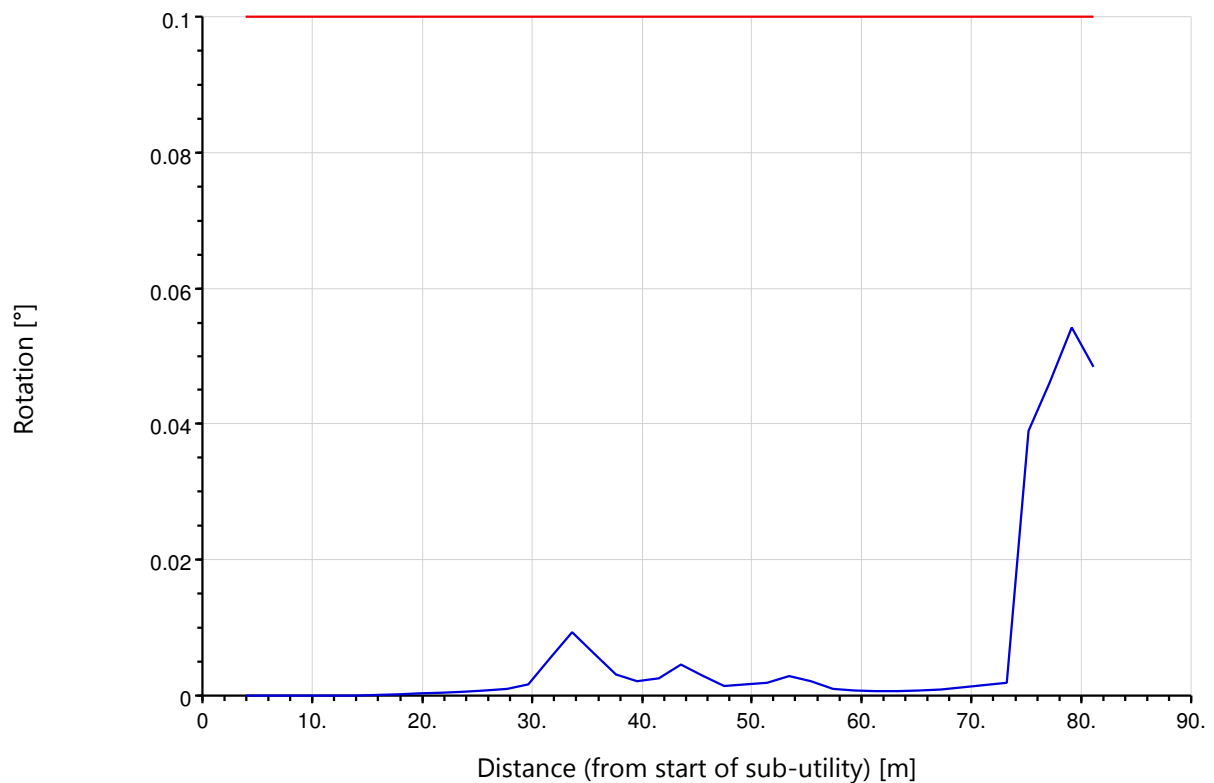
Distance (from start of sub-utility) [m] Note: Total pullout ignores the axial component where this is negative (i.e. comp

Specific Utility - Rotation Chart

Stage: Base model, Specific Utility 6: TW Fresh Water (a) - St Pancras/1

— Rotation (factored)

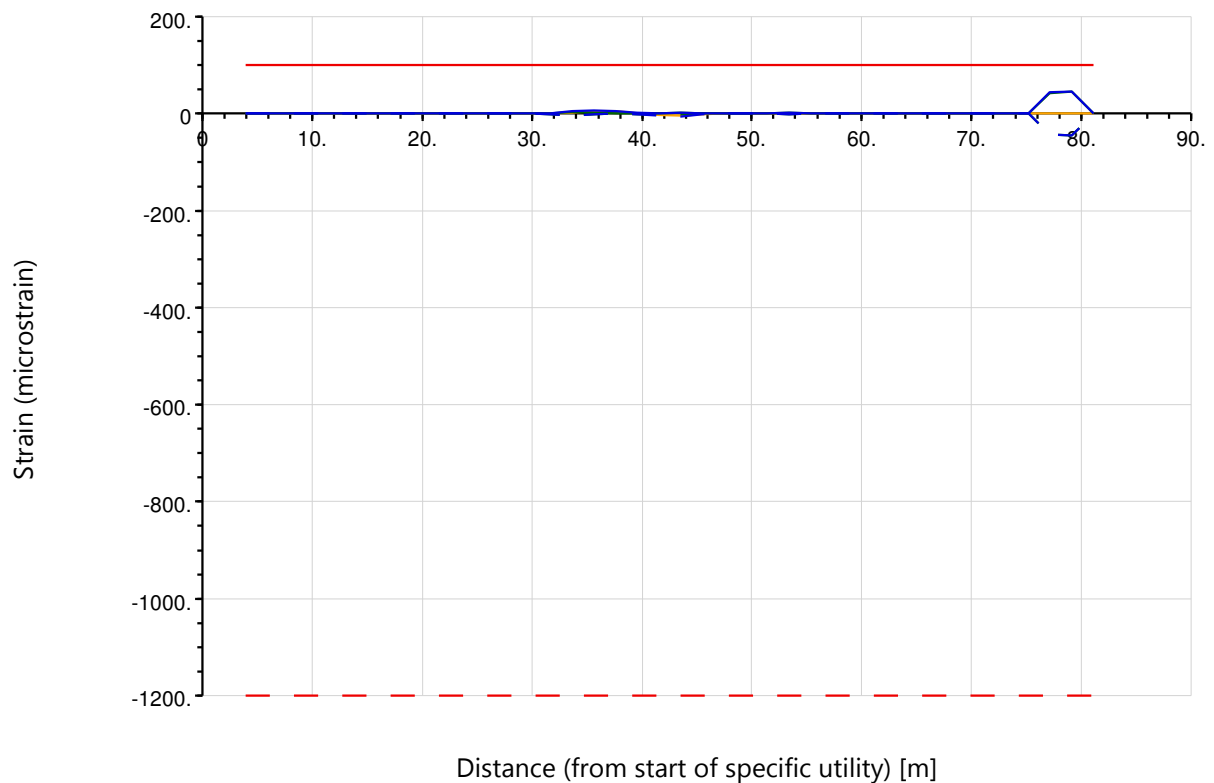
— Rotation Limit



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 6: TW Fresh Water (a) - St Pancras/1

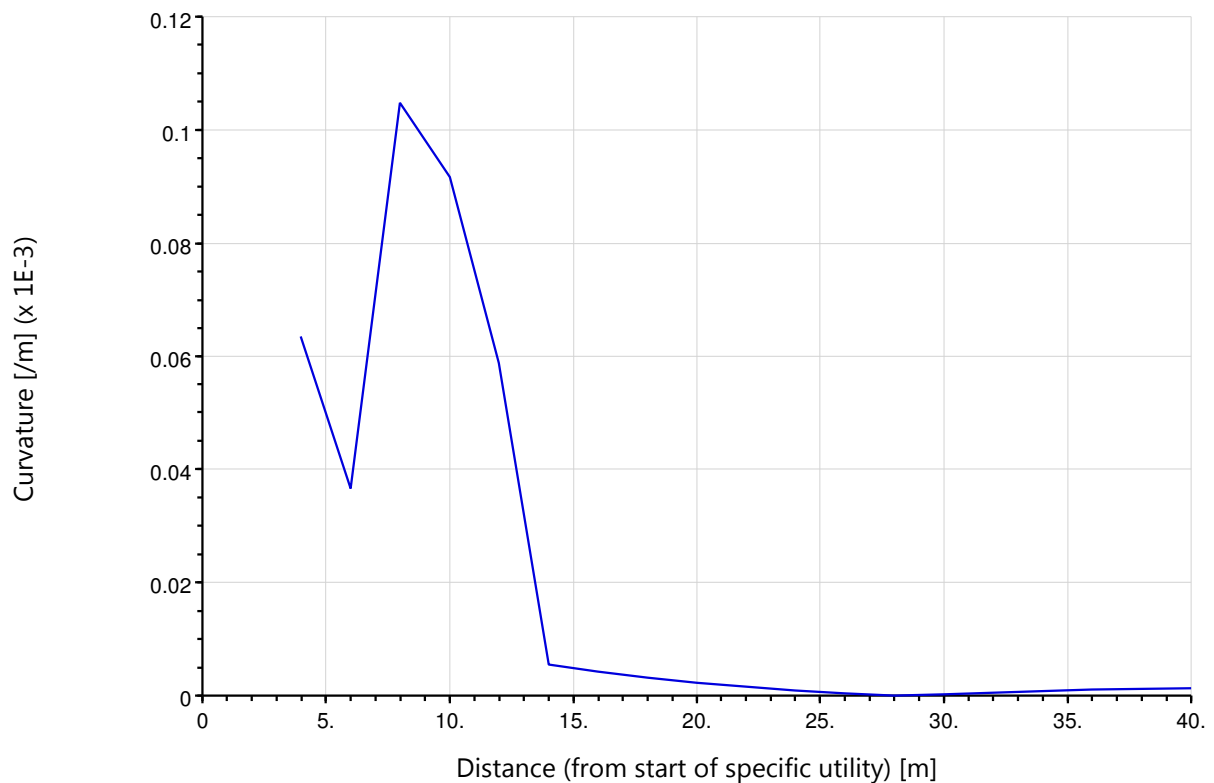
- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 7: TW Fresh Water (b) - St Pancras/1

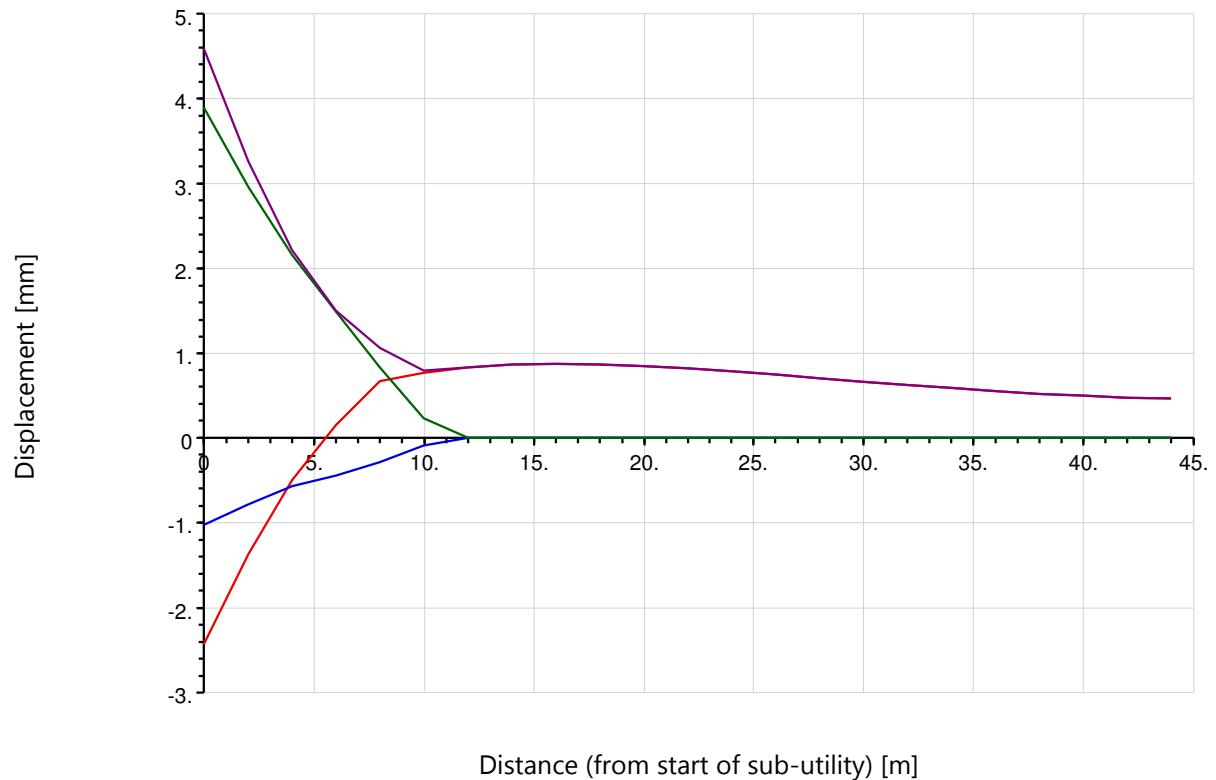
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 7: TW Fresh Water (b) - St Pancras/1

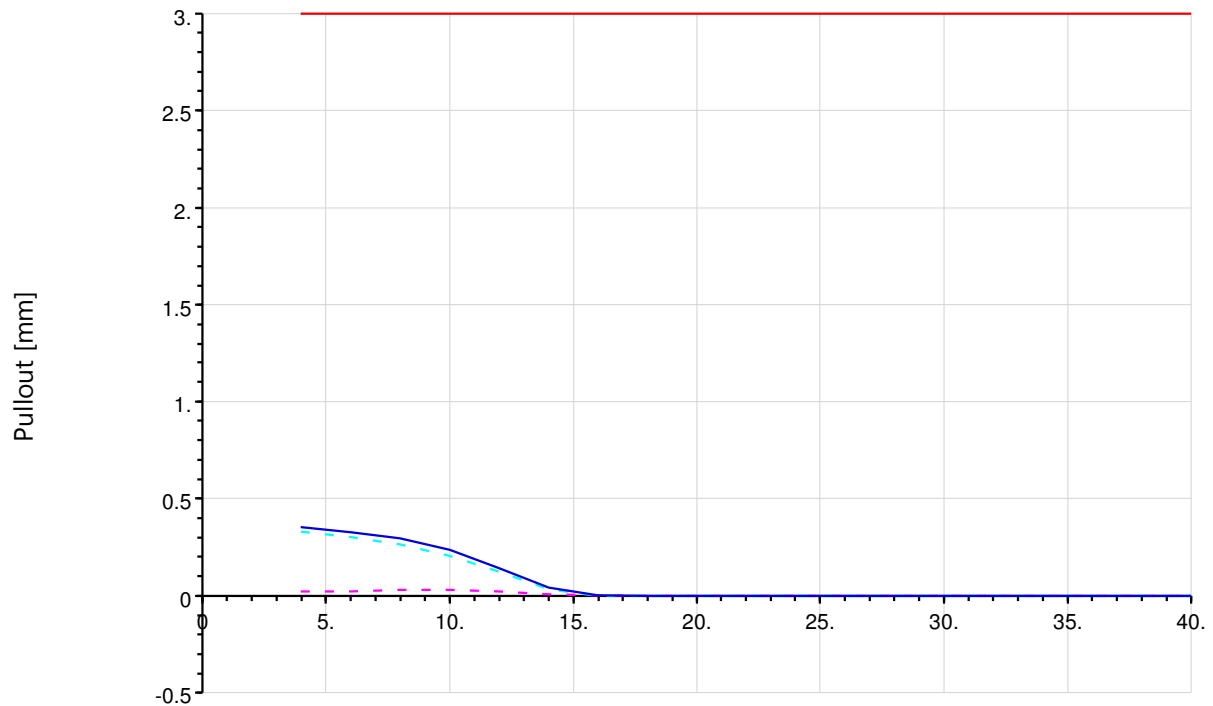
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - Pullout Chart

Stage: Base model, Specific Utility 7: TW Fresh Water (b) - St Pancras/1

- - - Axial Pullout (factored)
- - - Flexural Pullout (factored)
- Total Pullout (factored)
- Total Pullout Limit



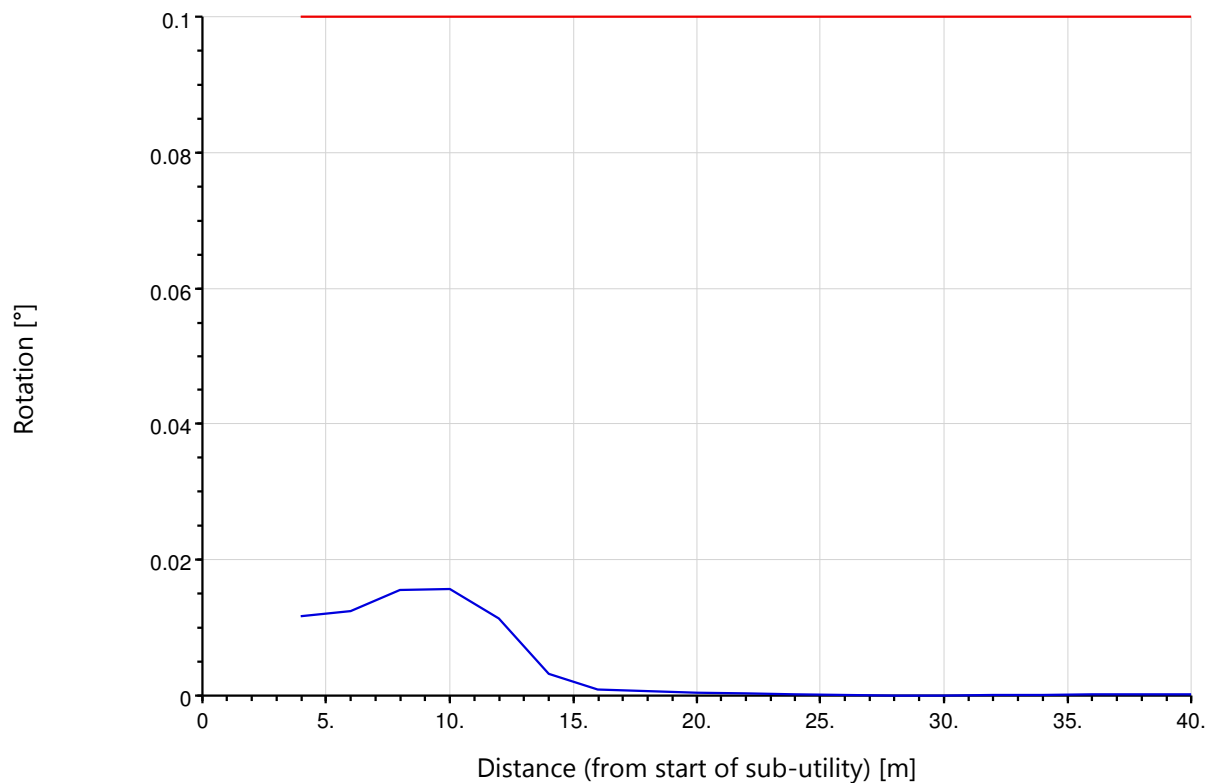
Distance (from start of sub-utility) [m] Note: Total pullout ignores the axial component where this is negative (i.e. comp

Specific Utility - Rotation Chart

Stage: Base model, Specific Utility 7: TW Fresh Water (b) - St Pancras/1

— Rotation (factored)

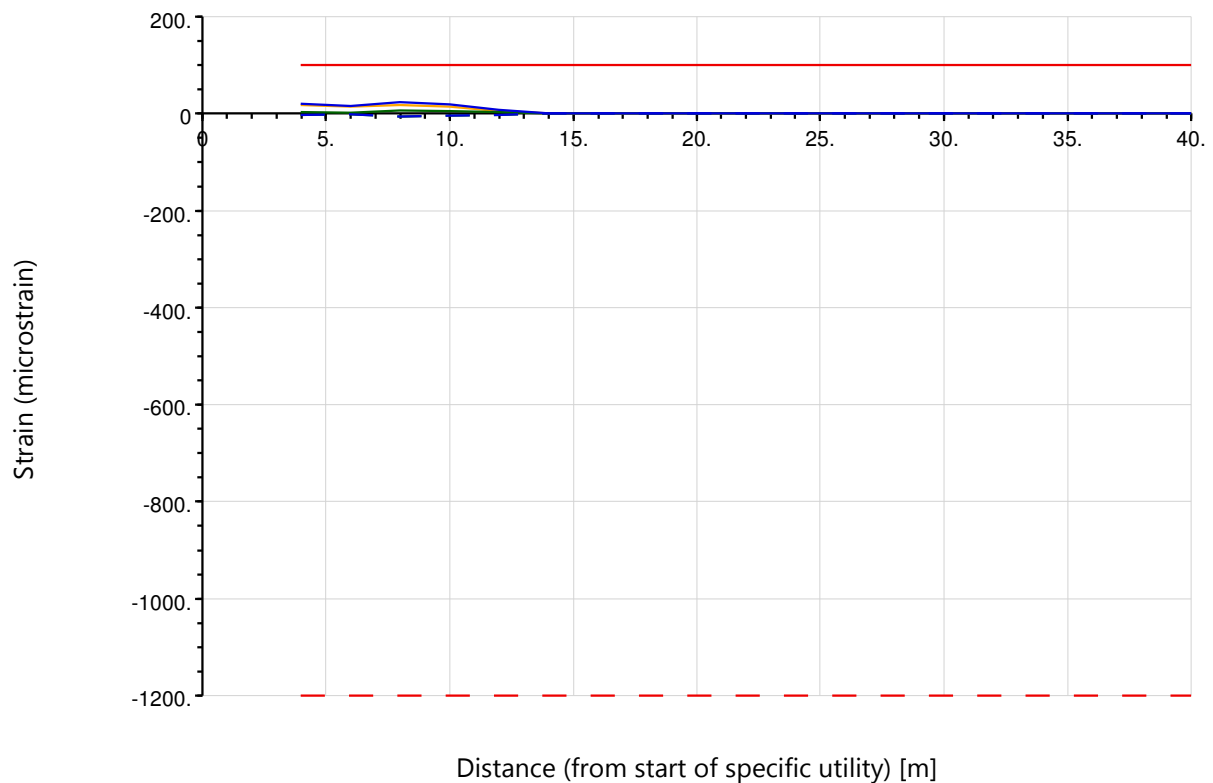
— Rotation Limit



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 7: TW Fresh Water (b) - St Pancras/1

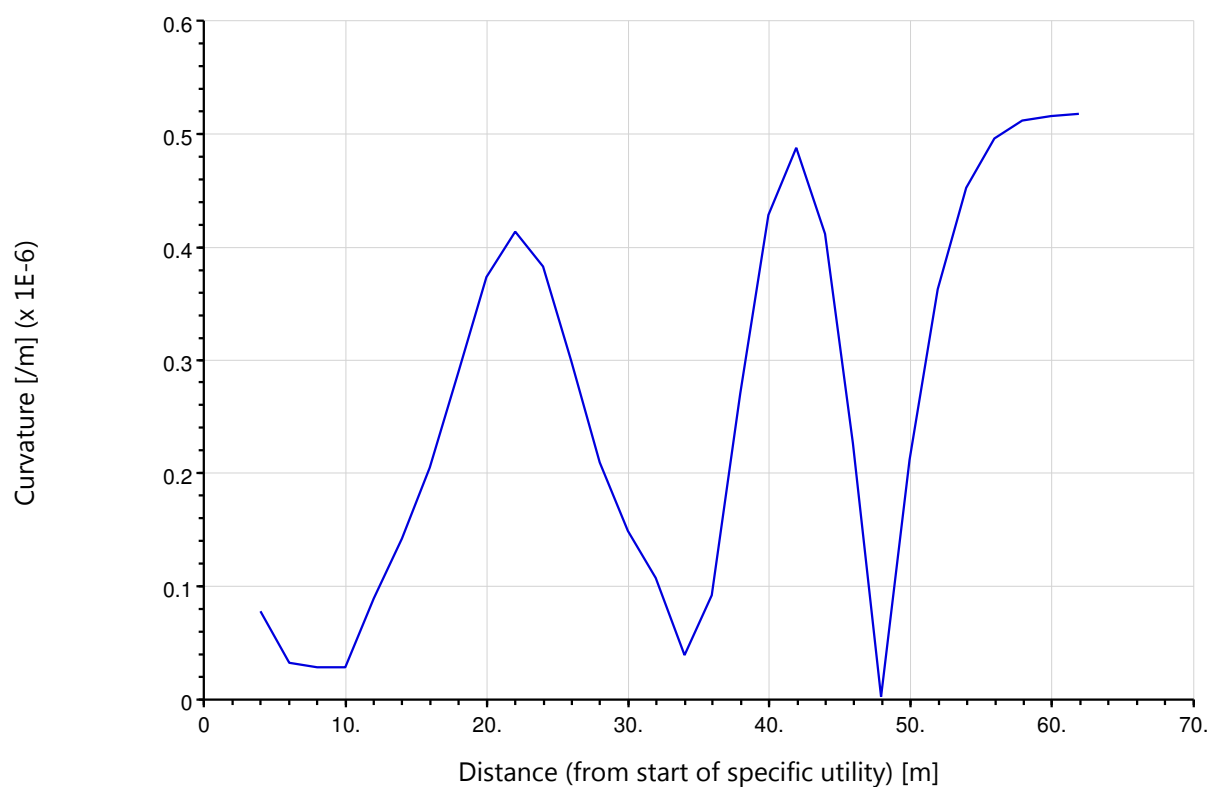
- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 8: TW Fresh Water (c) - St Pancras/1

— Curvature

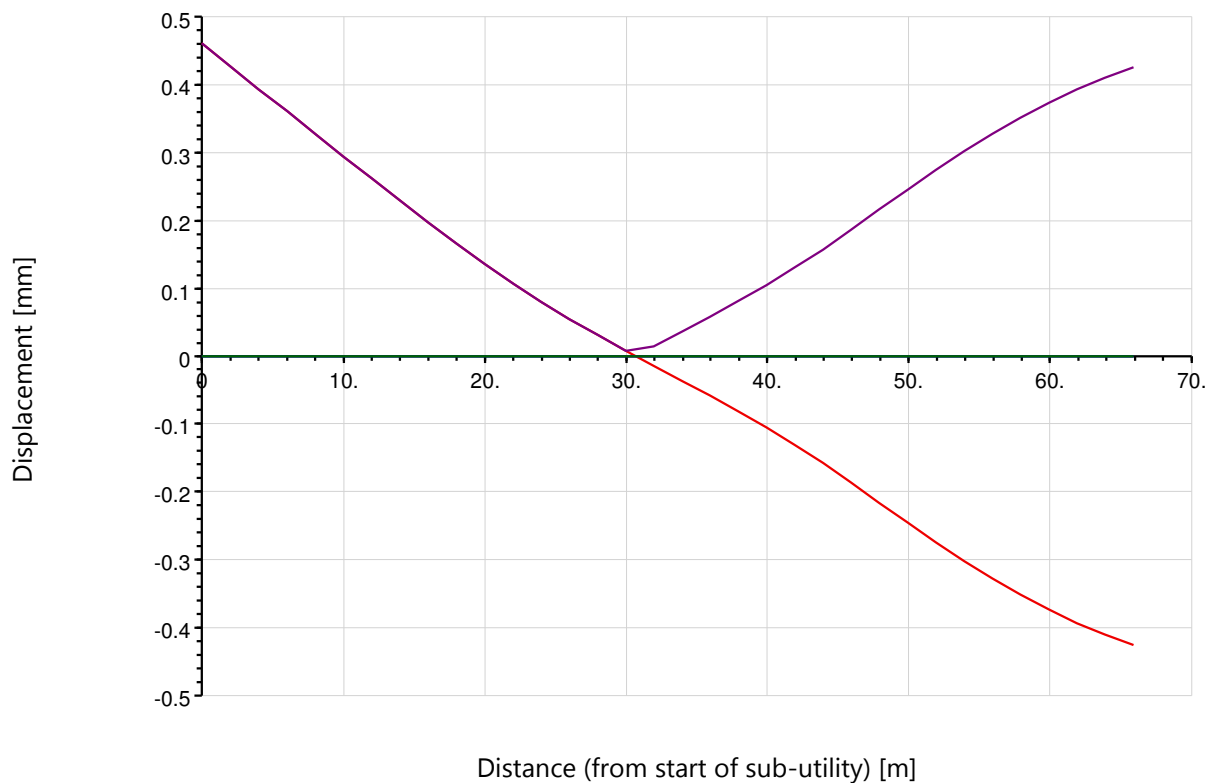


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Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 8: TW Fresh Water (c) - St Pancras/1

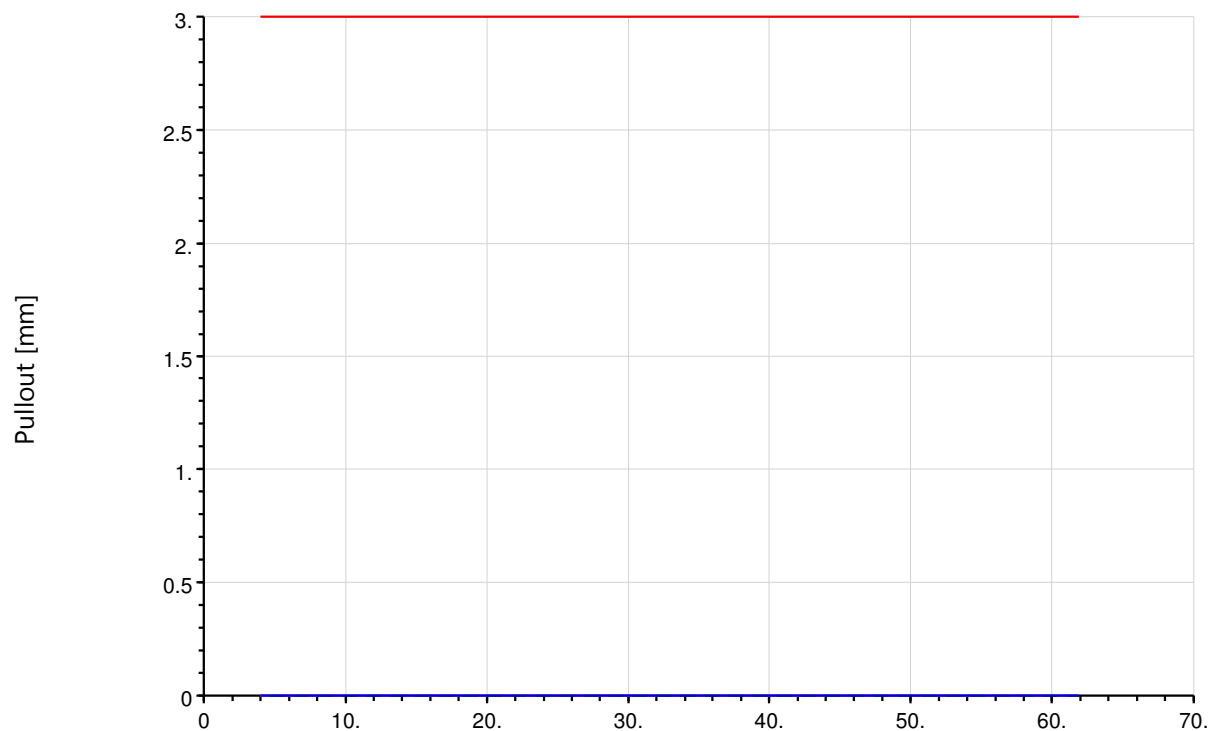
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - Pullout Chart

Stage: Base model, Specific Utility 8: TW Fresh Water (c) - St Pancras/1

- - - Axial Pullout (factored)
- - - Flexural Pullout (factored)
- Total Pullout (factored)
- Total Pullout Limit



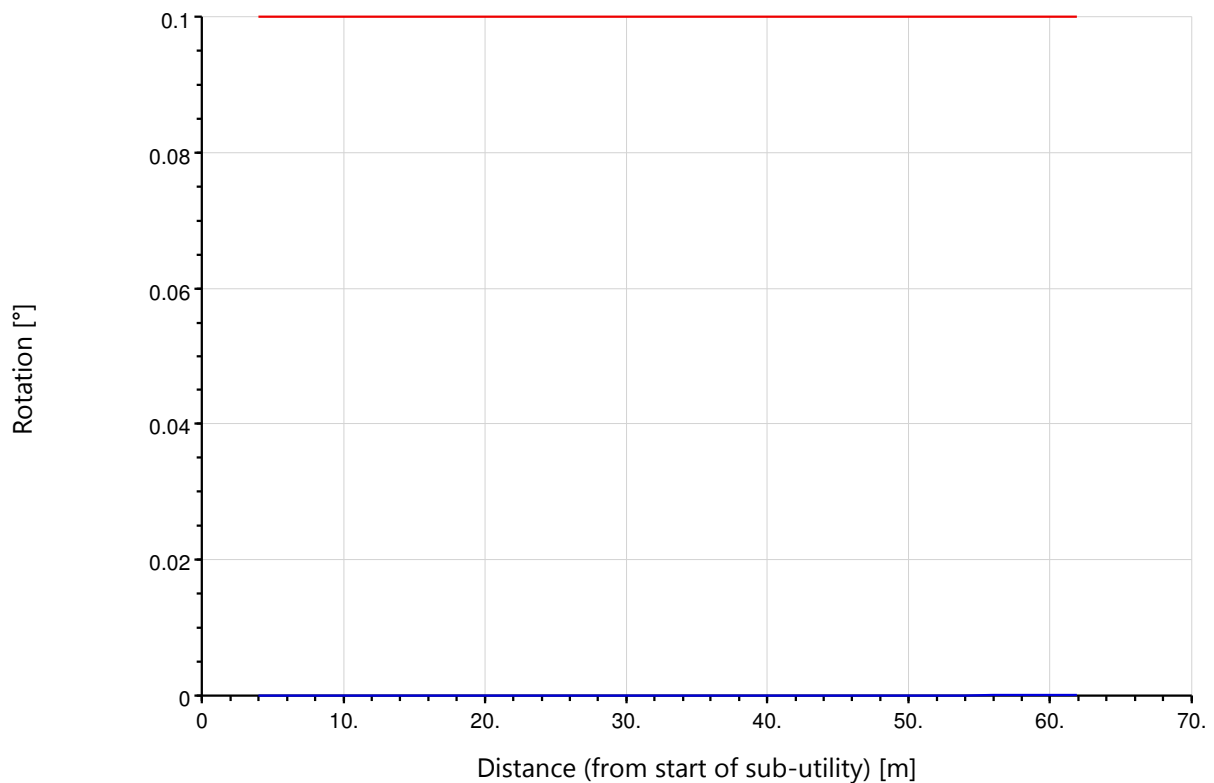
Distance (from start of sub-utility) [m] Note: Total pullout ignores the axial component where this is negative (i.e. comp

Specific Utility - Rotation Chart

Stage: Base model, Specific Utility 8: TW Fresh Water (c) - St Pancras/1

— Rotation (factored)

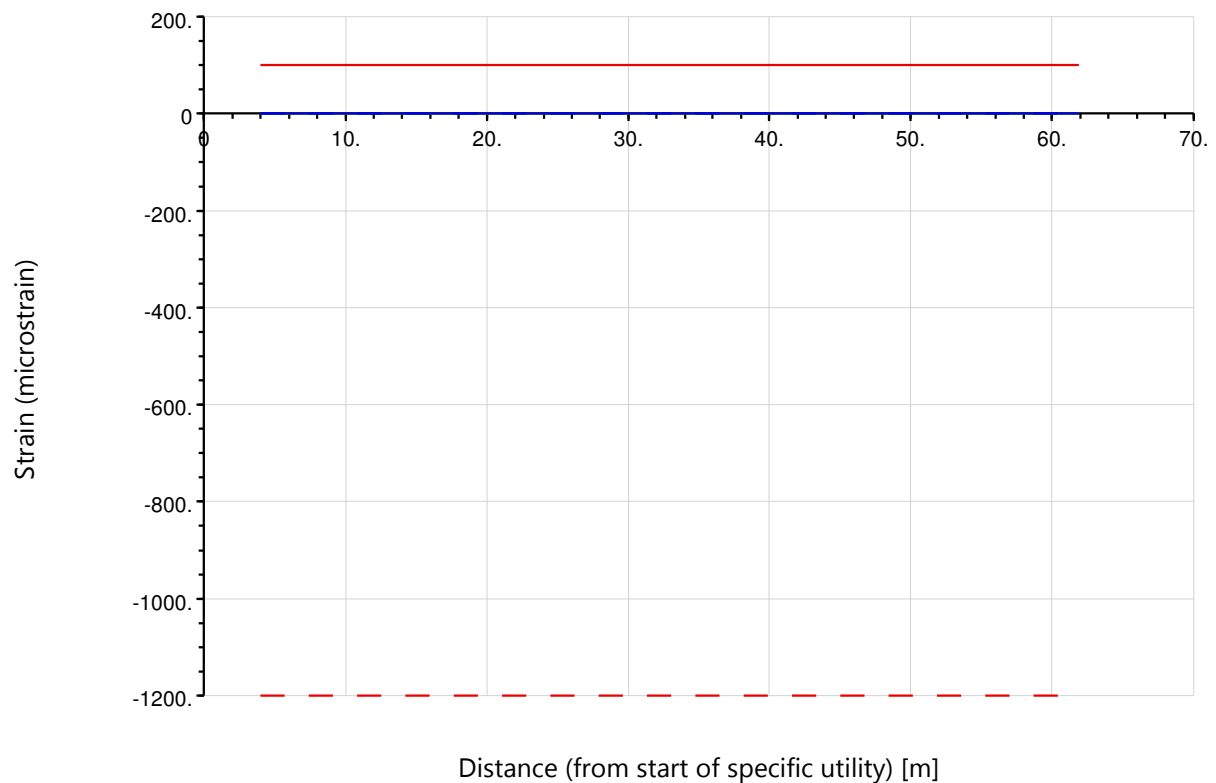
— Rotation Limit



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 8: TW Fresh Water (c) - St Pancras/1

- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain

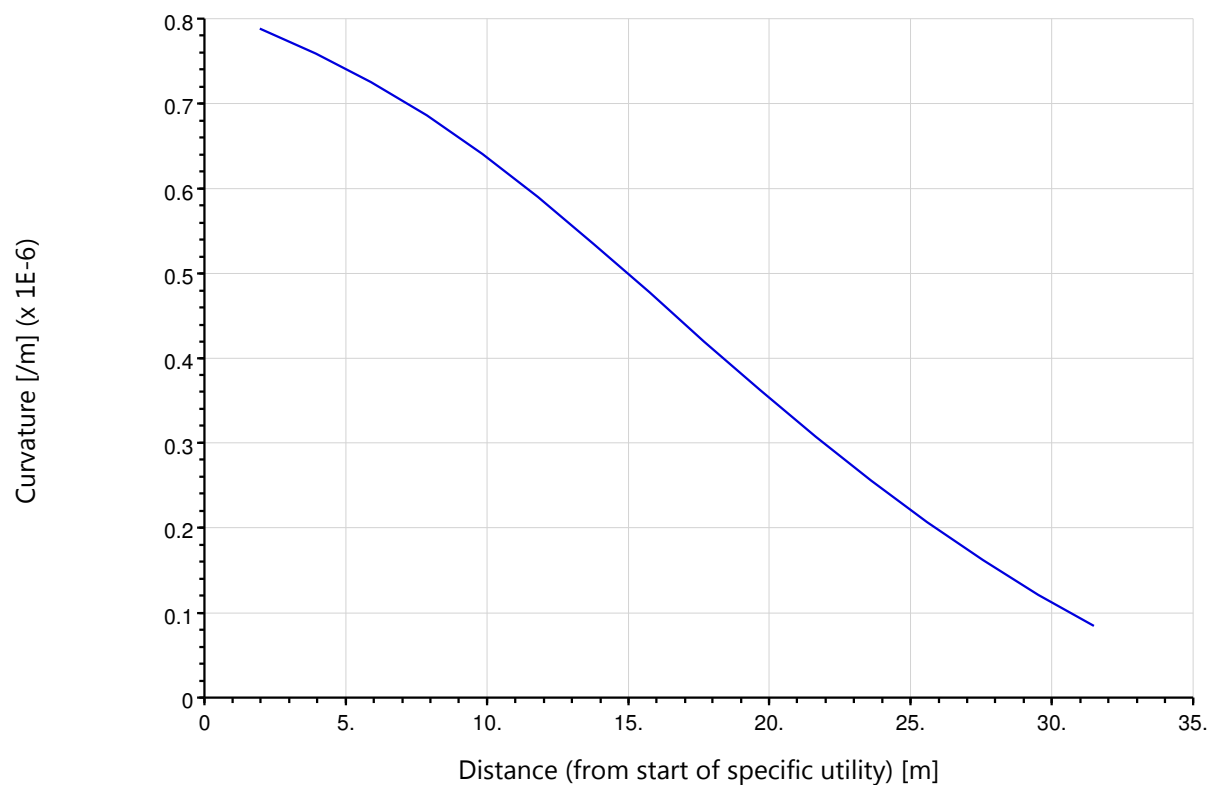


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Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 9: TW Fresh Water (d) - St Pancras/1

— Curvature

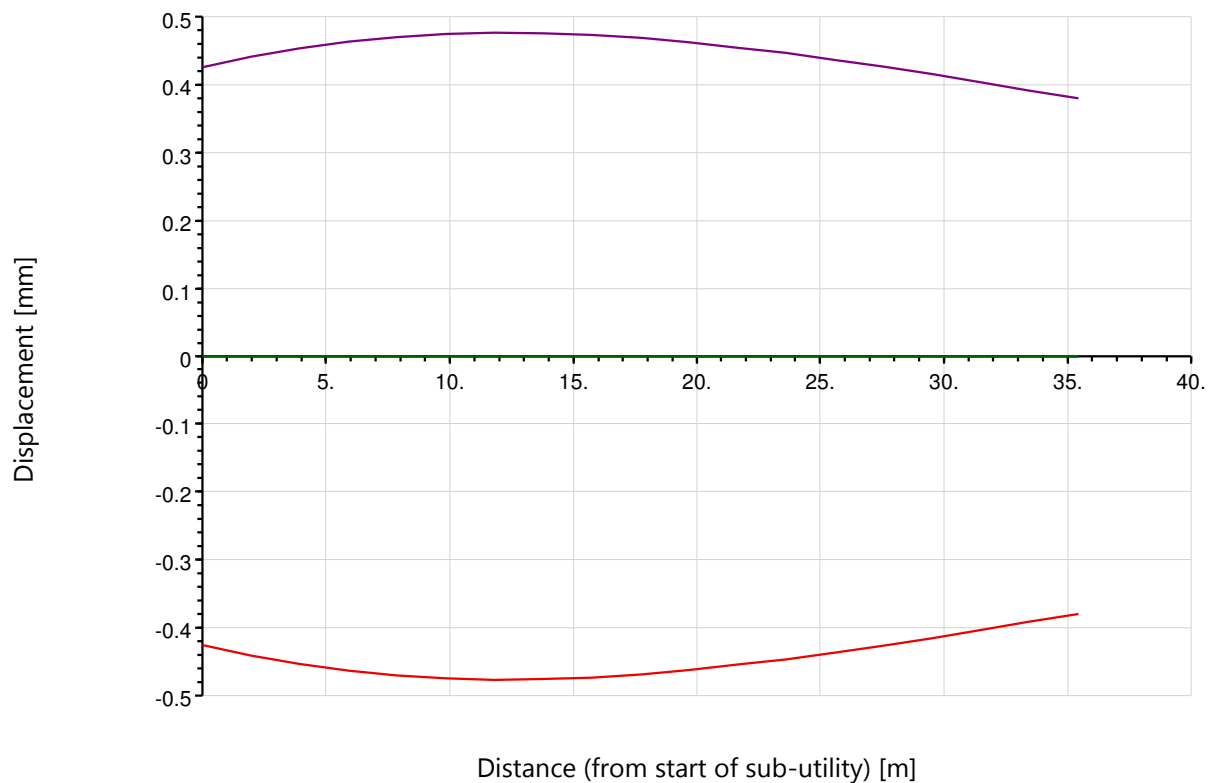


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Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 9: TW Fresh Water (d) - St Pancras/1

- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - Pullout Chart

Stage: Base model, Specific Utility 9: TW Fresh Water (d) - St Pancras/1

- - - Axial Pullout (factored)
- - - Flexural Pullout (factored)
- Total Pullout (factored)
- Total Pullout Limit



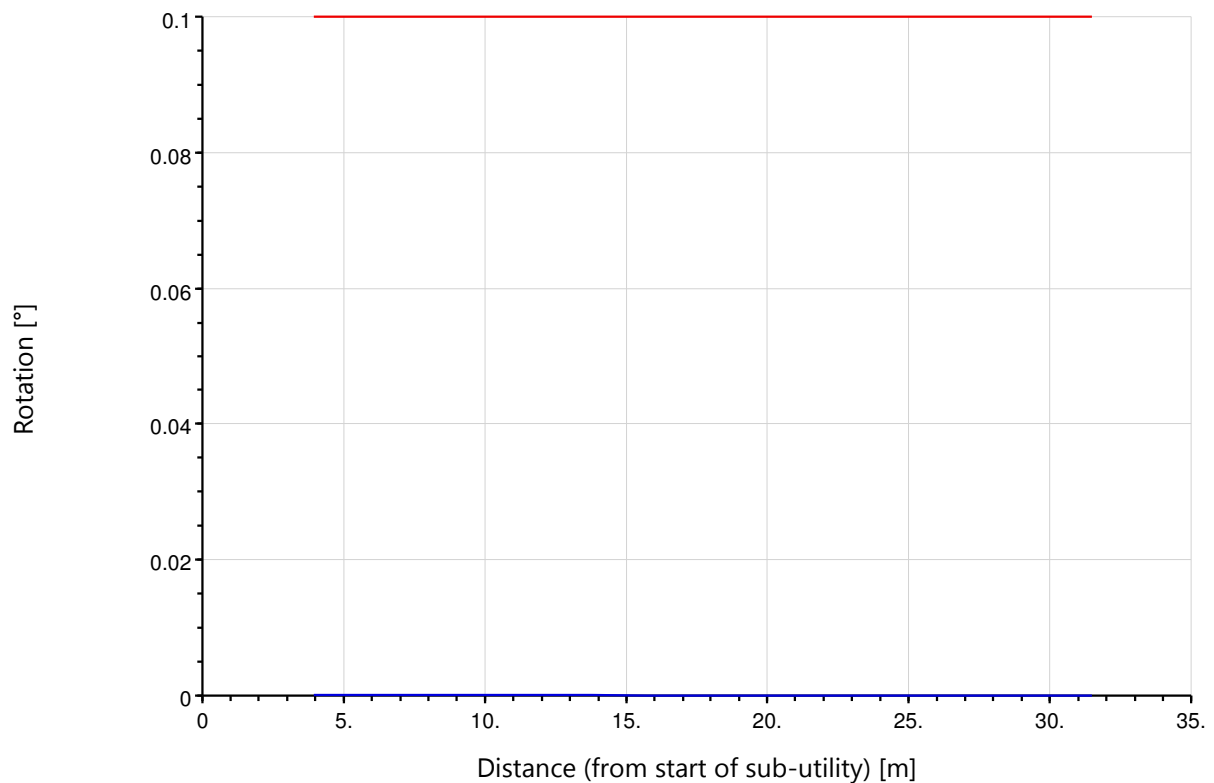
Distance (from start of sub-utility) [m]Note: Total pullout ignores the axial component where this is negative (i.e. comp

Specific Utility - Rotation Chart

Stage: Base model, Specific Utility 9: TW Fresh Water (d) - St Pancras/1

— Rotation (factored)

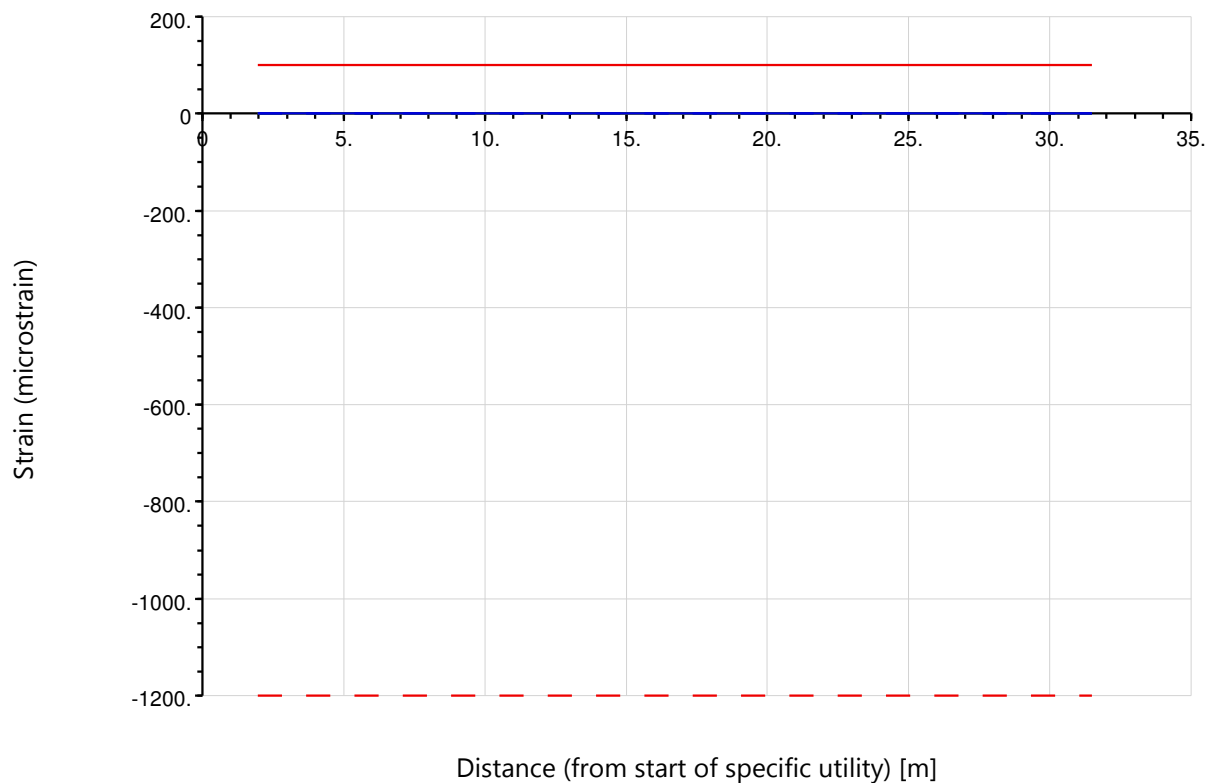
— Rotation Limit



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 9: TW Fresh Water (d) - St Pancras/1

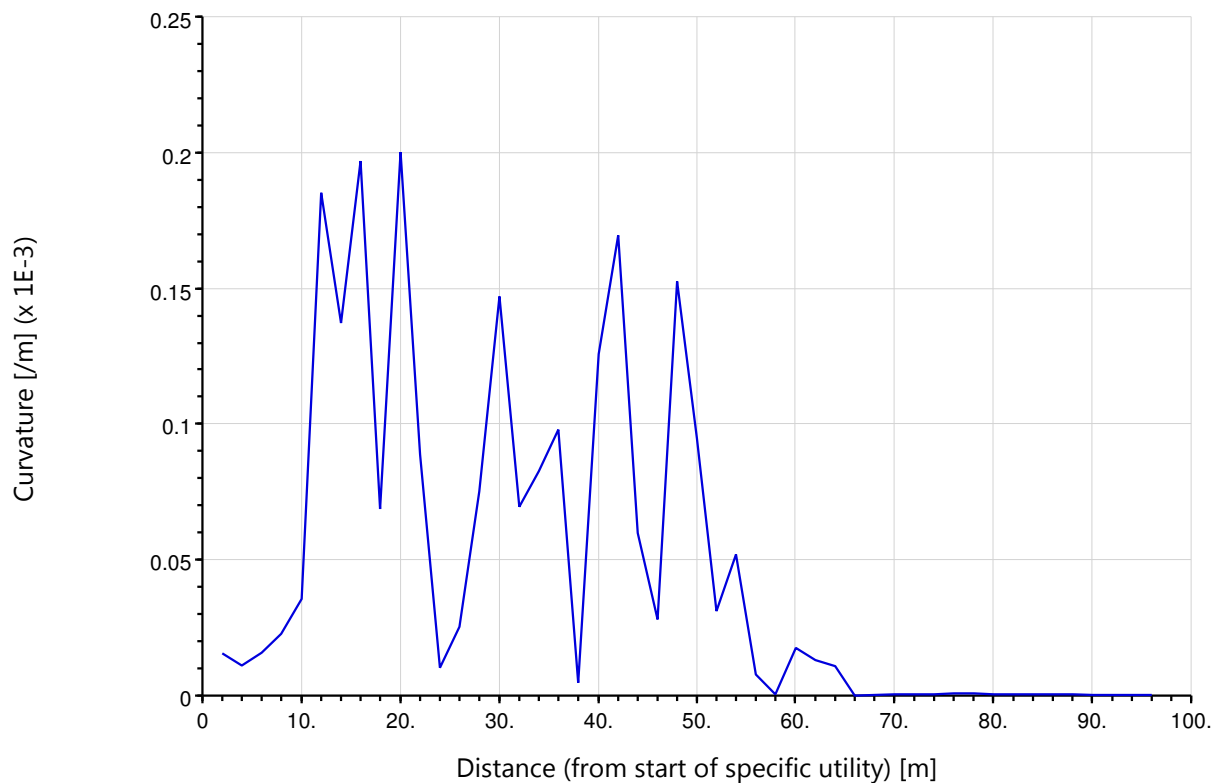
- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 1: TWS(1)_1/1

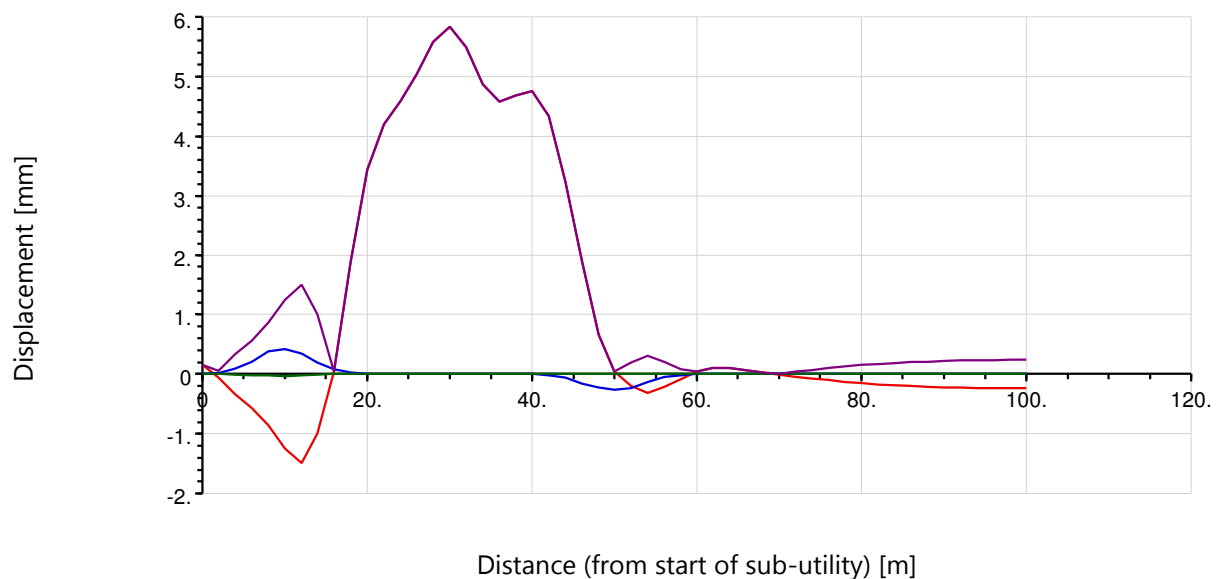
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 1: TWS(1)_1/1

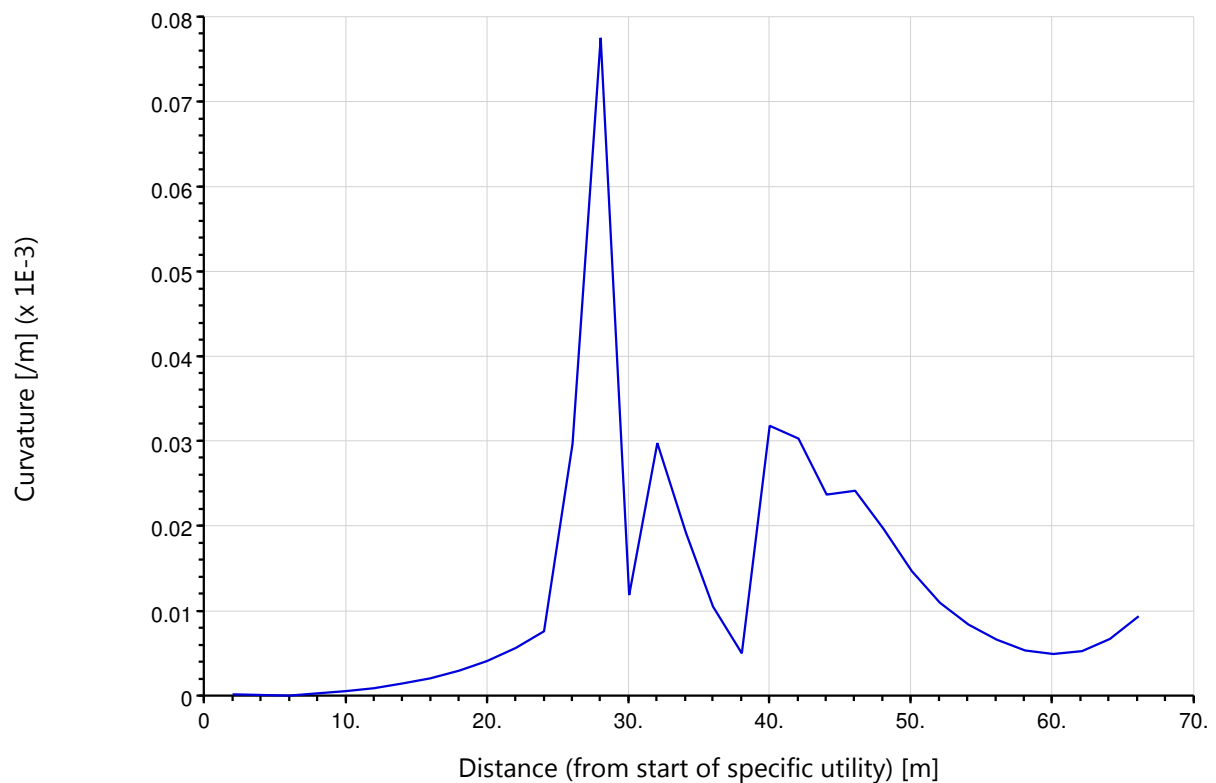
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 2: TWS(2)_1/1

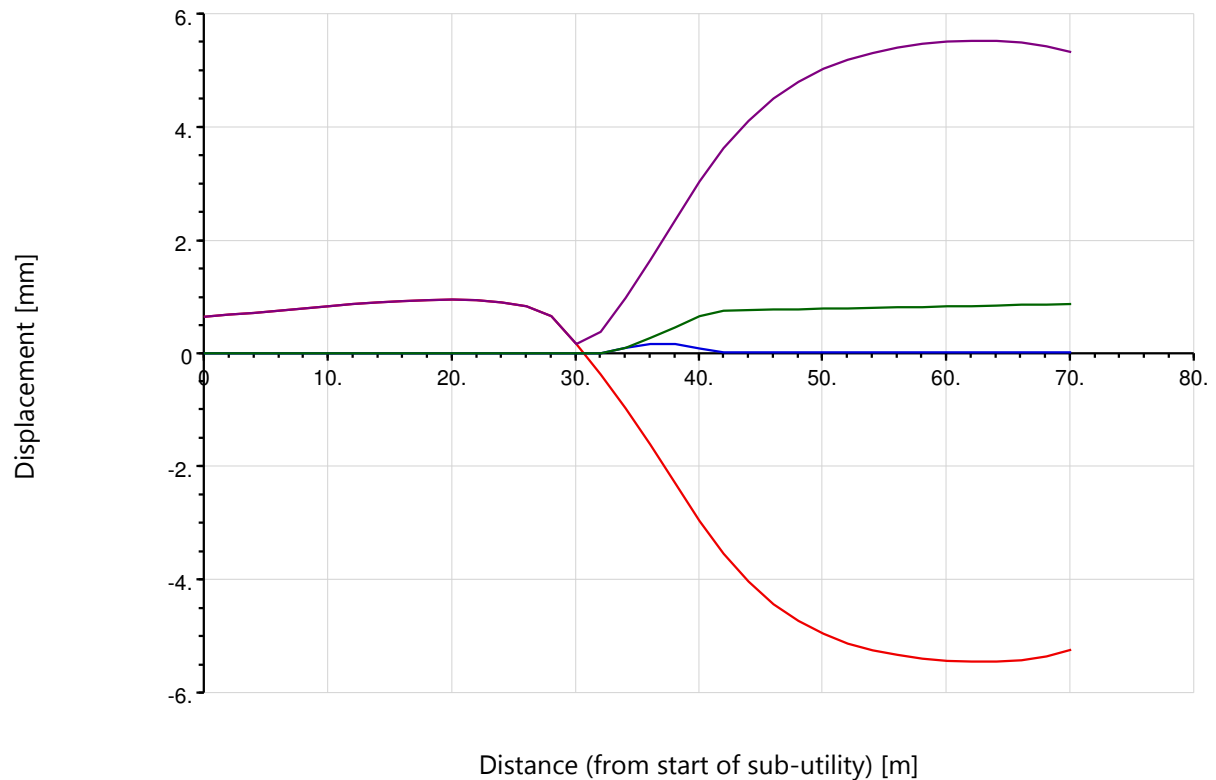
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 2: TWS(2)_1/1

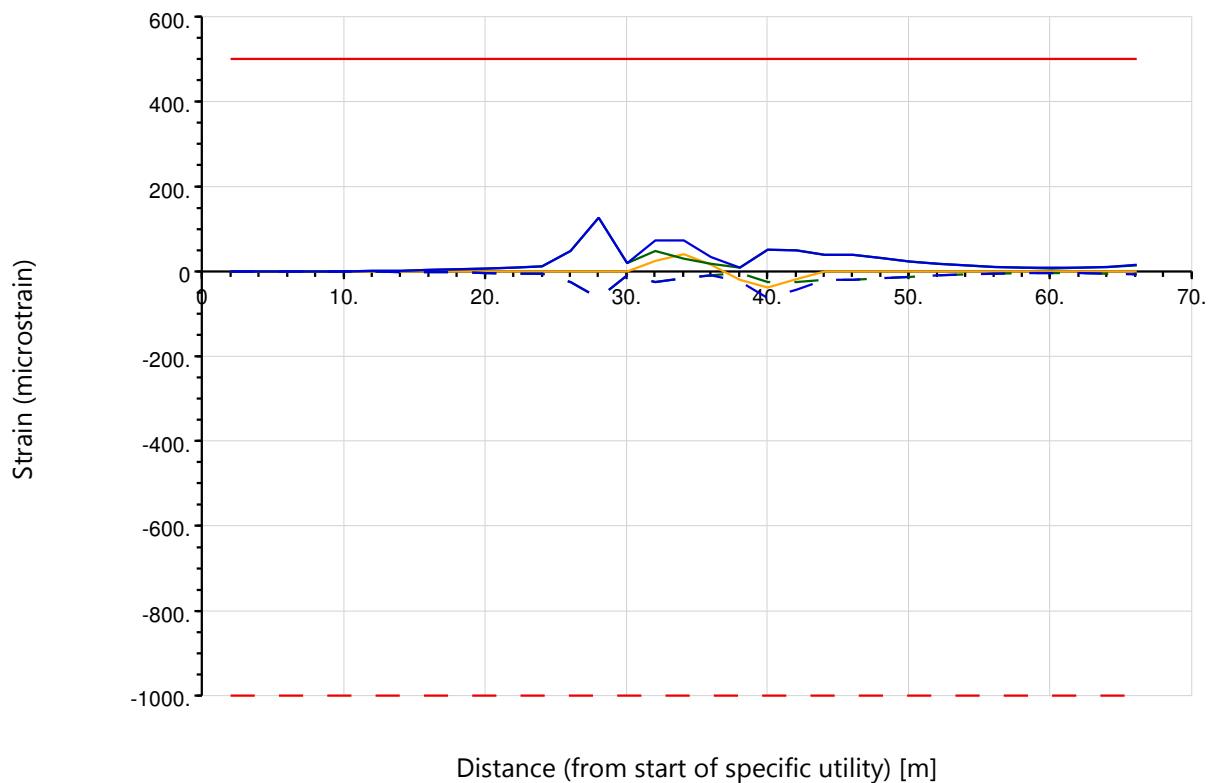
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 2: TWS(2)_1/1

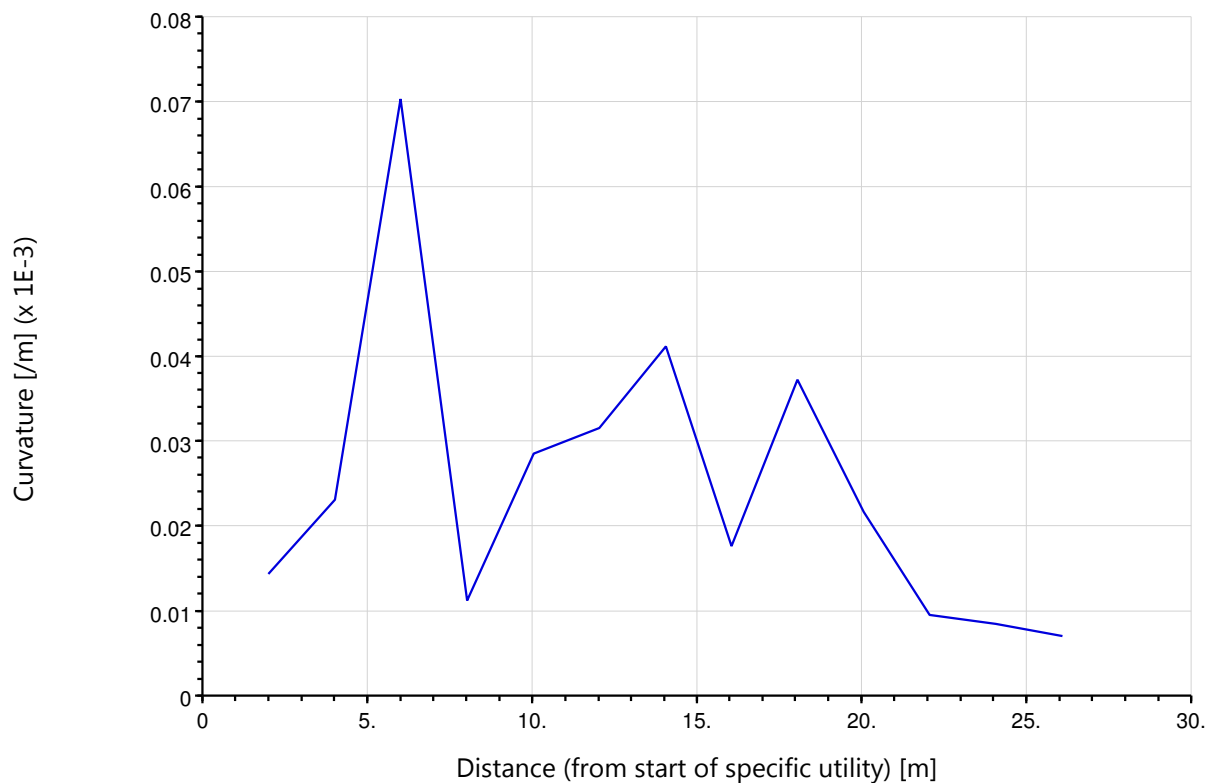
- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 3: TWS(2)_2/1

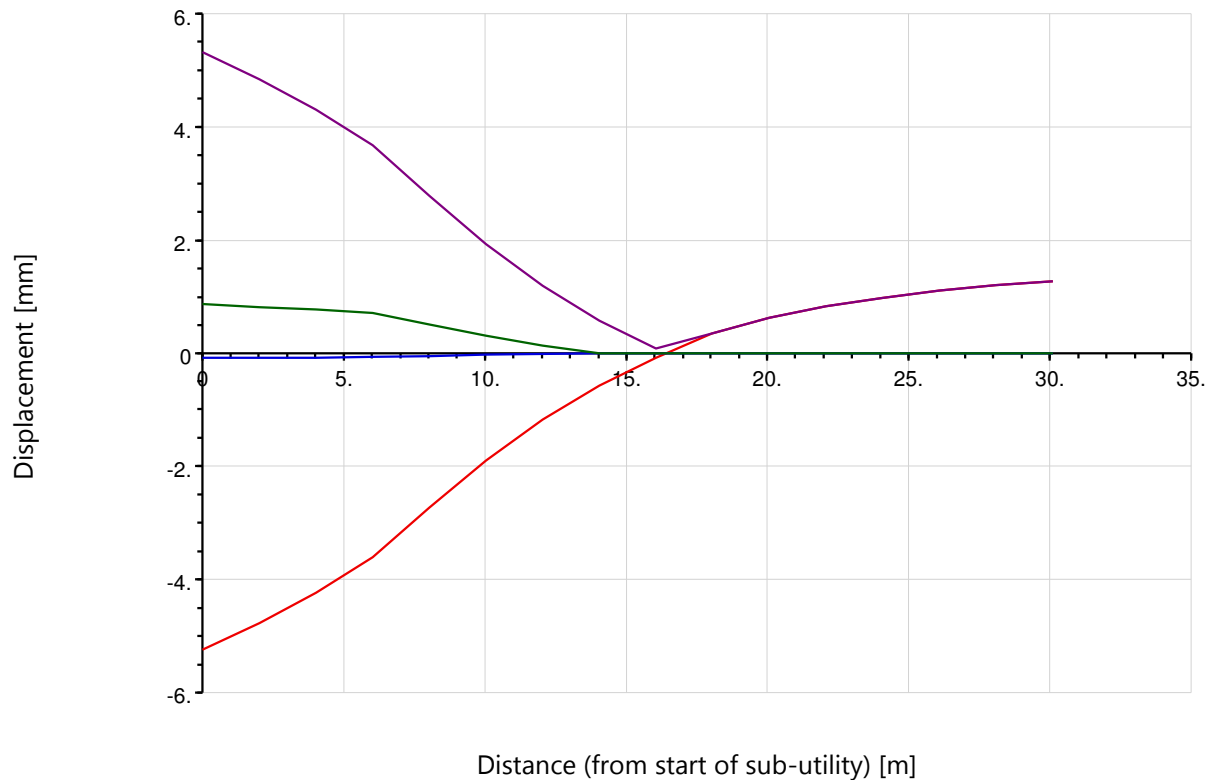
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 3: TWS(2)_2/1

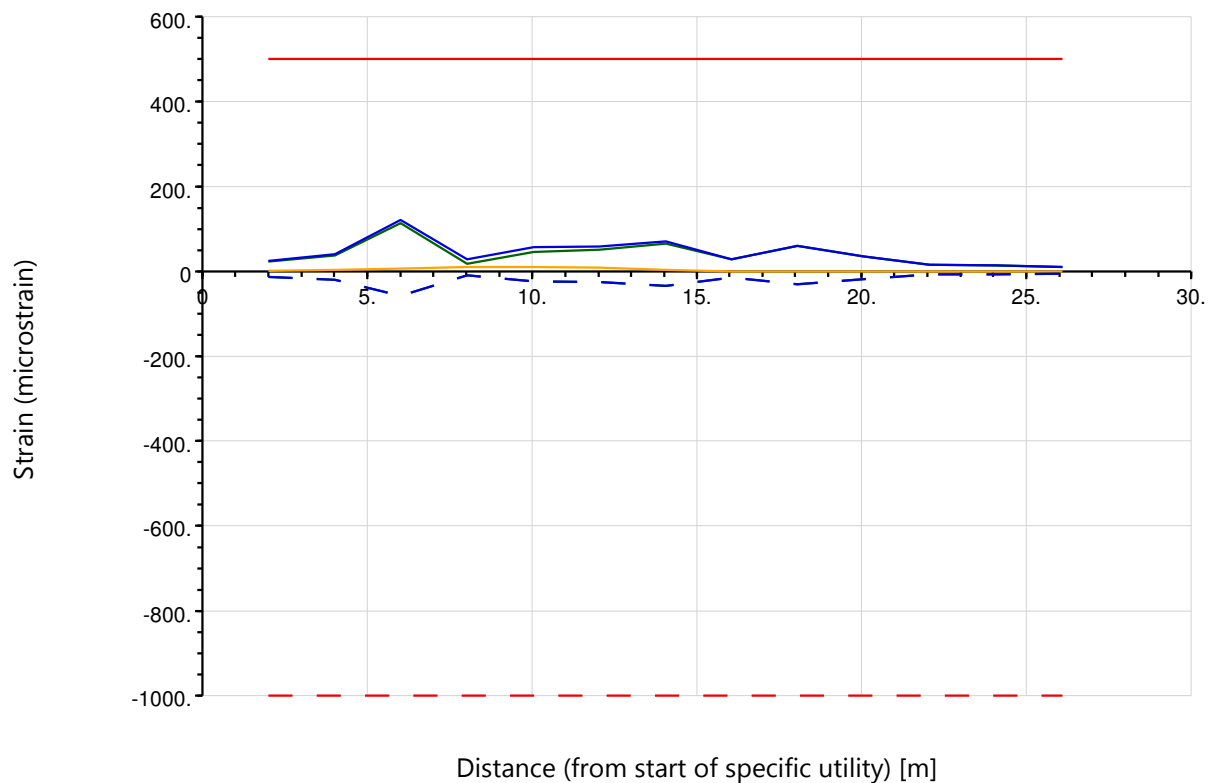
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 3: TWS(2)_2/1

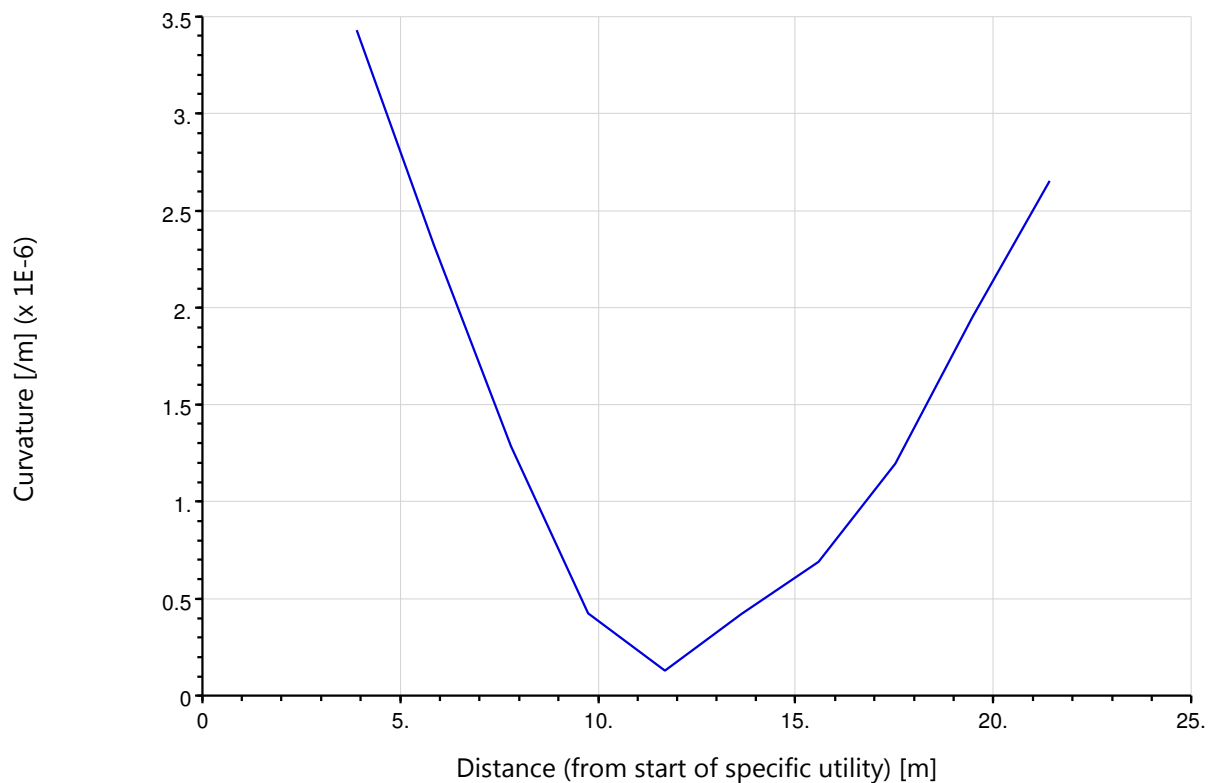
- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 4: TWS(2)_3/1

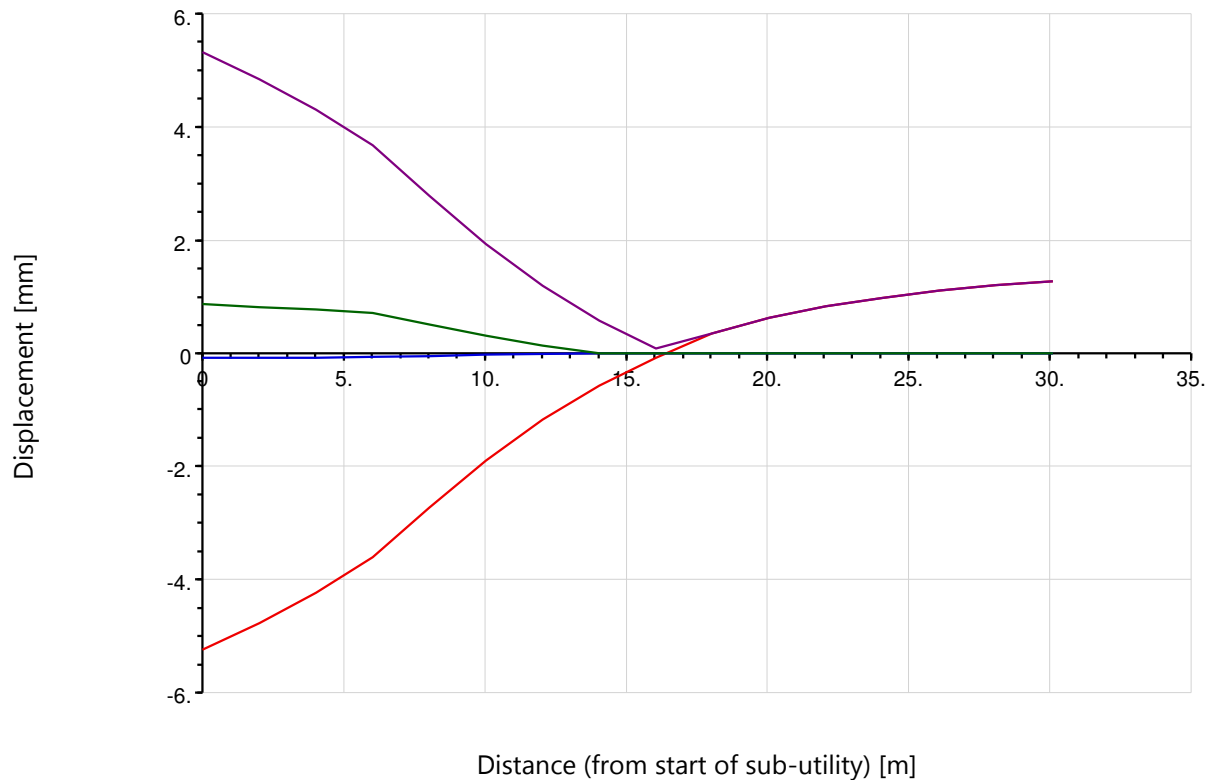
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 3: TWS(2)_2/1

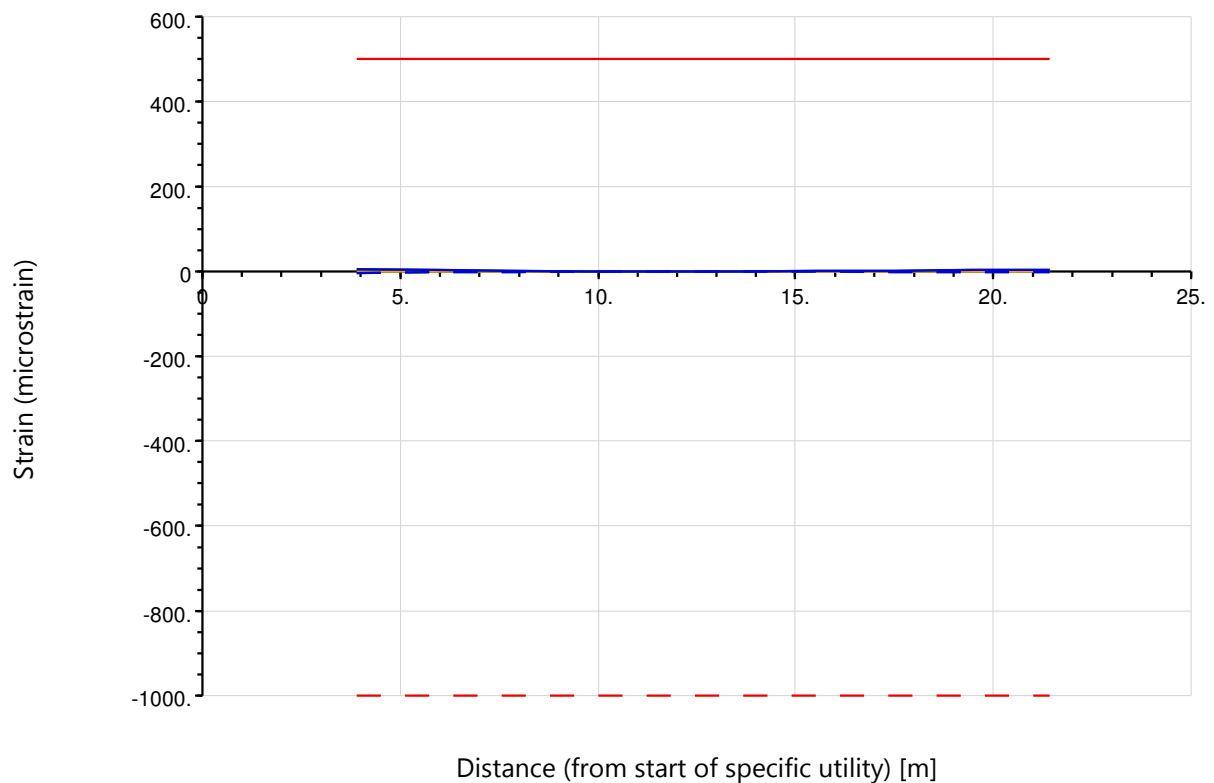
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 4: TWS(2)_3/1

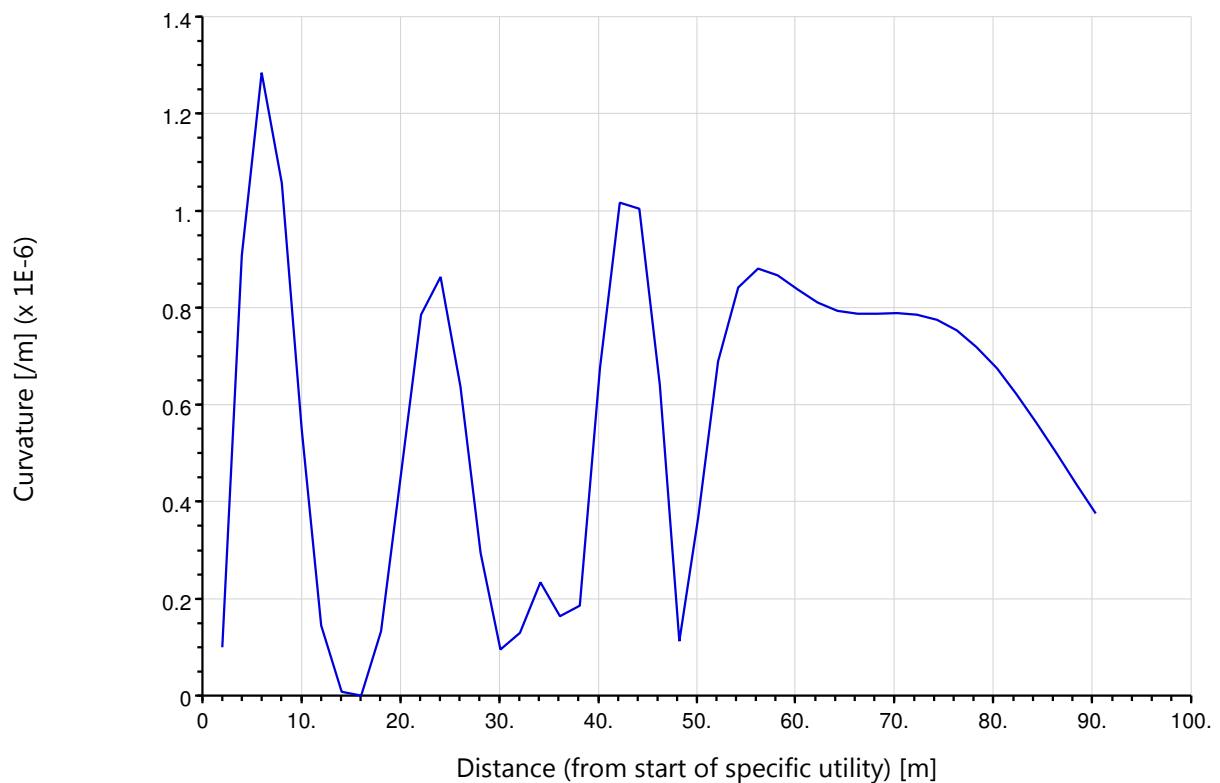
- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 5: TWS(2)_4/1

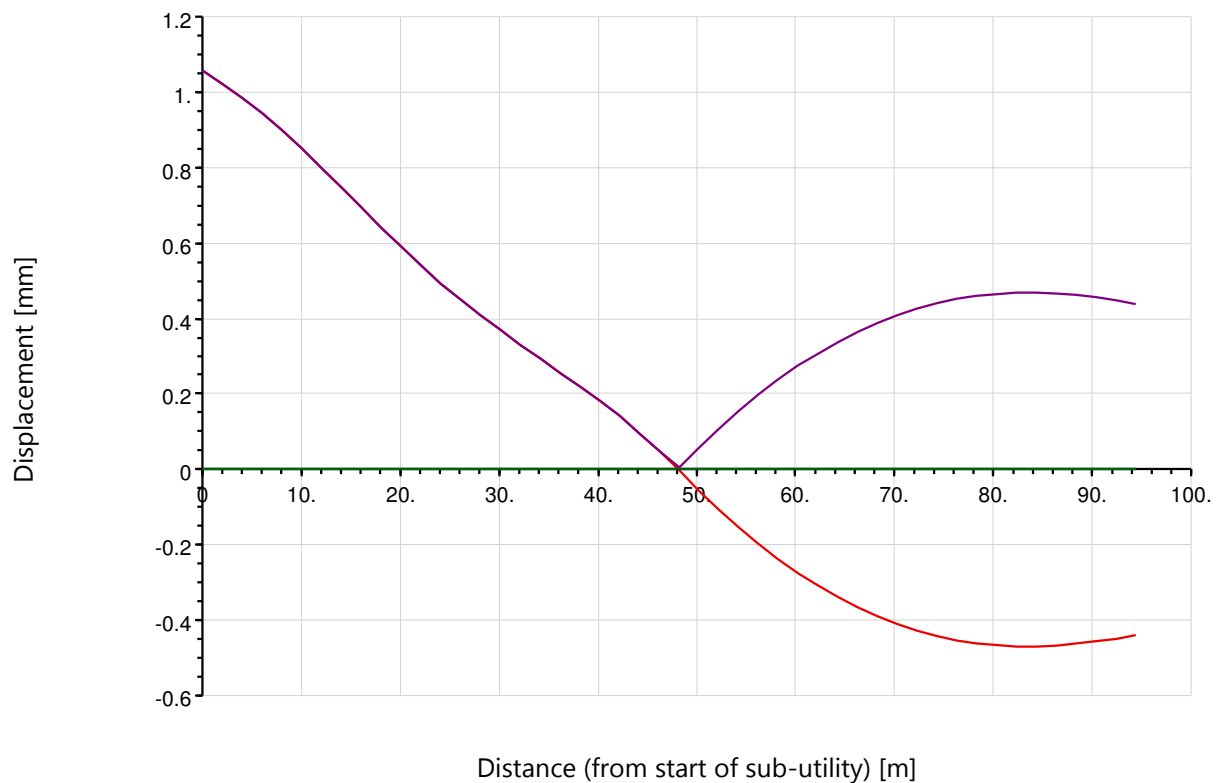
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 5: TWS(2)_4/1

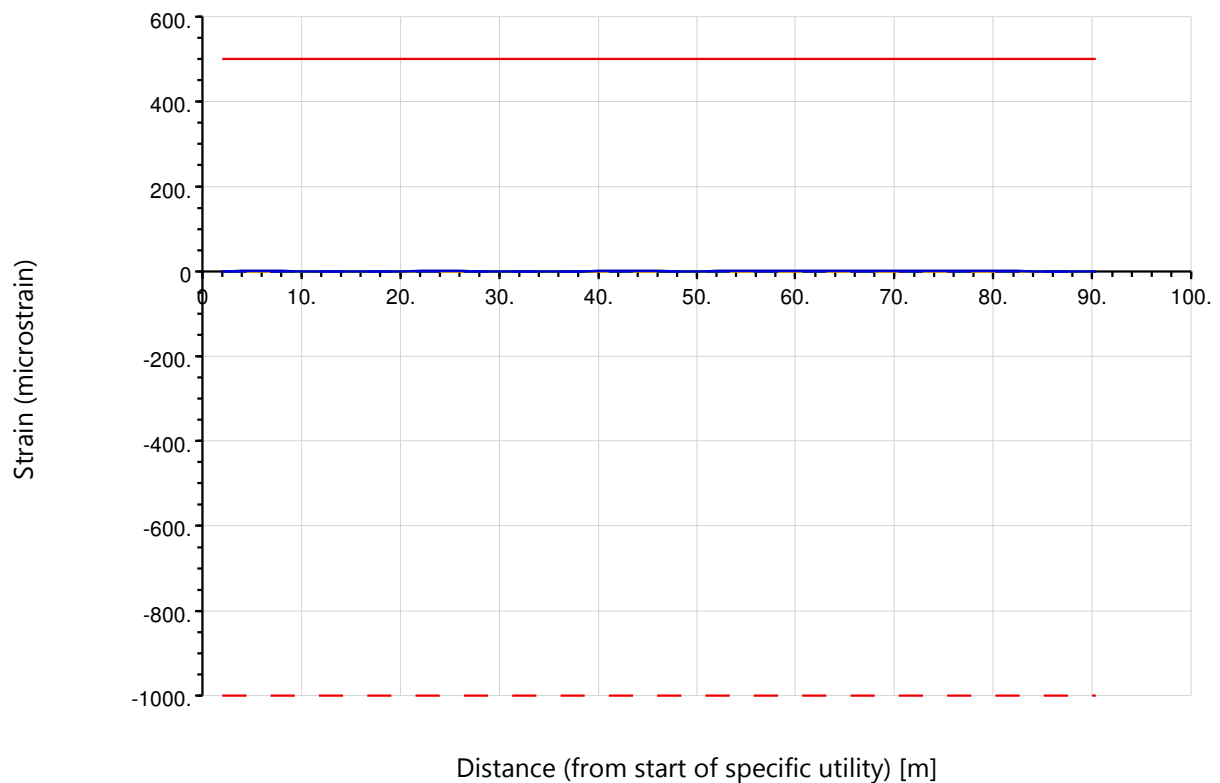
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 5: TWS(2)_4/1

- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



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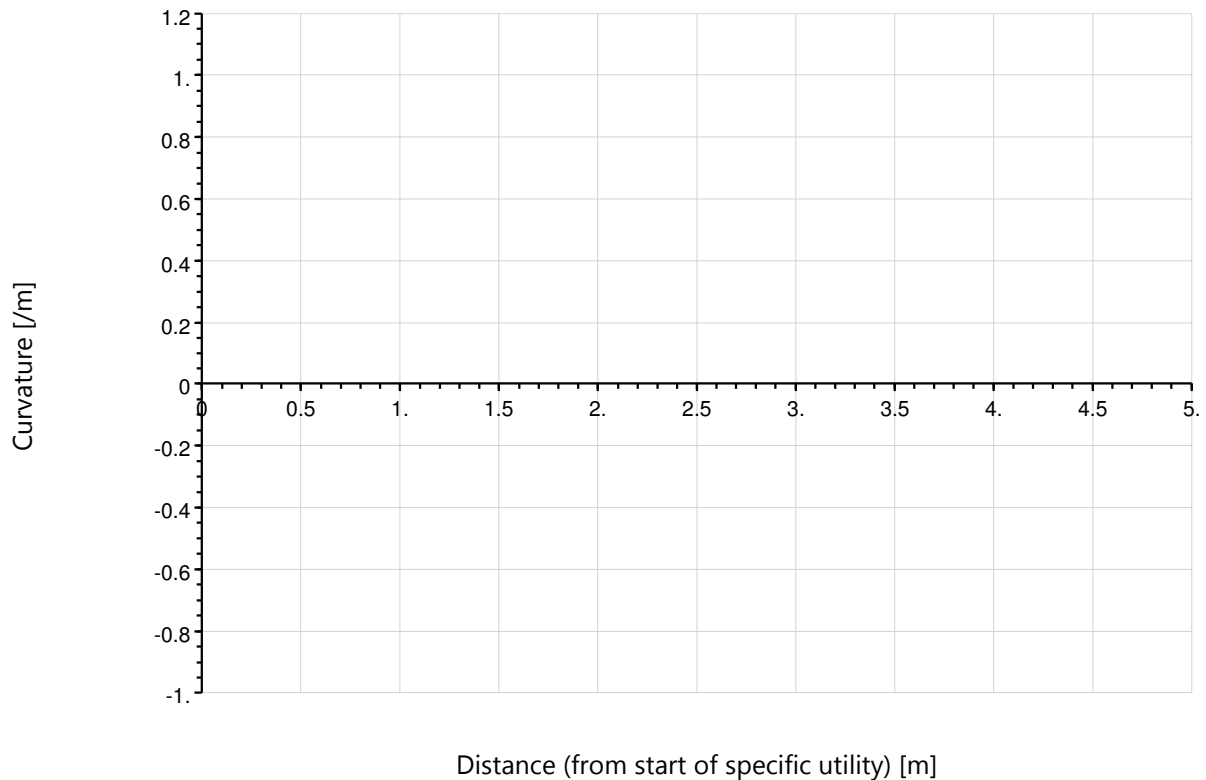
TW Sewer Assessment

PLOT A RESULTS (Smoothed) + PLOT B&C DEMO+WALL INST

Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 10: Assumed FW400 connection to TW2_1/1

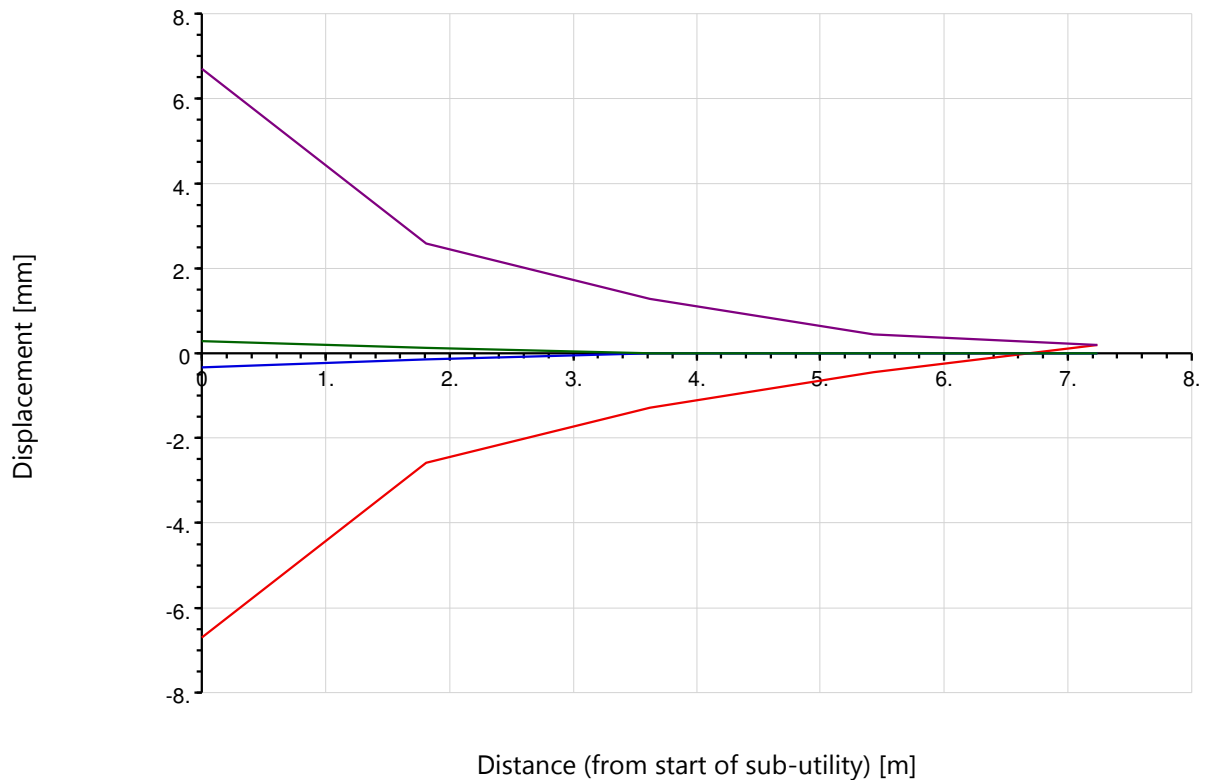
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 10: Assumed FW400 connection to TW2_1/1

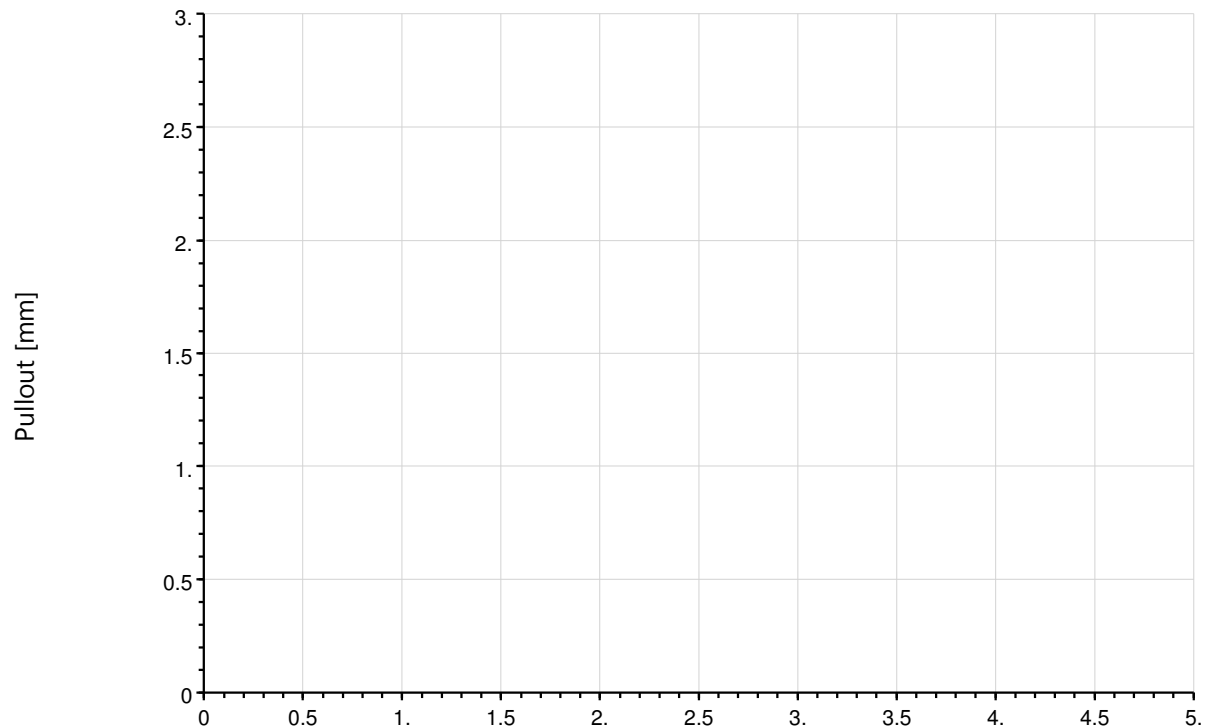
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - Pullout Chart

Stage: Base model, Specific Utility 10: Assumed FW400 connection to TW2_1/1

- - - Axial Pullout (factored)
- - - Flexural Pullout (factored)
- Total Pullout (factored)
- Total Pullout Limit



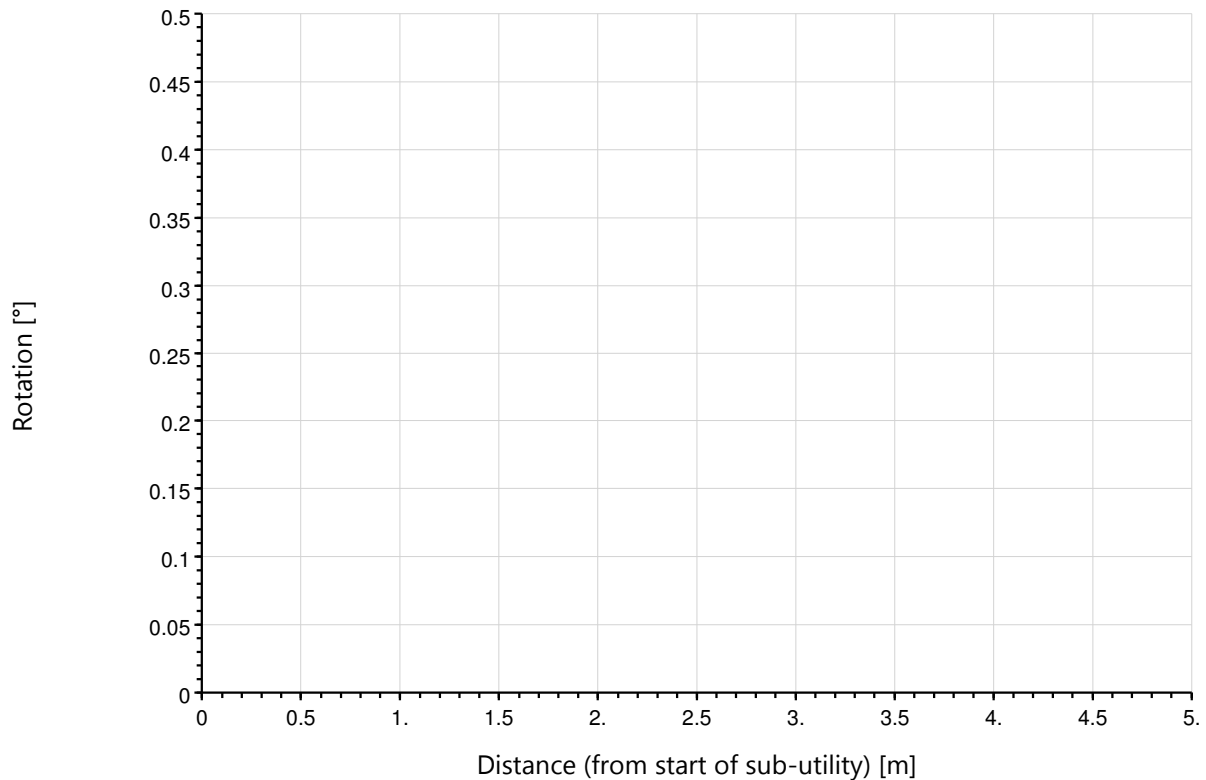
Distance (from start of sub-utility) [m] Note: Total pullout ignores the axial component where this is negative (i.e. comp

Specific Utility - Rotation Chart

Stage: Base model, Specific Utility 10: Assumed FW400 connection to TW2_1/1

Rotation (factored)

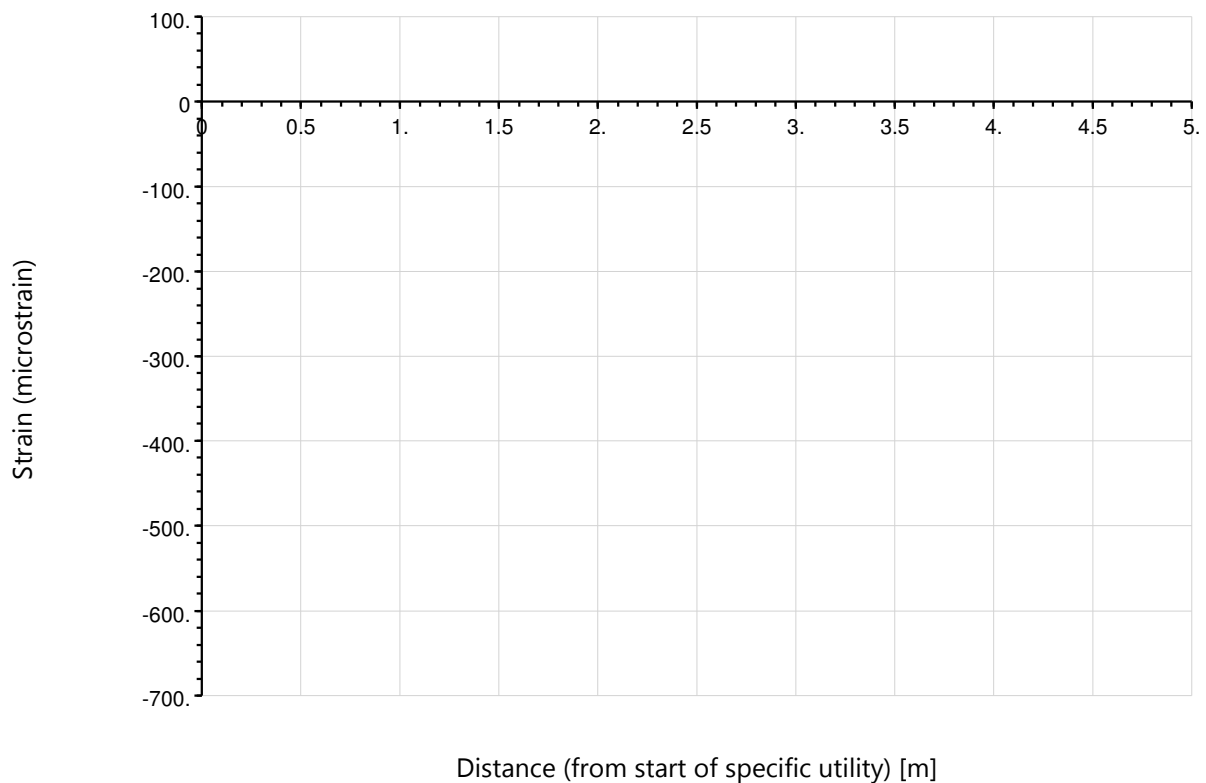
Rotation Limit



Specific Utility - Combined Strain Chart

Stage: Base model, Specific Utility 10: Assumed FW400 connection to TW2 1/1

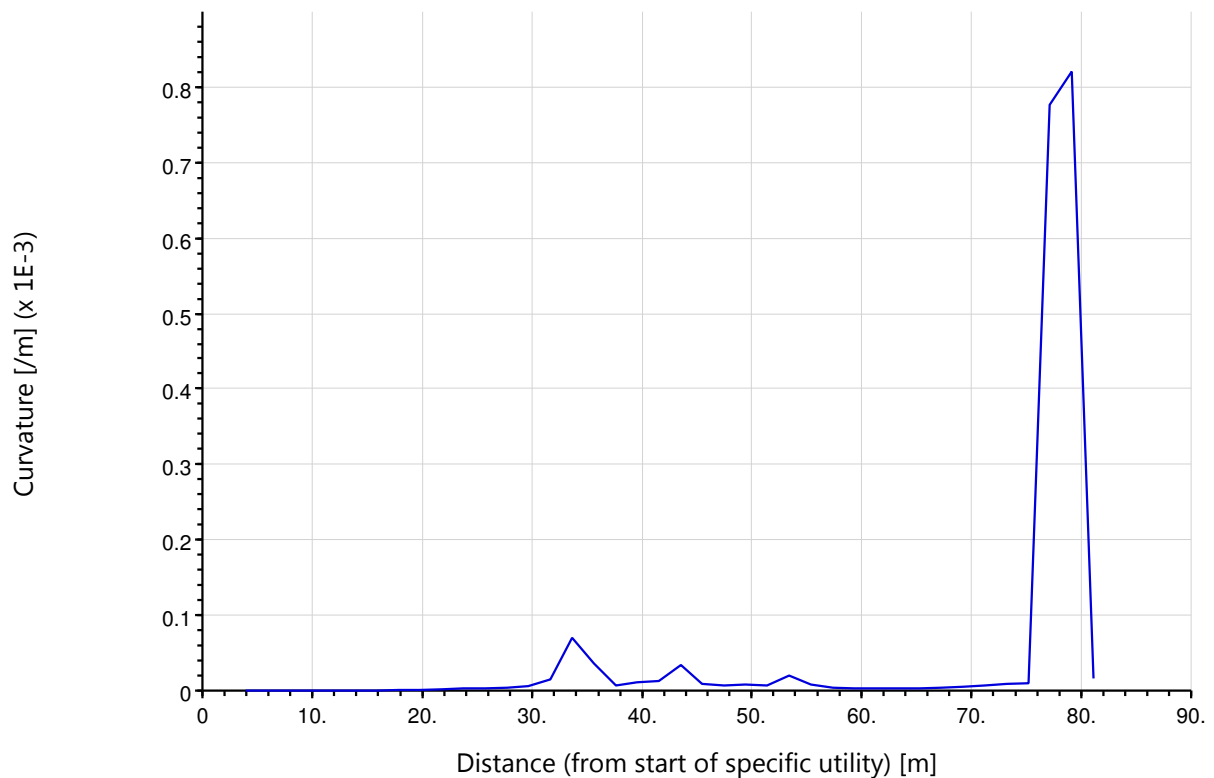
- Combined Tensile Strain (factored)
- Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 6: TW Fresh Water (a) - St Pancras/1

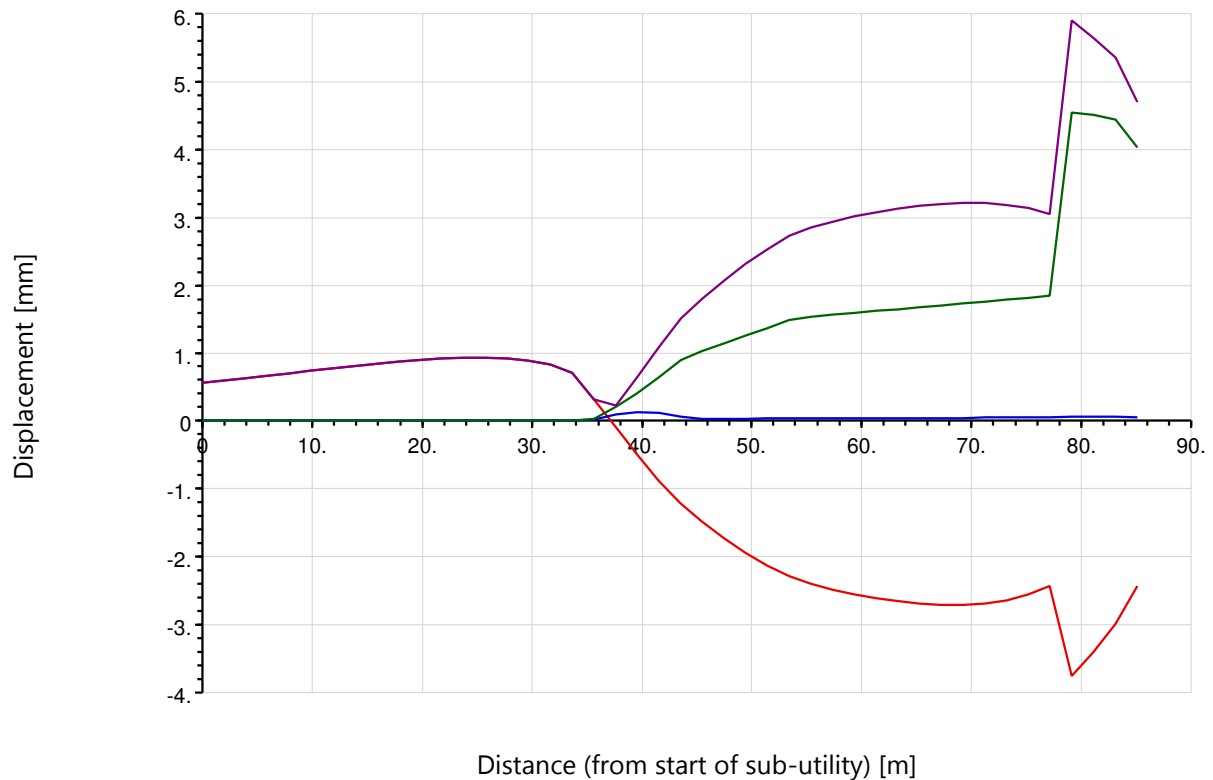
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 6: TW Fresh Water (a) - St Pancras/1

- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)

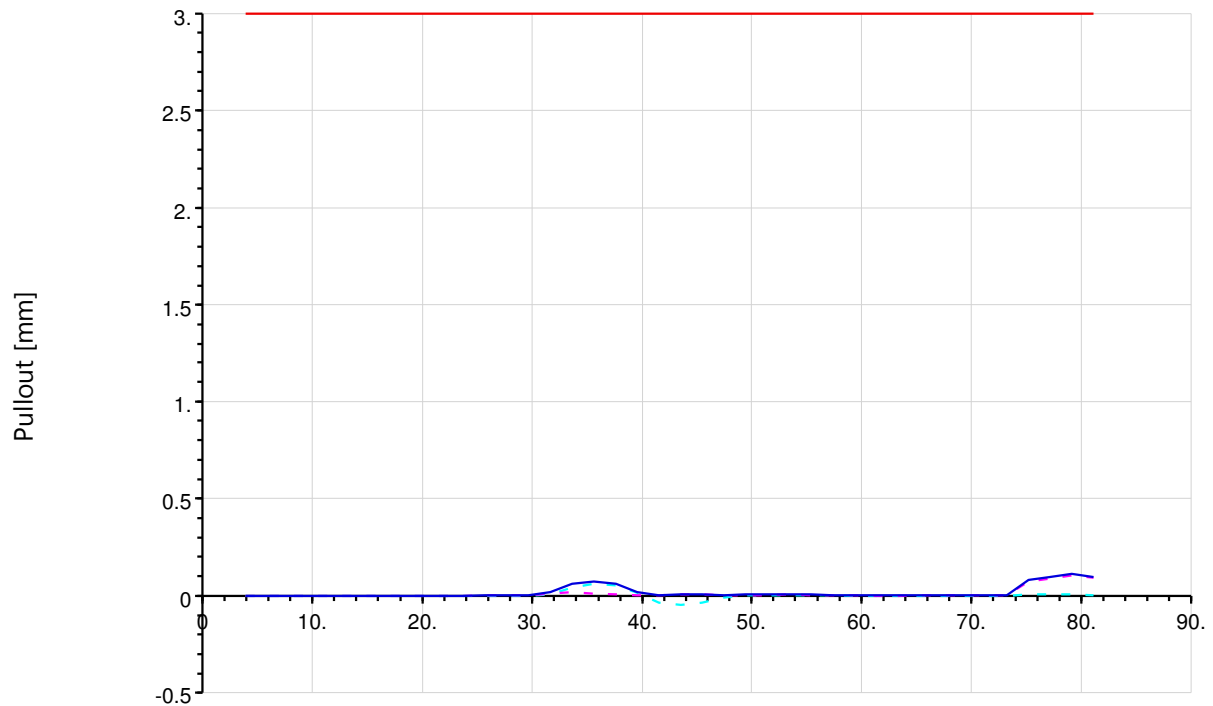


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Specific Utility - Pullout Chart

Stage: Base model, Specific Utility 6: TW Fresh Water (a) - St Pancras/1

- - - Axial Pullout (factored)
- - - Flexural Pullout (factored)
- Total Pullout (factored)
- Total Pullout Limit



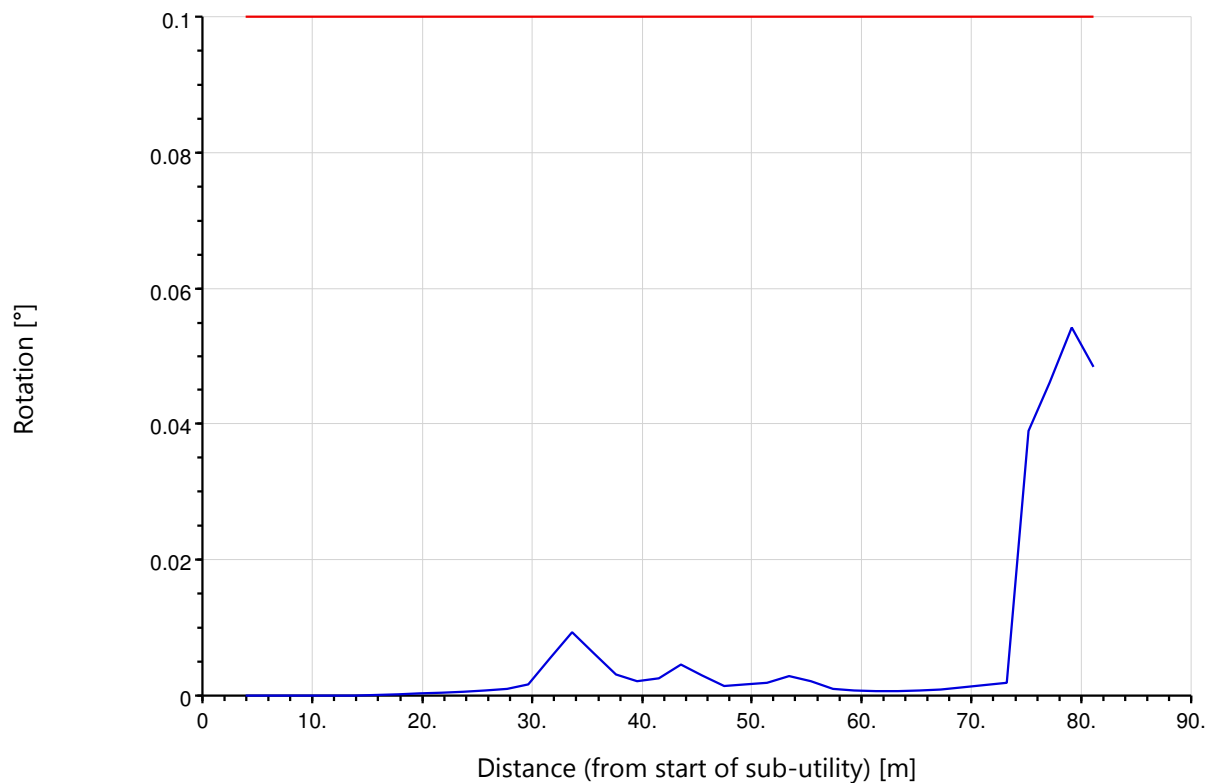
Distance (from start of sub-utility) [m] Note: Total pullout ignores the axial component where this is negative (i.e. comp

Specific Utility - Rotation Chart

Stage: Base model, Specific Utility 6: TW Fresh Water (a) - St Pancras/1

— Rotation (factored)

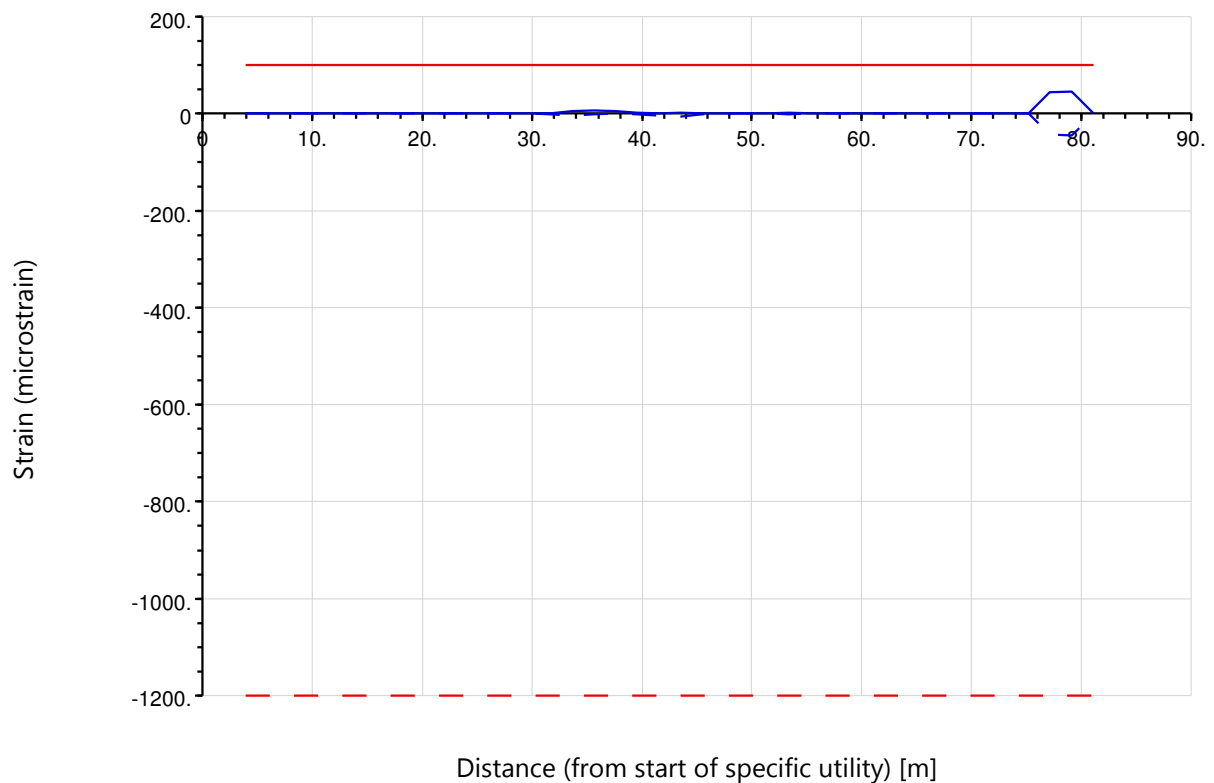
— Rotation Limit



Specific Utility - Combined Strain Chart

Stage: Base model, Specific Utility 6: TW Fresh Water (a) - St Pancras/1

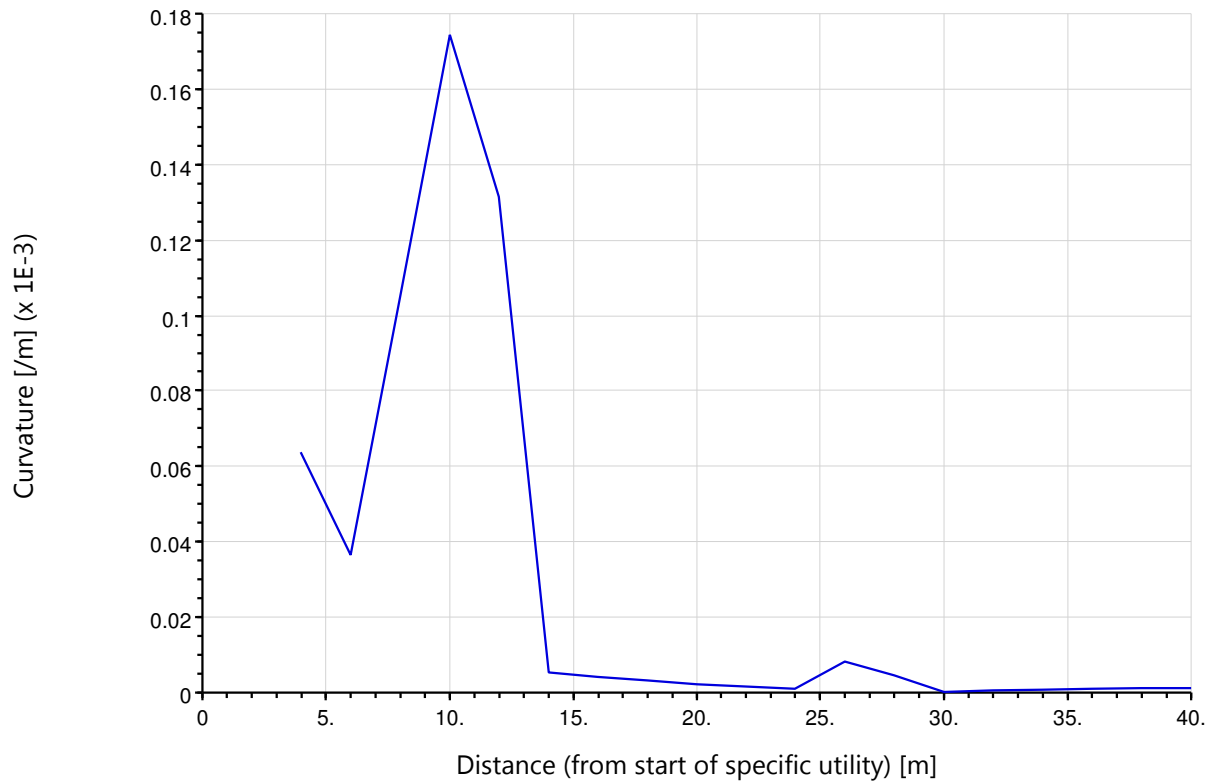
- Combined Tensile Strain (factored)
- Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 7: TW Fresh Water (b) - St Pancras/1

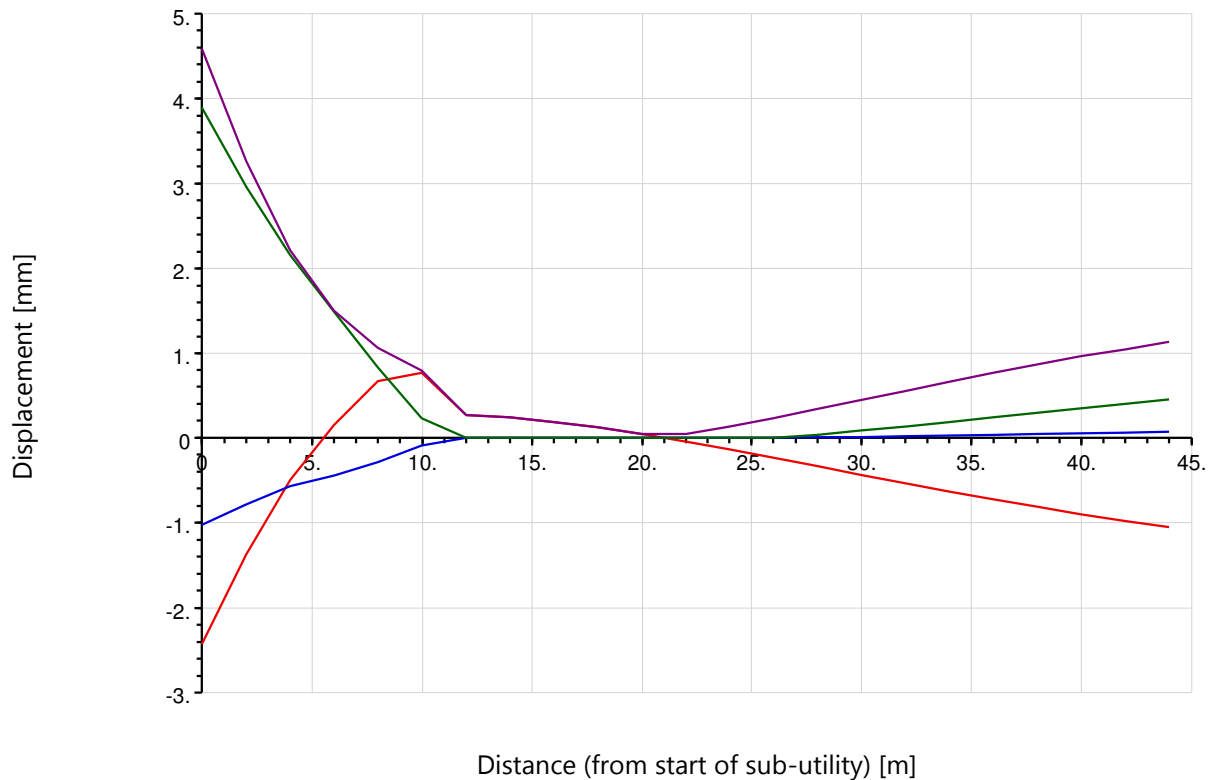
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 7: TW Fresh Water (b) - St Pancras/1

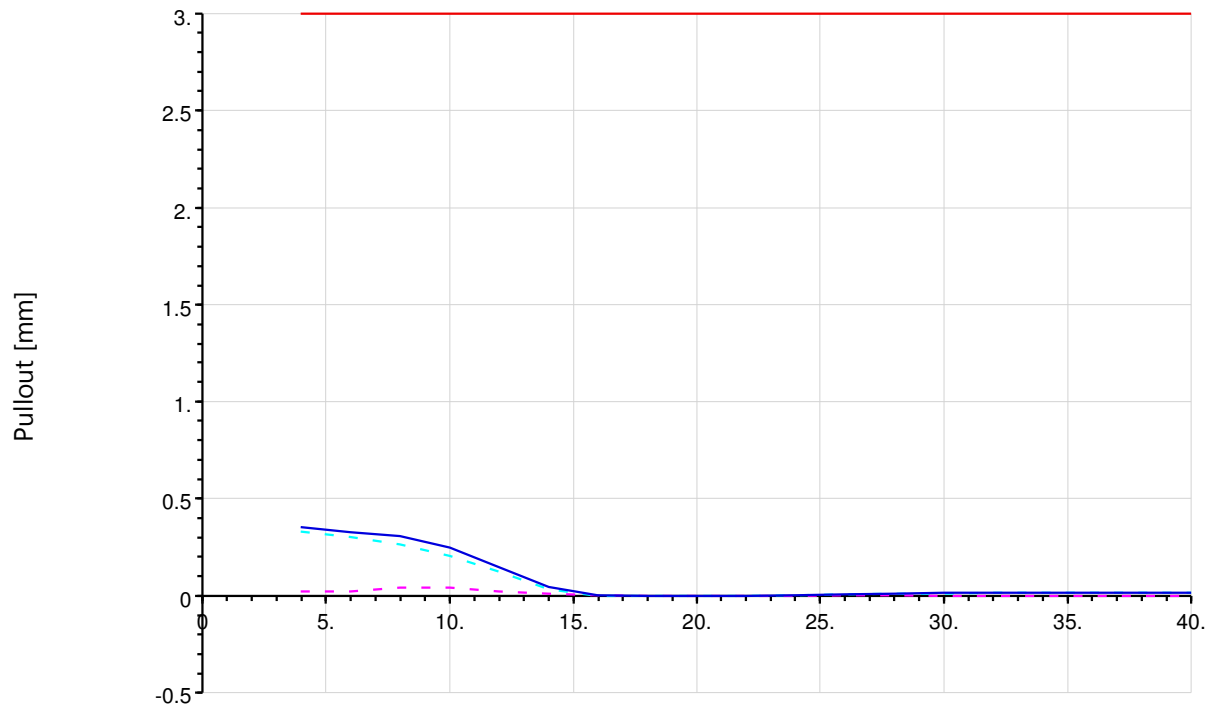
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - Pullout Chart

Stage: Base model, Specific Utility 7: TW Fresh Water (b) - St Pancras/1

- - - Axial Pullout (factored)
- - - Flexural Pullout (factored)
- Total Pullout (factored)
- Total Pullout Limit



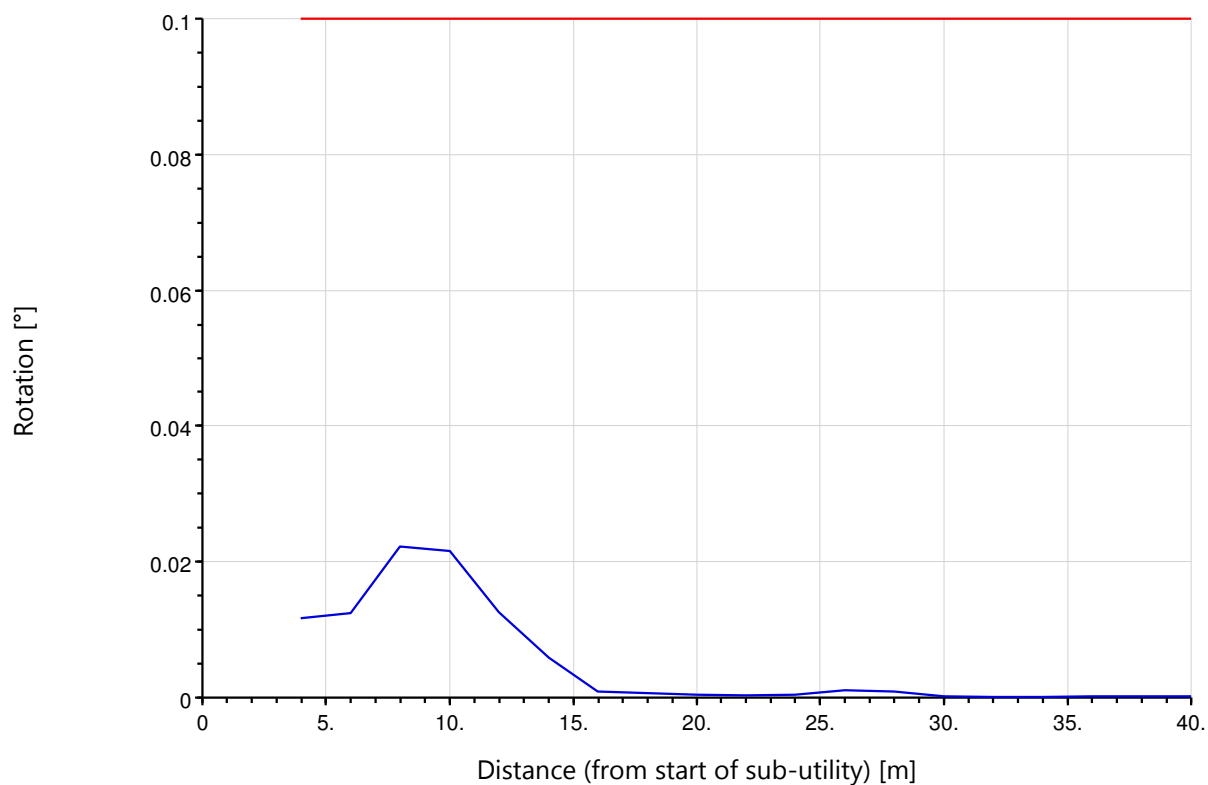
Distance (from start of sub-utility) [m] Note: Total pullout ignores the axial component where this is negative (i.e. comp

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Specific Utility - Rotation Chart

Stage: Base model, Specific Utility 7: TW Fresh Water (b) - St Pancras/1

— Rotation (factored)
— Rotation Limit



Specific Utility - Combined Strain Chart

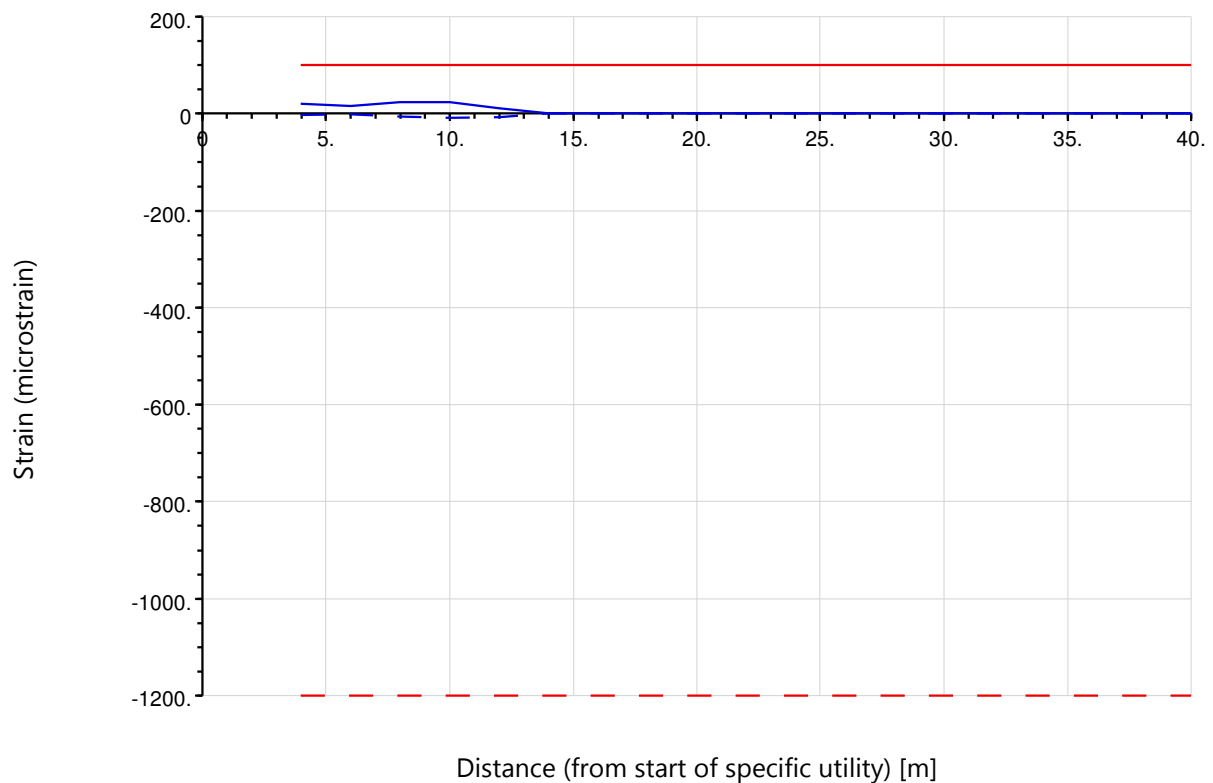
Stage: Base model, Specific Utility 7: TW Fresh Water (b) - St Pancras/1

— Combined Tensile Strain (factored)

— Combined Compressive Strain (factored)

— Allowable Tensile Strain

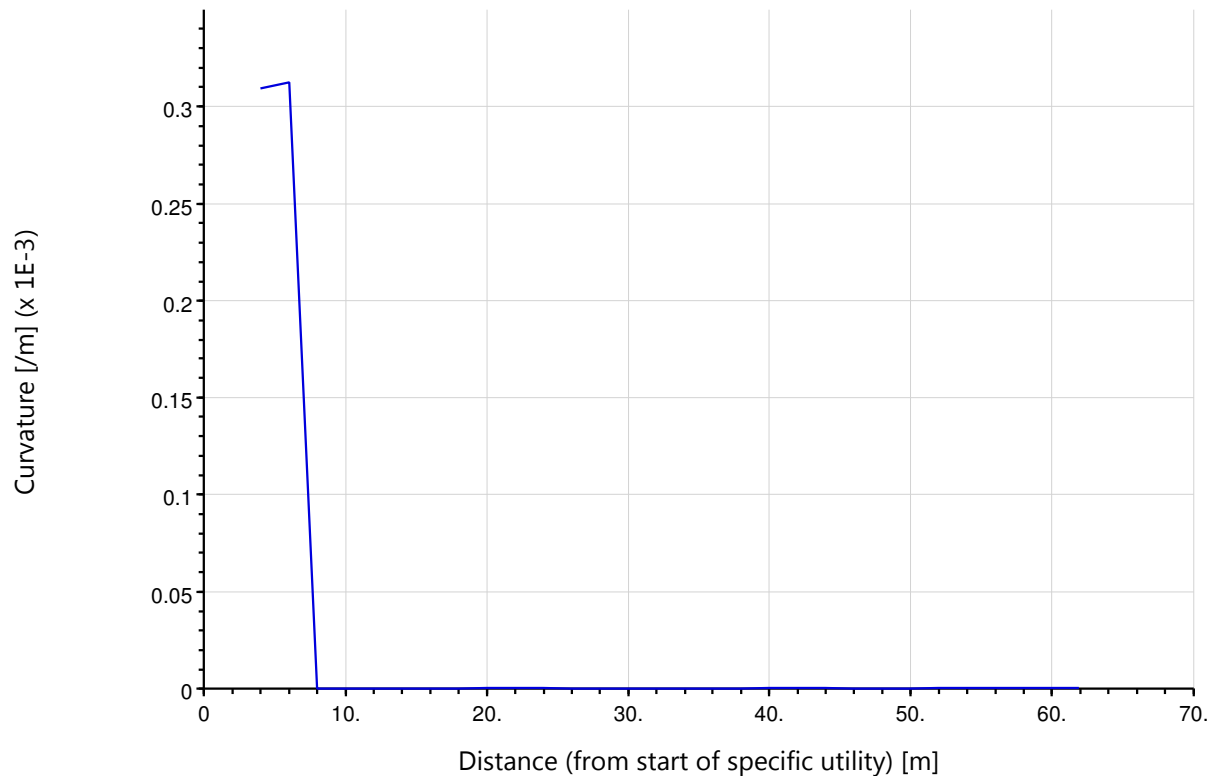
- - Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 8: TW Fresh Water (c) - St Pancras/1

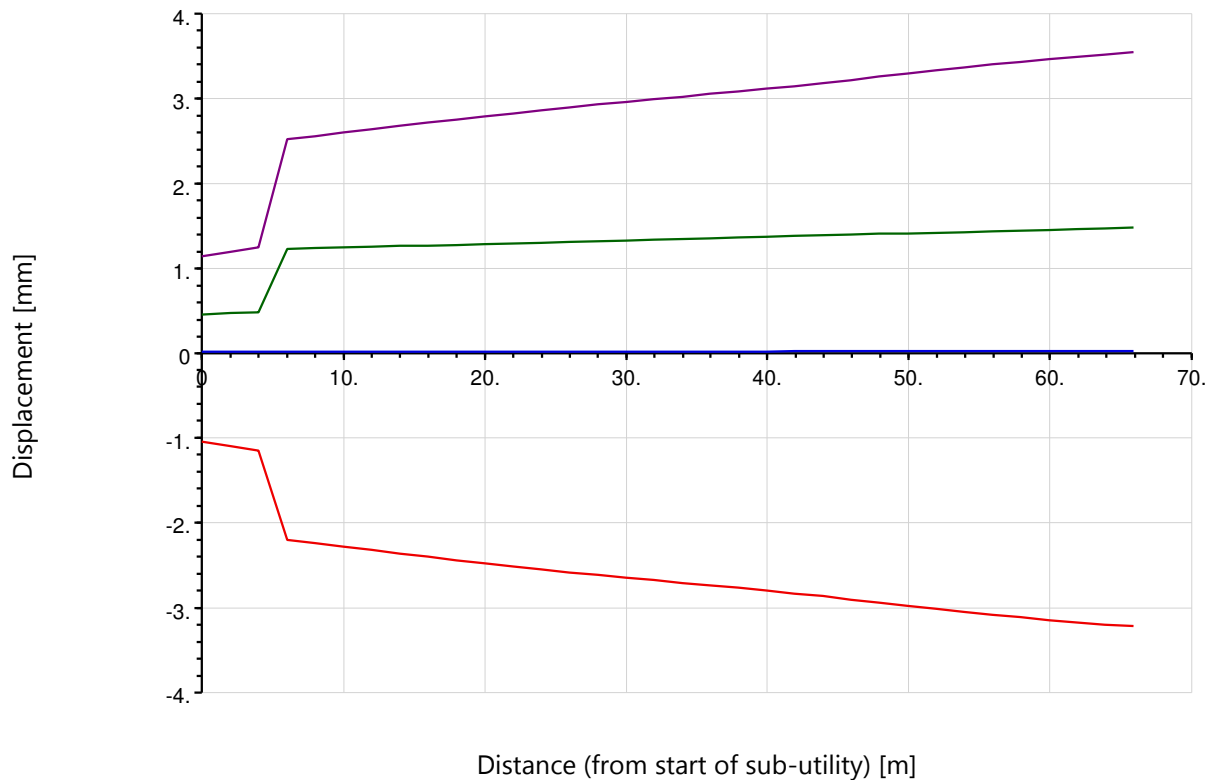
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 8: TW Fresh Water (c) - St Pancras/1

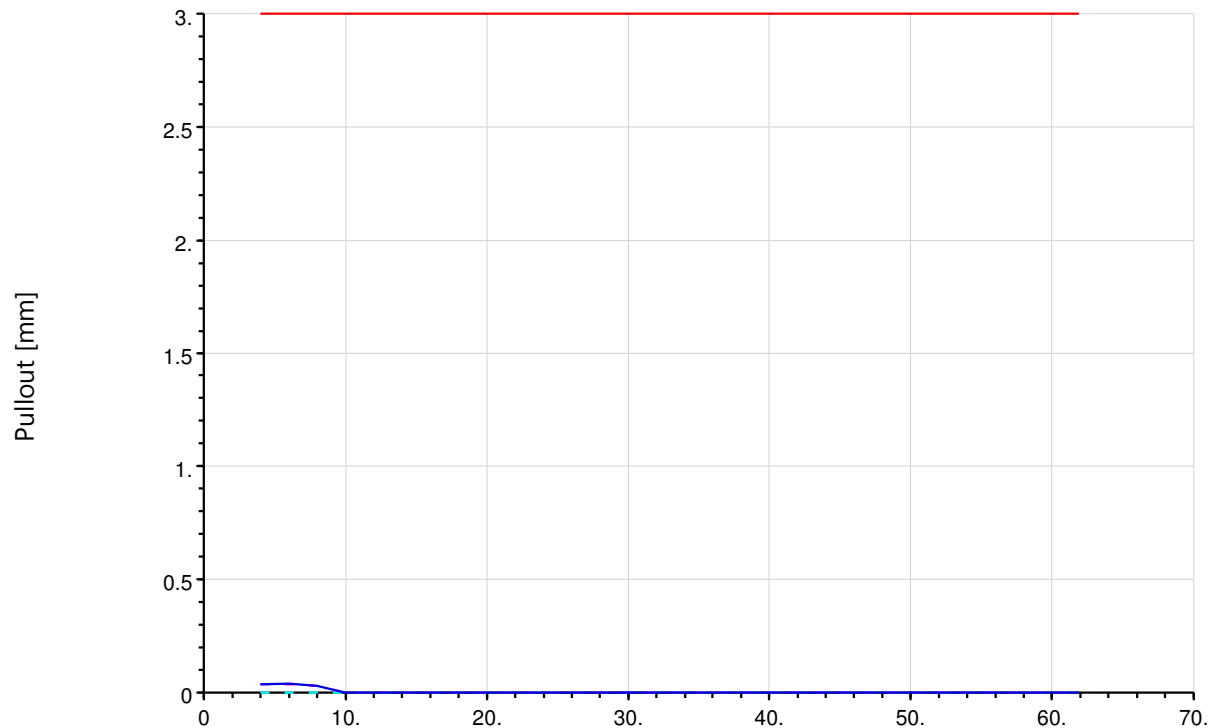
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - Pullout Chart

Stage: Base model, Specific Utility 8: TW Fresh Water (c) - St Pancras/1

- - - Axial Pullout (factored)
- - - Flexural Pullout (factored)
- Total Pullout (factored)
- Total Pullout Limit



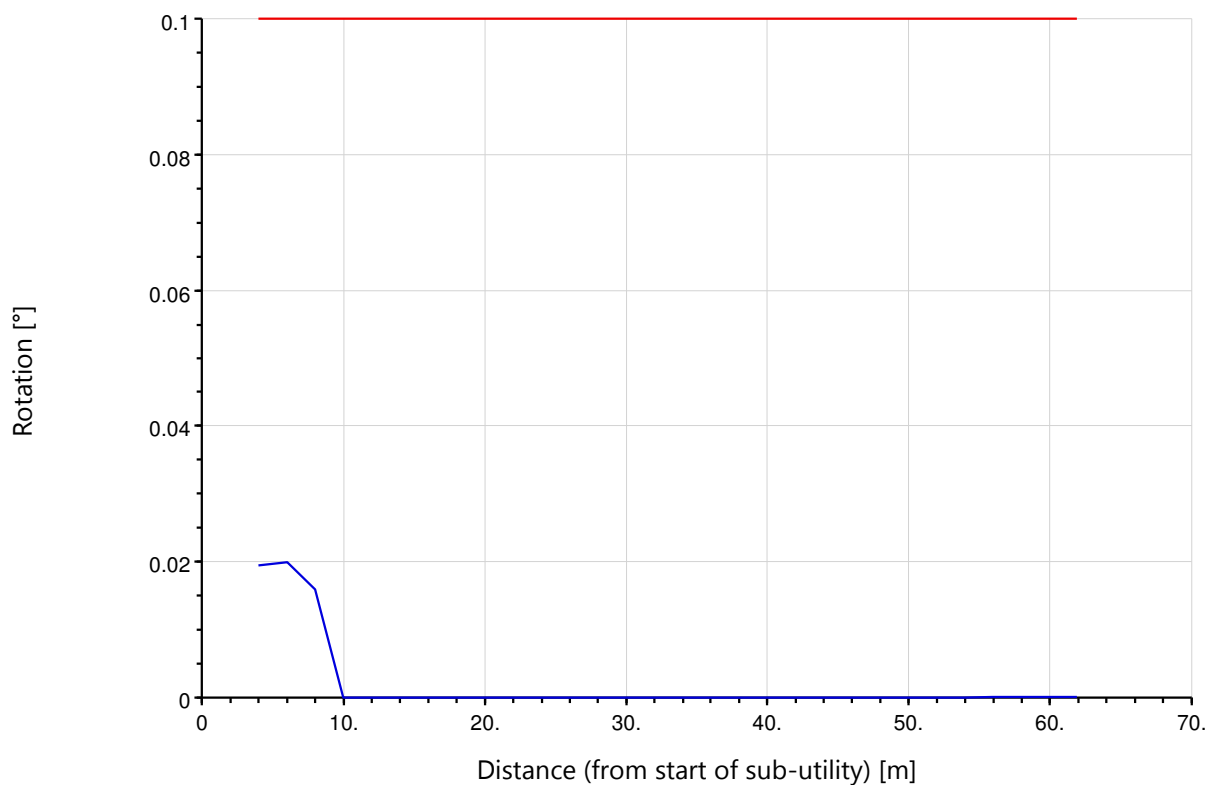
Distance (from start of sub-utility) [m] Note: Total pullout ignores the axial component where this is negative (i.e. comp

Specific Utility - Rotation Chart

Stage: Base model, Specific Utility 8: TW Fresh Water (c) - St Pancras/1

— Rotation (factored)

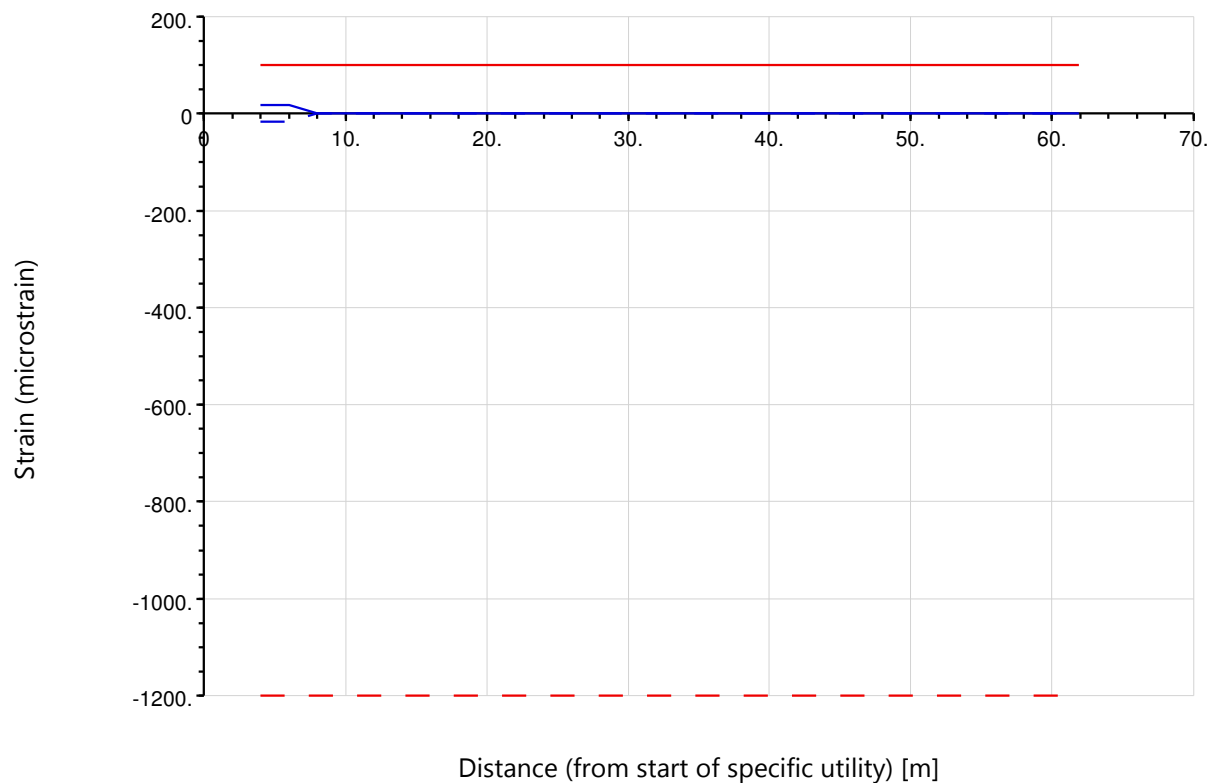
— Rotation Limit



Specific Utility - Combined Strain Chart

Stage: Base model, Specific Utility 8: TW Fresh Water (c) - St Pancras/1

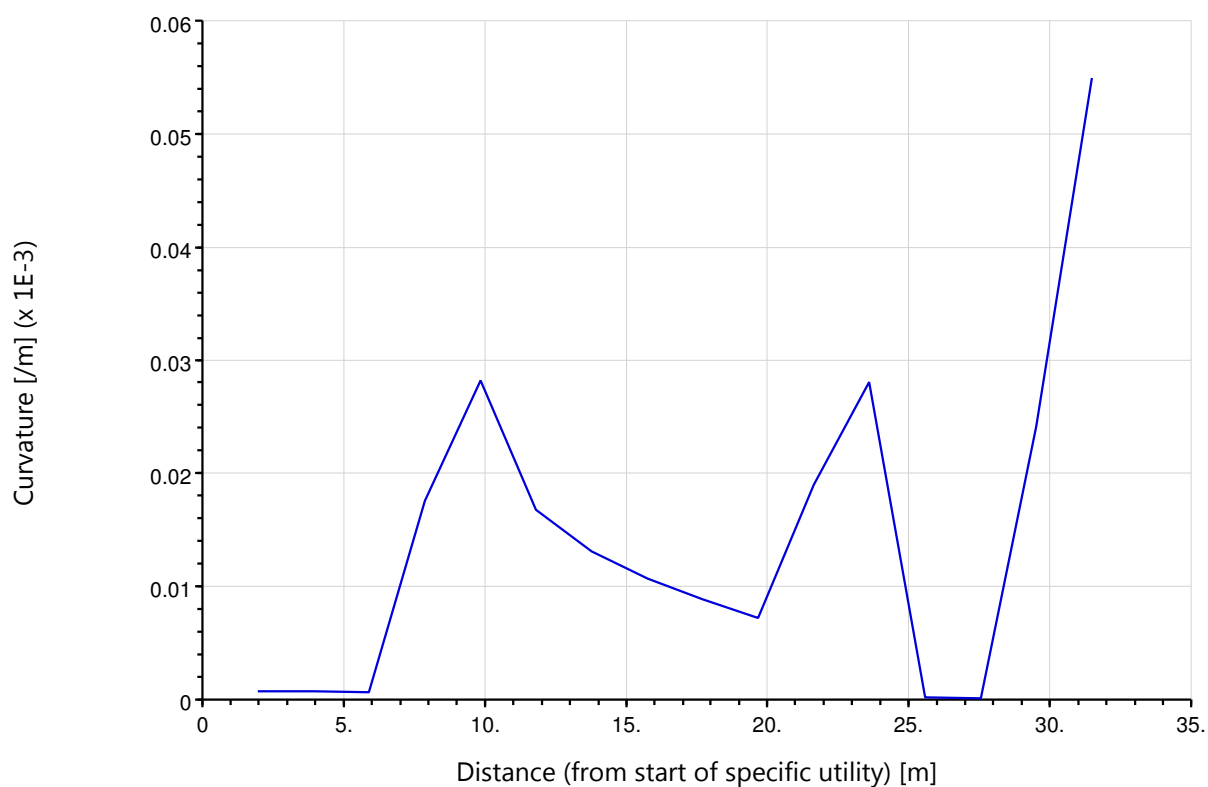
- Combined Tensile Strain (factored)
- Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 9: TW Fresh Water (d) - St Pancras/1

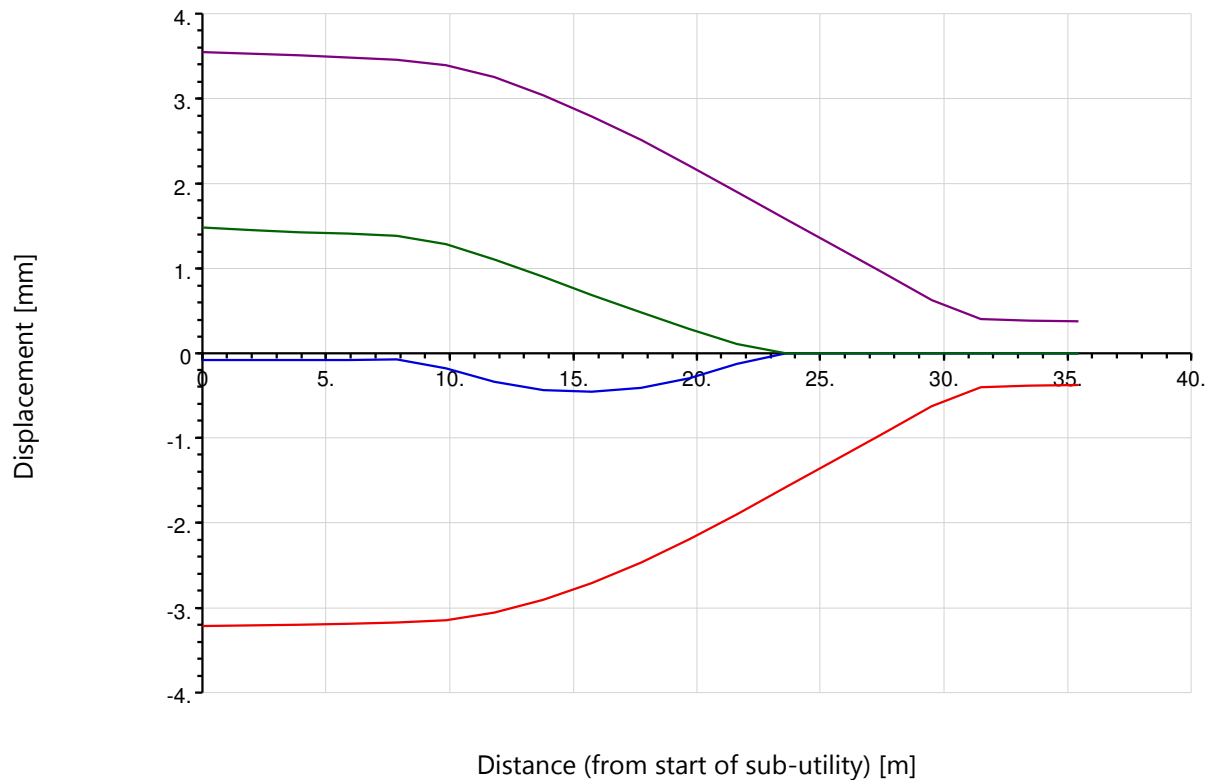
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 9: TW Fresh Water (d) - St Pancras/1

- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)

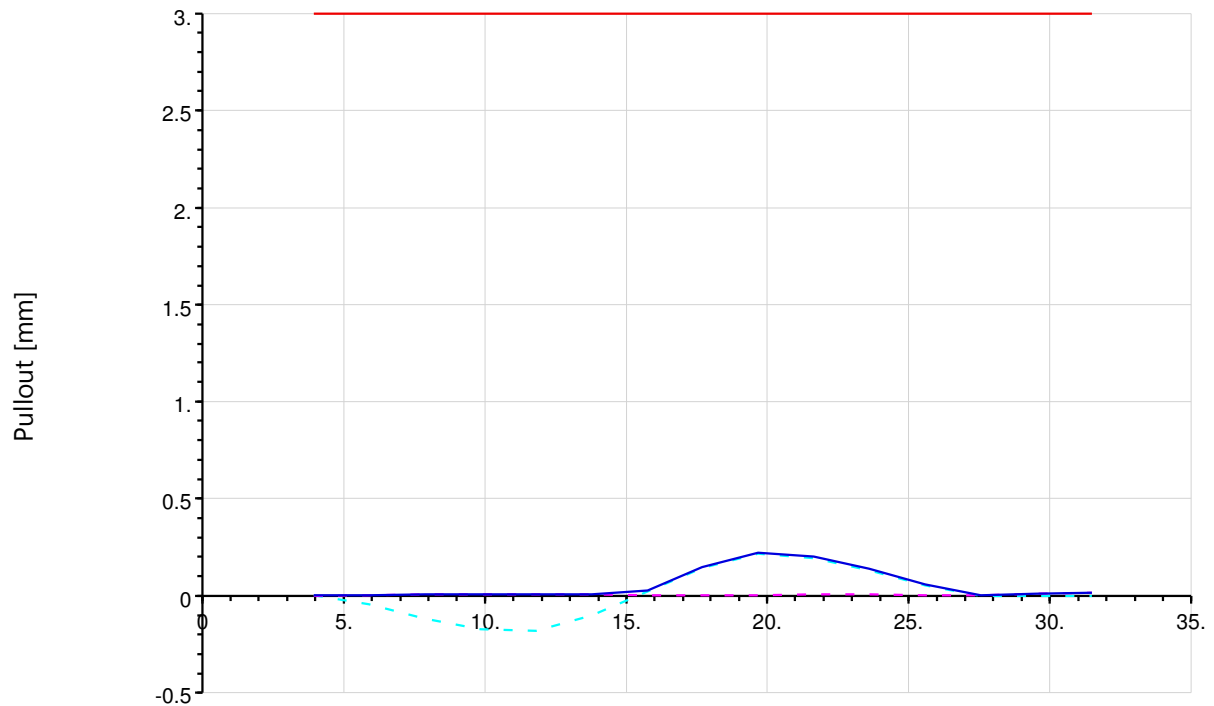


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Specific Utility - Pullout Chart

Stage: Base model, Specific Utility 9: TW Fresh Water (d) - St Pancras/1

- - - Axial Pullout (factored)
- - - Flexural Pullout (factored)
- Total Pullout (factored)
- Total Pullout Limit



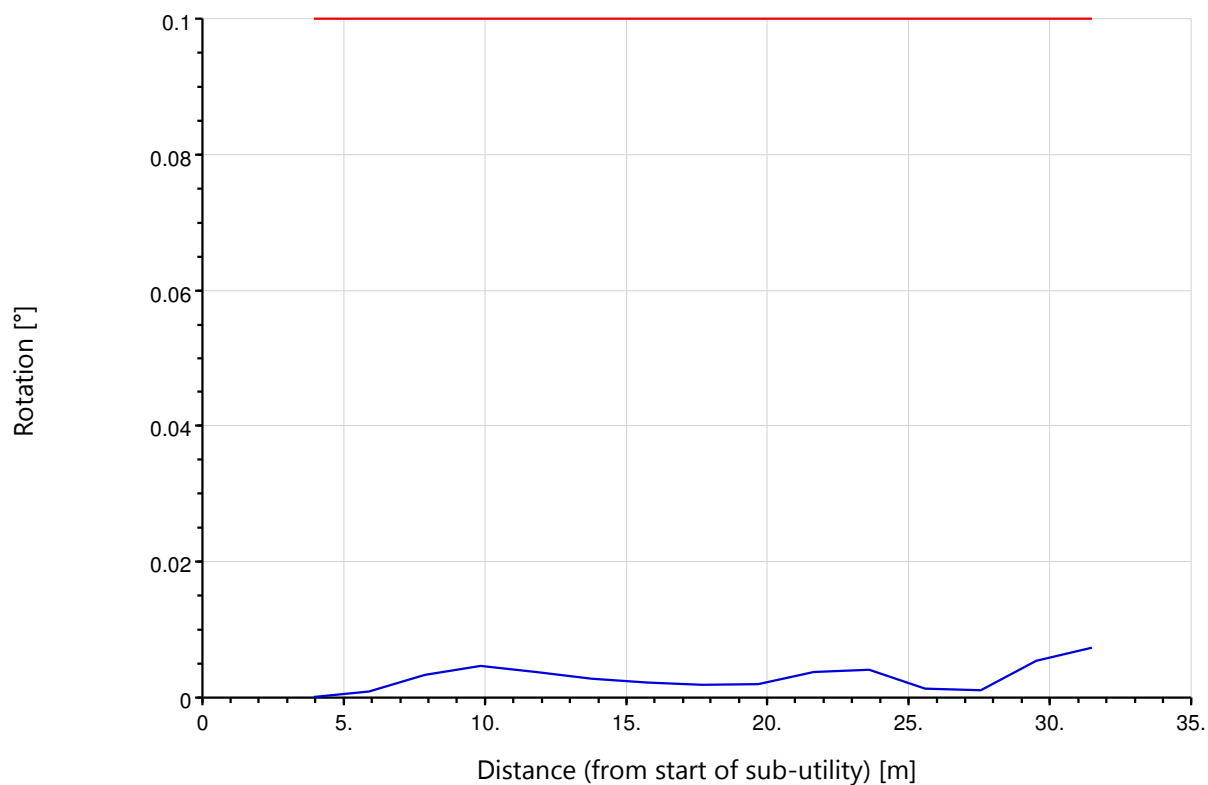
Distance (from start of sub-utility) [m] Note: Total pullout ignores the axial component where this is negative (i.e. comp

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Specific Utility - Rotation Chart

Stage: Base model, Specific Utility 9: TW Fresh Water (d) - St Pancras/1

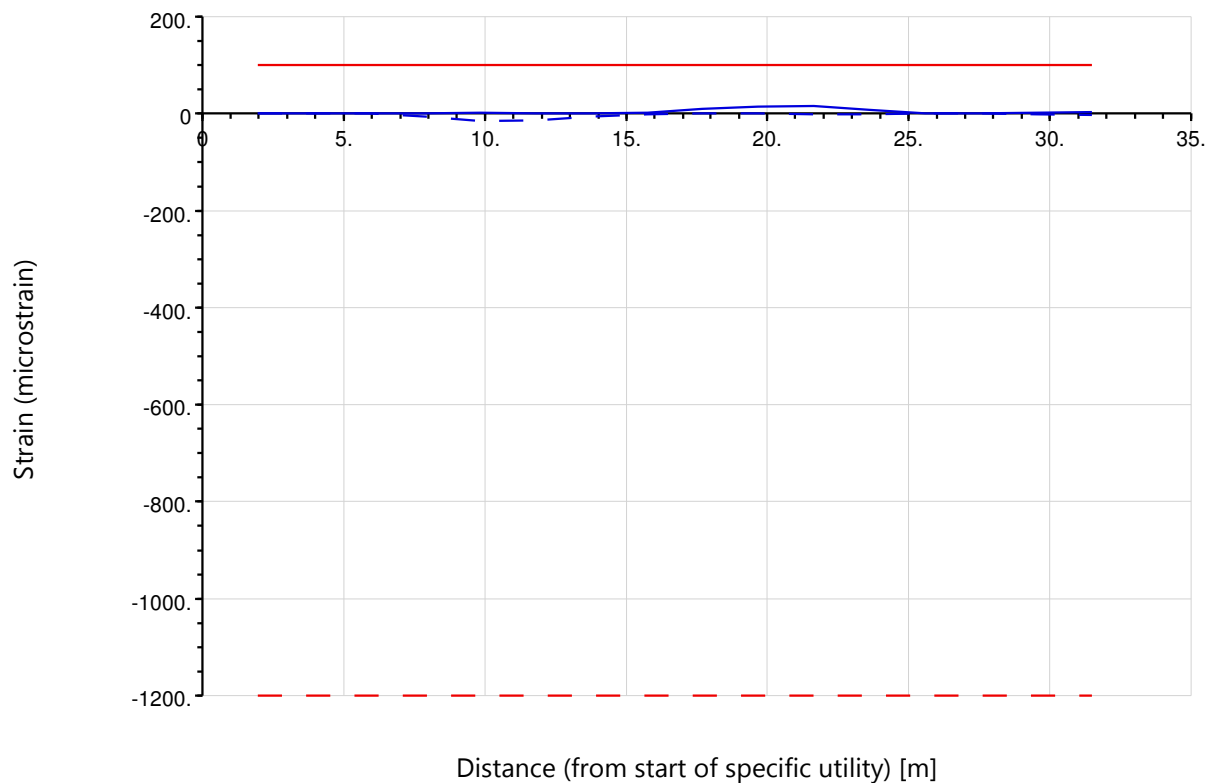
— Rotation (factored)
— Rotation Limit



Specific Utility - Combined Strain Chart

Stage: Base model, Specific Utility 9: TW Fresh Water (d) - St Pancras/1

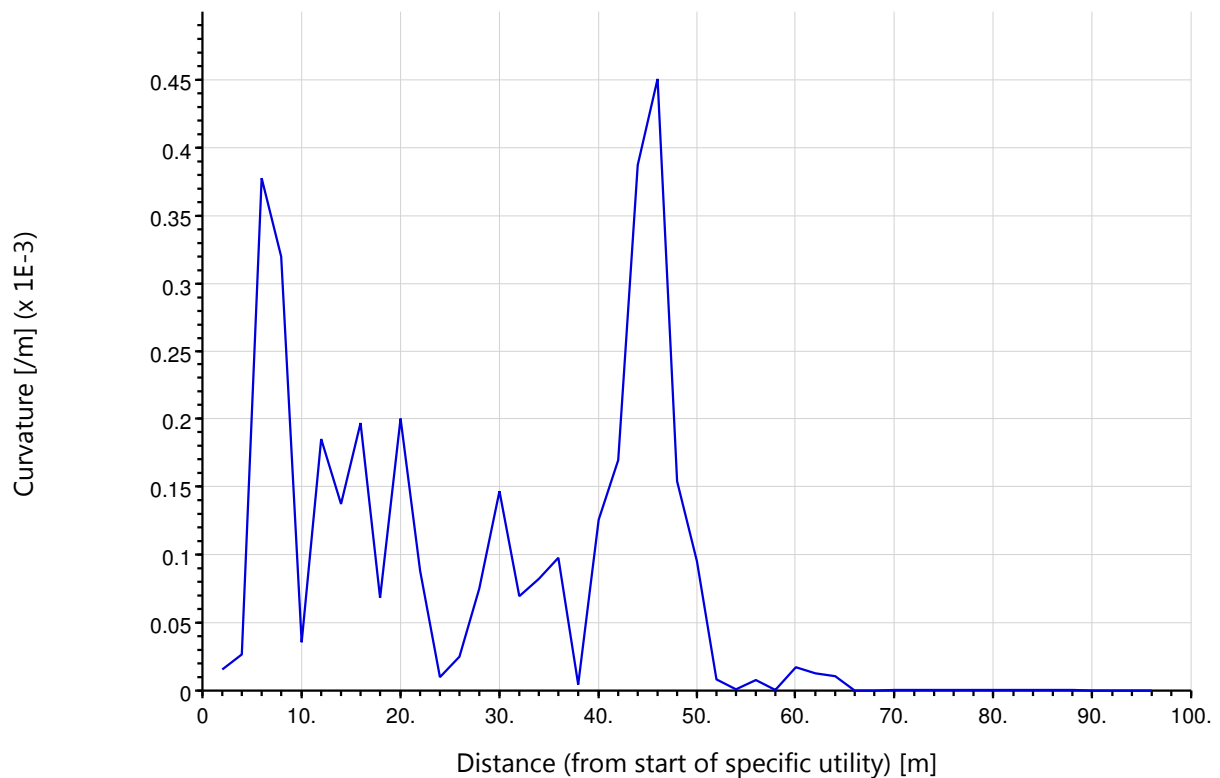
- Combined Tensile Strain (factored)
- Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 1: TWS(1)_1/1

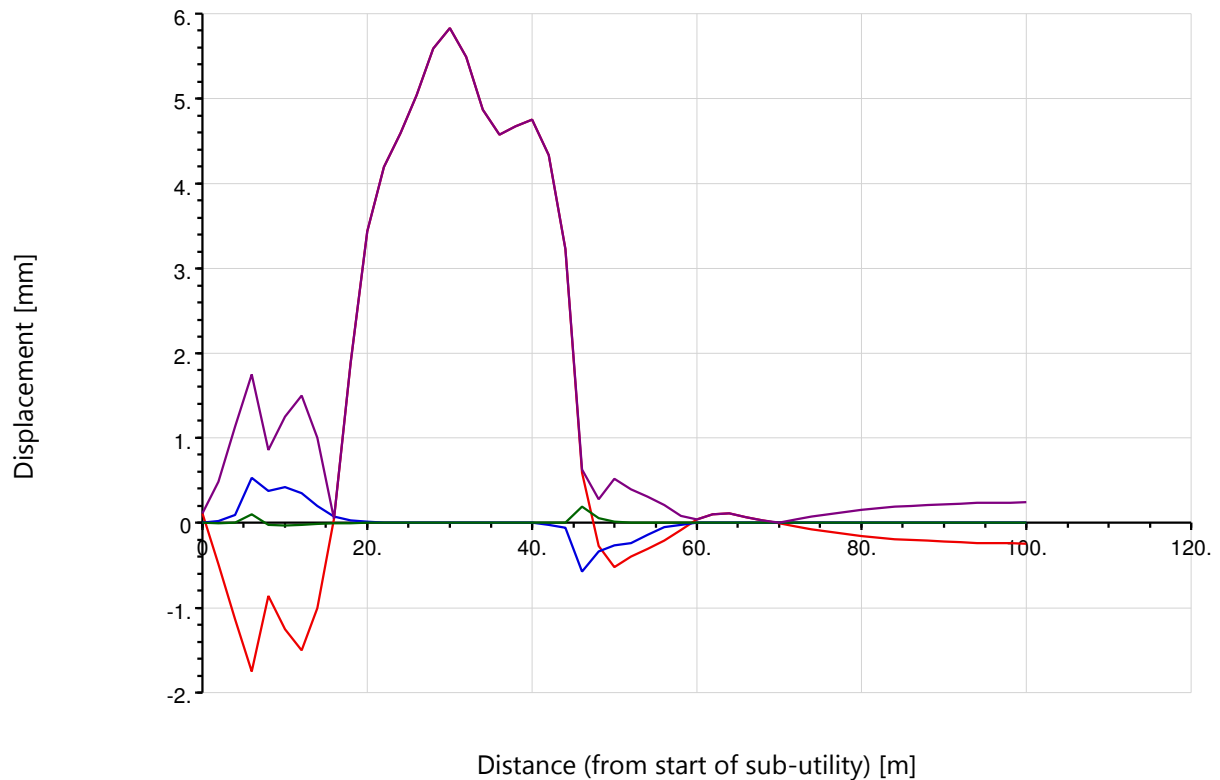
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 1: TWS(1)_1/1

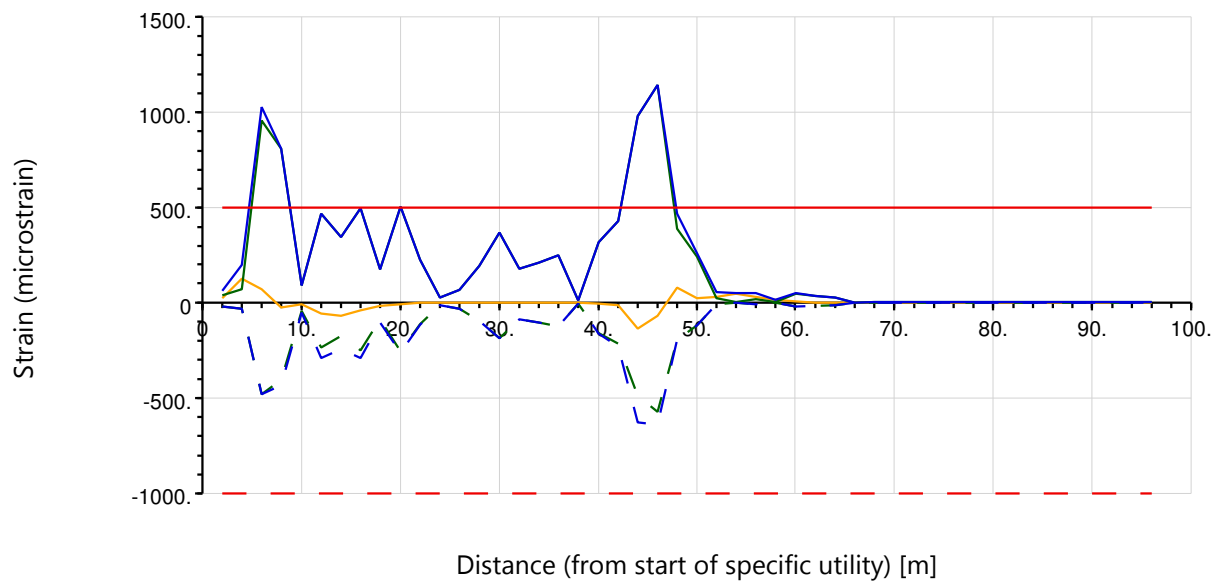
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 1: TWS(1)_1/1

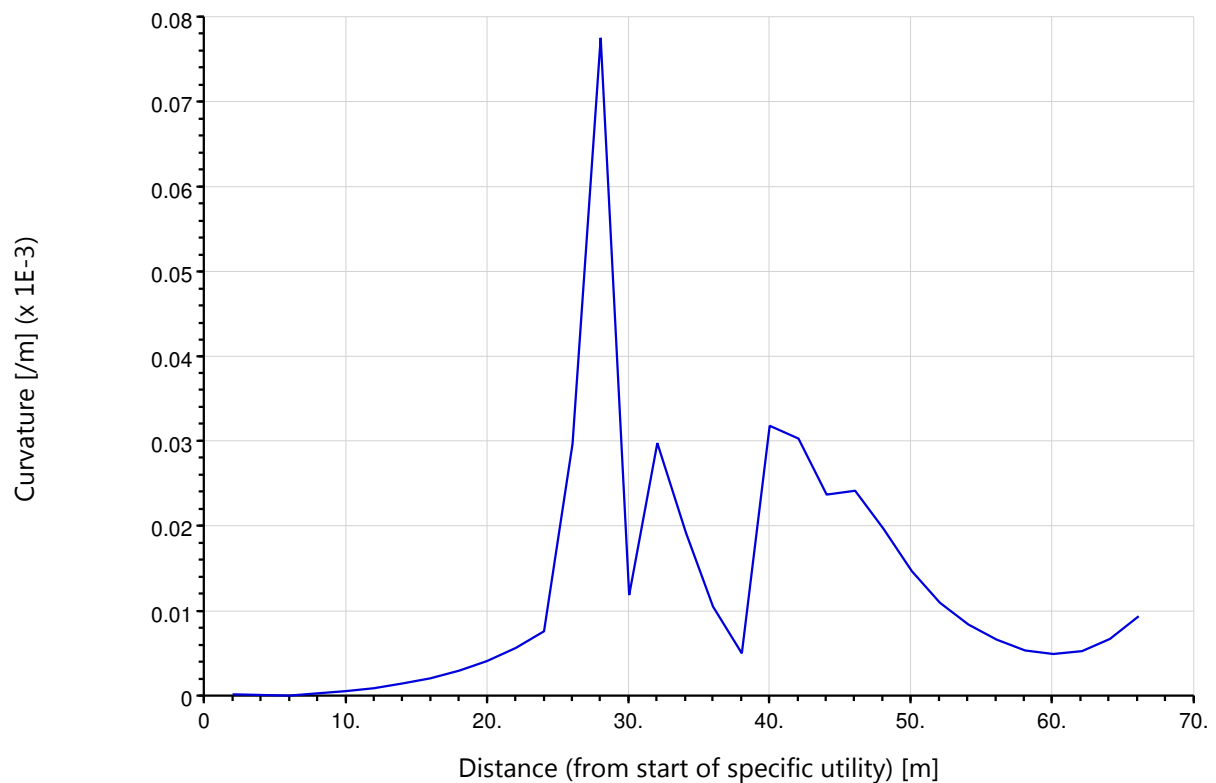
- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 2: TWS(2)_1/1

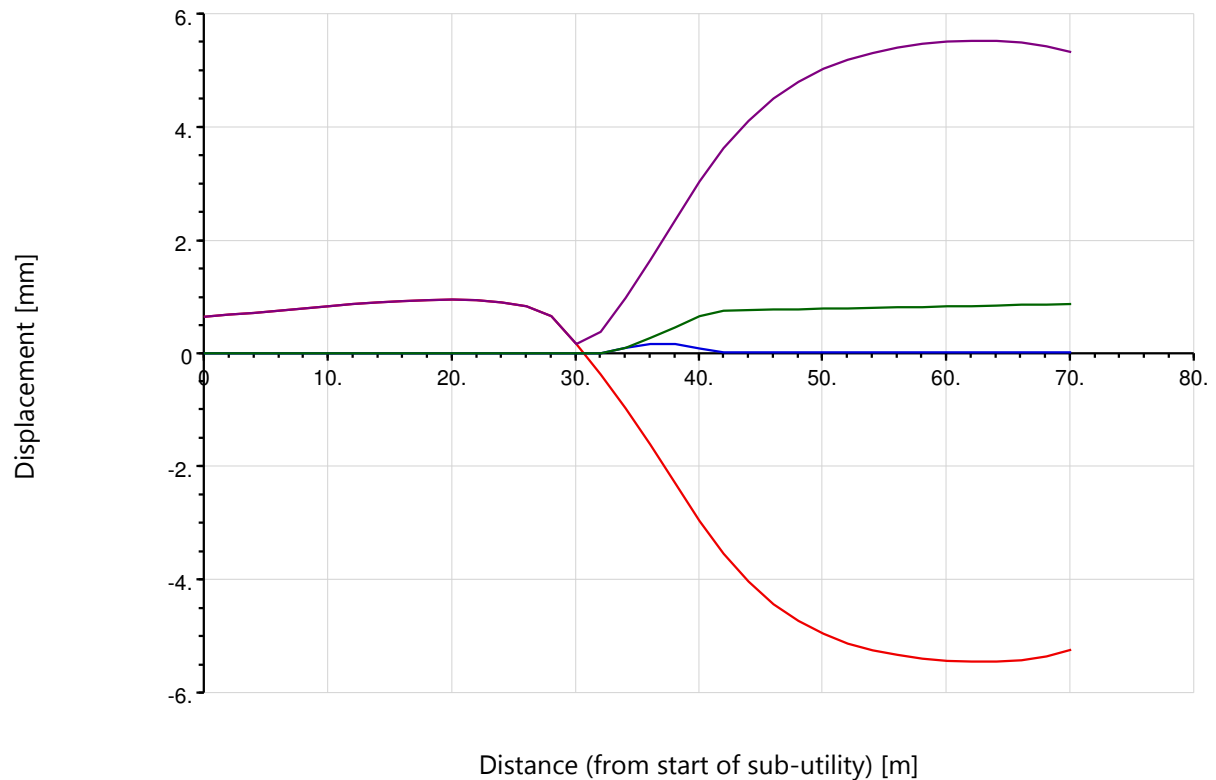
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 2: TWS(2)_1/1

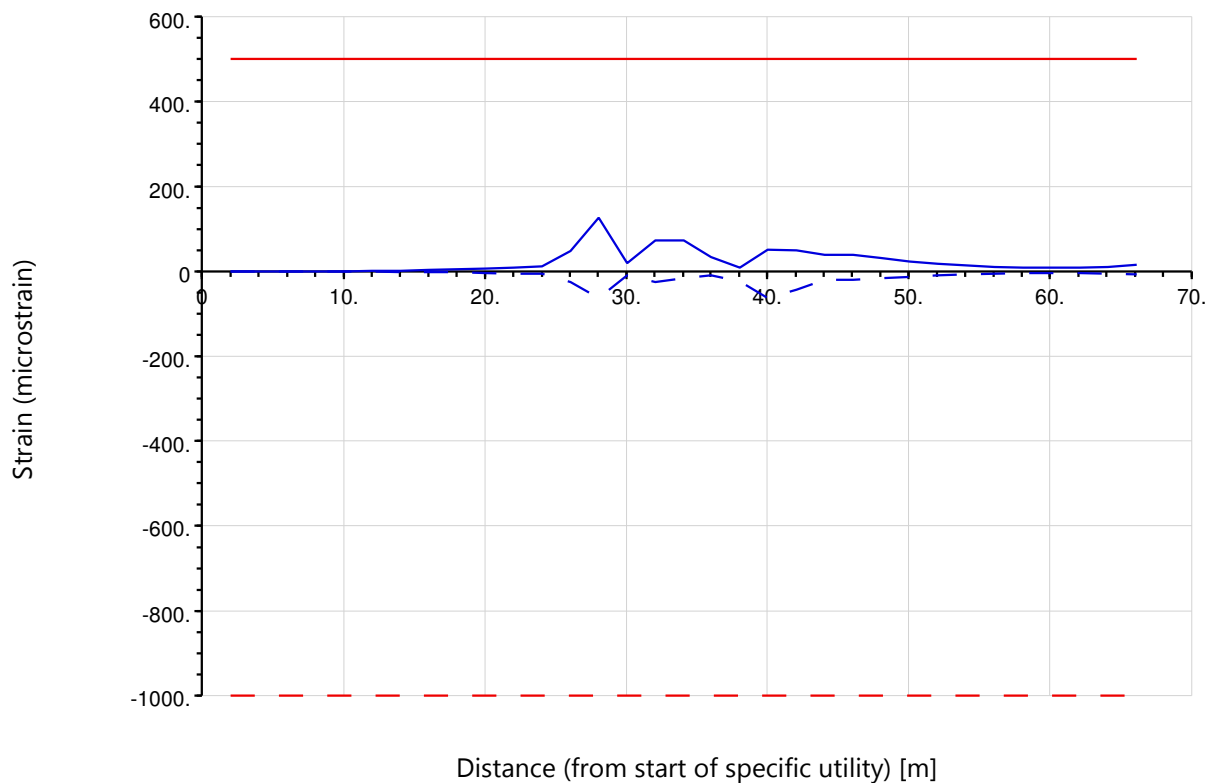
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - Combined Strain Chart

Stage: Base model, Specific Utility 2: TWS(2)_1/1

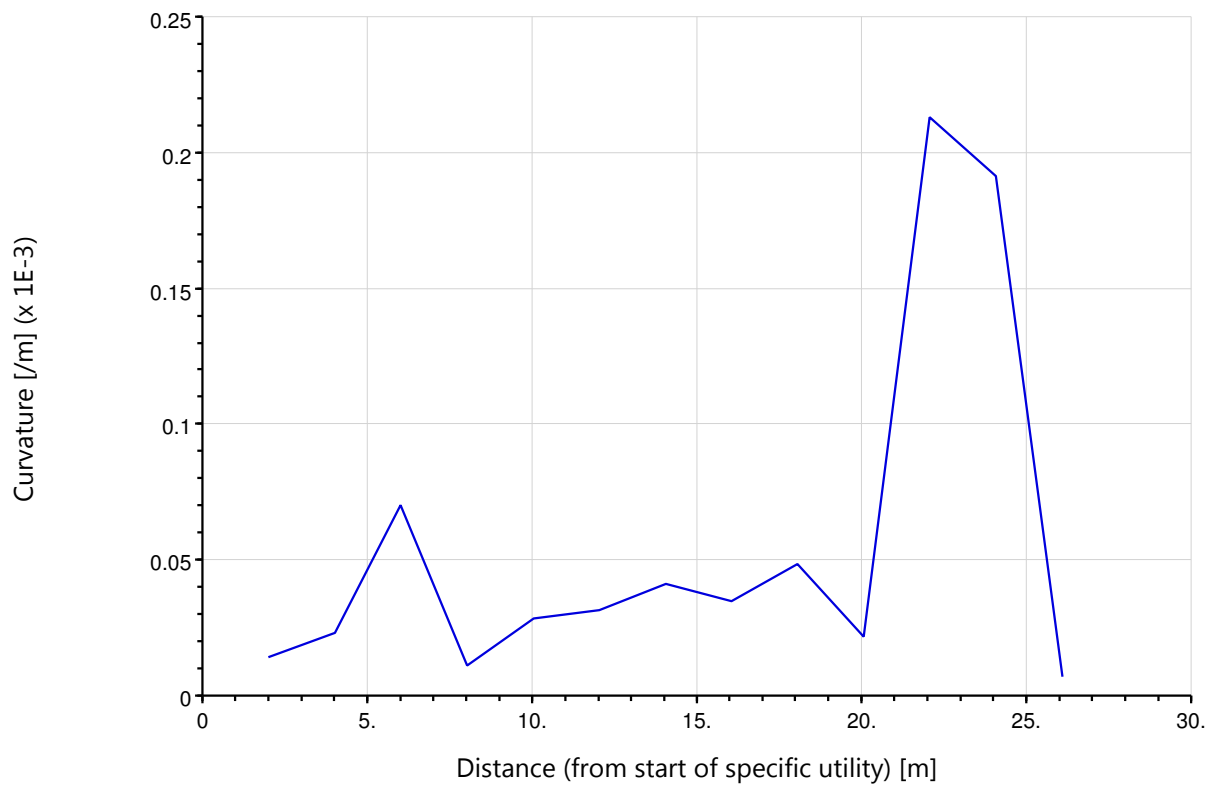
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 3: TWS(2)_2/1

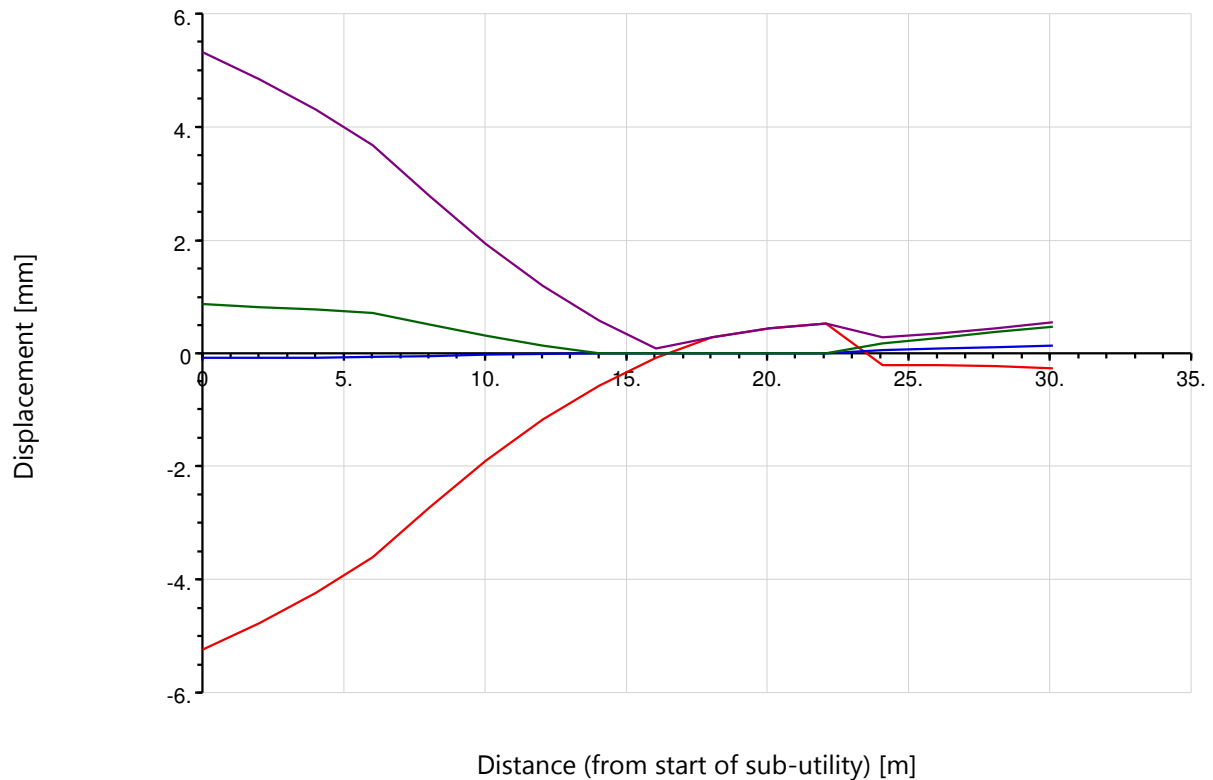
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 3: TWS(2)_2/1

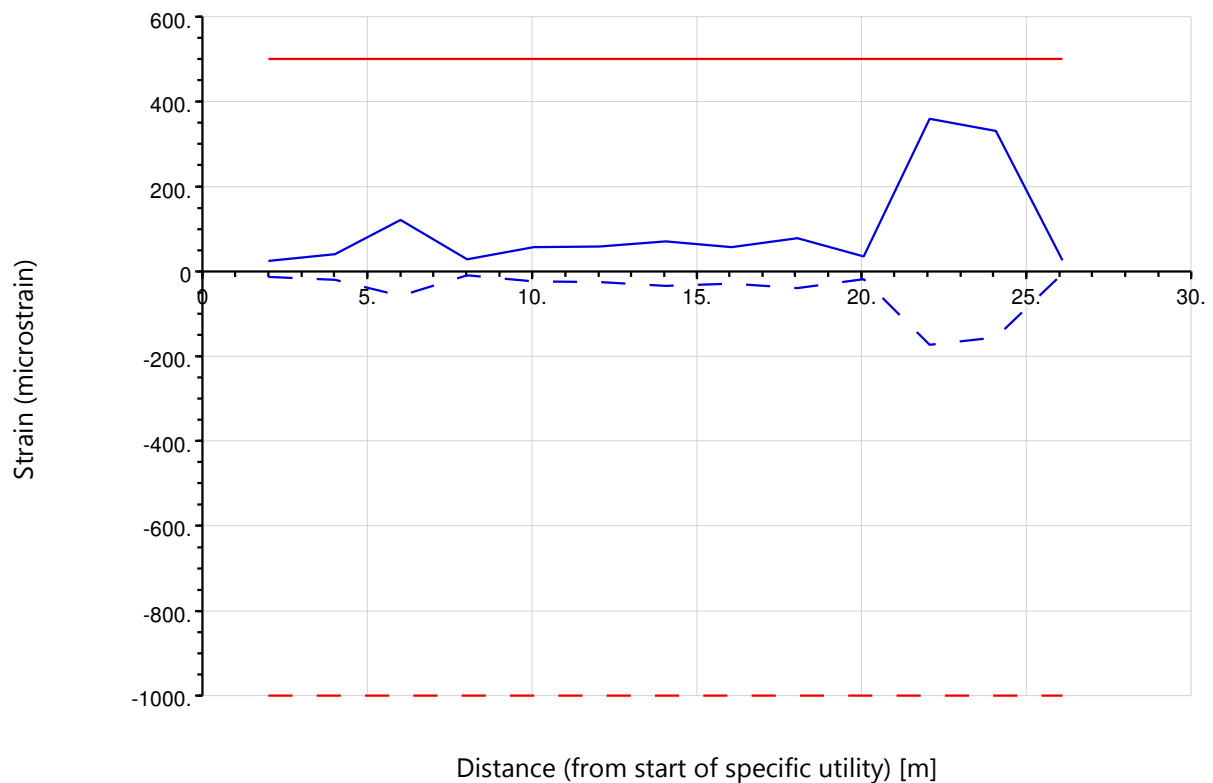
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - Combined Strain Chart

Stage: Base model, Specific Utility 3: TWS(2)_2/1

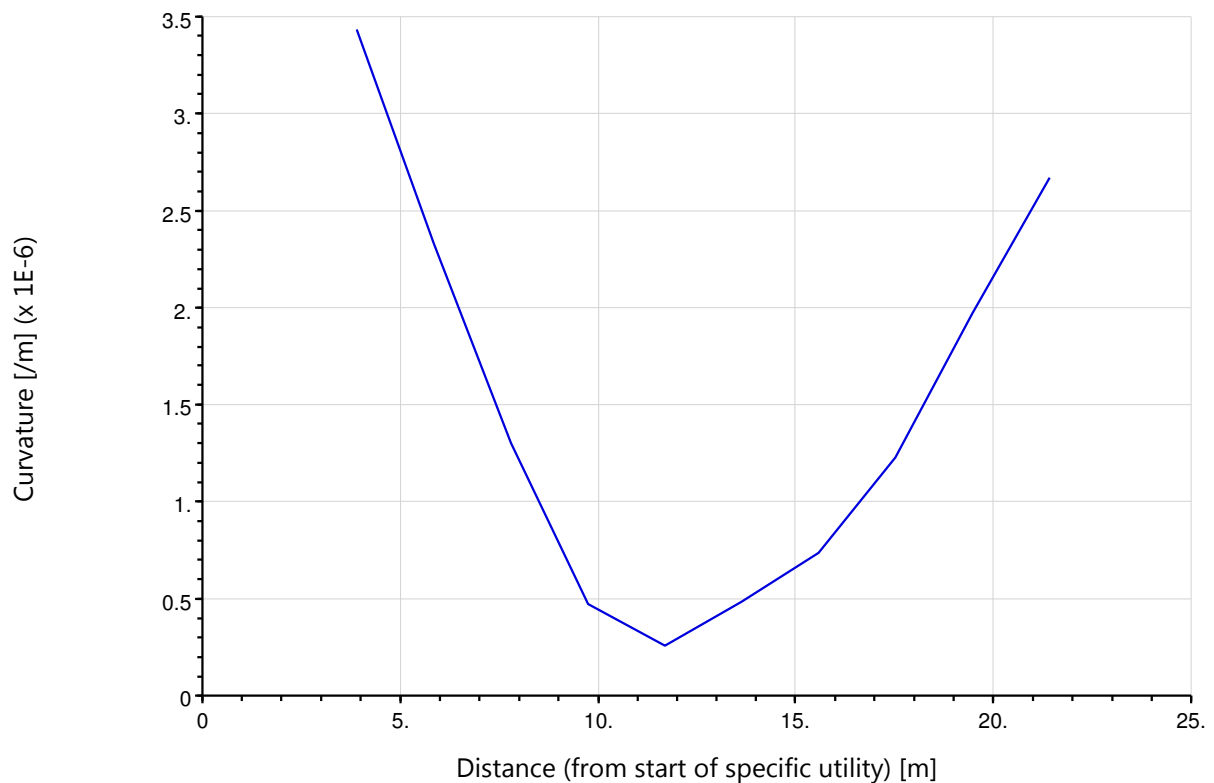
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 4: TWS(2)_3/1

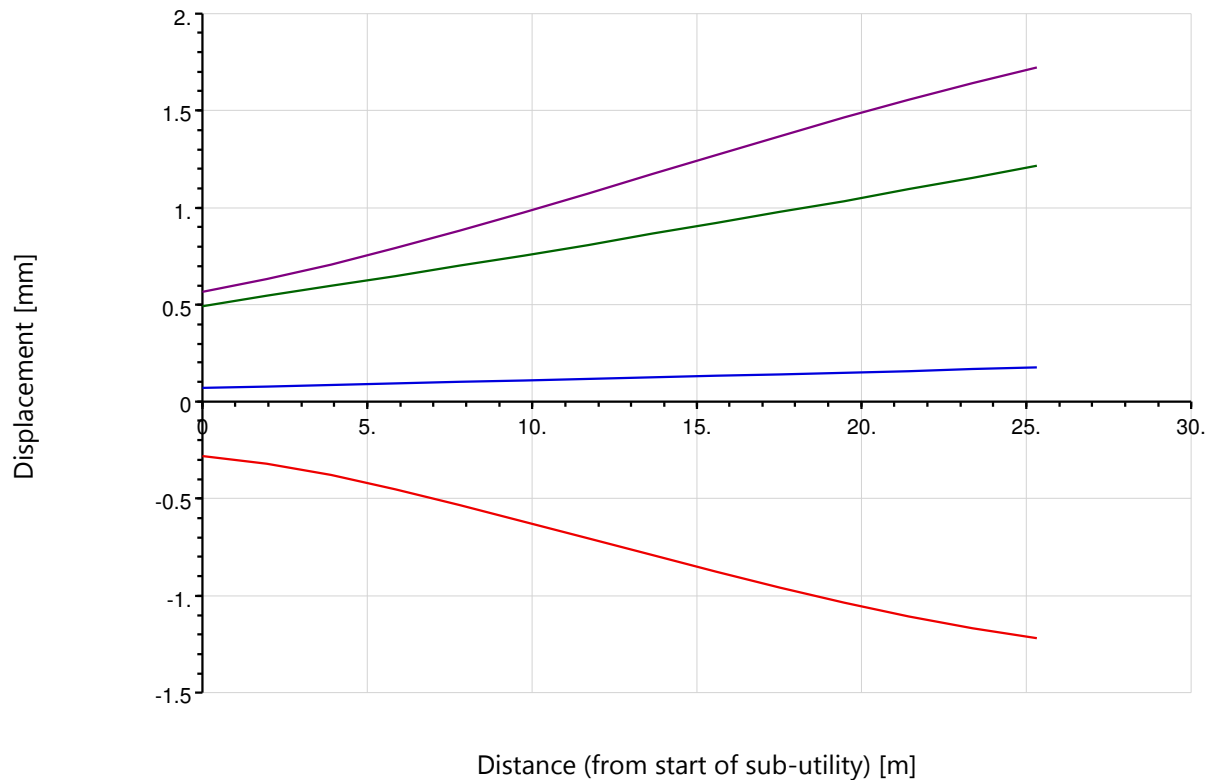
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 4: TWS(2)_3/1

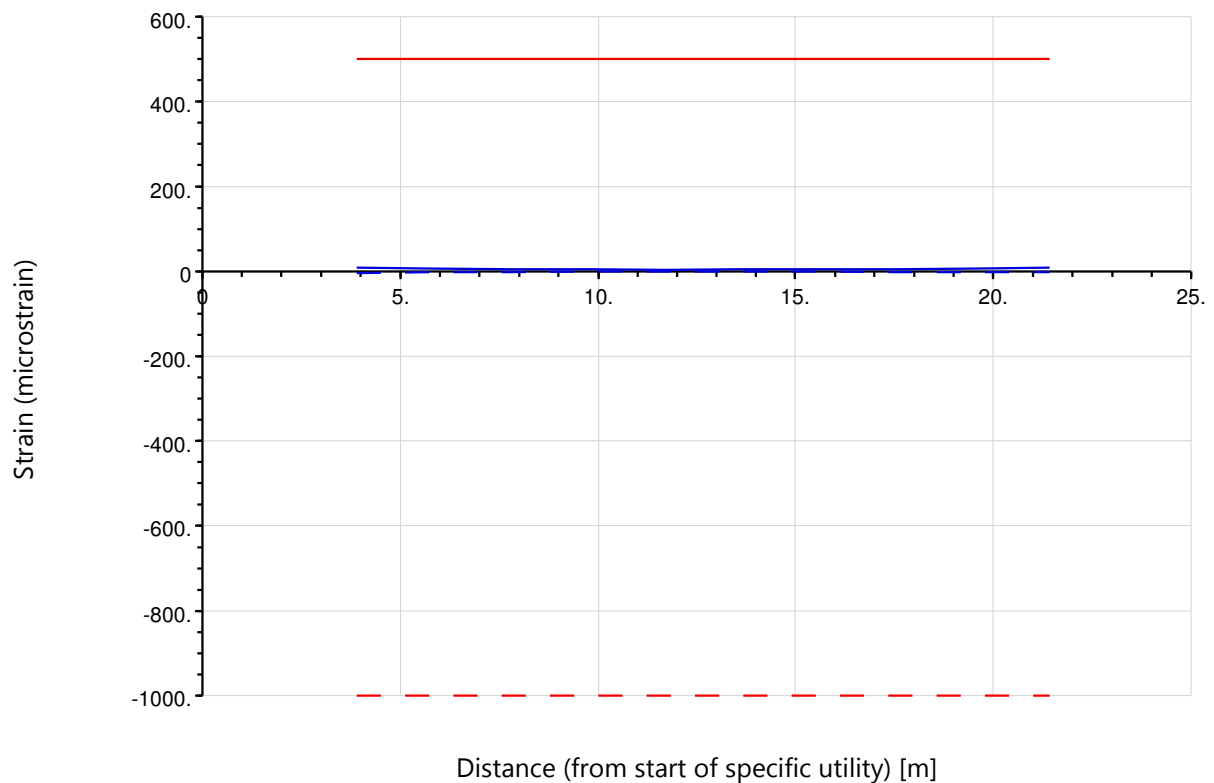
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - Combined Strain Chart

Stage: Base model, Specific Utility 4: TWS(2)_3/1

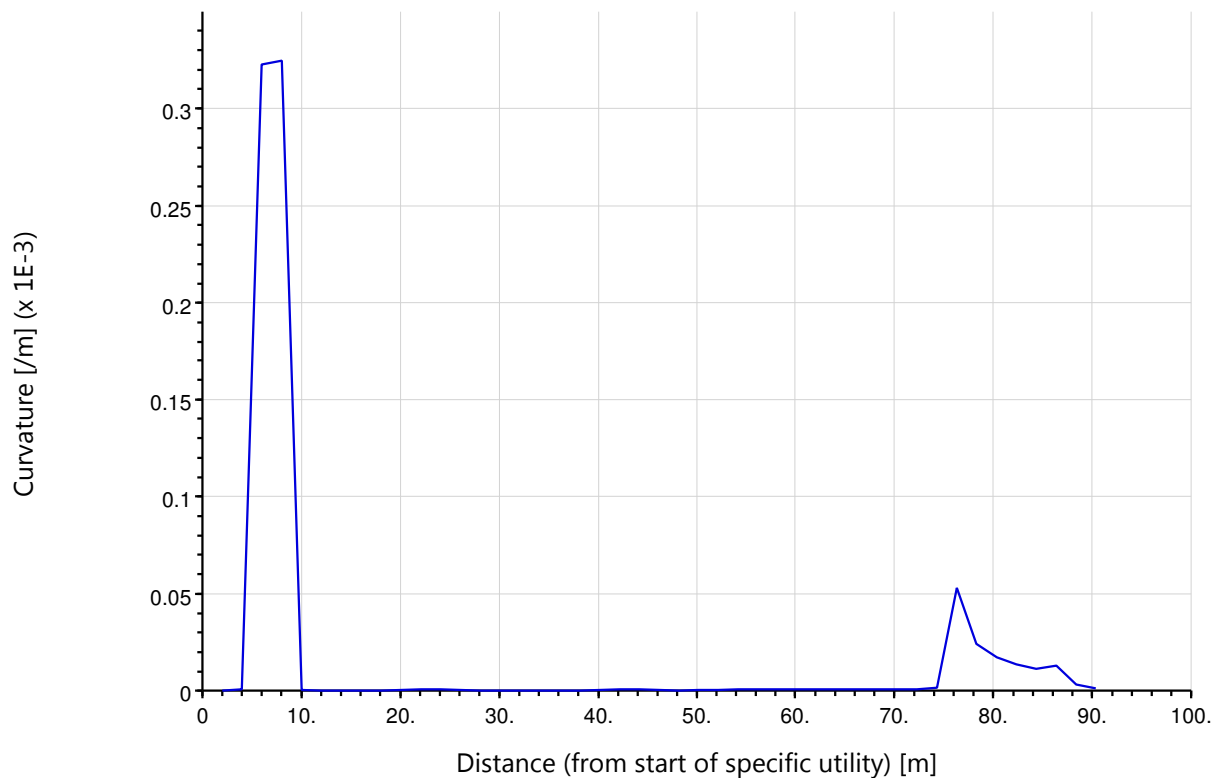
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 5: TWS(2)_4/1

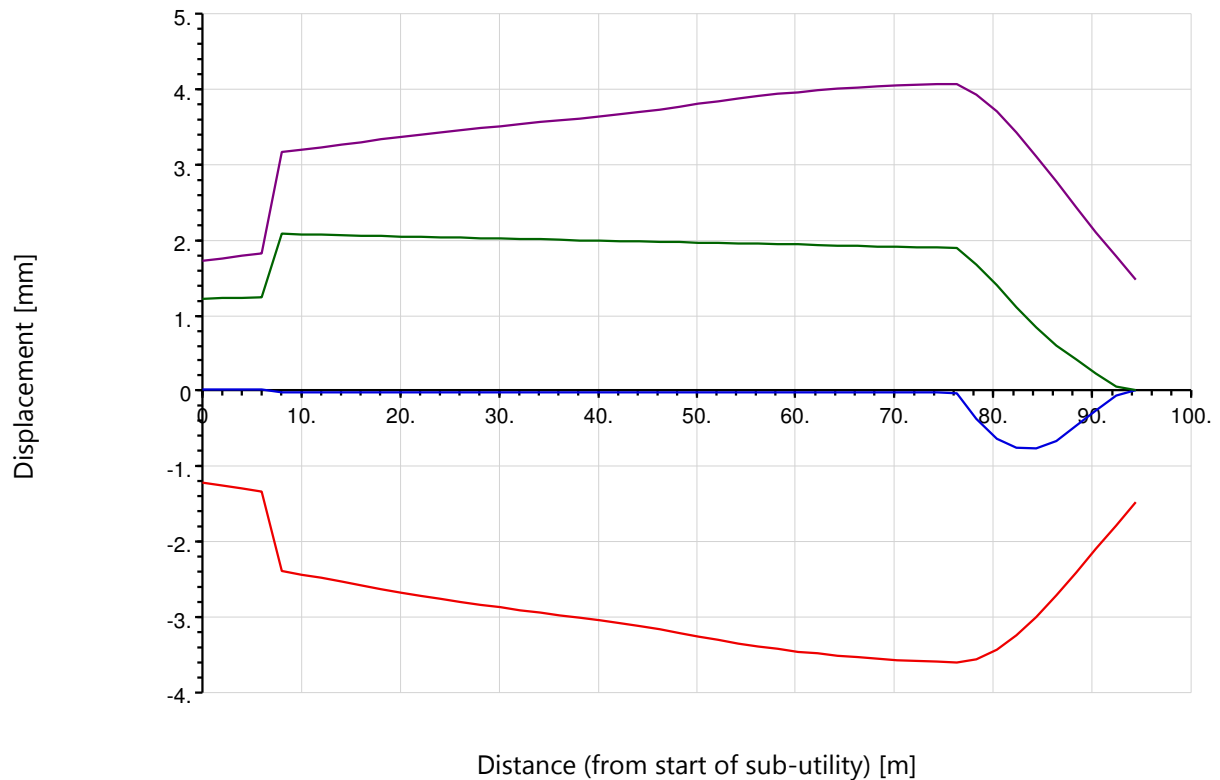
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 5: TWS(2)_4/1

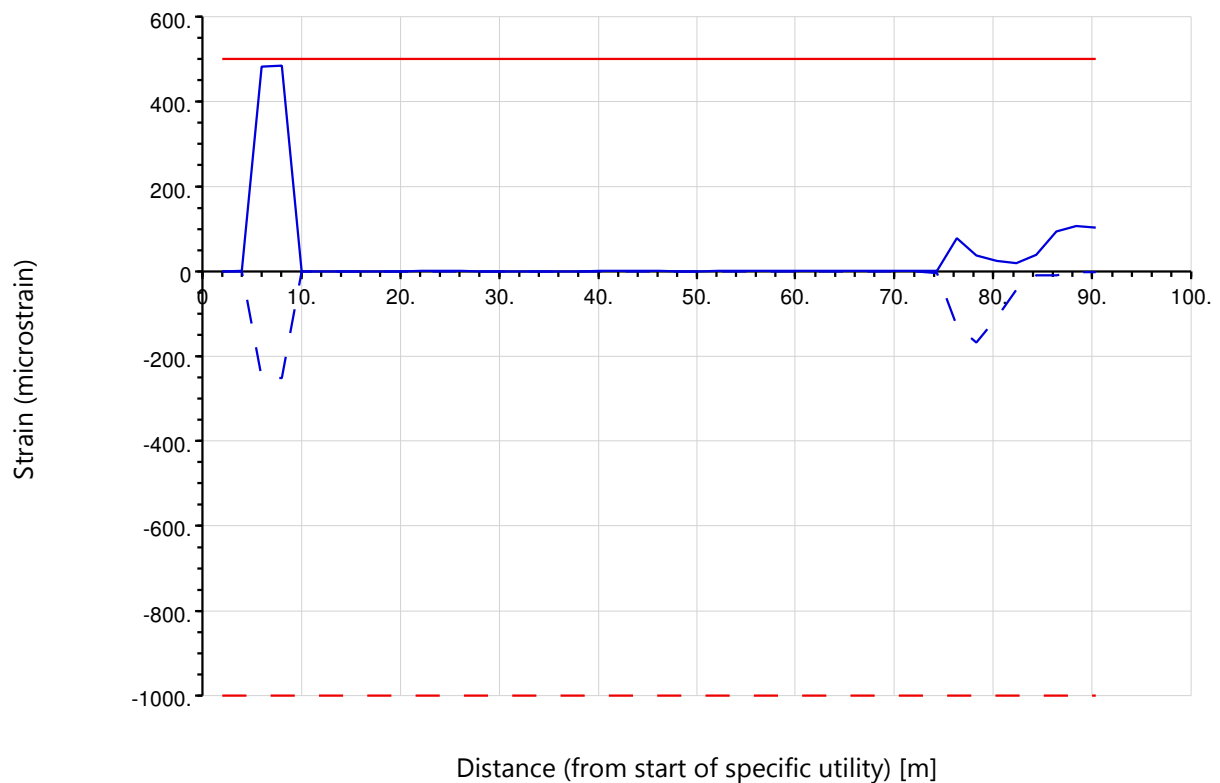
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - Combined Strain Chart

Stage: Base model, Specific Utility 5: TWS(2)_4/1

- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain

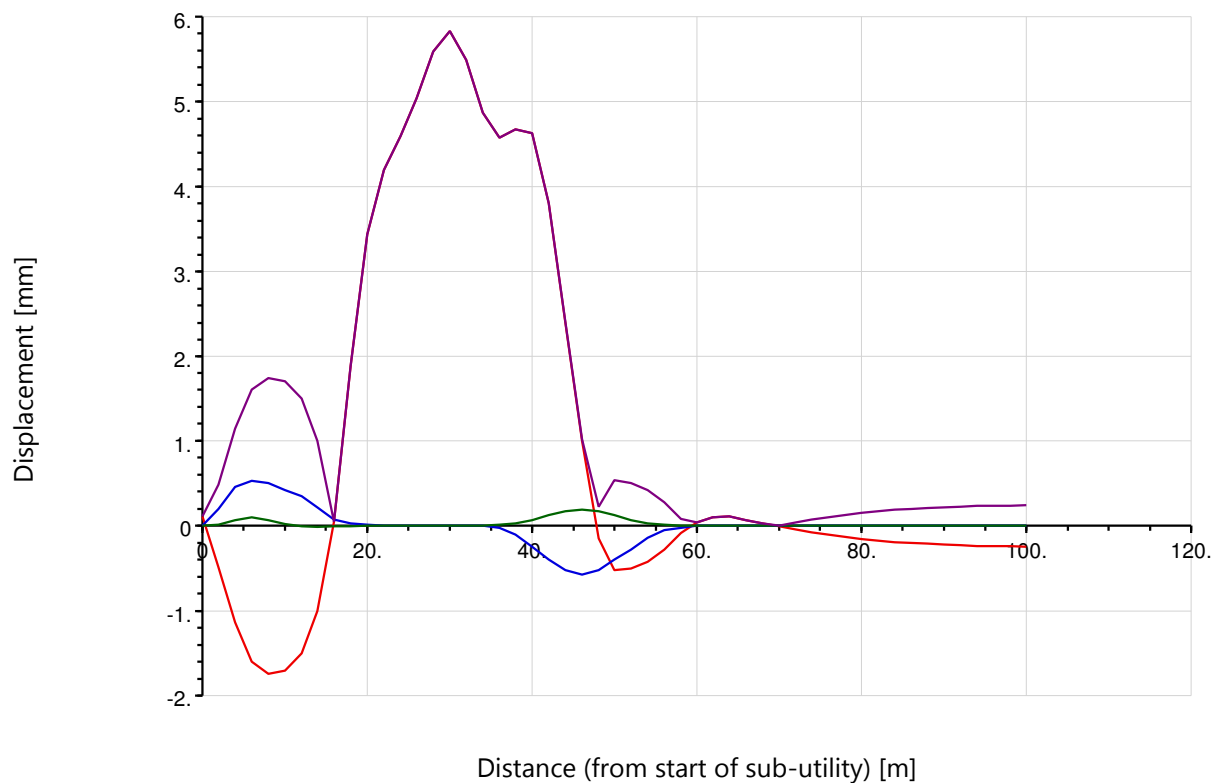


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Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 1: TWS(1)_1/1

- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)

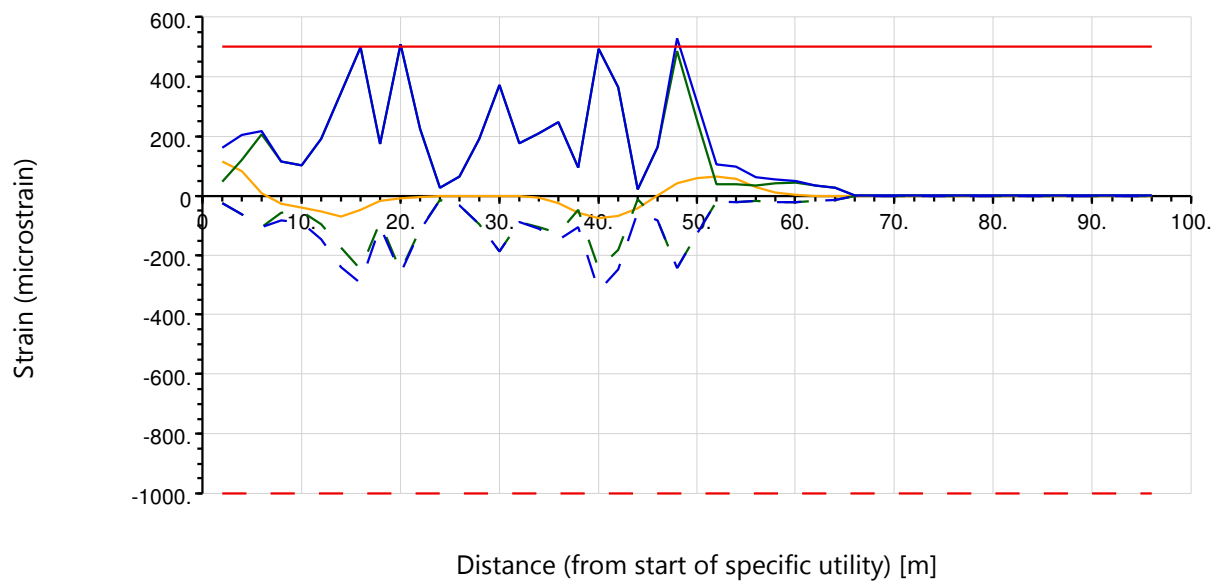


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Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 1: TWS(1)_1/1

- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain

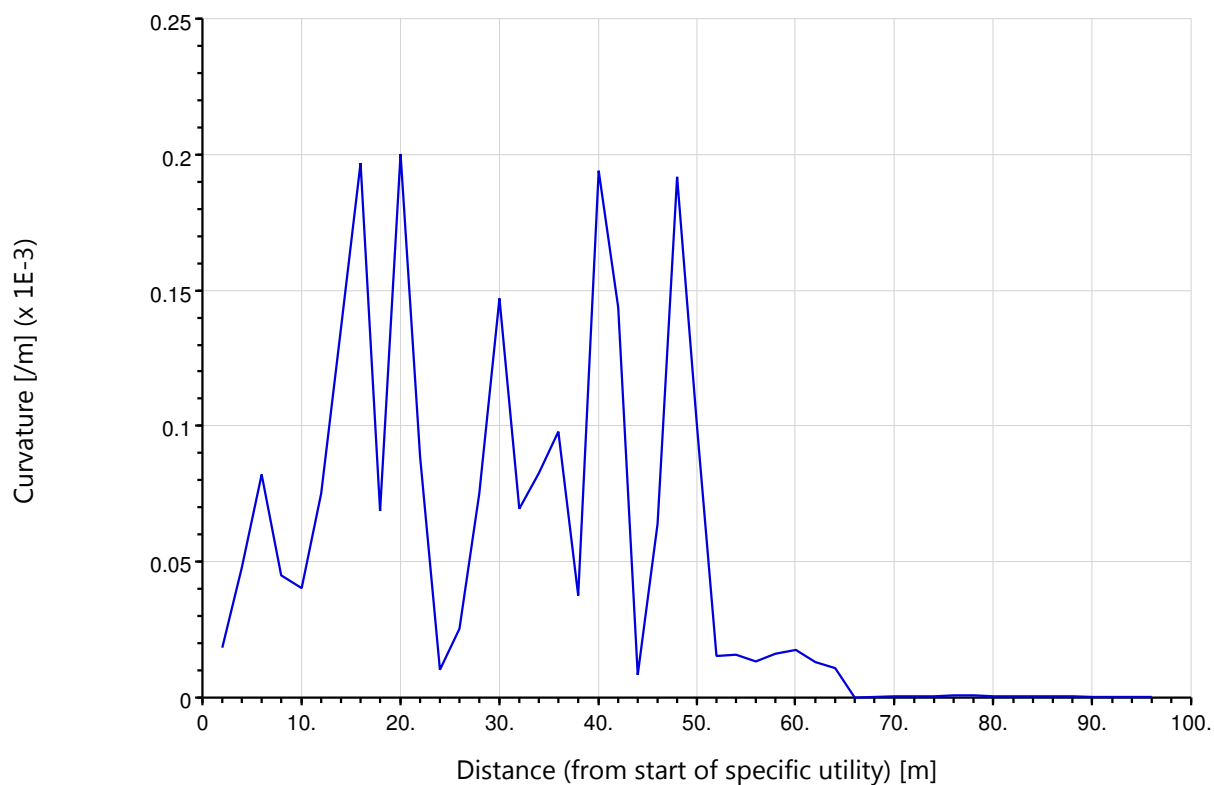


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Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 1: TWS(1)_1/1

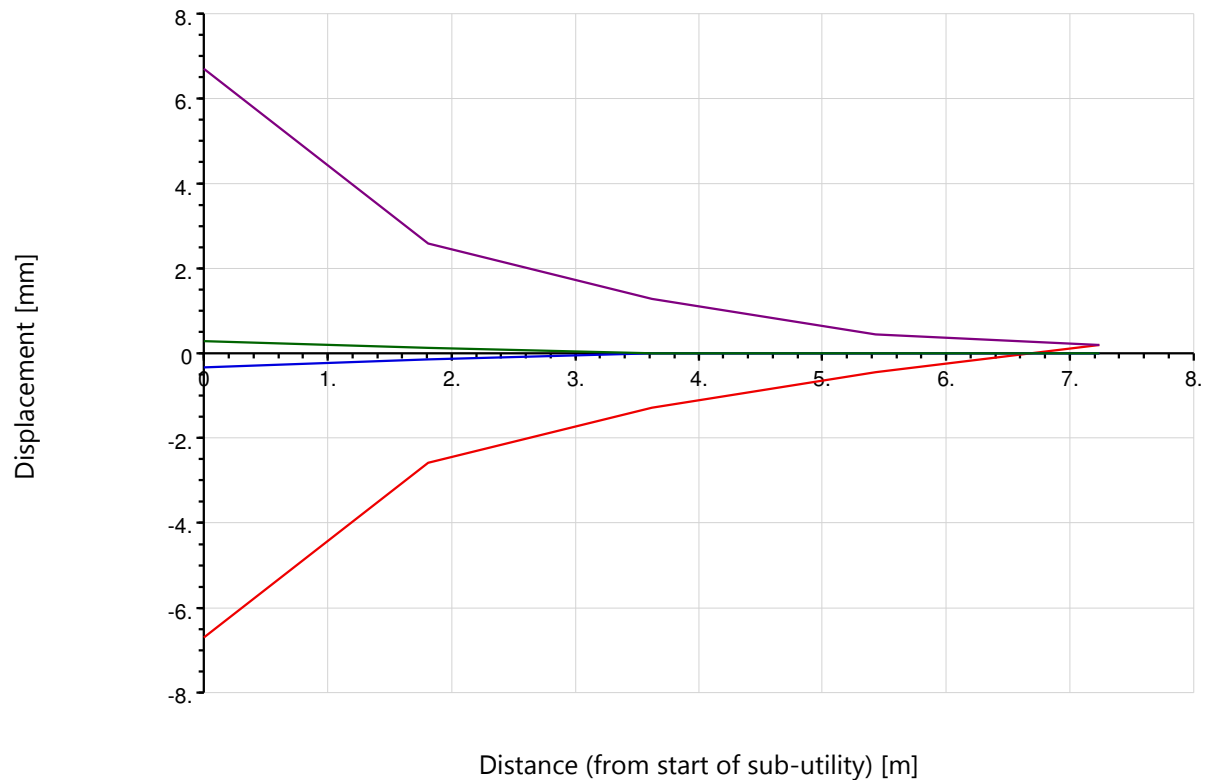
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 10: Assumed FW400 connection to TW2_1/1

- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)

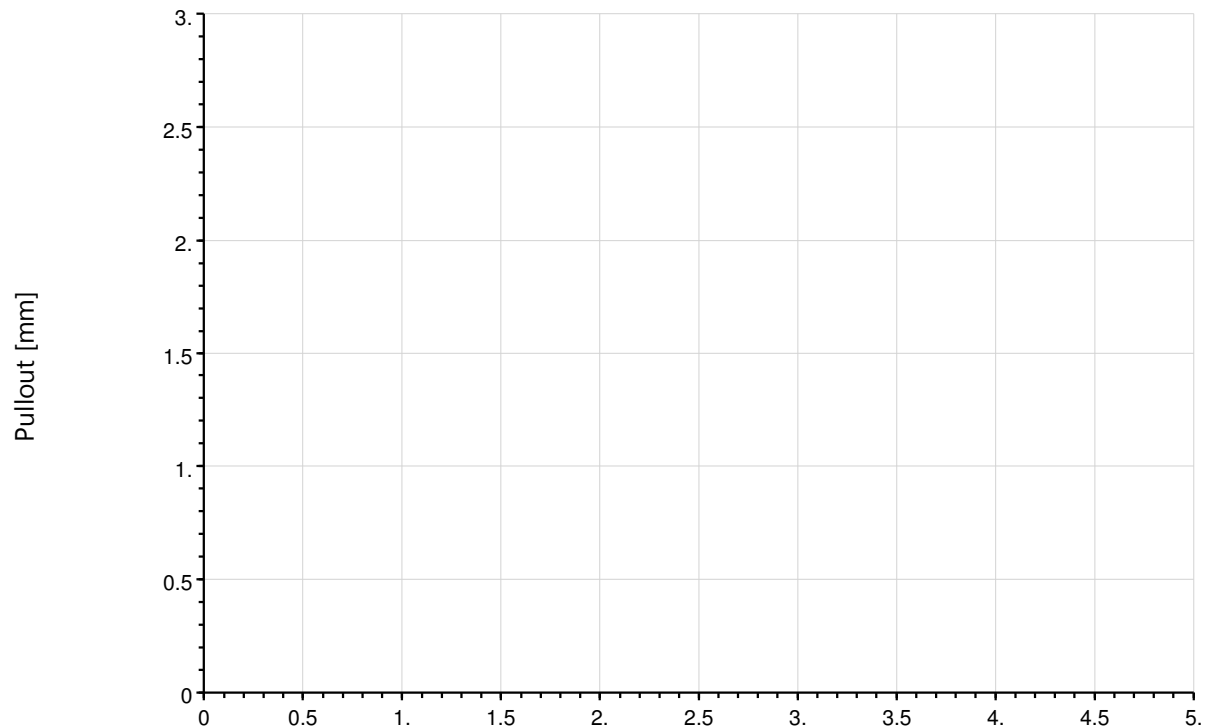


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Specific Utility - Pullout Chart

Stage: Base model, Specific Utility 10: Assumed FW400 connection to TW2_1/1

- - - Axial Pullout (factored)
- - - Flexural Pullout (factored)
- Total Pullout (factored)
- Total Pullout Limit



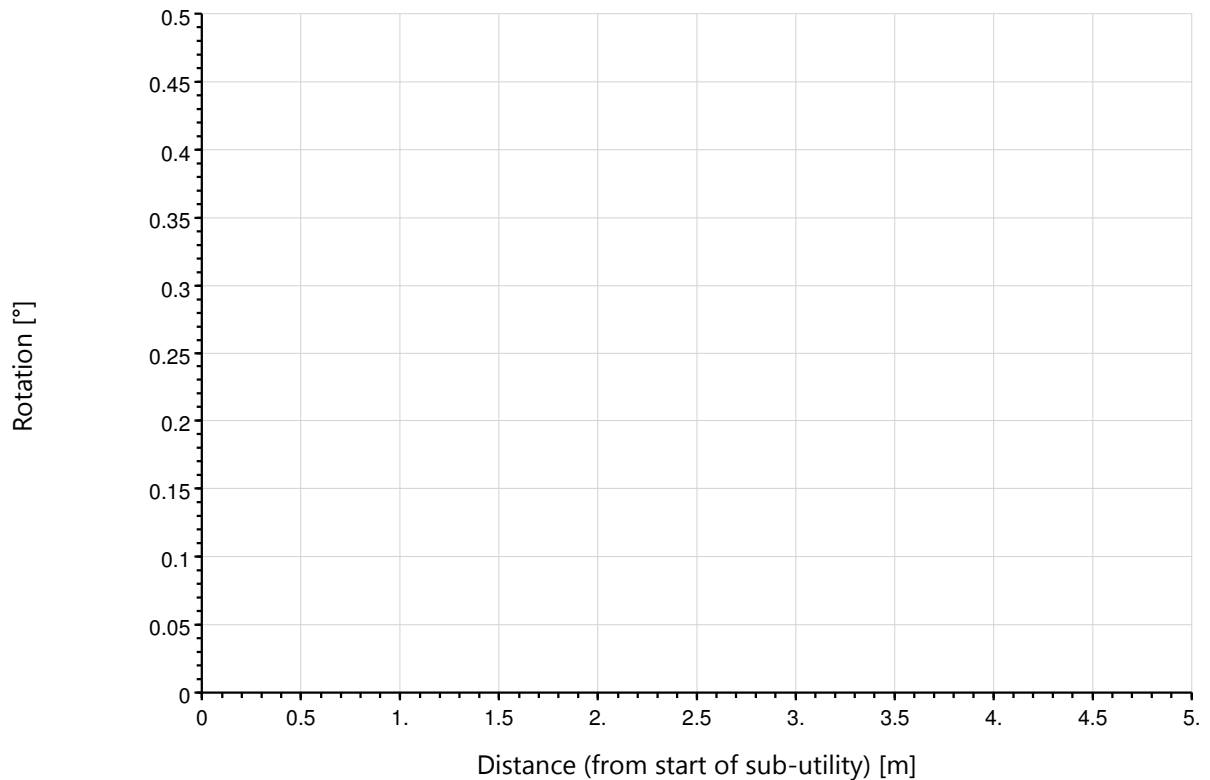
Distance (from start of sub-utility) [m] Note: Total pullout ignores the axial component where this is negative (i.e. comp

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Specific Utility - Rotation Chart

Stage: Base model, Specific Utility 10: Assumed FW400 connection to TW2_1/1

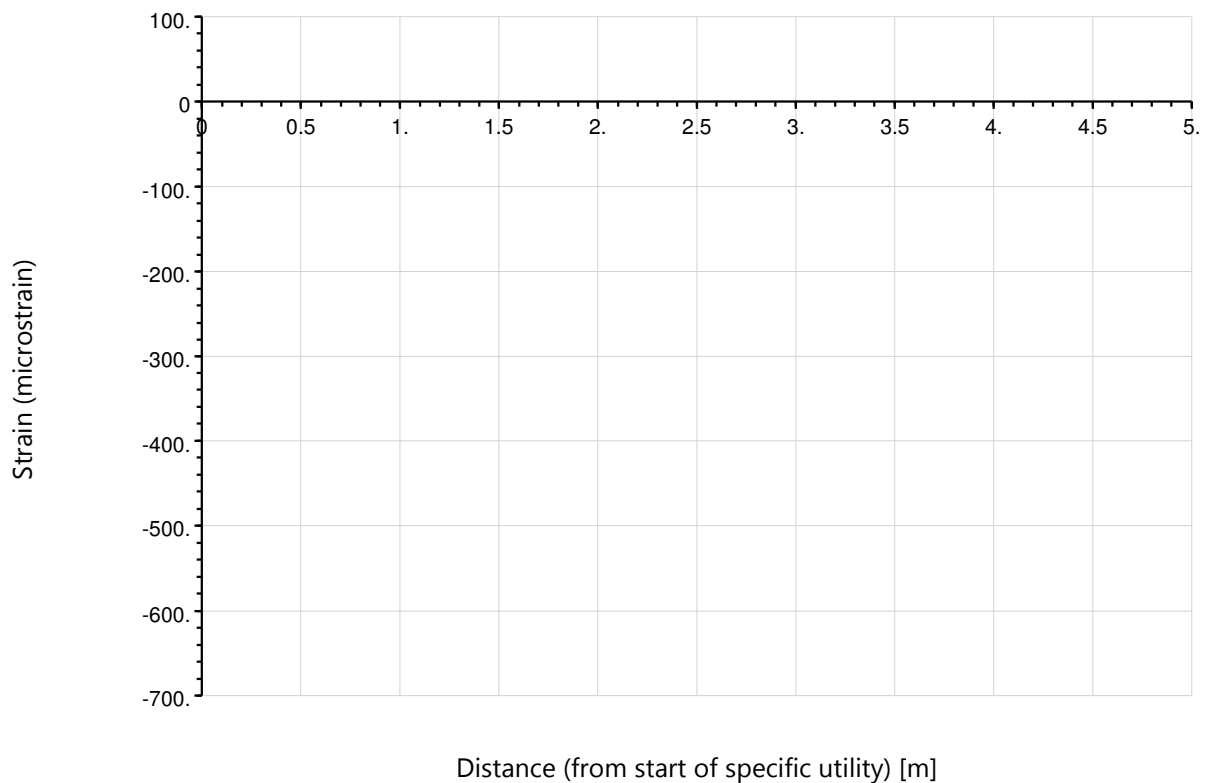
— Rotation (factored)
— Rotation Limit



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 10: Assumed FW400 connection to TW2, 1/1

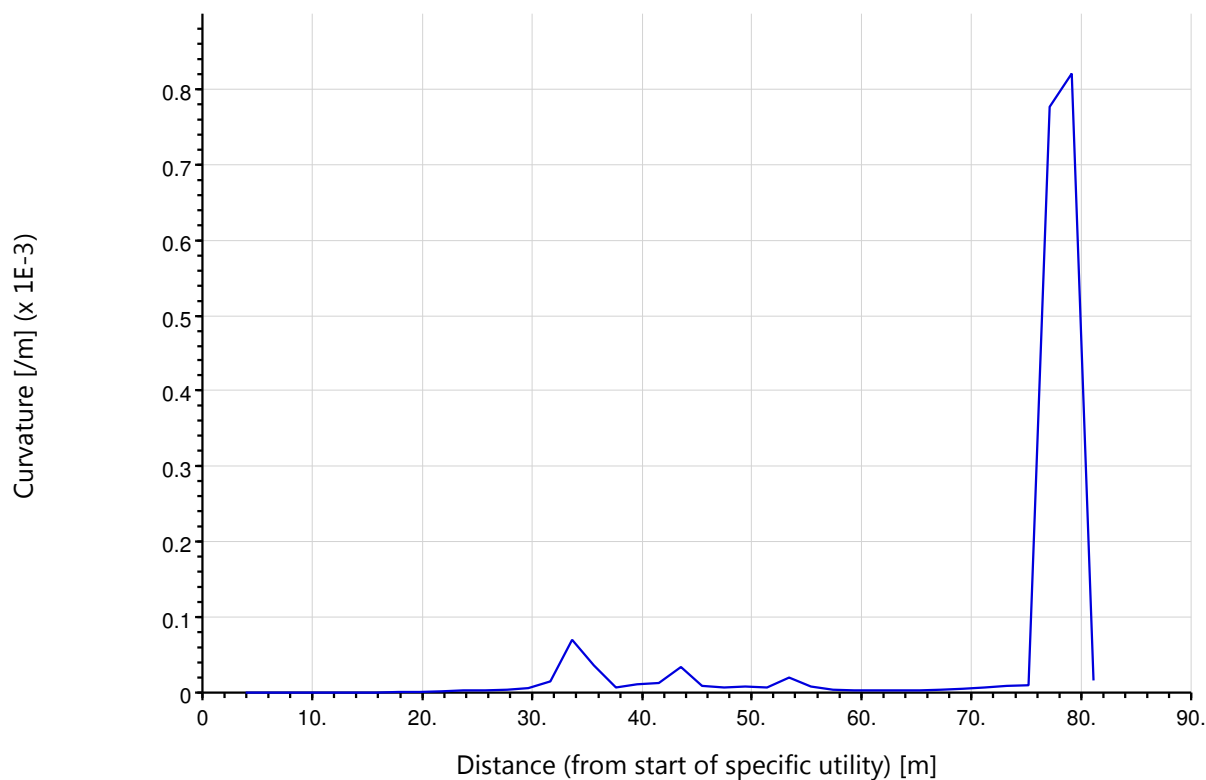
- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- Combined Compressive Strain (factored)
- Allowable Tensile Strain
- Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 6: TW Fresh Water (a) - St Pancras/1

— Curvature



UBB, London

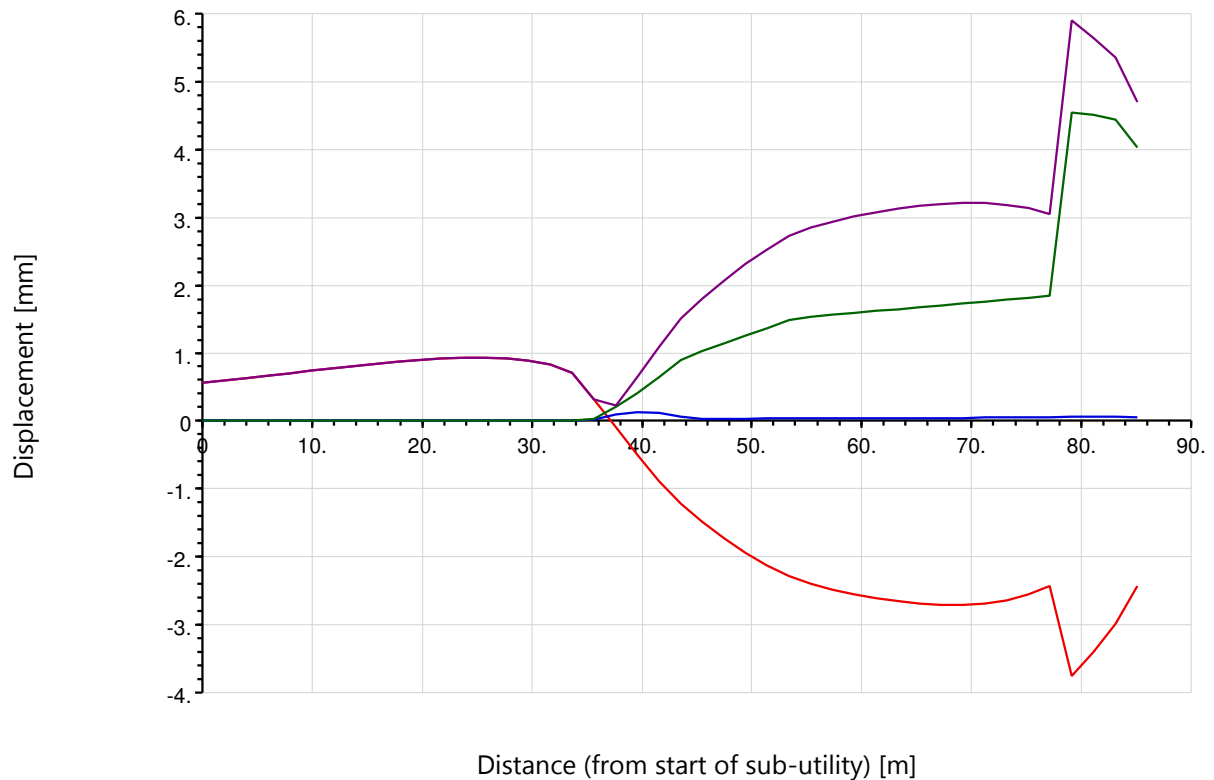
TW Sewer Assessment

PLOT A RESULTS (S) + PLOT B&C DEMO+WALL INST-(S)+EXC

Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 6: TW Fresh Water (a) - St Pancras/1

- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)

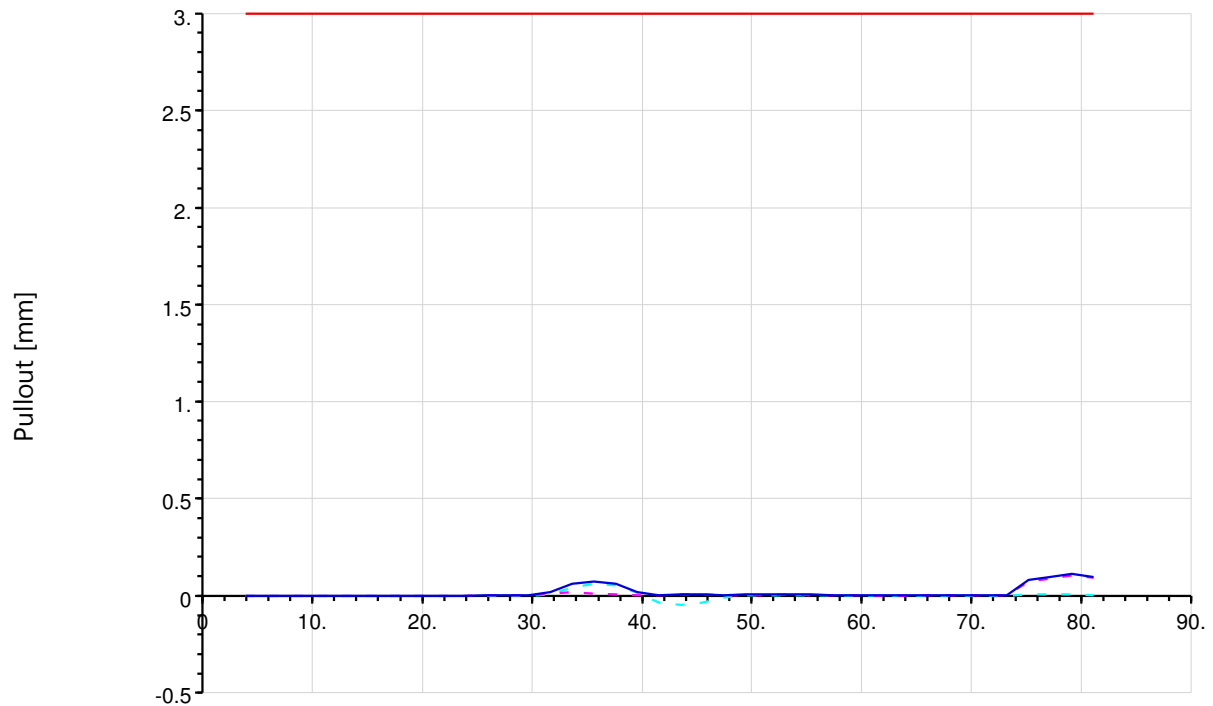


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Specific Utility - Pullout Chart

Stage: Base model, Specific Utility 6: TW Fresh Water (a) - St Pancras/1

- - - Axial Pullout (factored)
- - - Flexural Pullout (factored)
- Total Pullout (factored)
- Total Pullout Limit



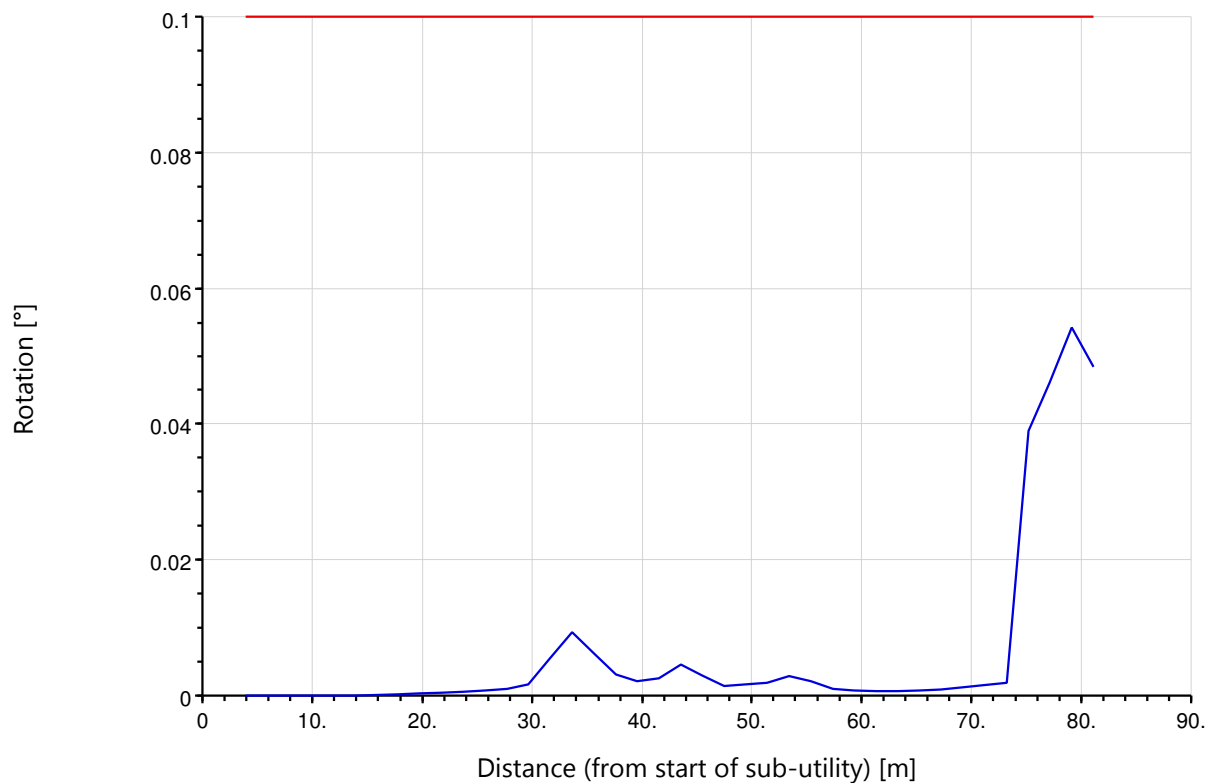
Distance (from start of sub-utility) [m] Note: Total pullout ignores the axial component where this is negative (i.e. comp

Specific Utility - Rotation Chart

Stage: Base model, Specific Utility 6: TW Fresh Water (a) - St Pancras/1

— Rotation (factored)

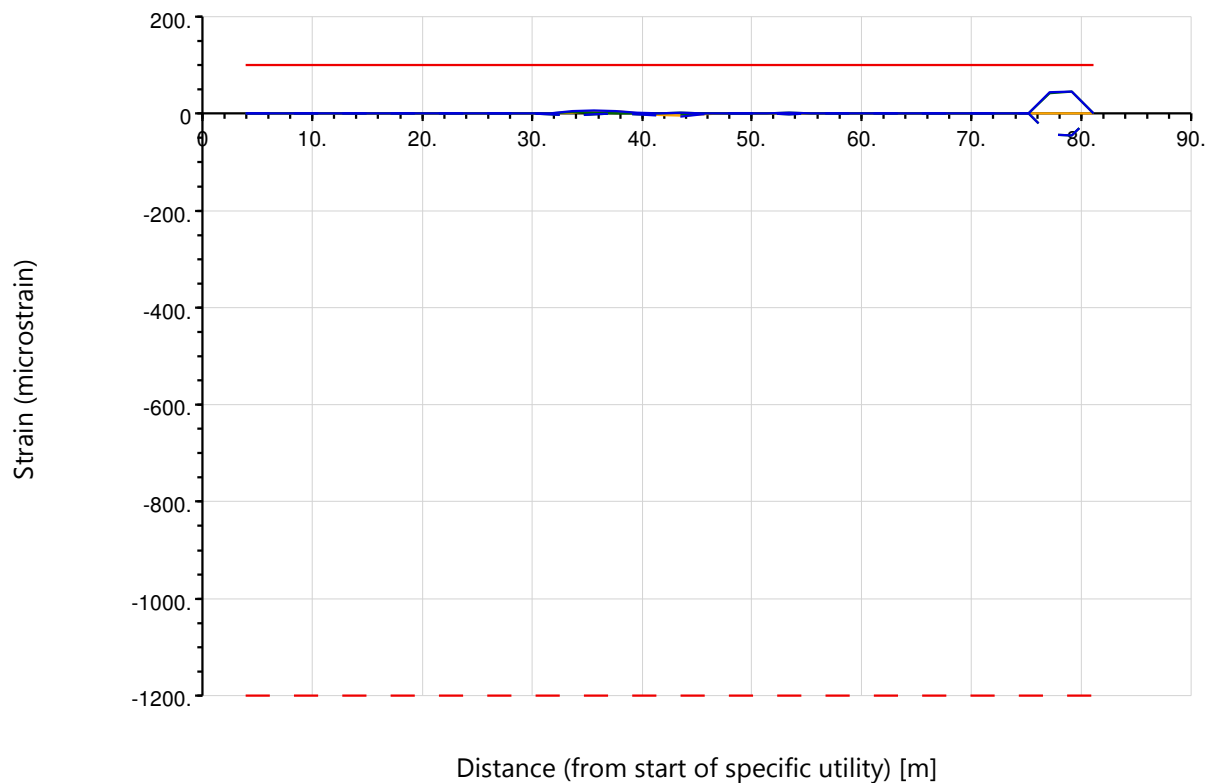
— Rotation Limit



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 6: TW Fresh Water (a) - St Pancras/1

- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- Combined Compressive Strain (factored)
- Allowable Tensile Strain
- Allowable Compressive Strain



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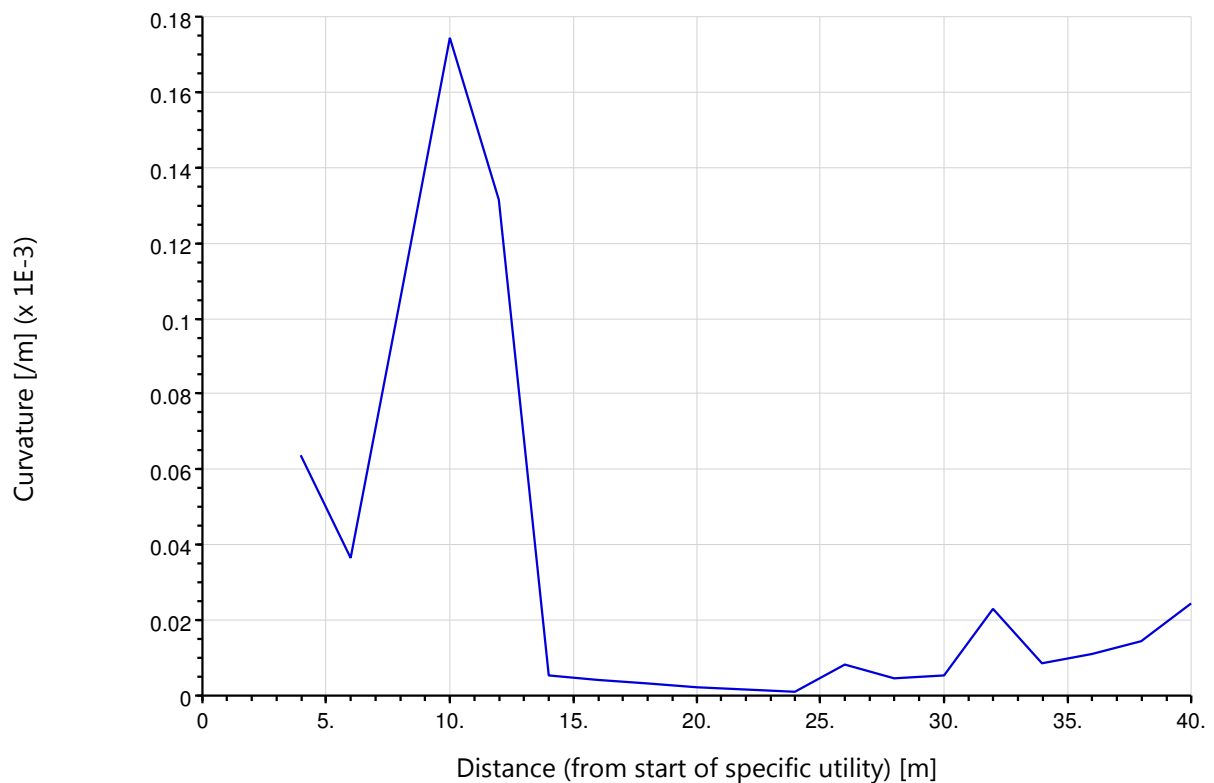
TW Sewer Assessment

PLOT A RESULTS (S) + PLOT B&C DEMO+WALL INST-(S)+EXC

Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 7: TW Fresh Water (b) - St Pancras/1

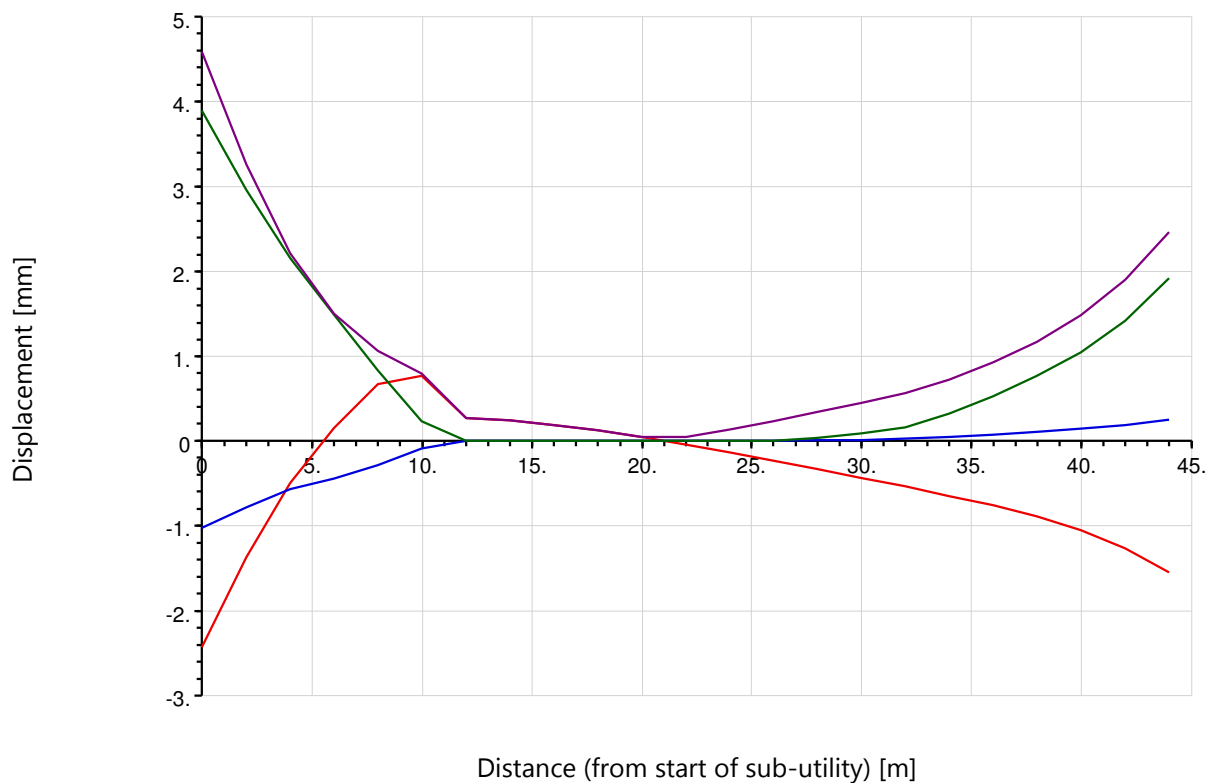
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 7: TW Fresh Water (b) - St Pancras/1

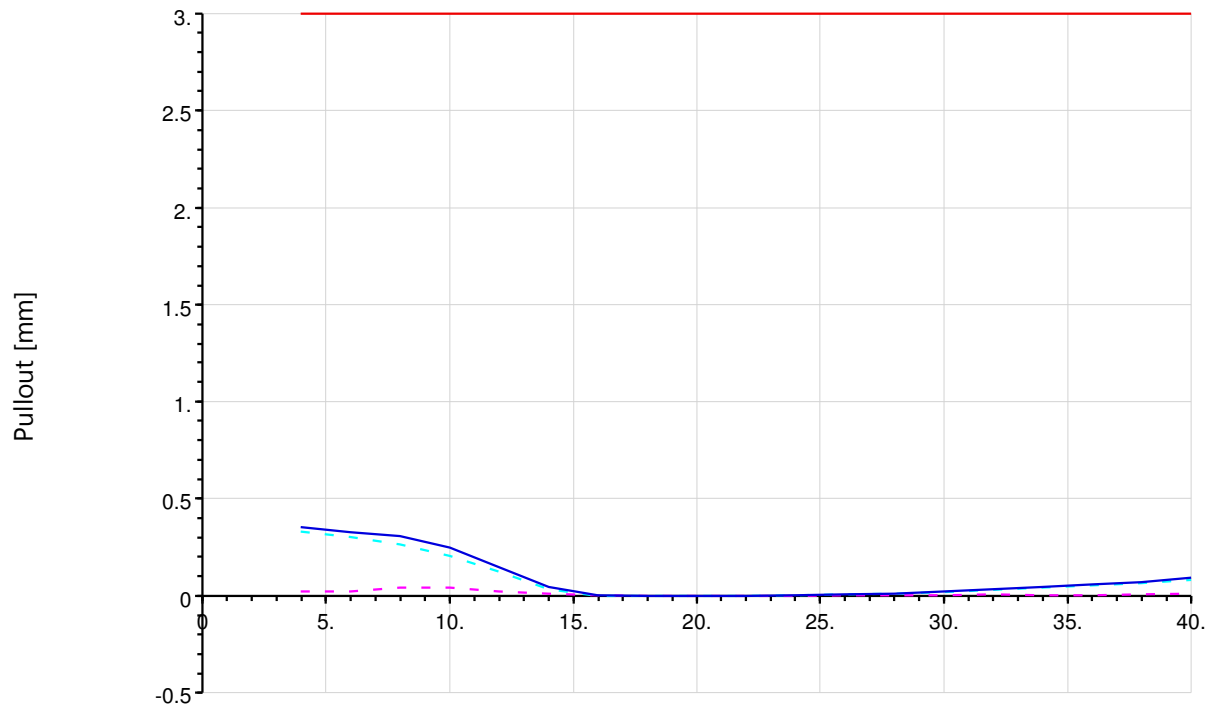
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - Pullout Chart

Stage: Base model, Specific Utility 7: TW Fresh Water (b) - St Pancras/1

- - - Axial Pullout (factored)
- - - Flexural Pullout (factored)
- Total Pullout (factored)
- Total Pullout Limit



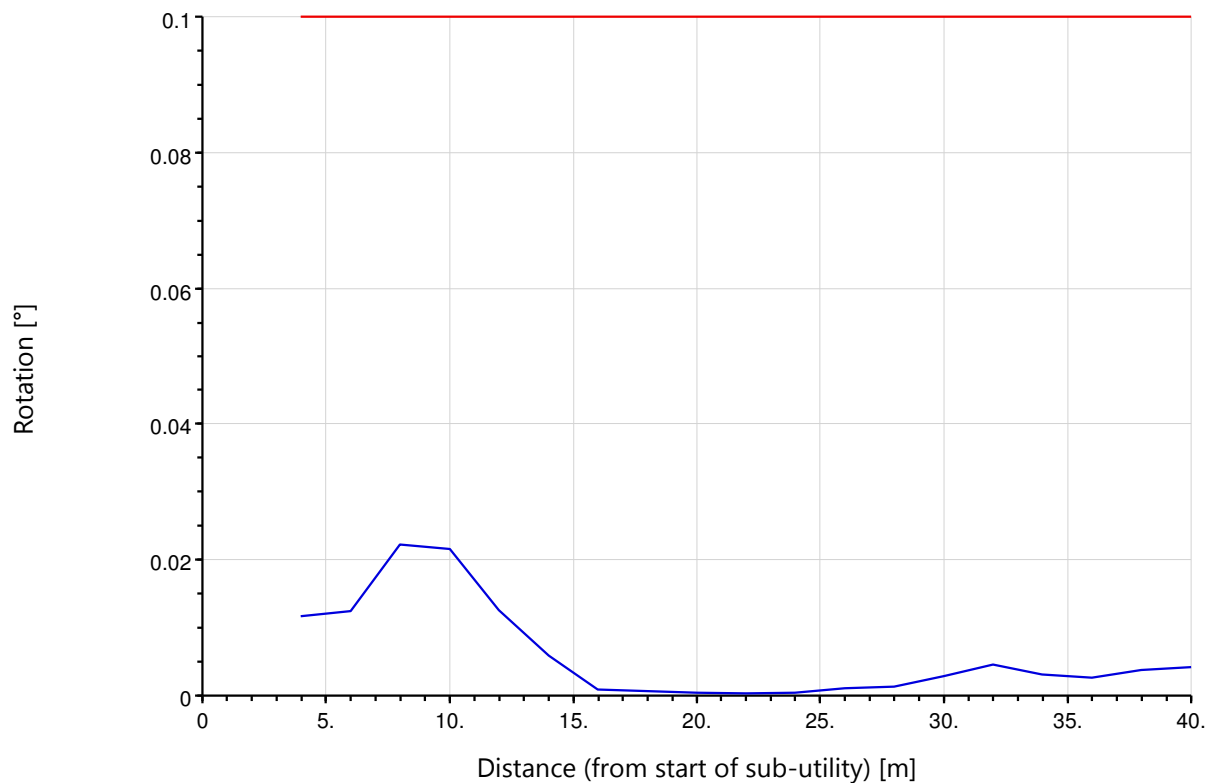
Distance (from start of sub-utility) [m] Note: Total pullout ignores the axial component where this is negative (i.e. comp

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Specific Utility - Rotation Chart

Stage: Base model, Specific Utility 7: TW Fresh Water (b) - St Pancras/1

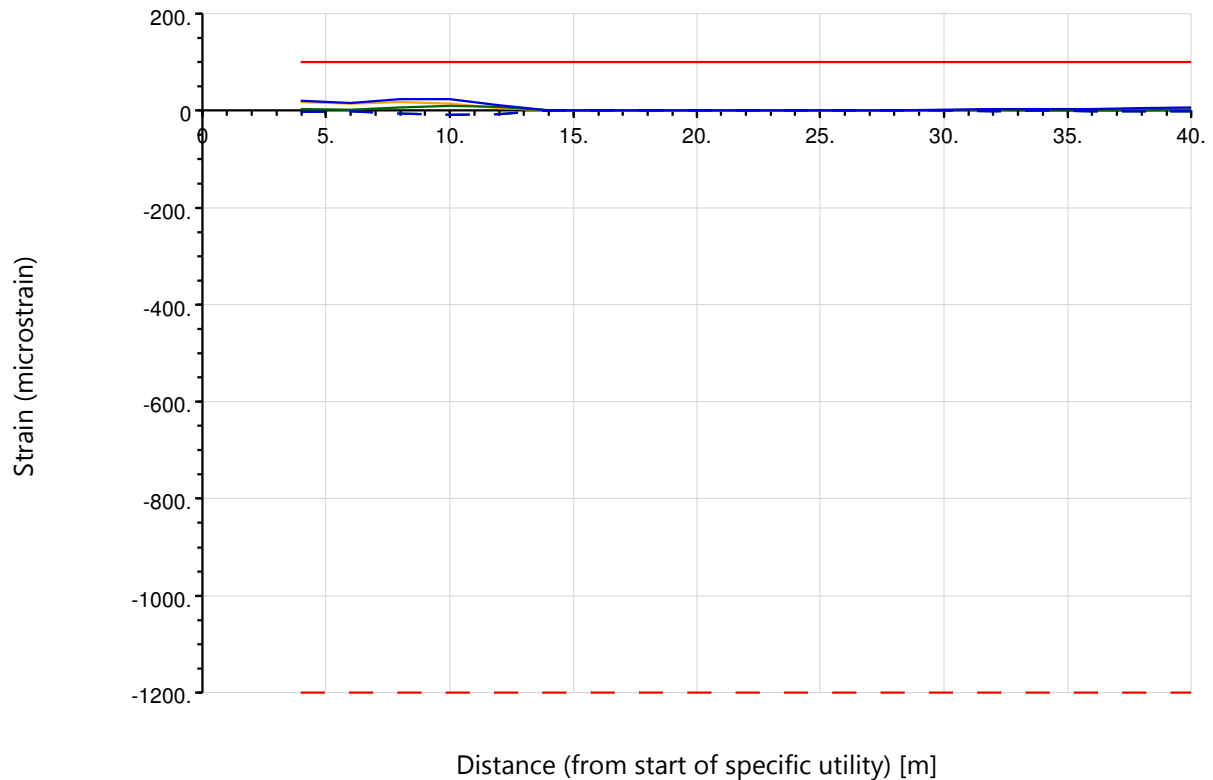
— Rotation (factored)
— Rotation Limit



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 7: TW Fresh Water (b) - St Pancras/1

- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- Combined Compressive Strain (factored)
- Allowable Tensile Strain
- Allowable Compressive Strain



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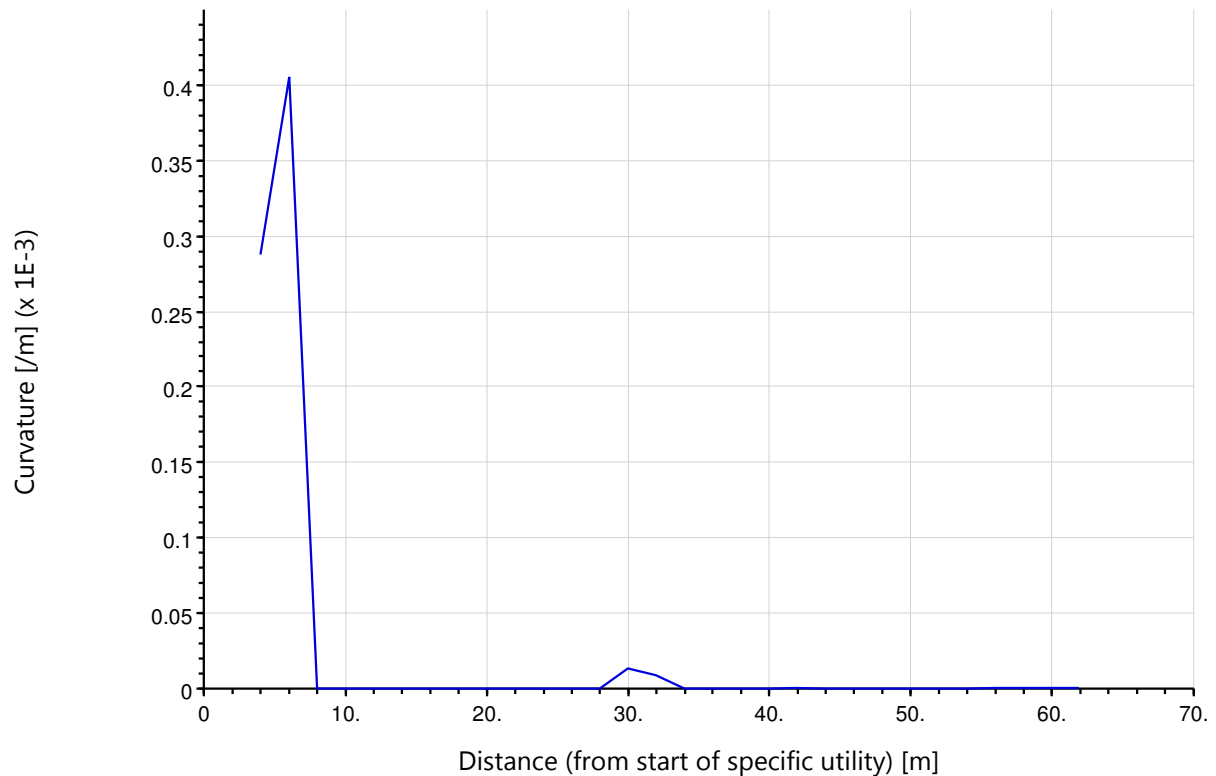
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PLOT A RESULTS (S) + PLOT B&C DEMO+WALL INST-(S)+EXC

Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 8: TW Fresh Water (c) - St Pancras/1

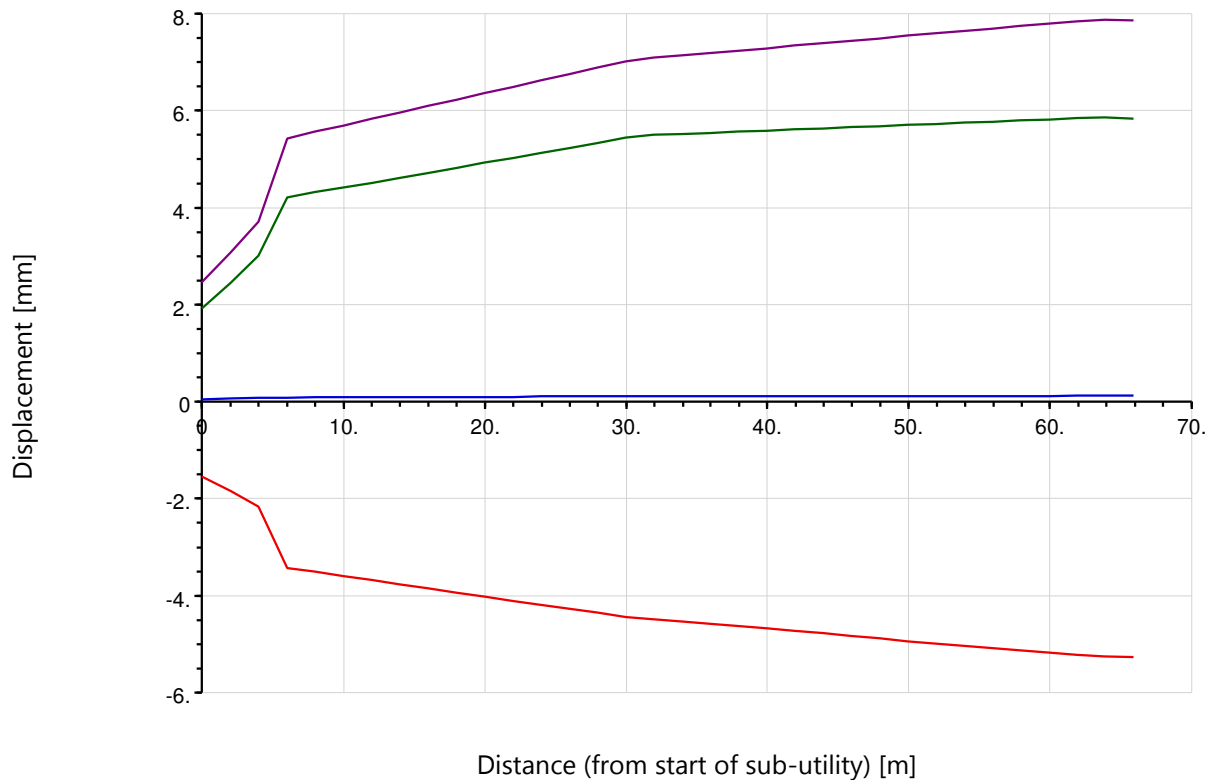
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 8: TW Fresh Water (c) - St Pancras/1

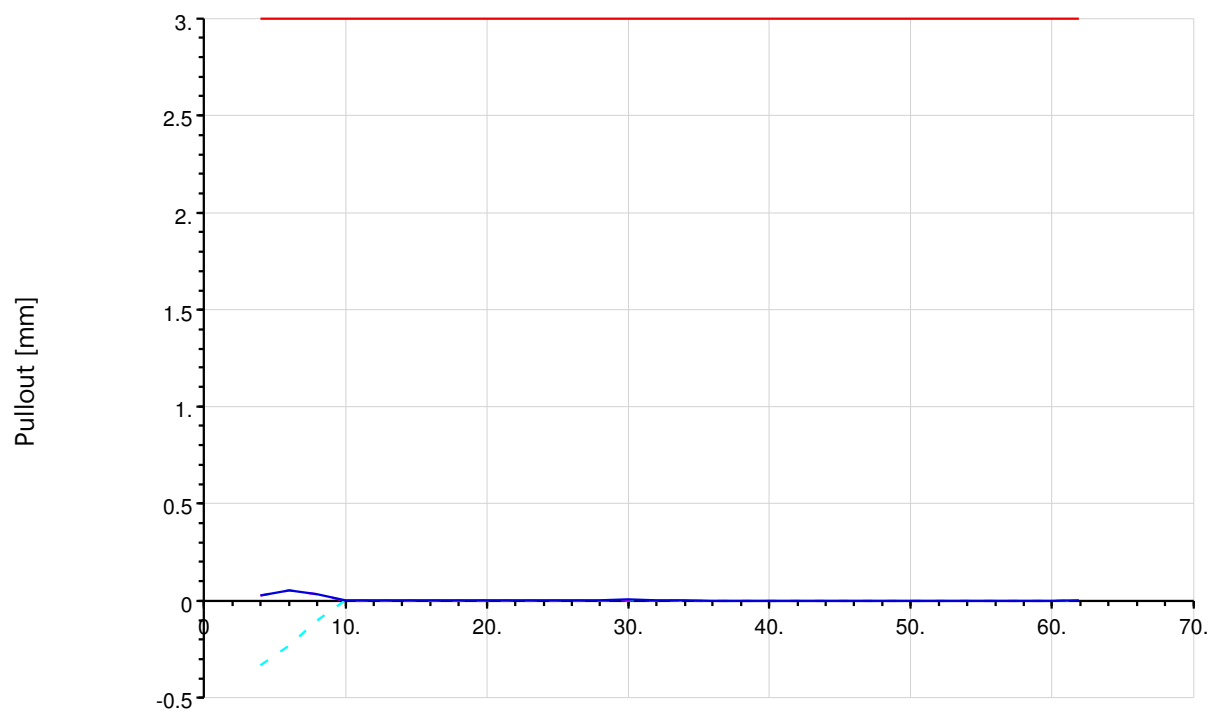
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - Pullout Chart

Stage: Base model, Specific Utility 8: TW Fresh Water (c) - St Pancras/1

- - - Axial Pullout (factored)
- - - Flexural Pullout (factored)
- Total Pullout (factored)
- Total Pullout Limit



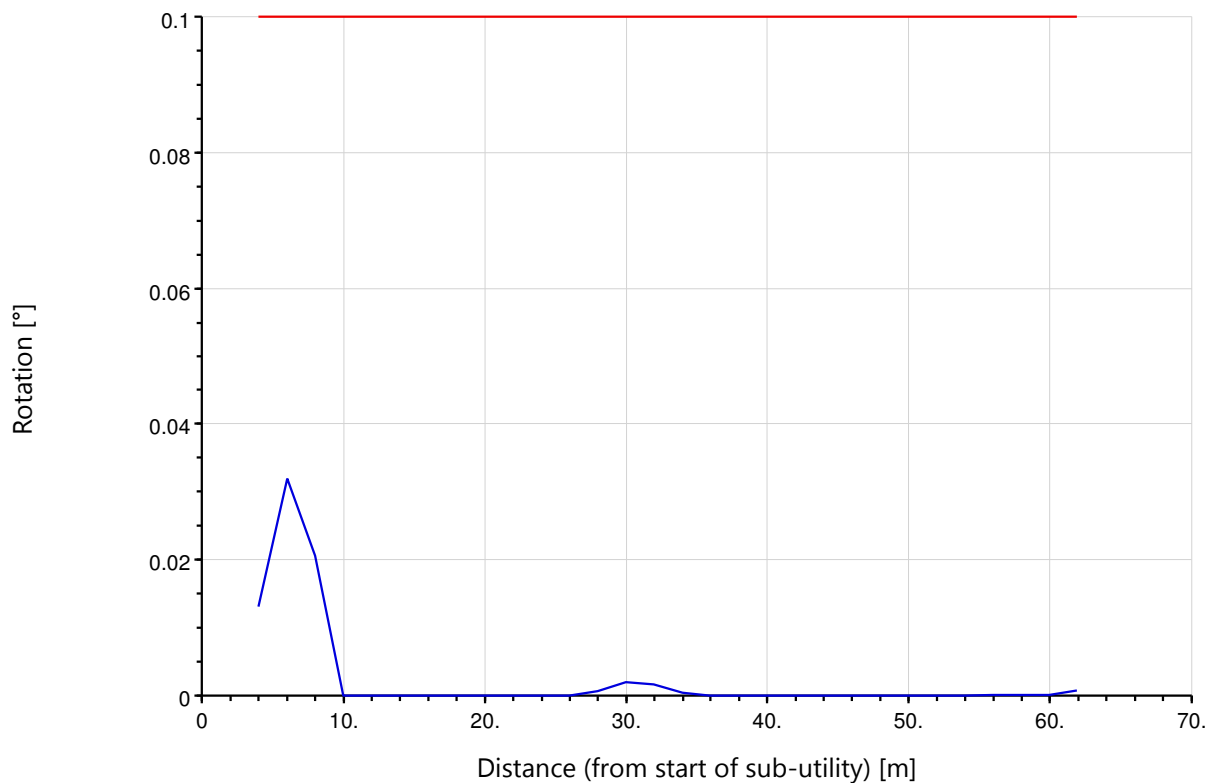
Distance (from start of sub-utility) [m] Note: Total pullout ignores the axial component where this is negative (i.e. comp

Specific Utility - Rotation Chart

Stage: Base model, Specific Utility 8: TW Fresh Water (c) - St Pancras/1

— Rotation (factored)

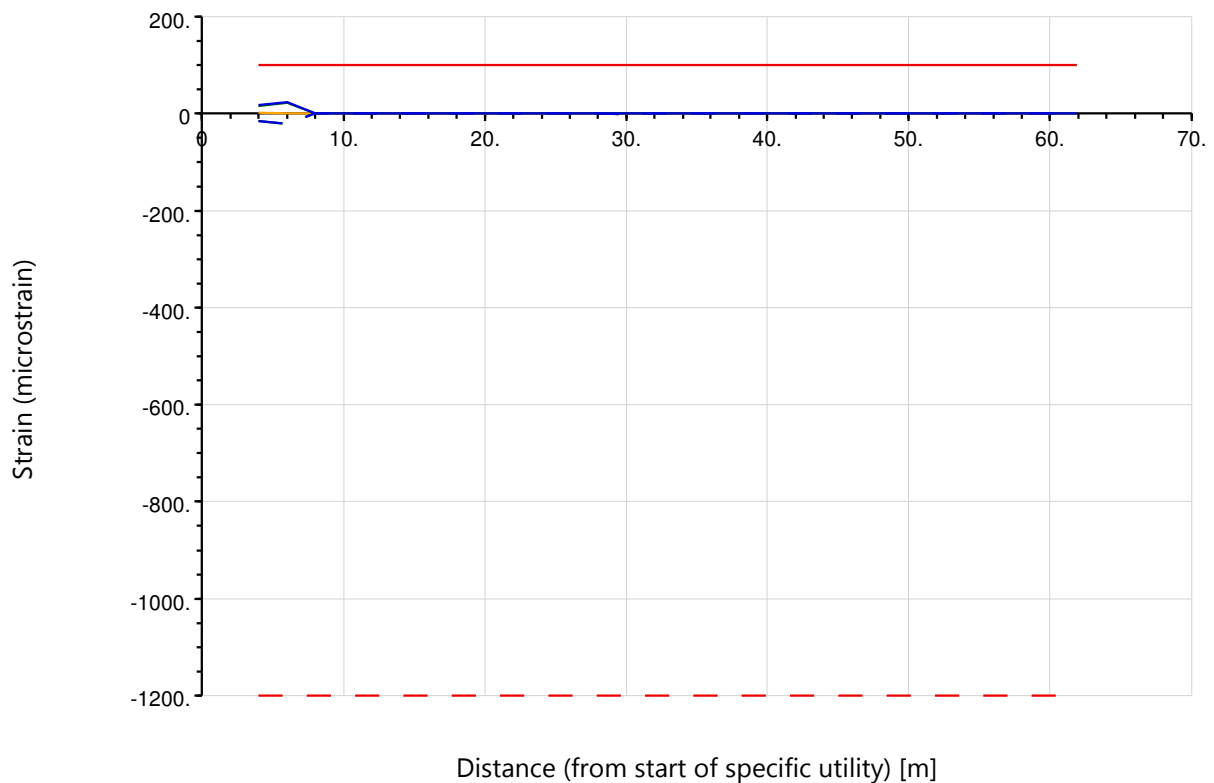
— Rotation Limit



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 8: TW Fresh Water (c) - St Pancras/1

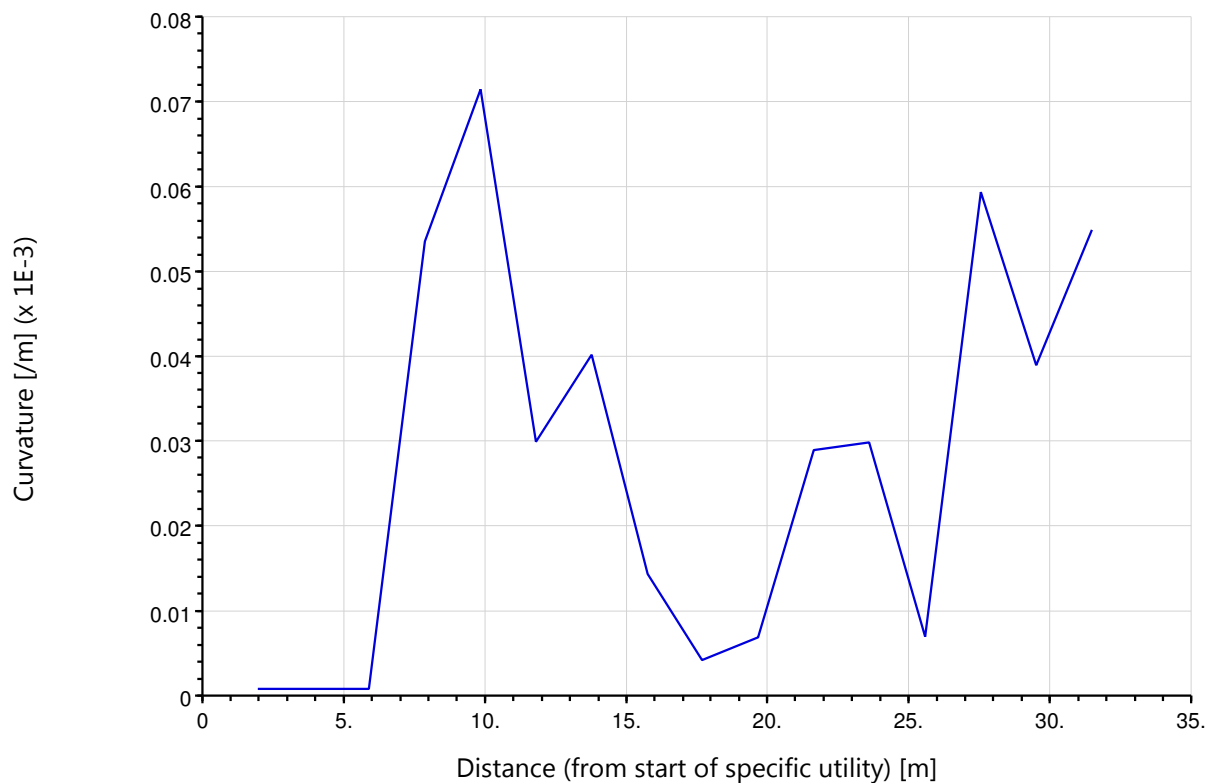
- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 9: TW Fresh Water (d) - St Pancras/1

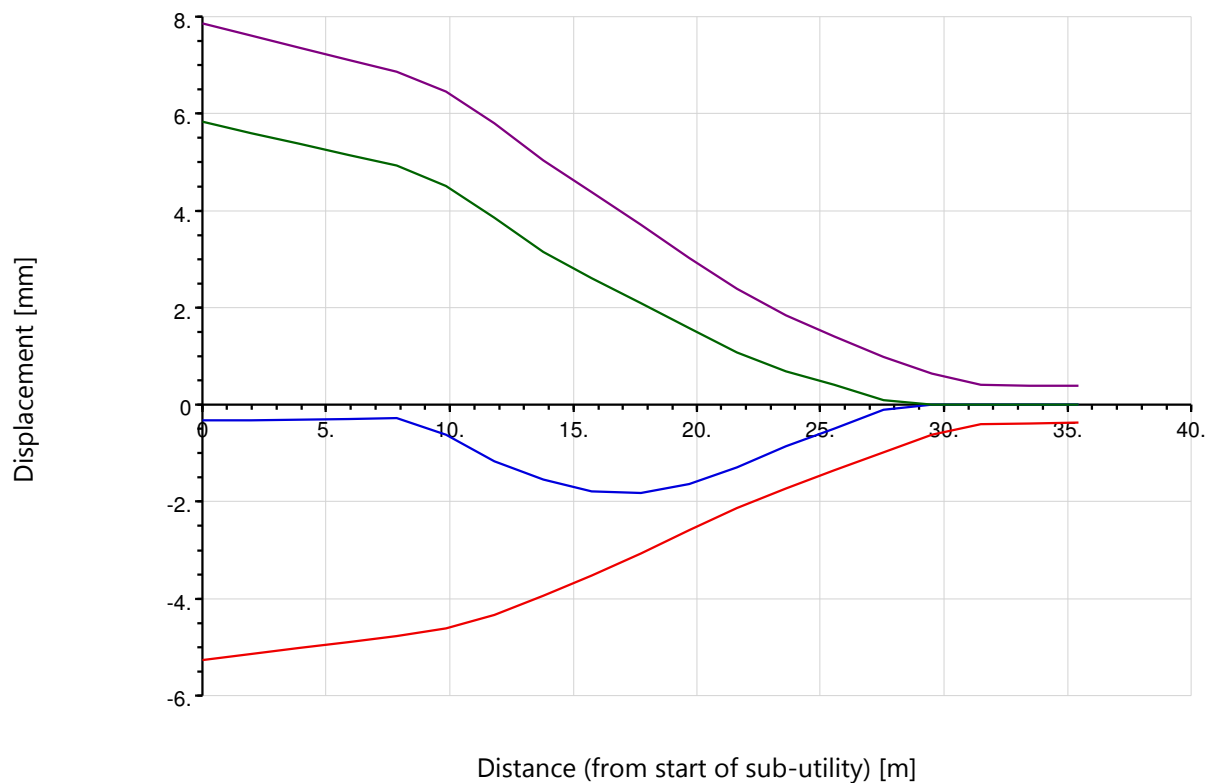
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 9: TW Fresh Water (d) - St Pancras/1

- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)

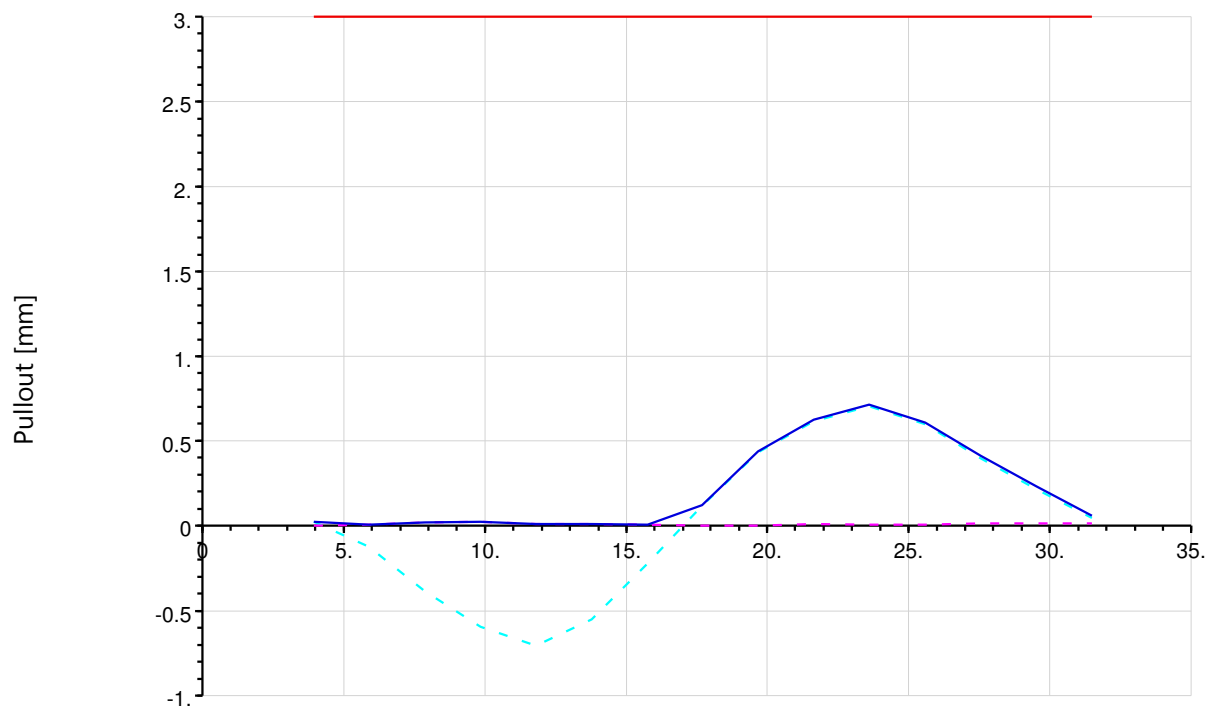


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Specific Utility - Pullout Chart

Stage: Base model, Specific Utility 9: TW Fresh Water (d) - St Pancras/1

- - - Axial Pullout (factored)
- - - Flexural Pullout (factored)
- Total Pullout (factored)
- Total Pullout Limit

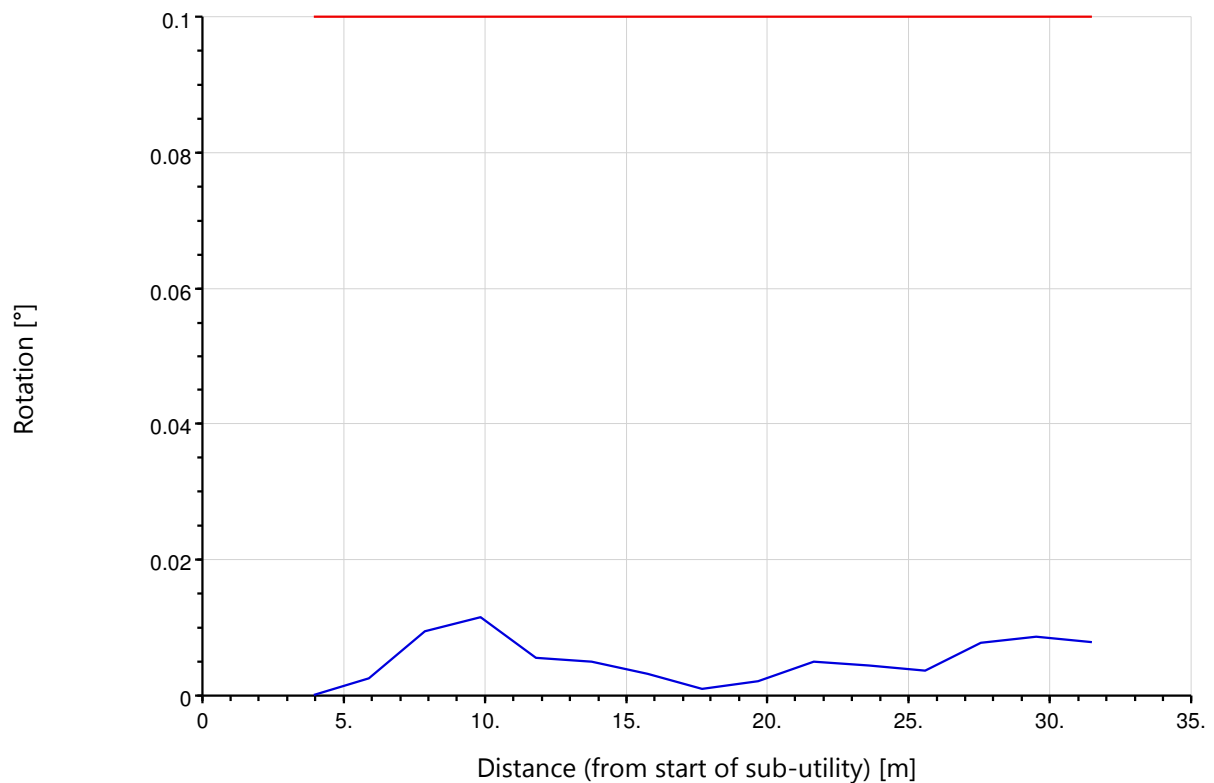


Distance (from start of sub-utility) [m] Note: Total pullout ignores the axial component where this is negative (i.e. comp

Specific Utility - Rotation Chart

Stage: Base model, Specific Utility 9: TW Fresh Water (d) - St Pancras/1

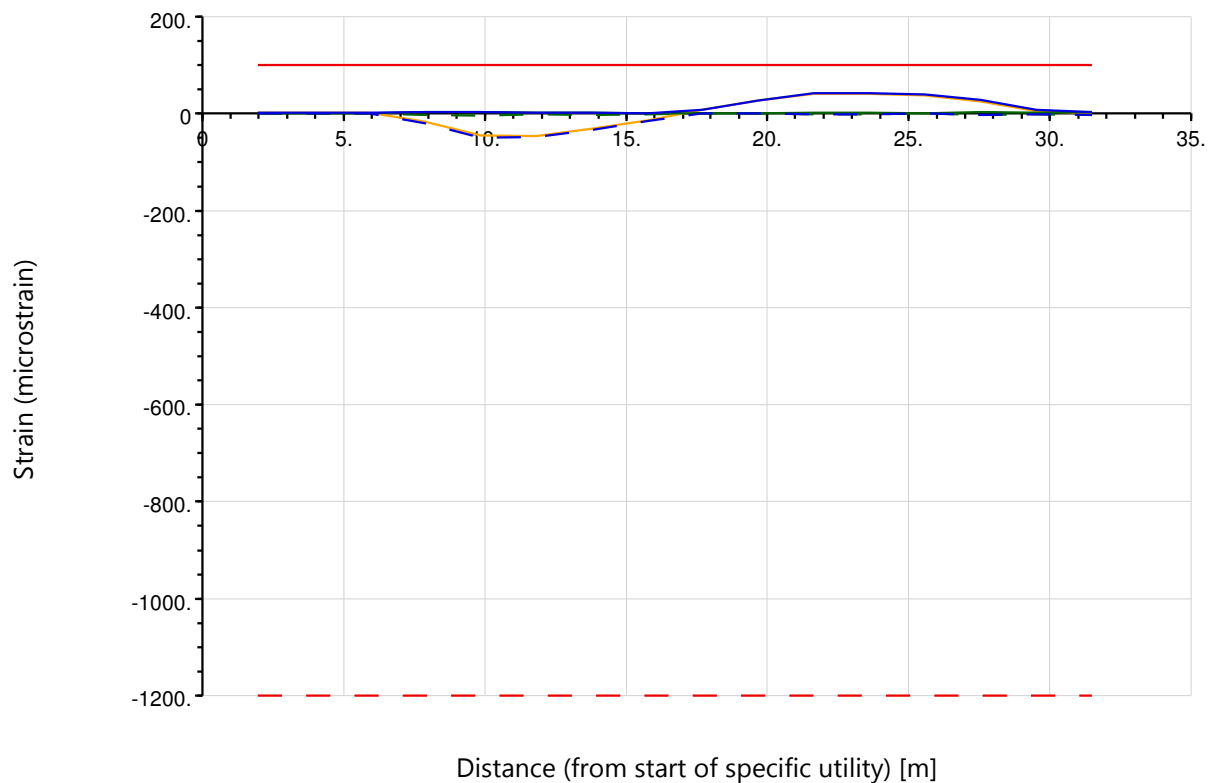
— Rotation (factored)
— Rotation Limit



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 9: TW Fresh Water (d) - St Pancras/1

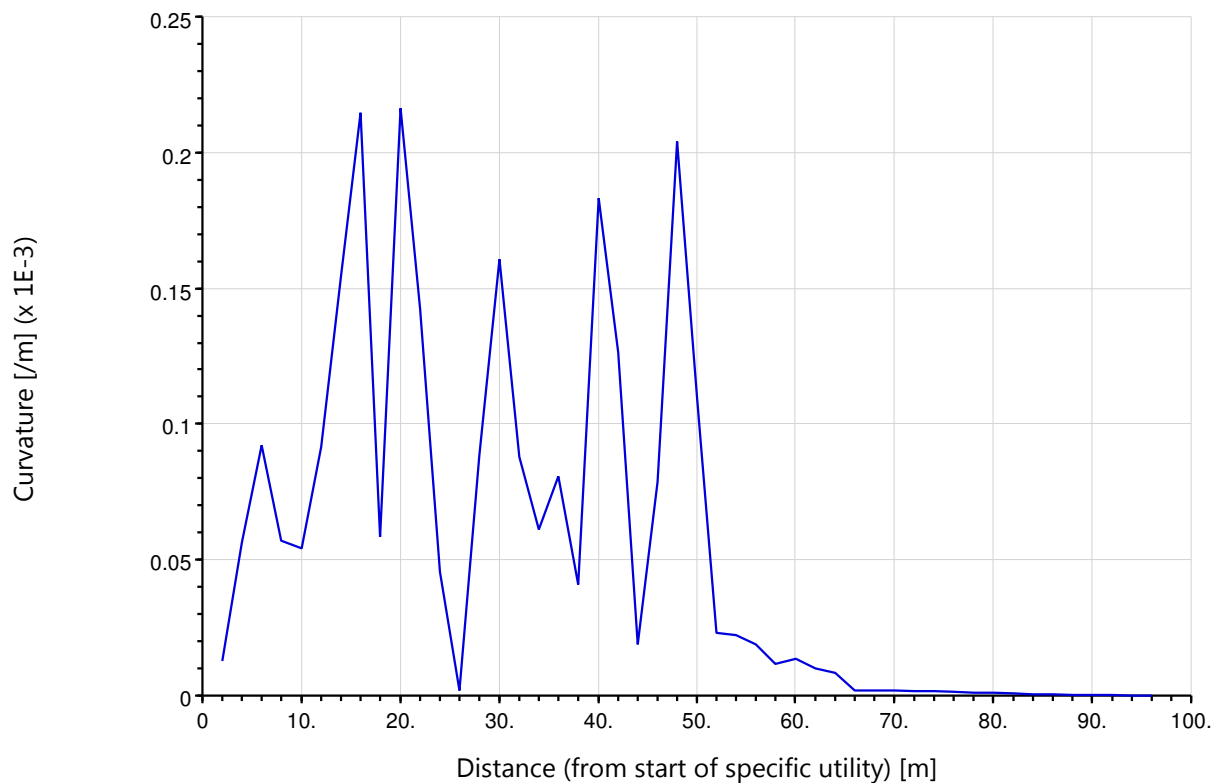
- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 1: TWS(1)_1/1

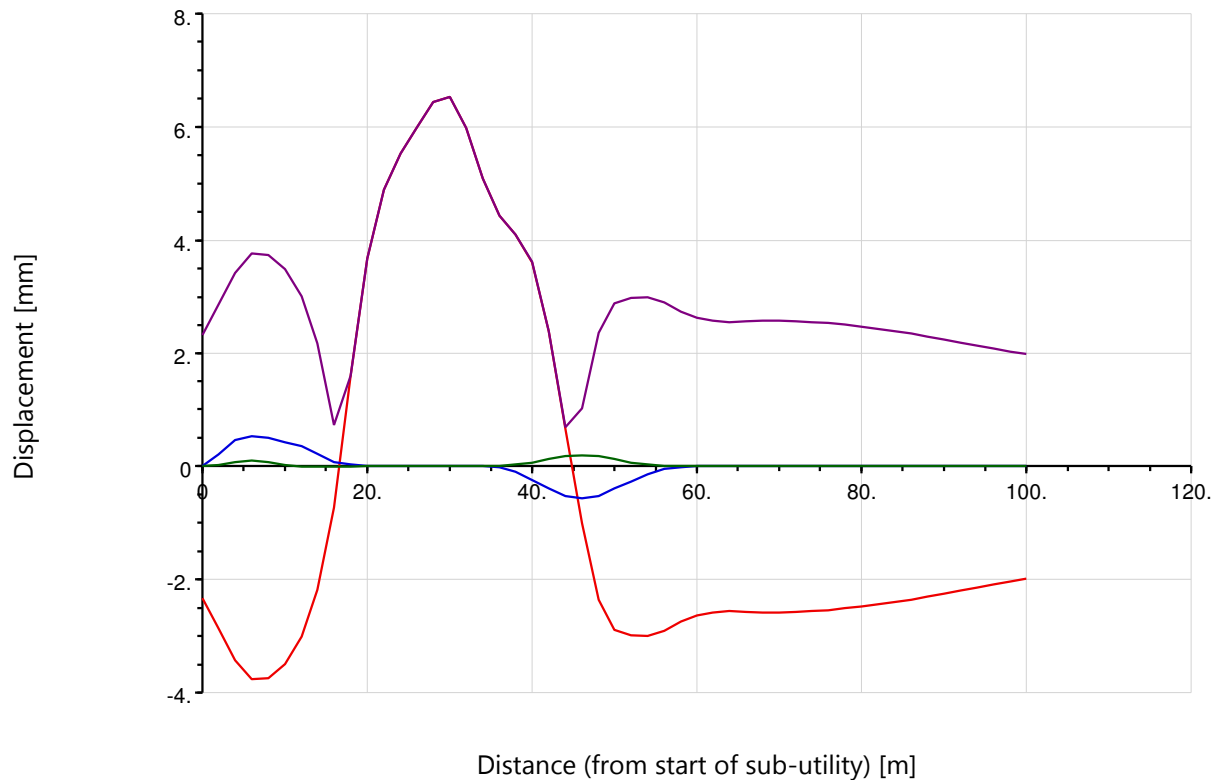
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 1: TWS(1)_1/1

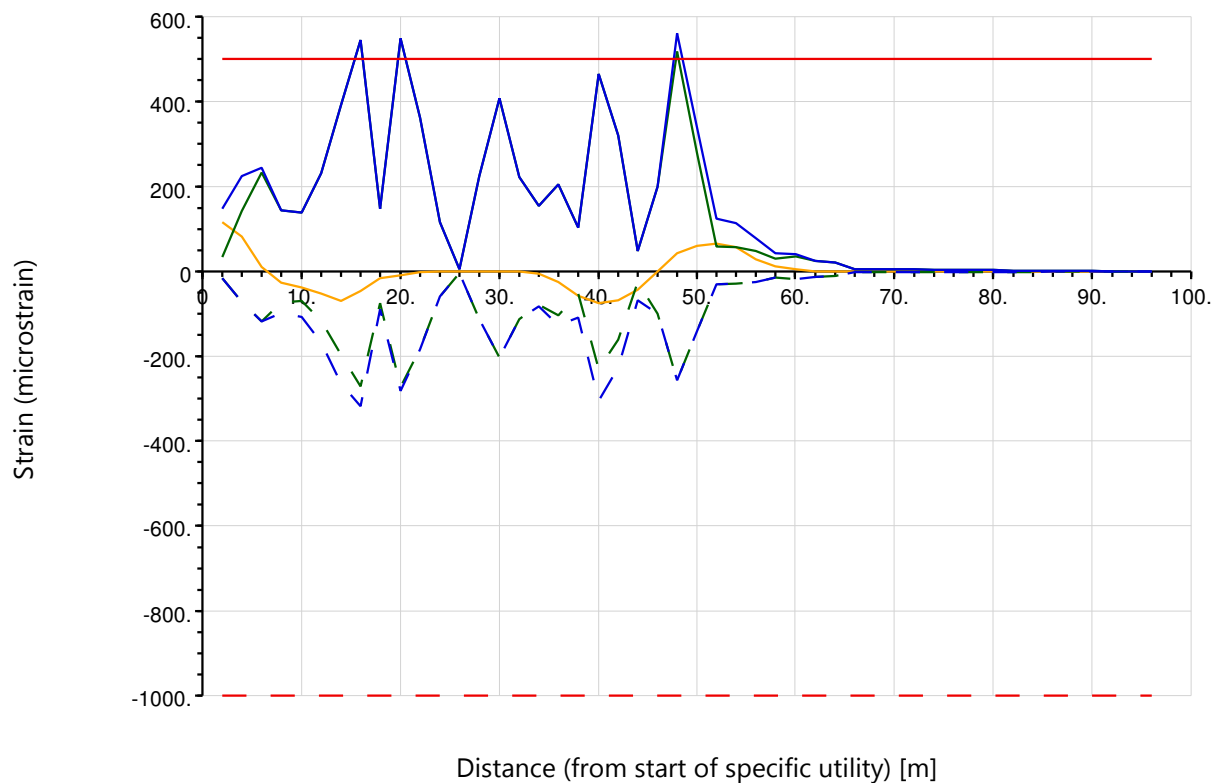
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 1: TWS(1)_1/1

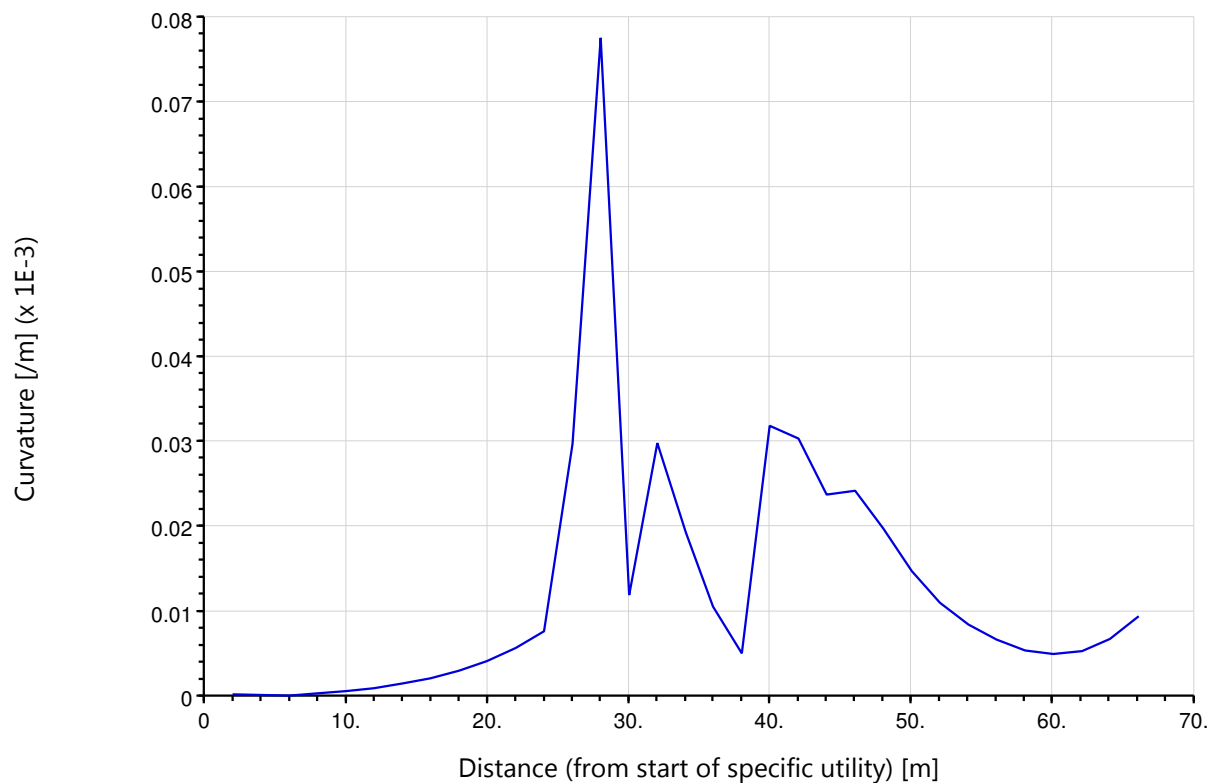
- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 2: TWS(2)_1/1

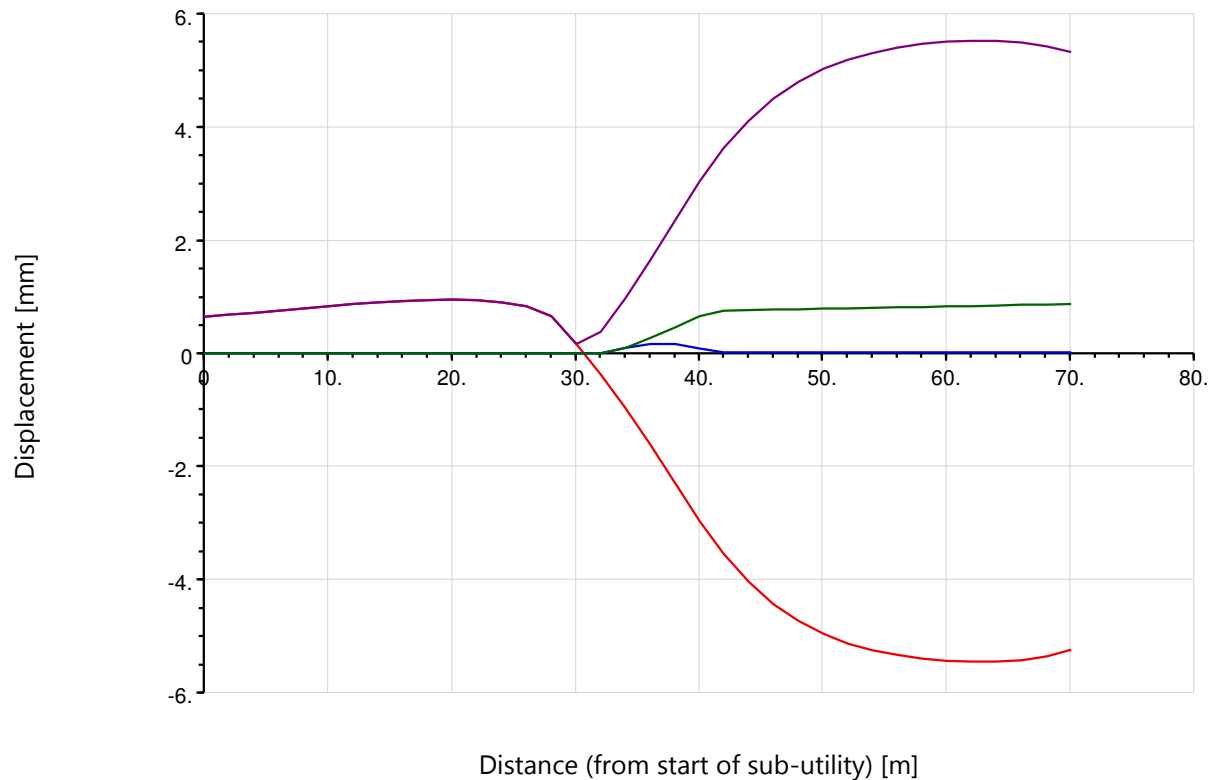
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 2: TWS(2)_1/1

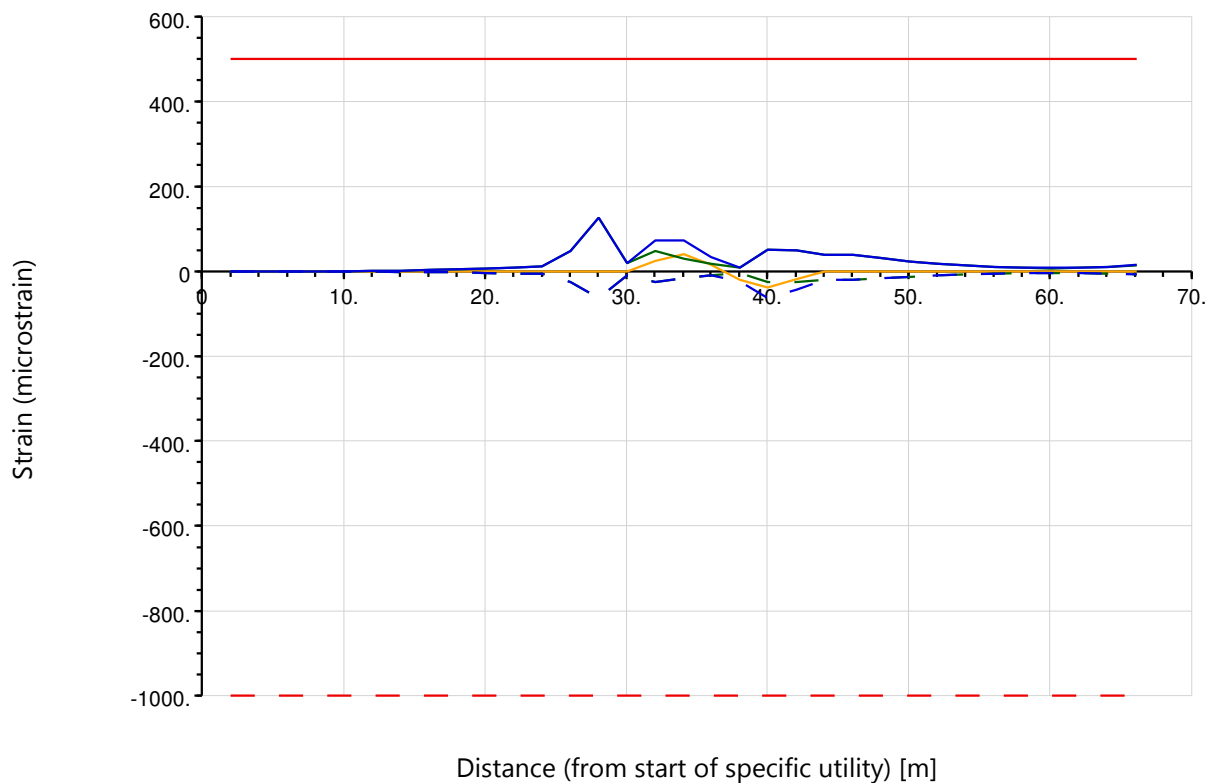
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 2: TWS(2)_1/1

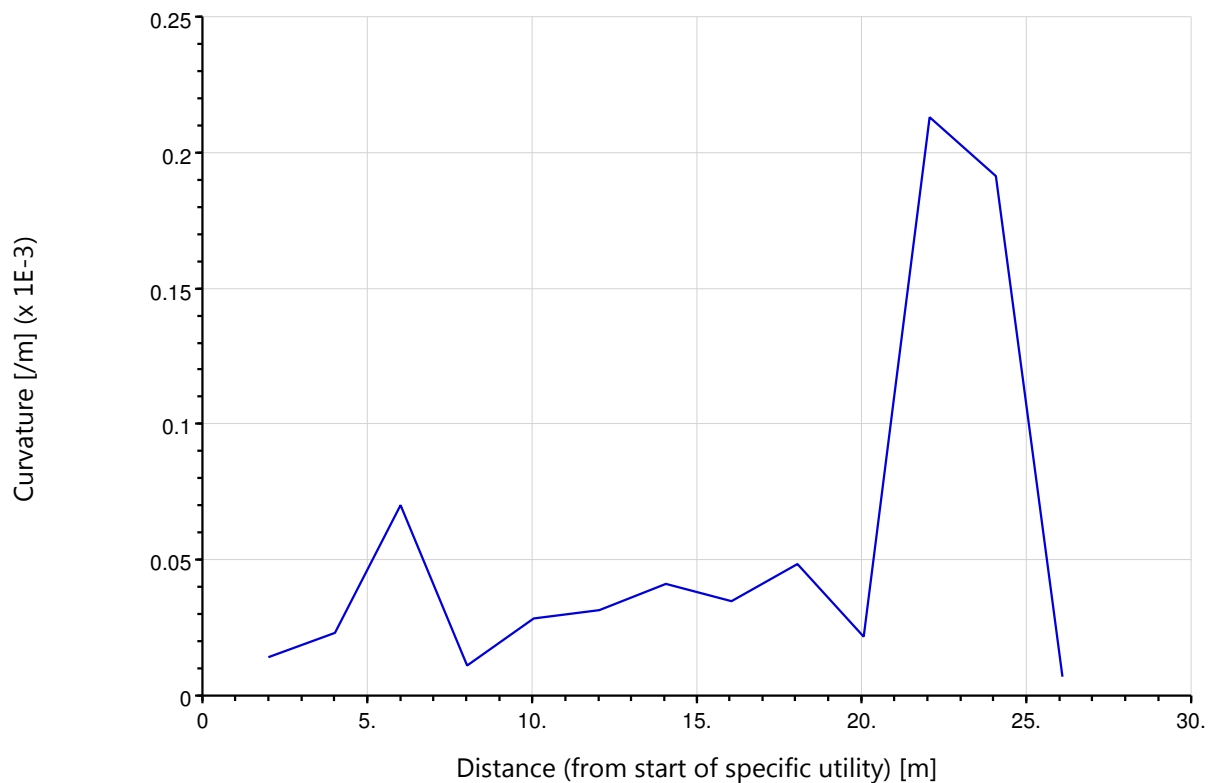
- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 3: TWS(2)_2/1

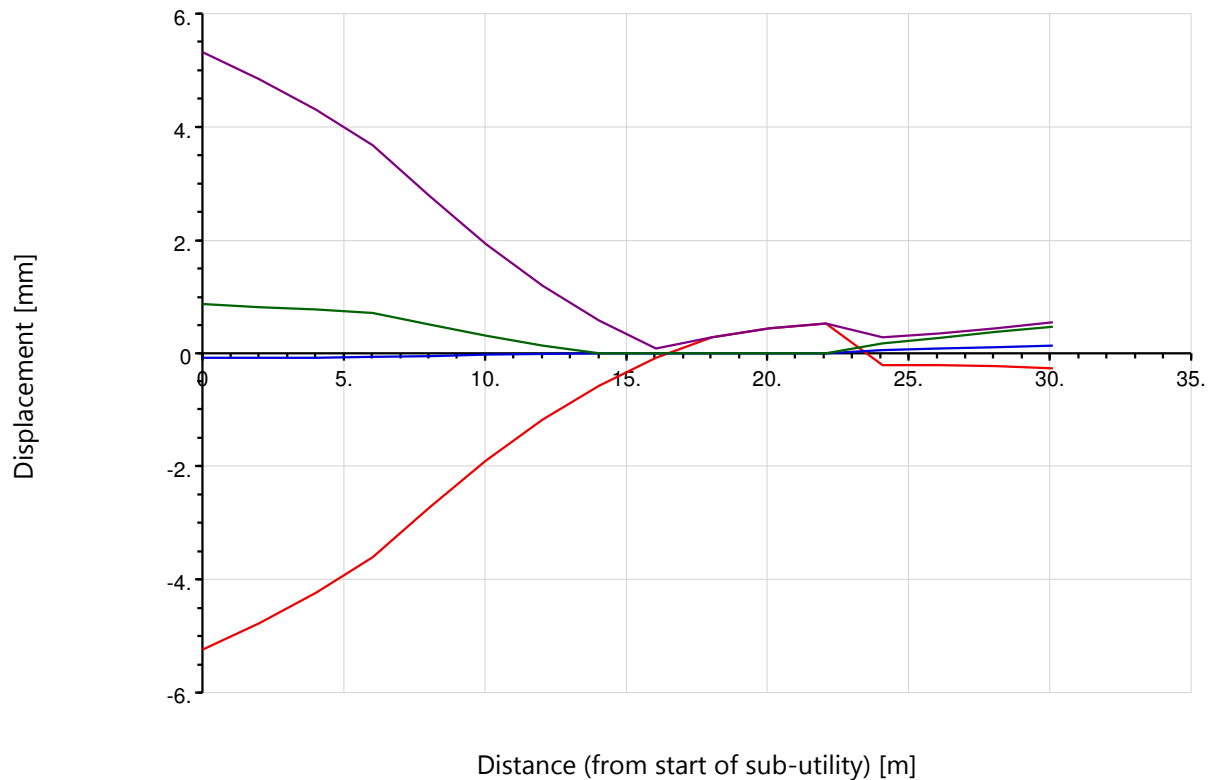
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 3: TWS(2)_2/1

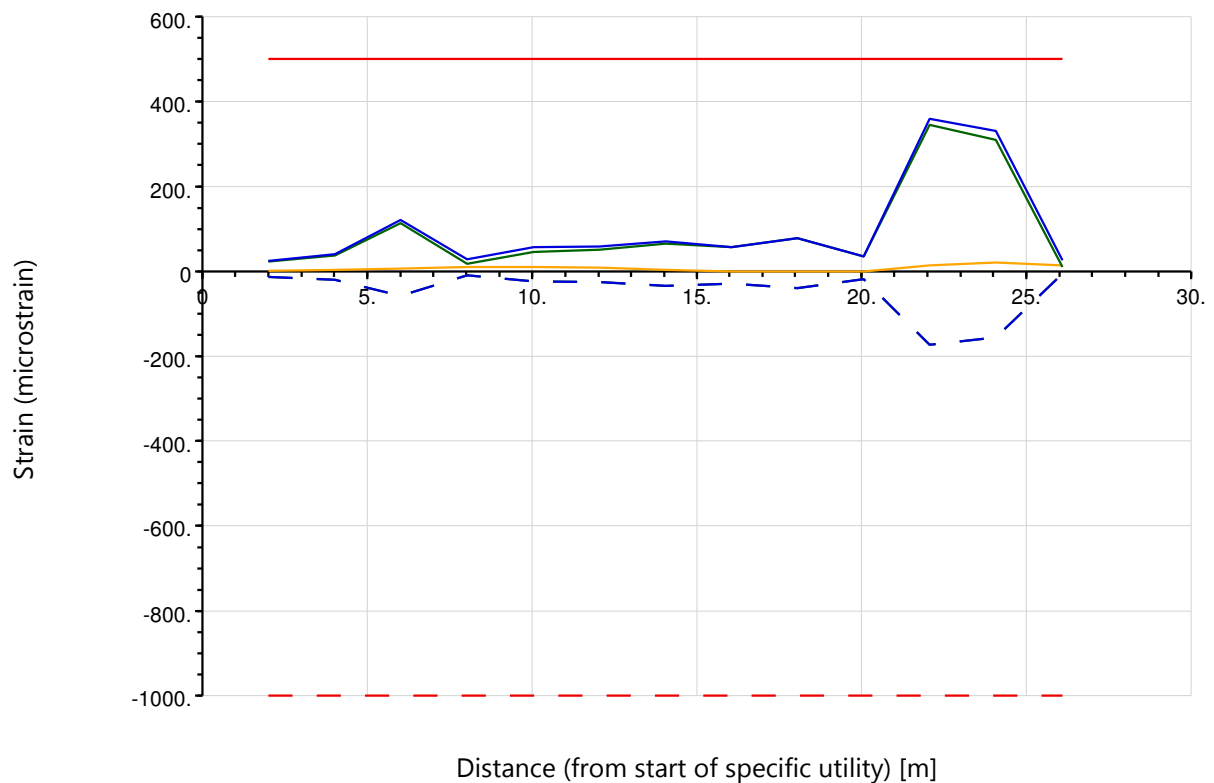
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 3: TWS(2)_2/1

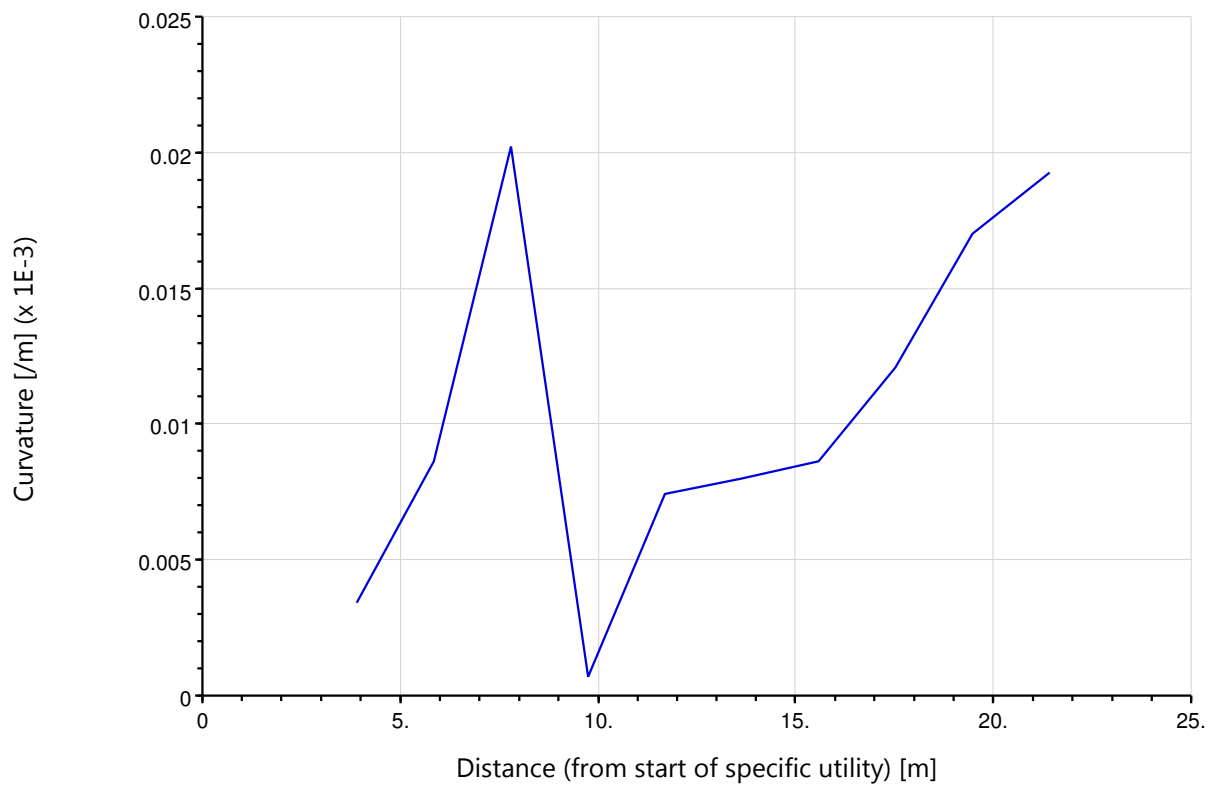
- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 4: TWS(2)_3/1

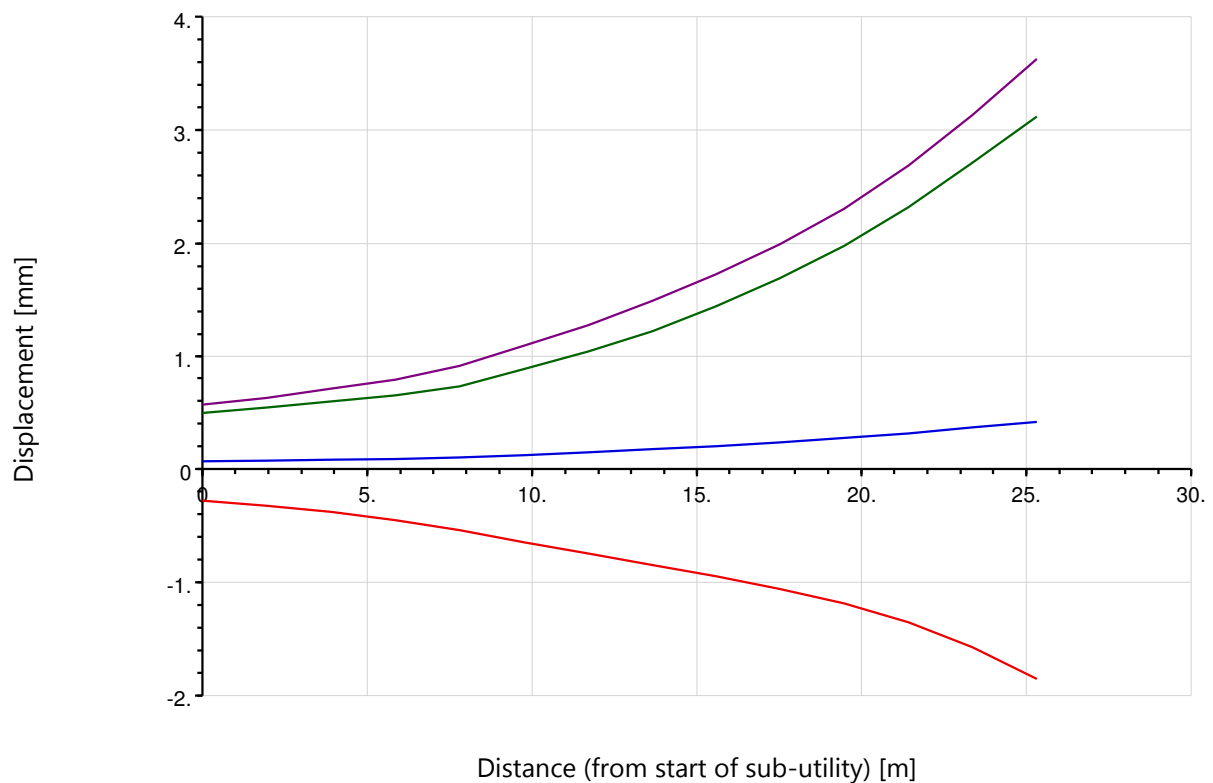
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 4: TWS(2)_3/1

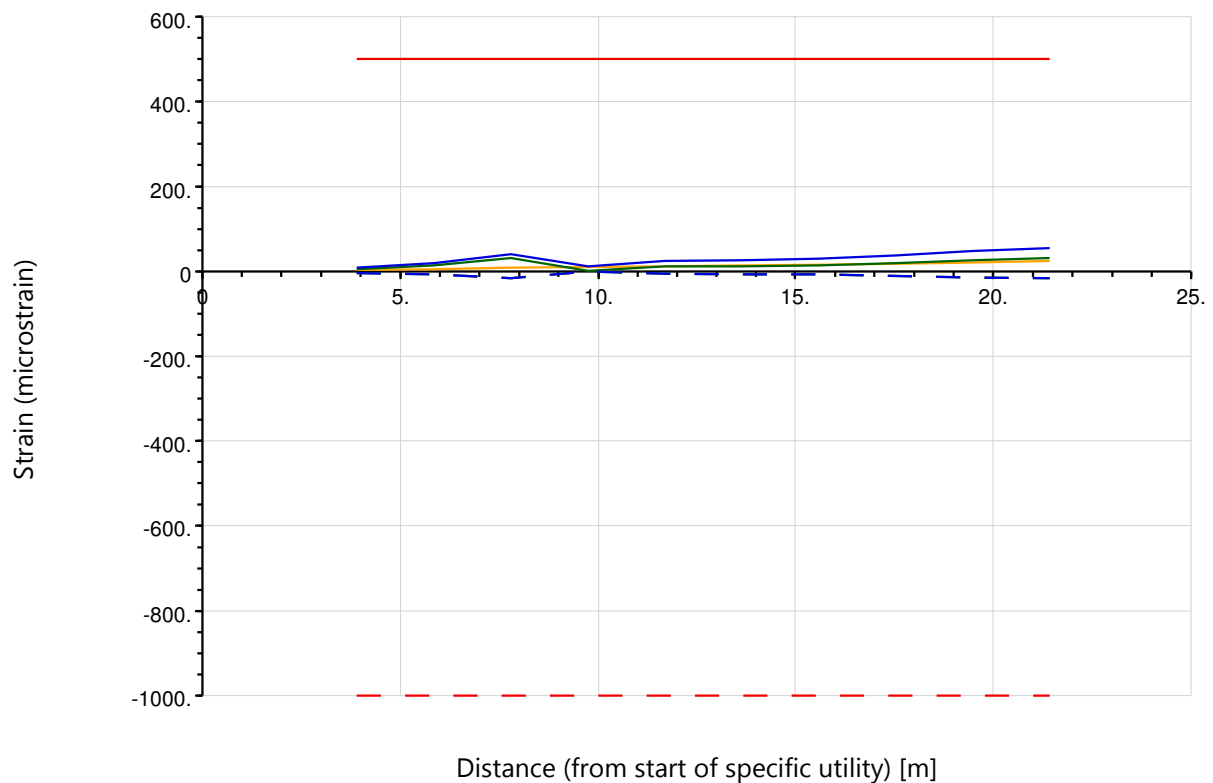
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 4: TWS(2)_3/1

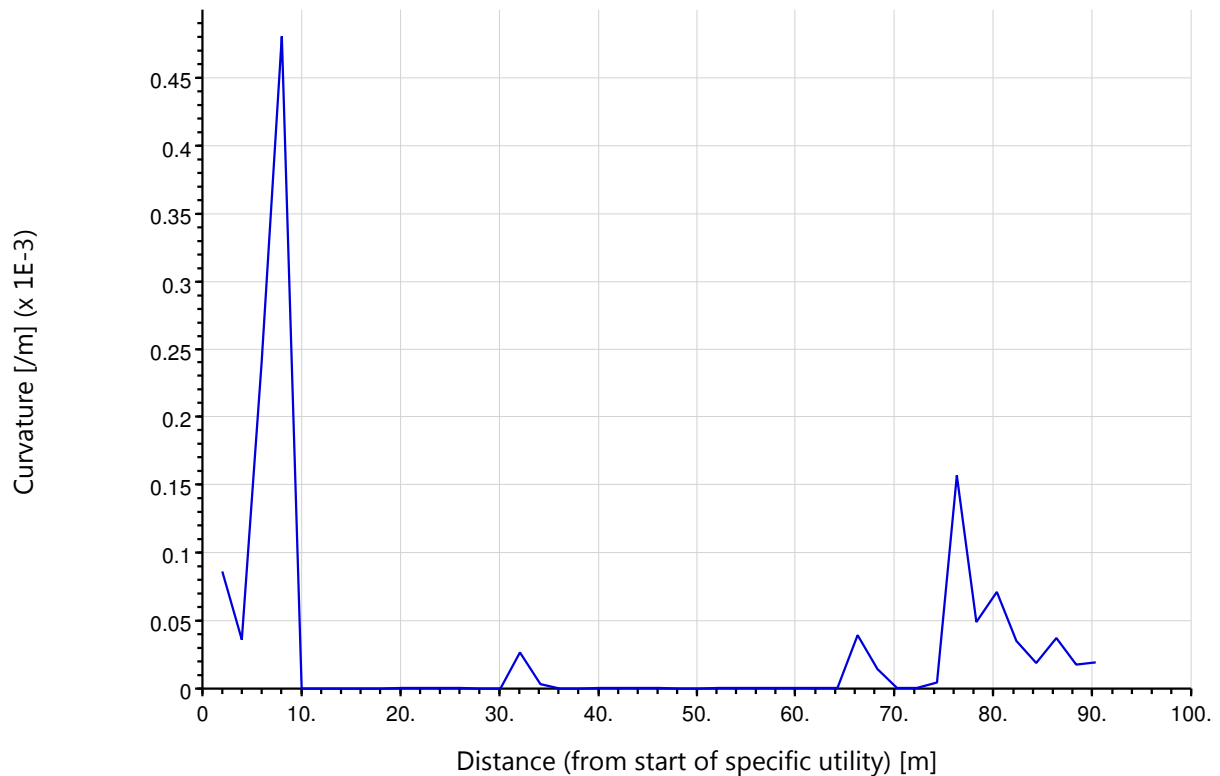
- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 5: TWS(2)_4/1

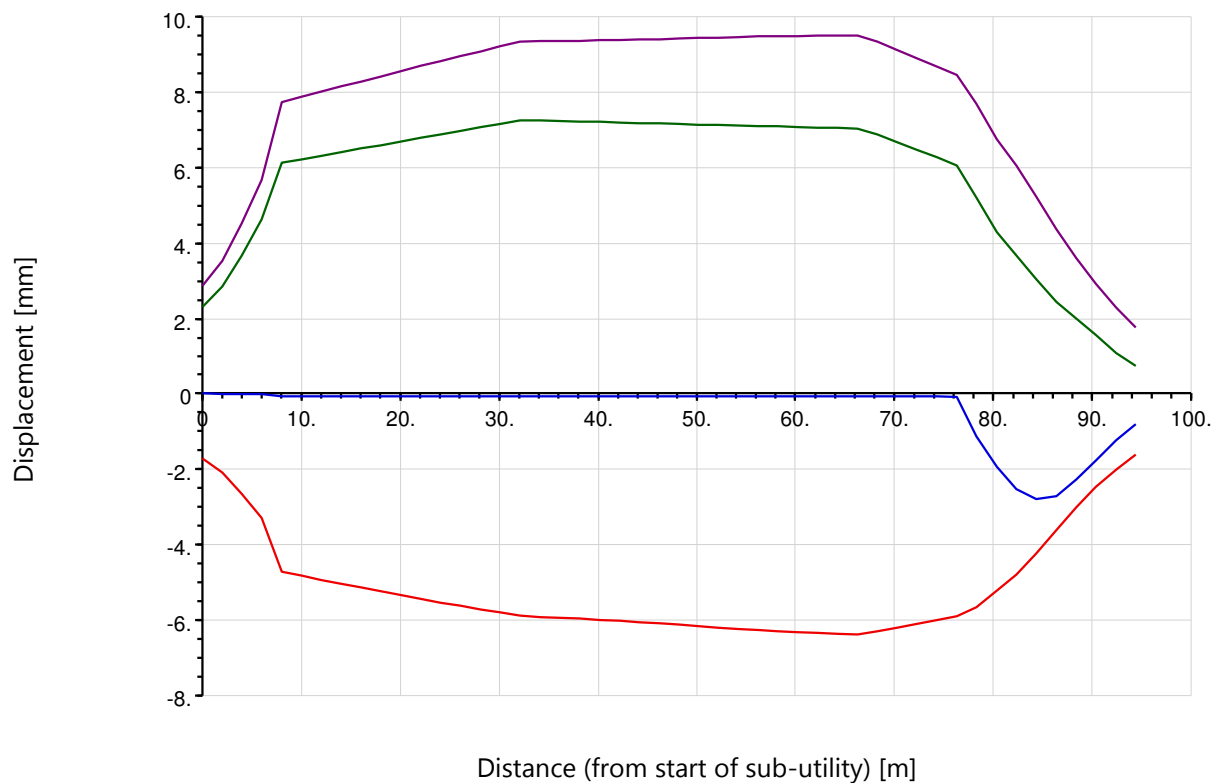
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 5: TWS(2)_4/1

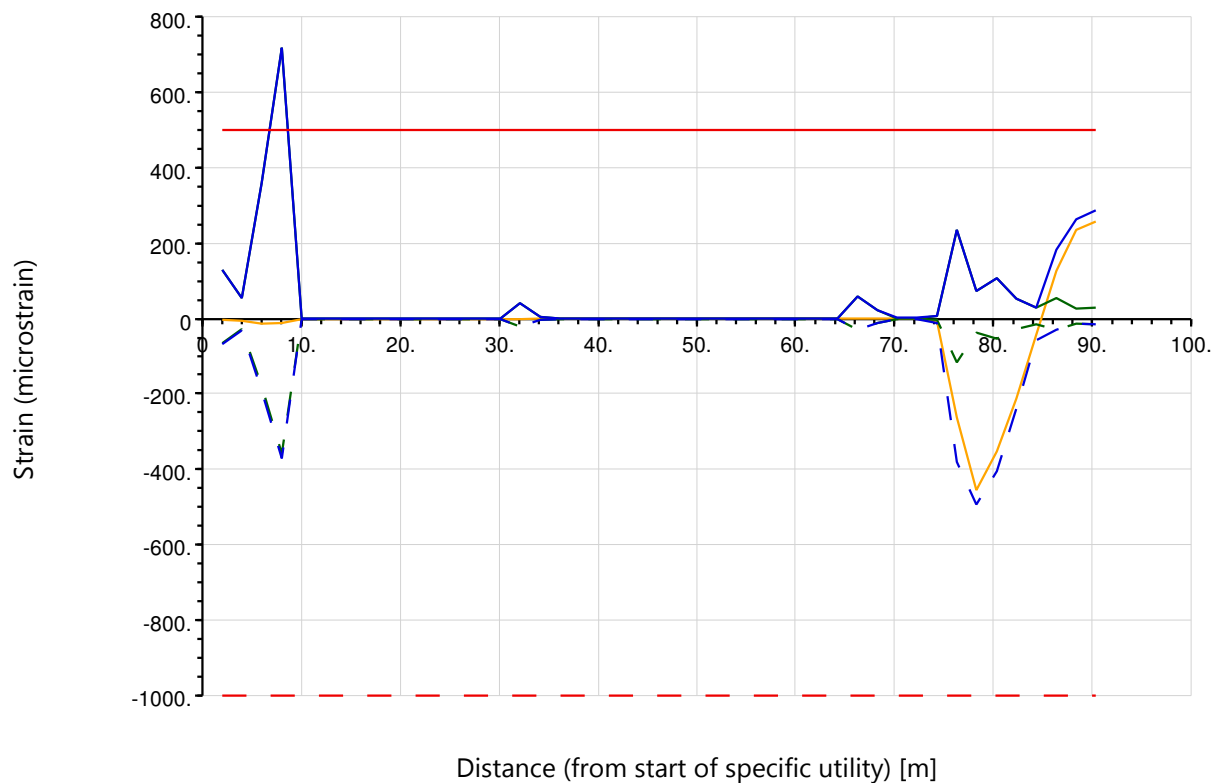
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 5: TWS(2)_4/1

- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain

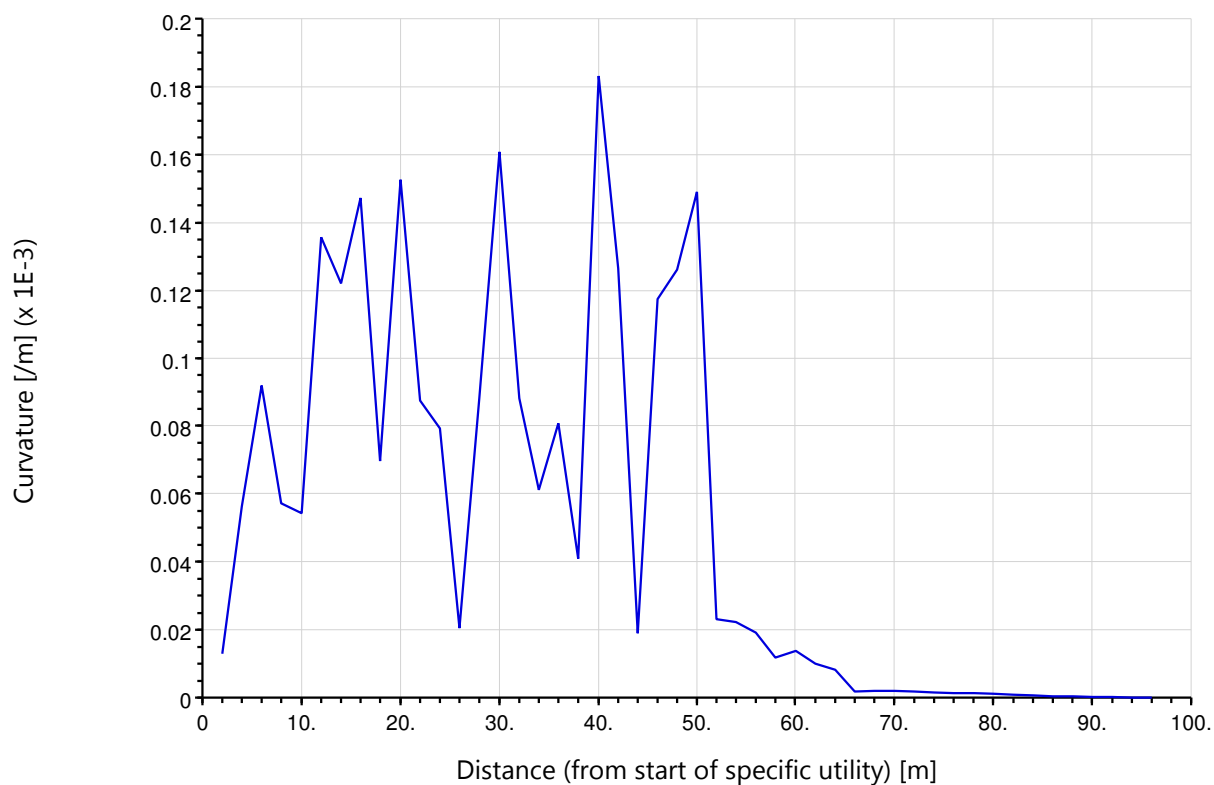


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Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 1: TWS(1)_1/1

— Curvature

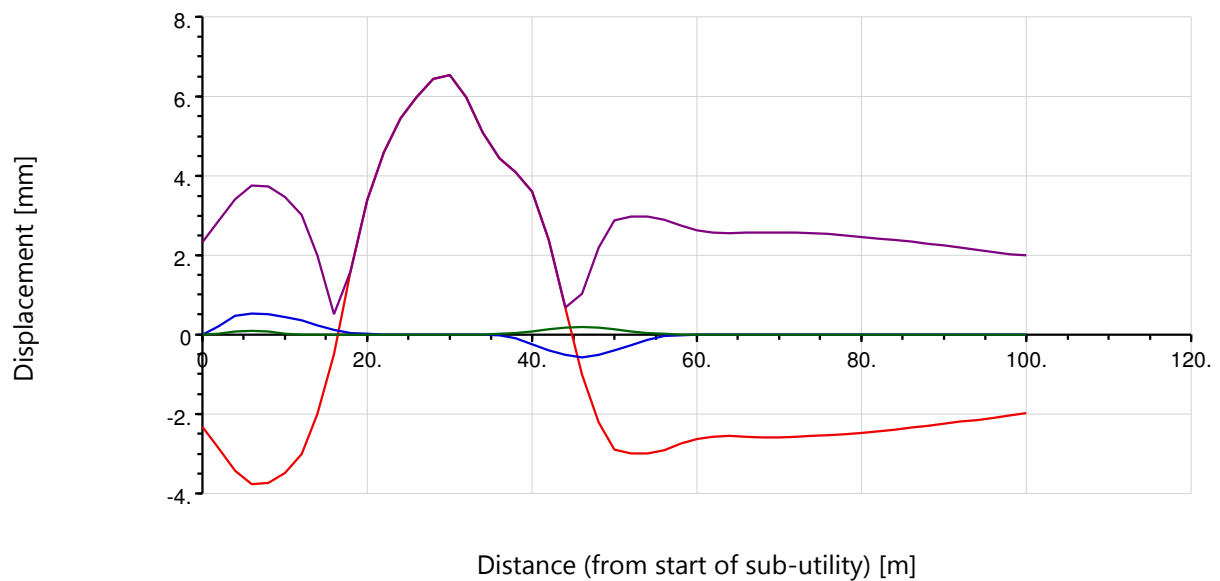


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Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 1: TWS(1)_1/1

- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)

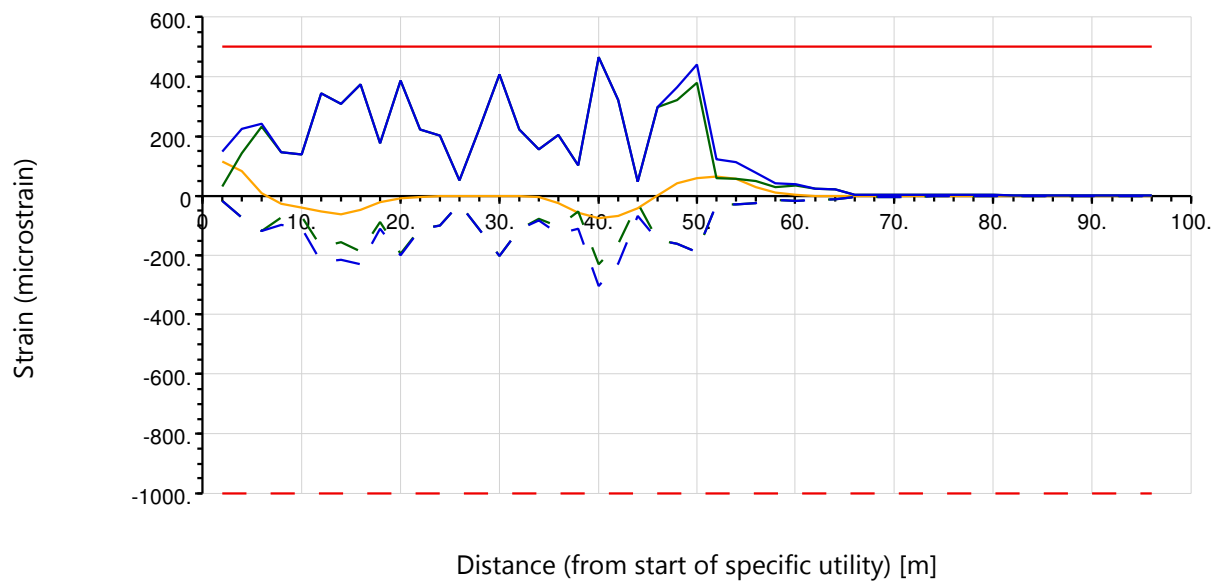


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Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 1: TWS(1)_1/1

- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



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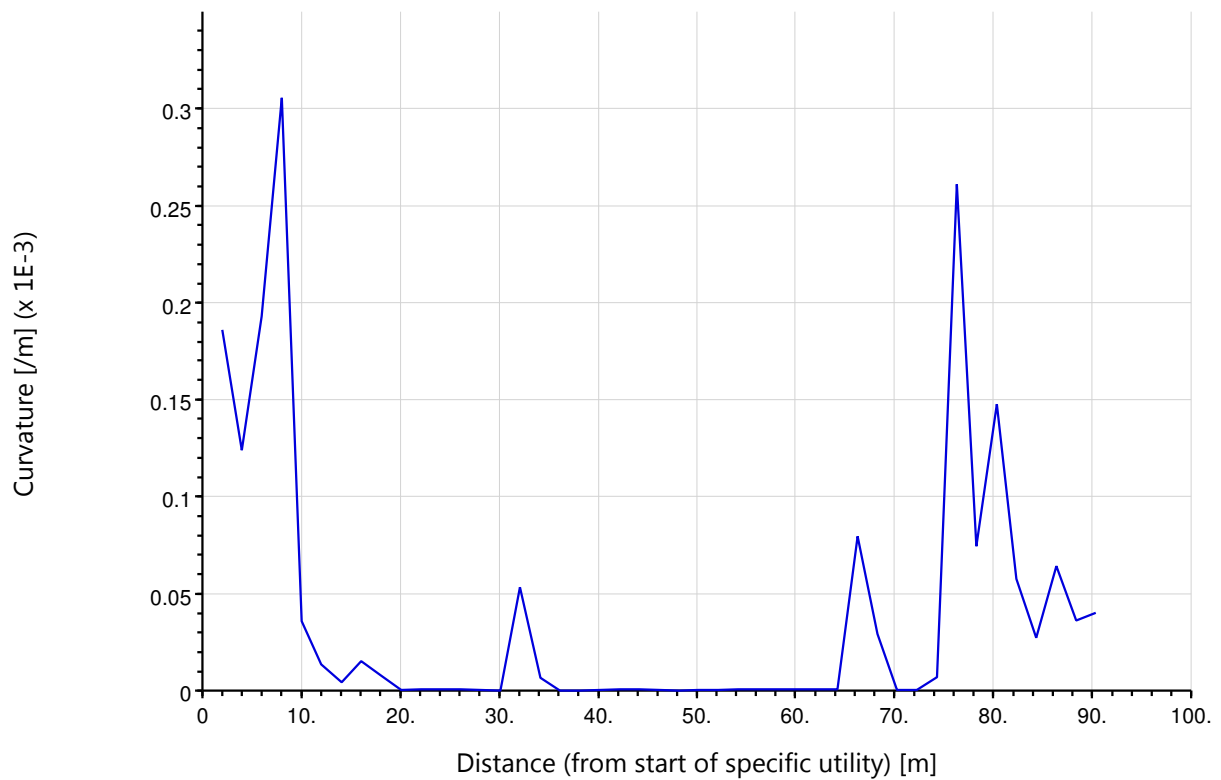
TW Sewer Assessment

PLOT A RESULTS (S) + PLOT B&C DEMO+WALL INST-(S)+EXC Smoothed

Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 5: TWS(2)_4/1

— Curvature



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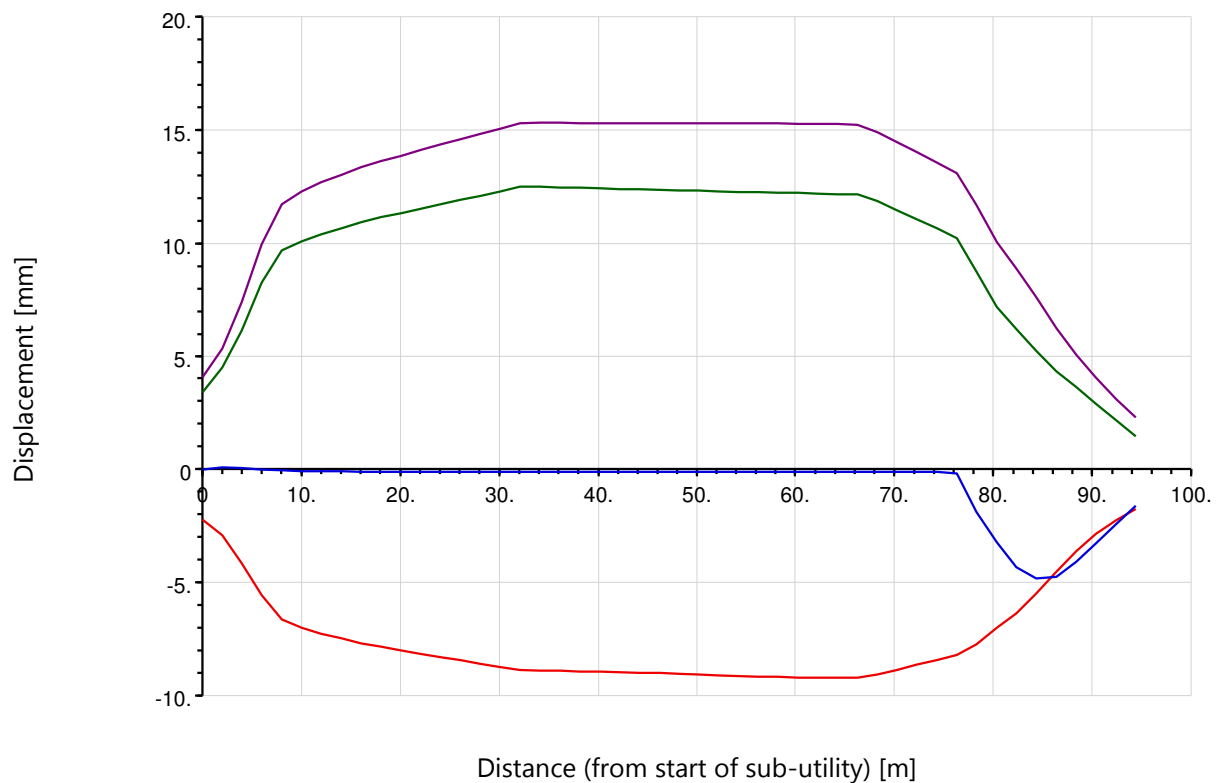
TW Sewer Assessment

PLOT A RESULTS (S) + PLOT B&C DEMO+WALL INST-(S)+EXC Smoothed

Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 5: TWS(2)_4/1

- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



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Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 5: TWS(2)_4/1

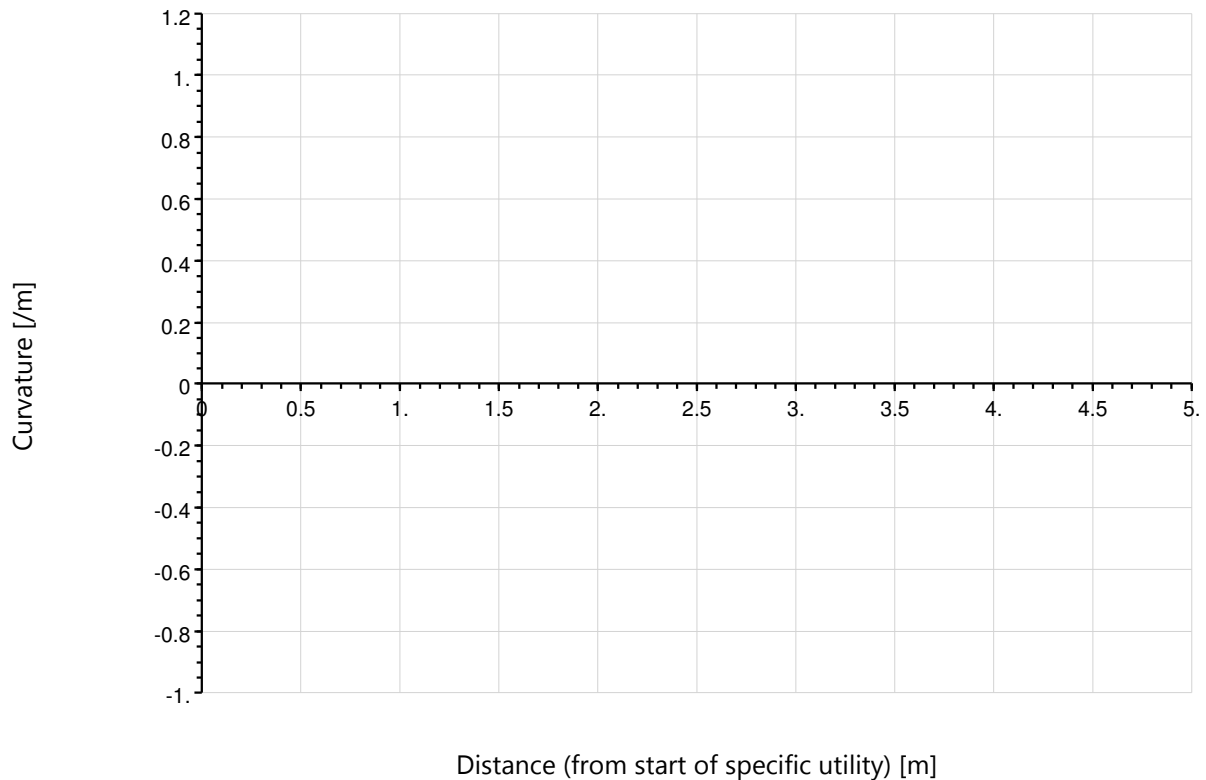
- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 10: Assumed FW400 connection to TW2_1/1

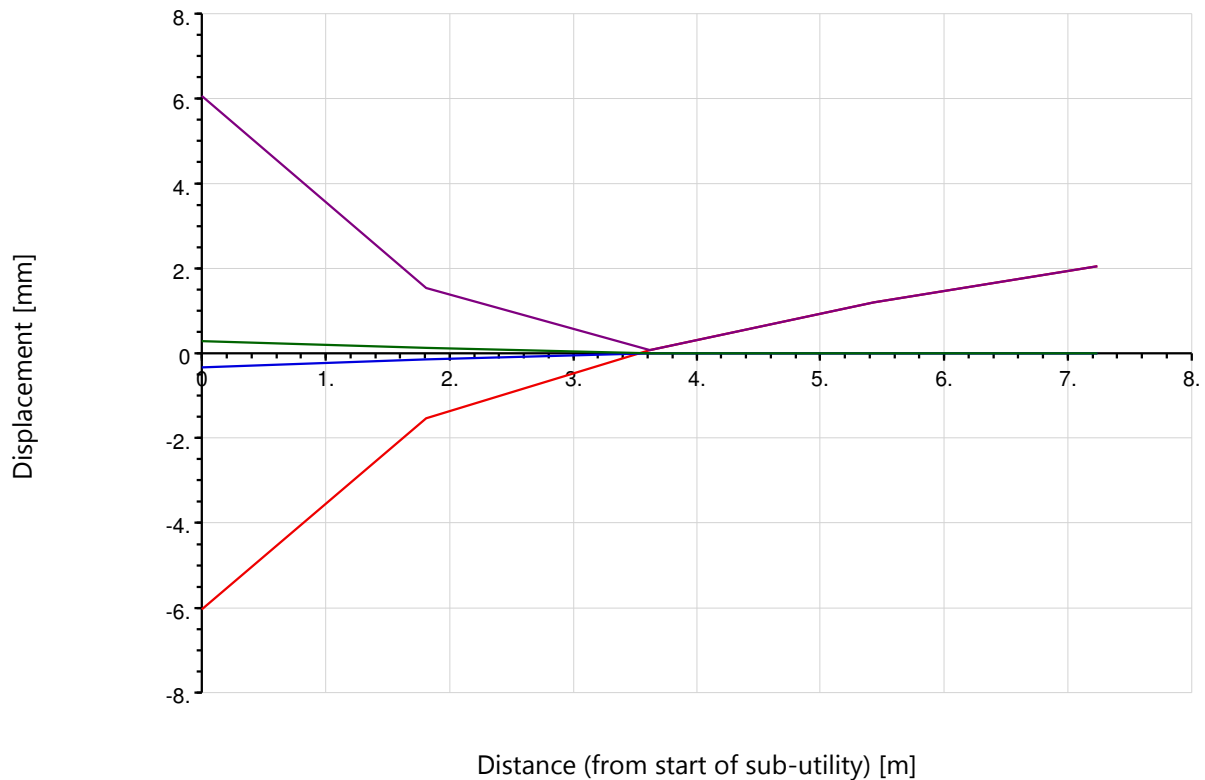
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 10: Assumed FW400 connection to TW2_1/1

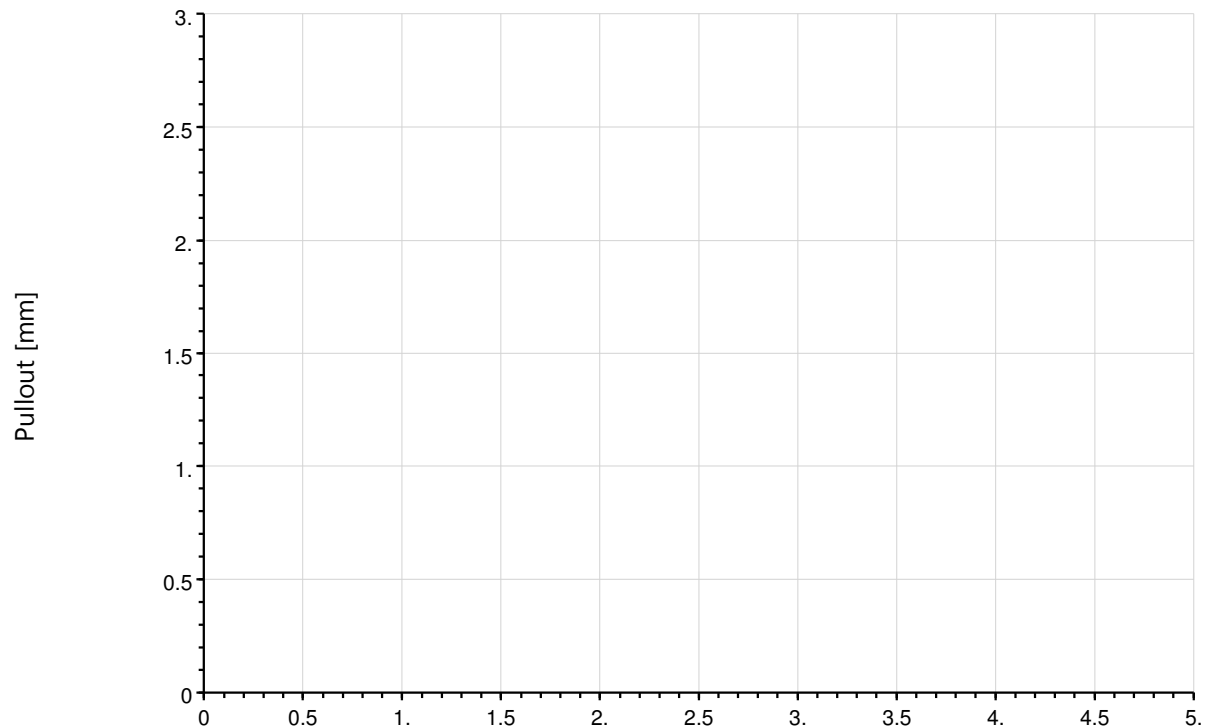
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - Pullout Chart

Stage: Base model, Specific Utility 10: Assumed FW400 connection to TW2_1/1

- - - Axial Pullout (factored)
- - - Flexural Pullout (factored)
- Total Pullout (factored)
- Total Pullout Limit

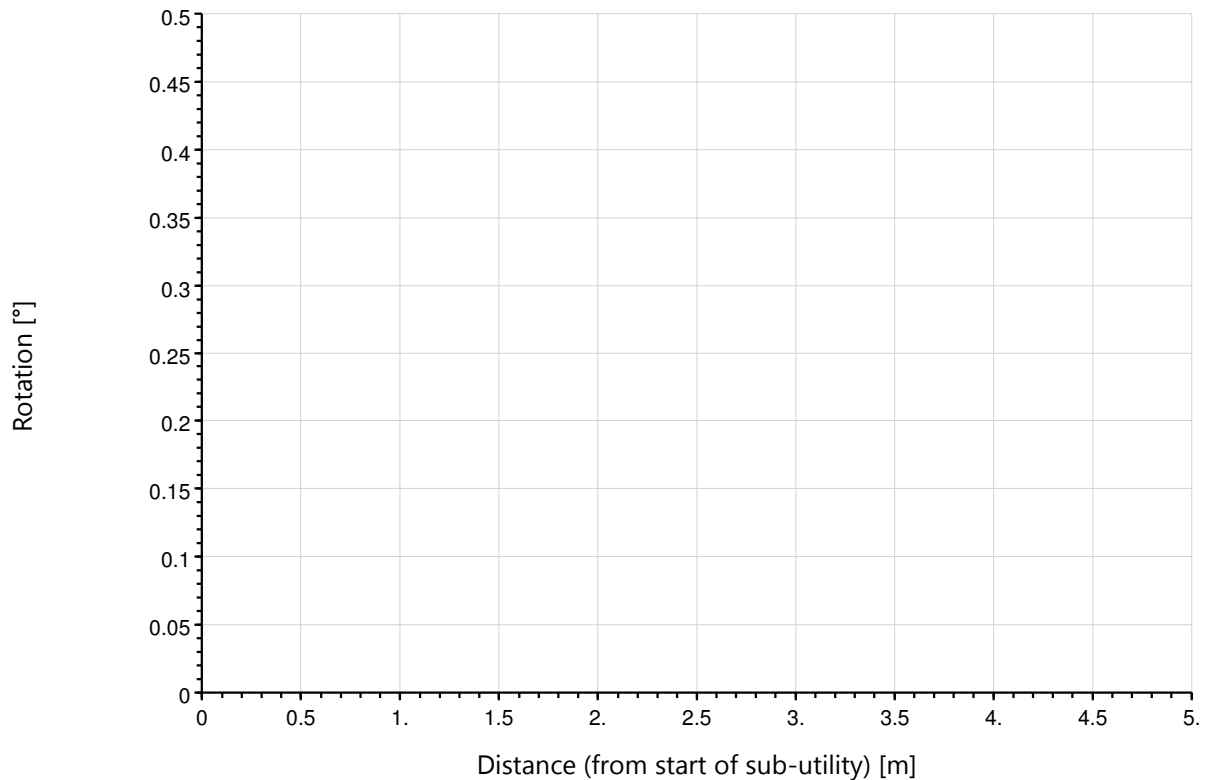


Distance (from start of sub-utility) [m] Note: Total pullout ignores the axial component where this is negative (i.e. comp

Specific Utility - Rotation Chart

Stage: Base model, Specific Utility 10: Assumed FW400 connection to TW2_1/1

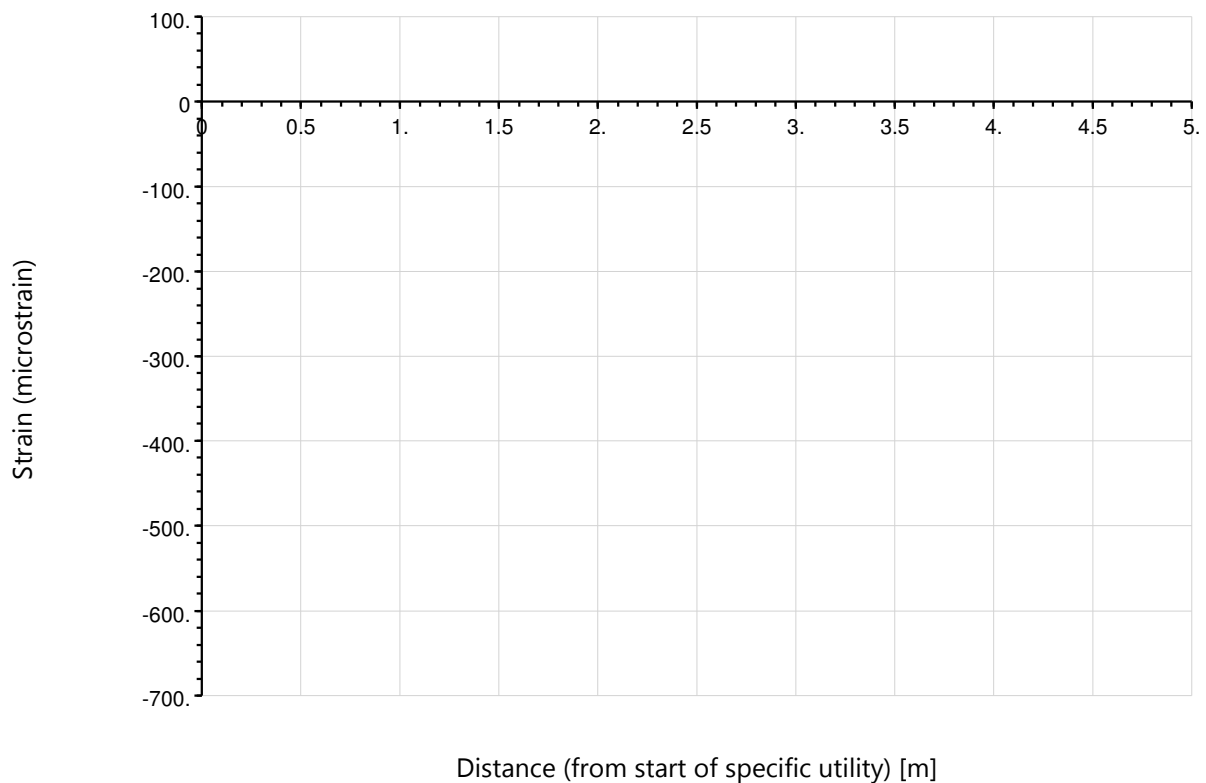
— Rotation (factored)
— Rotation Limit



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 10: Assumed FW400 connection to TW2, 1/1

- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- Combined Compressive Strain (factored)
- Allowable Tensile Strain
- Allowable Compressive Strain



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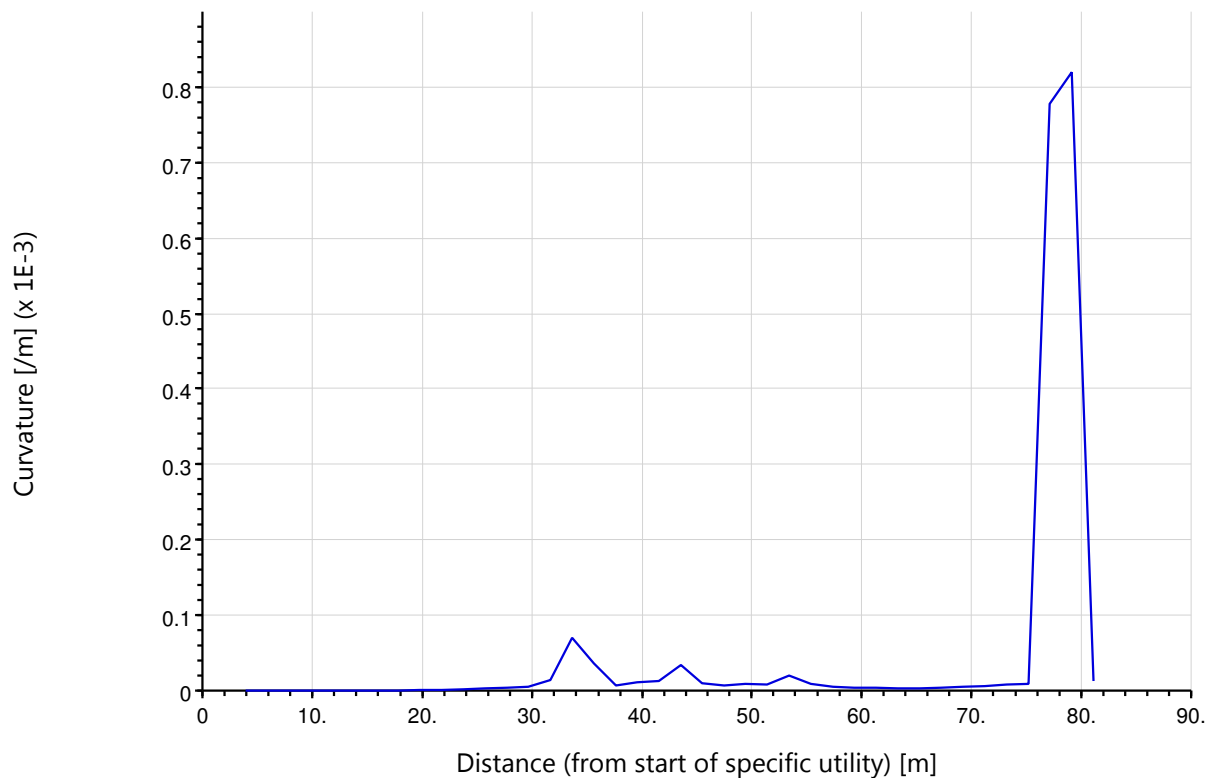
TW Sewer Assessment

(PLt A RES-Sm) + PLt B&C (DEMO+WALL+EXC-Sm)+New Load ST

Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 6: TW Fresh Water (a) - St Pancras/1

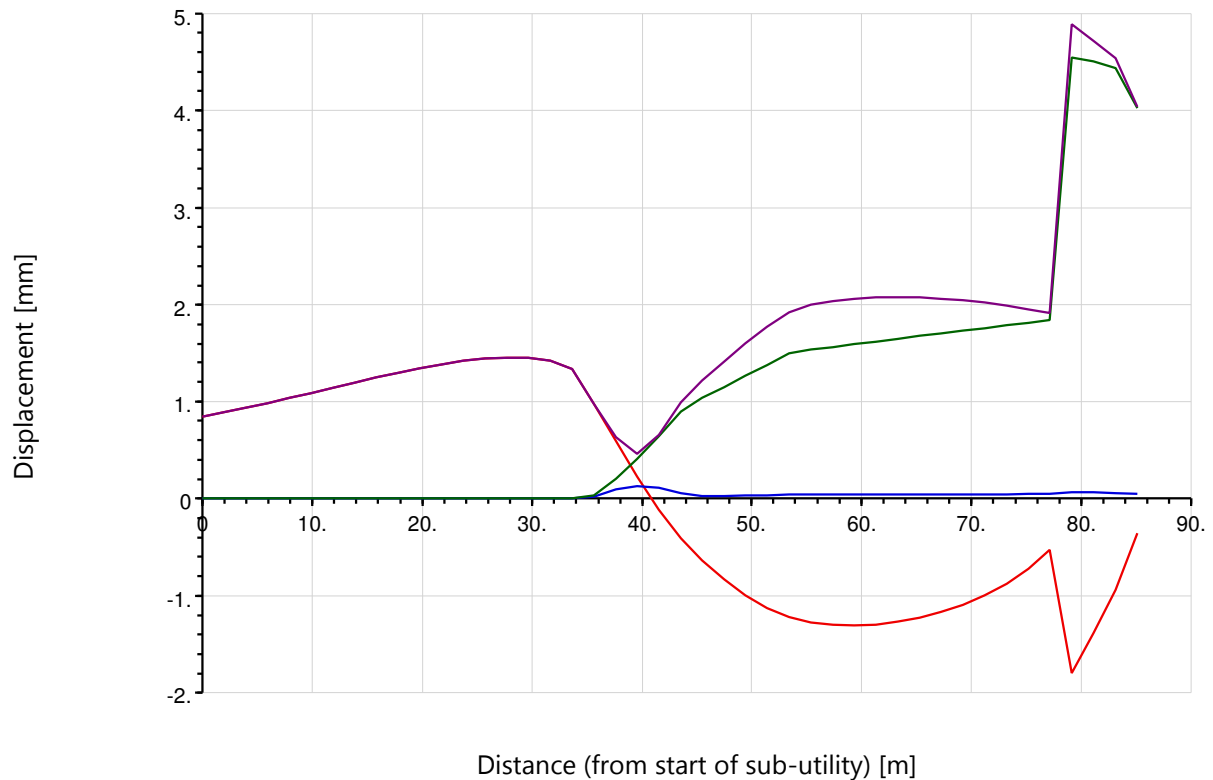
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 6: TW Fresh Water (a) - St Pancras/1

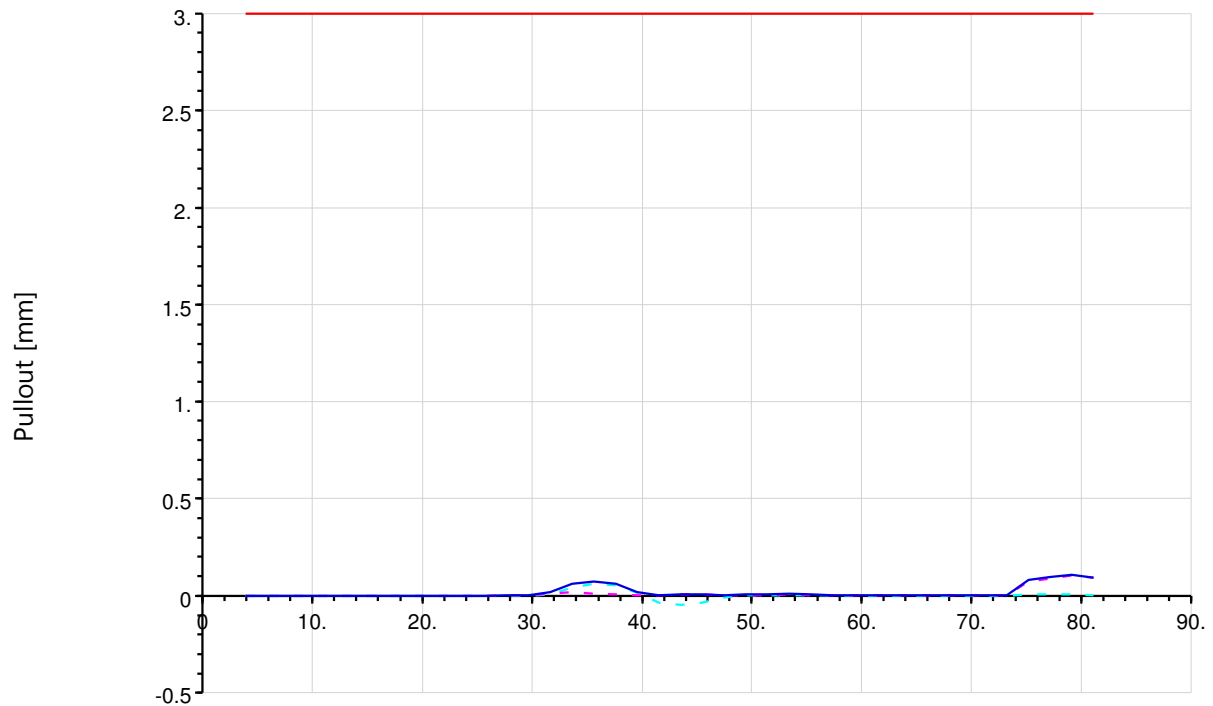
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - Pullout Chart

Stage: Base model, Specific Utility 6: TW Fresh Water (a) - St Pancras/1

- - - Axial Pullout (factored)
- - - Flexural Pullout (factored)
- Total Pullout (factored)
- Total Pullout Limit



Distance (from start of sub-utility) [m] Note: Total pullout ignores the axial component where this is negative (i.e. comp

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TW Sewer Assessment

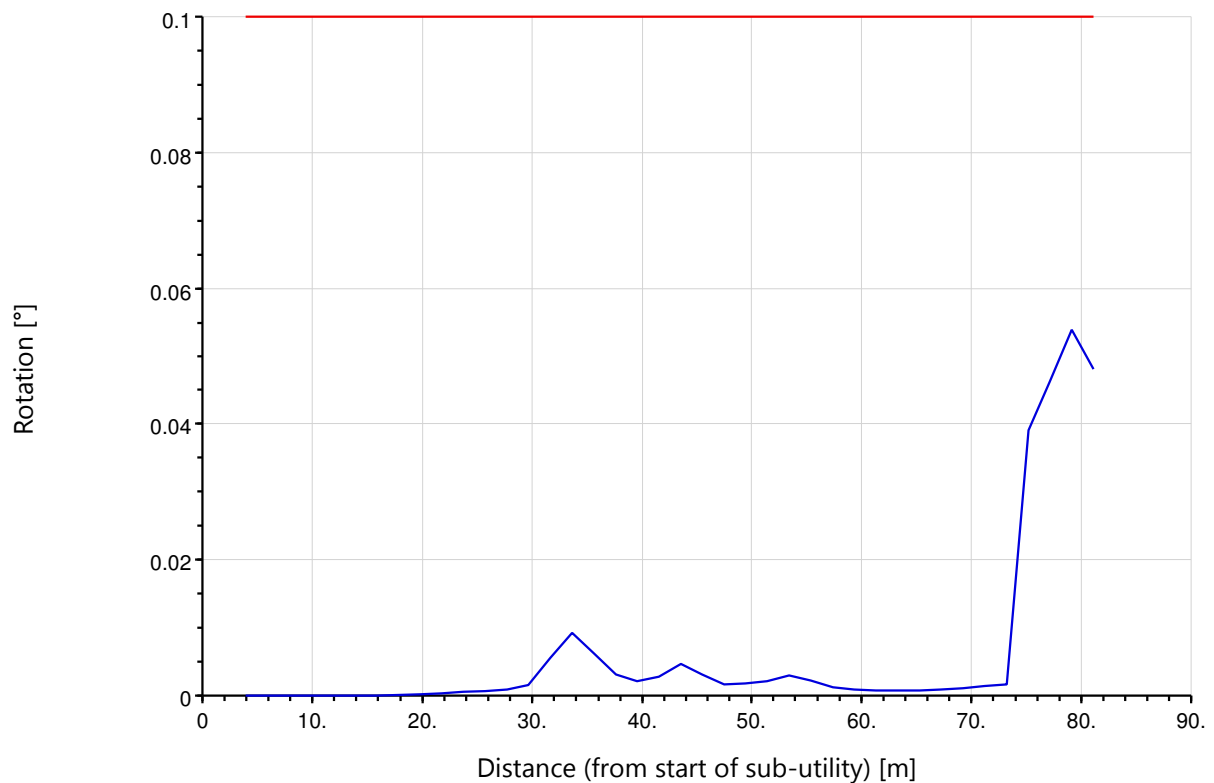
(PLt A RES-Sm) + PLt B&C (DEMO+WALL+EXC-Sm)+New Load ST

Specific Utility - Rotation Chart

Stage: Base model, Specific Utility 6: TW Fresh Water (a) - St Pancras/1

— Rotation (factored)

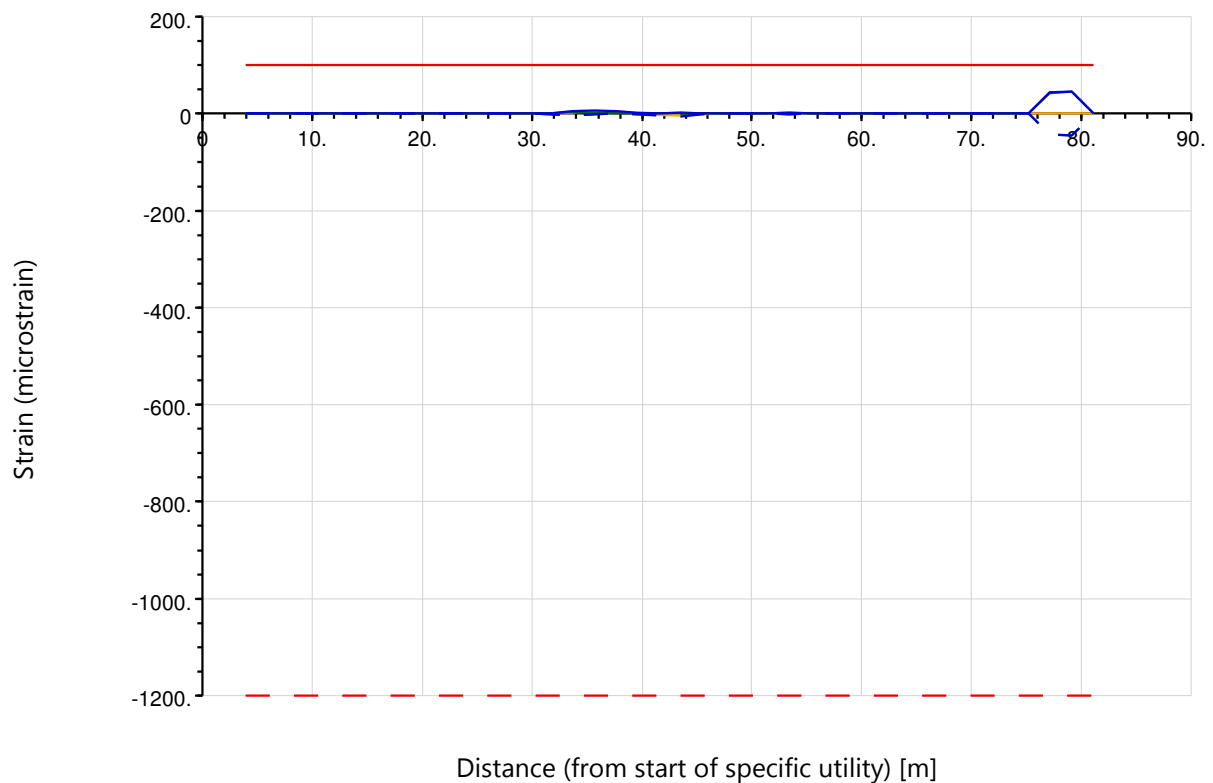
— Rotation Limit



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 6: TW Fresh Water (a) - St Pancras/1

- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- Combined Compressive Strain (factored)
- Allowable Tensile Strain
- Allowable Compressive Strain



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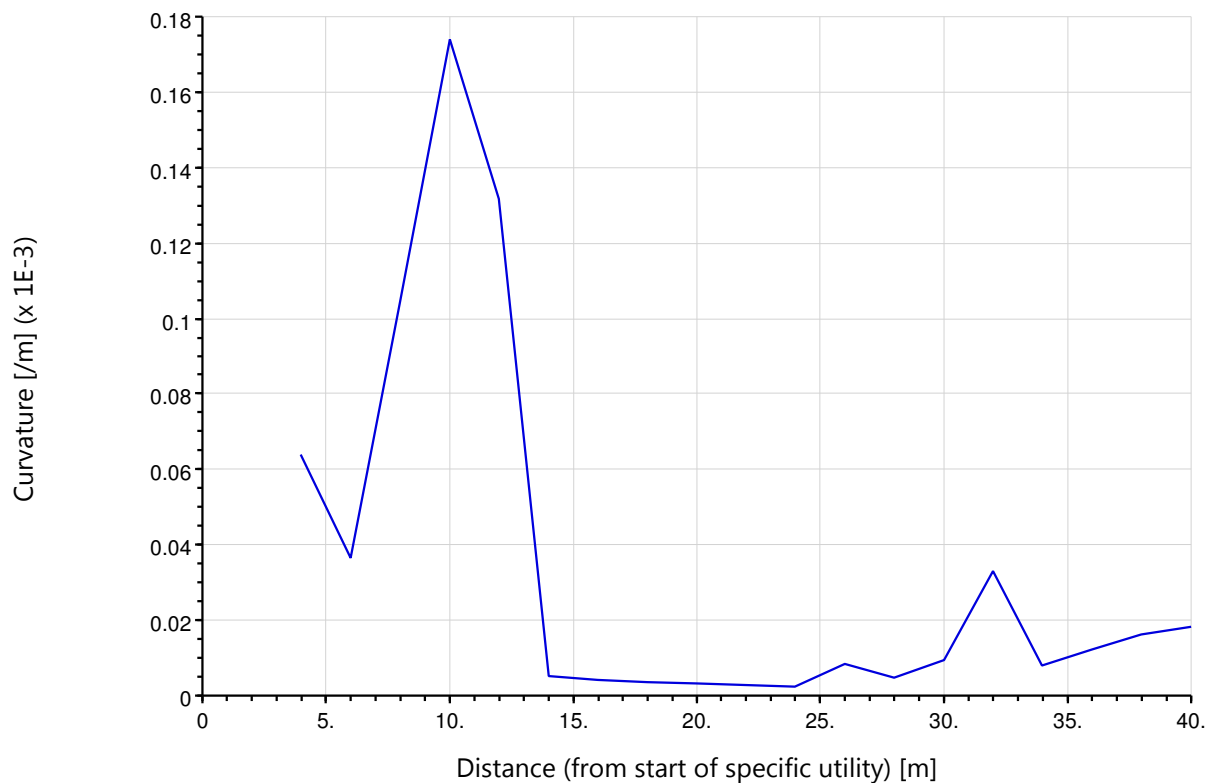
TW Sewer Assessment

(PLt A RES-Sm) + PLt B&C (DEMO+WALL+EXC-Sm)+New Load ST

Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 7: TW Fresh Water (b) - St Pancras/1

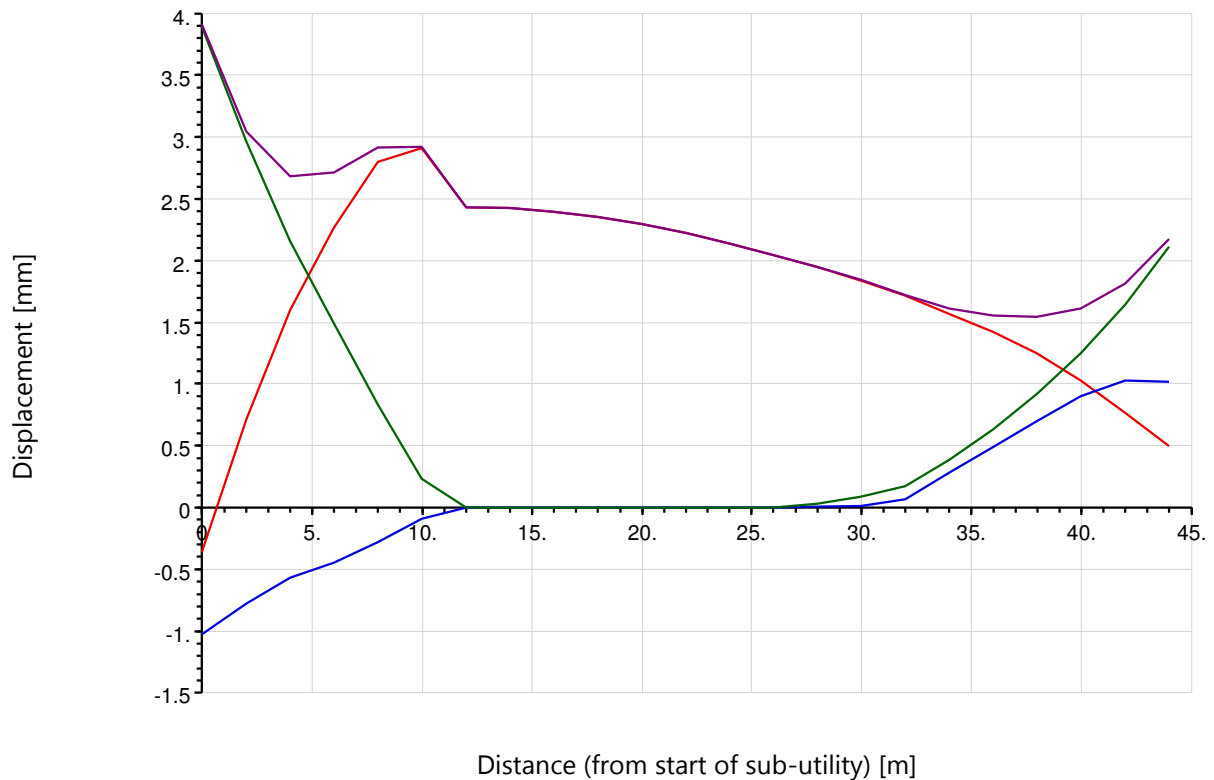
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 7: TW Fresh Water (b) - St Pancras/1

- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



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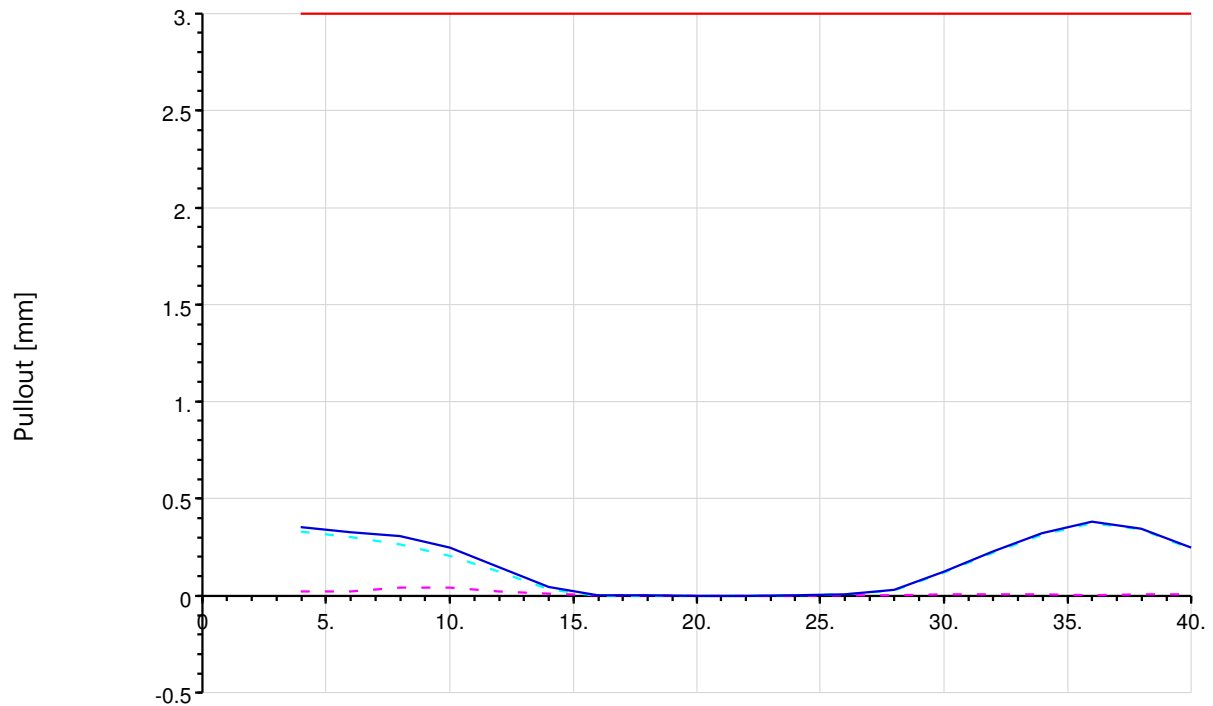
TW Sewer Assessment

(PLt A RES-Sm) + PLt B&C (DEMO+WALL+EXC-Sm)+New Load ST

Specific Utility - Pullout Chart

Stage: Base model, Specific Utility 7: TW Fresh Water (b) - St Pancras/1

- - - Axial Pullout (factored)
- - - Flexural Pullout (factored)
- Total Pullout (factored)
- Total Pullout Limit



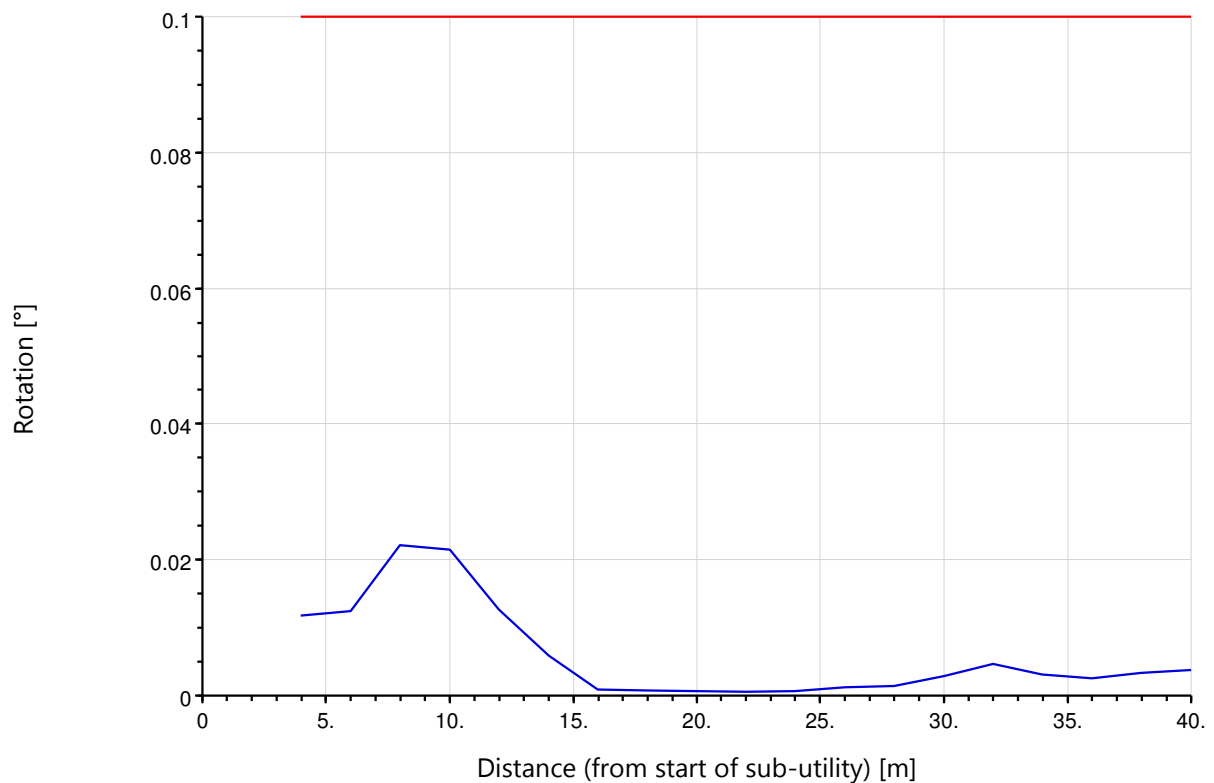
Distance (from start of sub-utility) [m] Note: Total pullout ignores the axial component where this is negative (i.e. comp

Specific Utility - Rotation Chart

Stage: Base model, Specific Utility 7: TW Fresh Water (b) - St Pancras/1

— Rotation (factored)

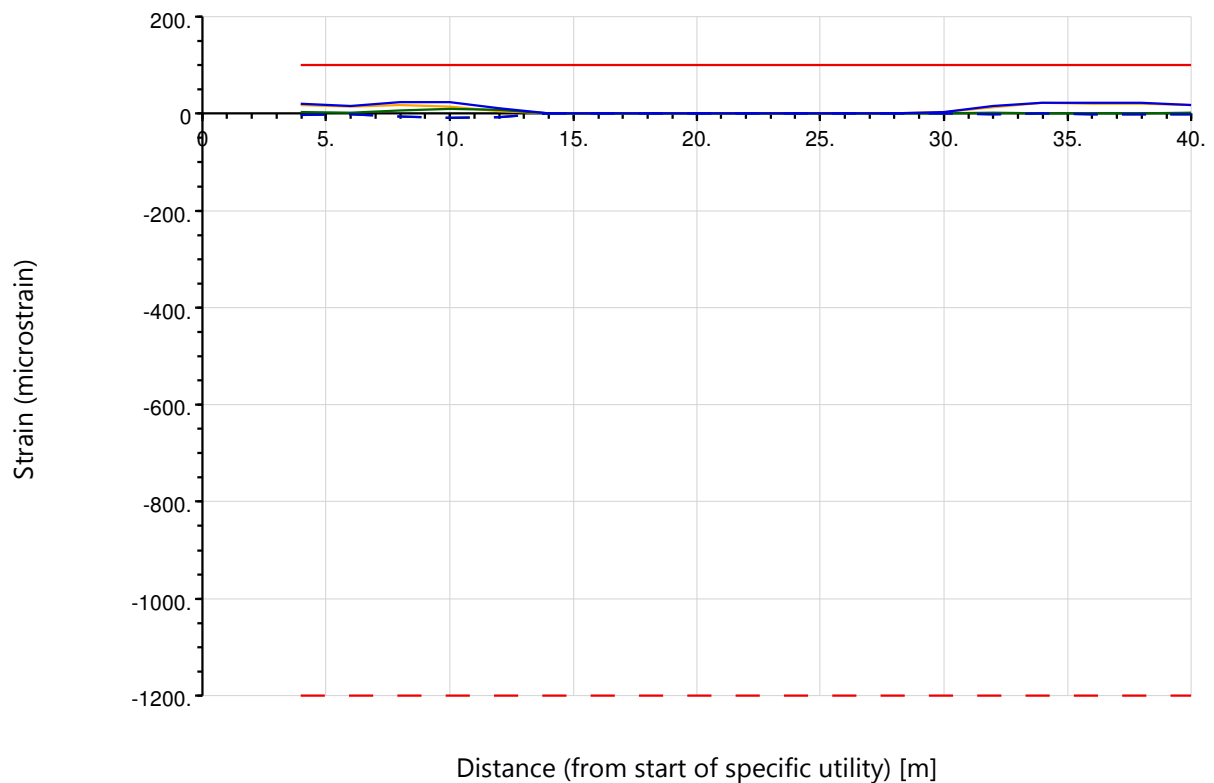
— Rotation Limit



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 7: TW Fresh Water (b) - St Pancras/1

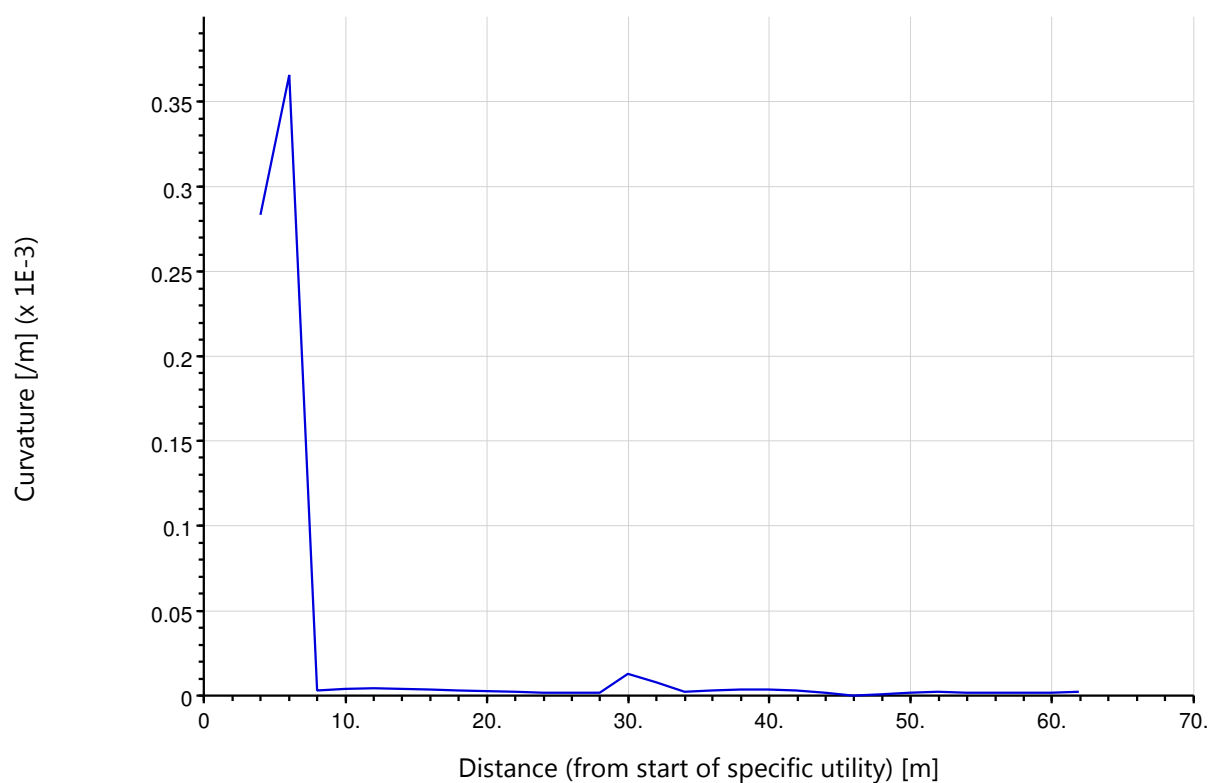
- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 8: TW Fresh Water (c) - St Pancras/1

— Curvature

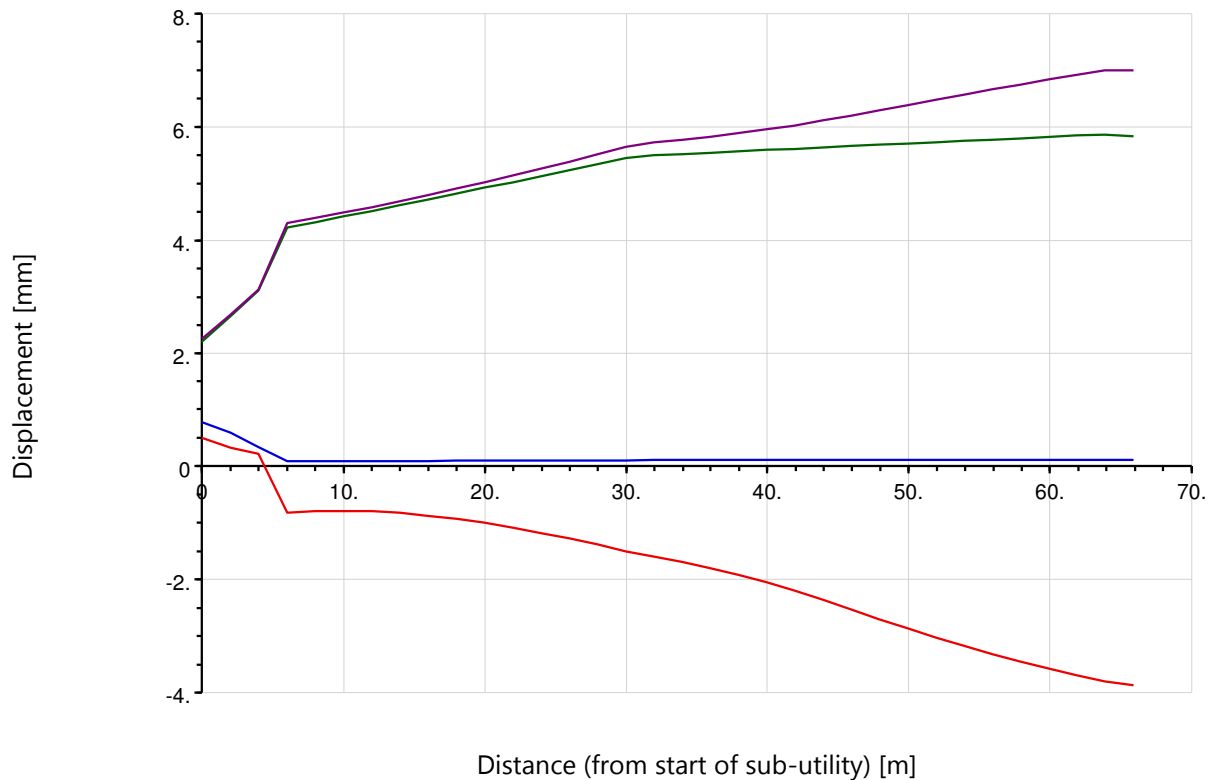


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Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 8: TW Fresh Water (c) - St Pancras/1

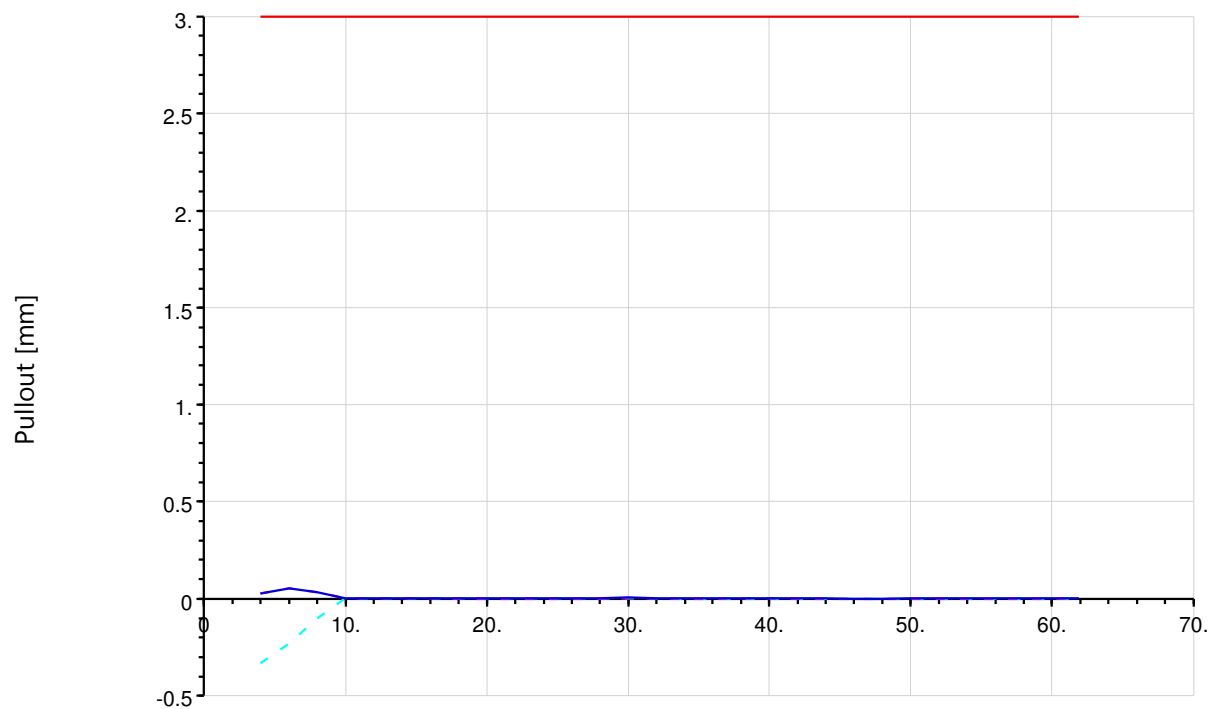
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - Pullout Chart

Stage: Base model, Specific Utility 8: TW Fresh Water (c) - St Pancras/1

- - - Axial Pullout (factored)
- - - Flexural Pullout (factored)
- Total Pullout (factored)
- Total Pullout Limit



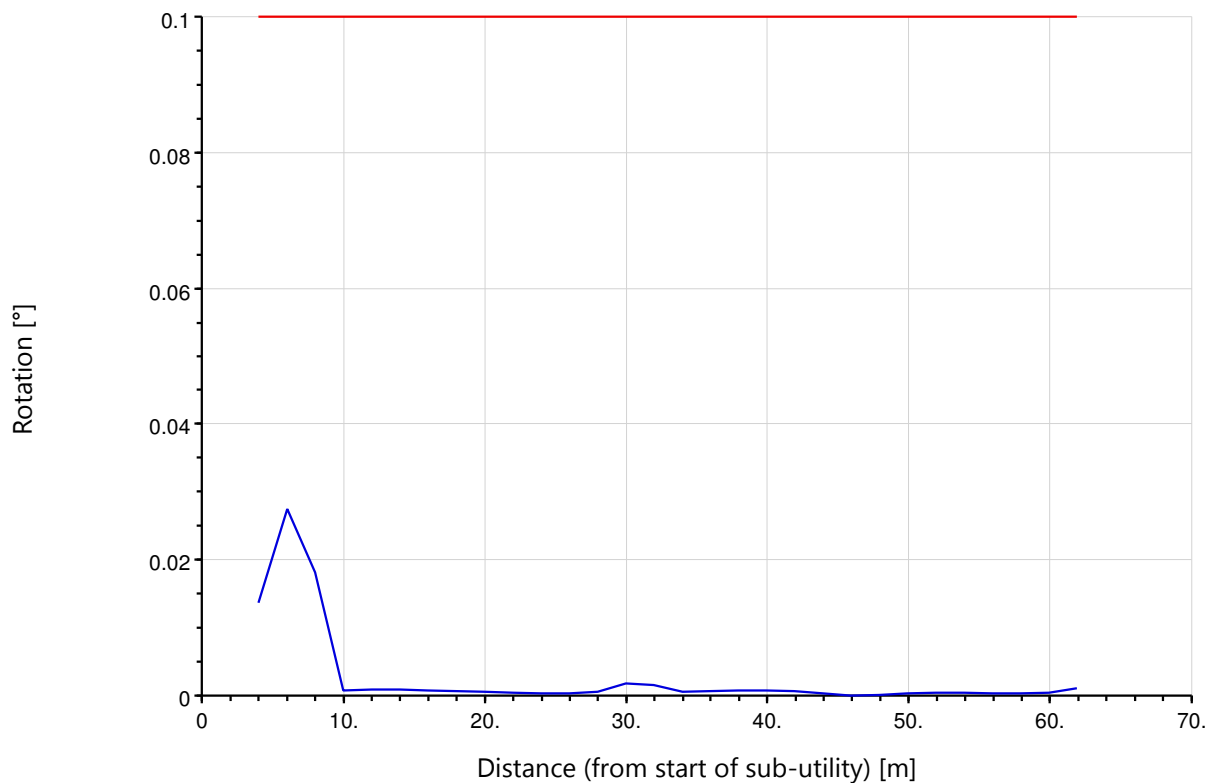
Distance (from start of sub-utility) [m] Note: Total pullout ignores the axial component where this is negative (i.e. comp

Specific Utility - Rotation Chart

Stage: Base model, Specific Utility 8: TW Fresh Water (c) - St Pancras/1

— Rotation (factored)

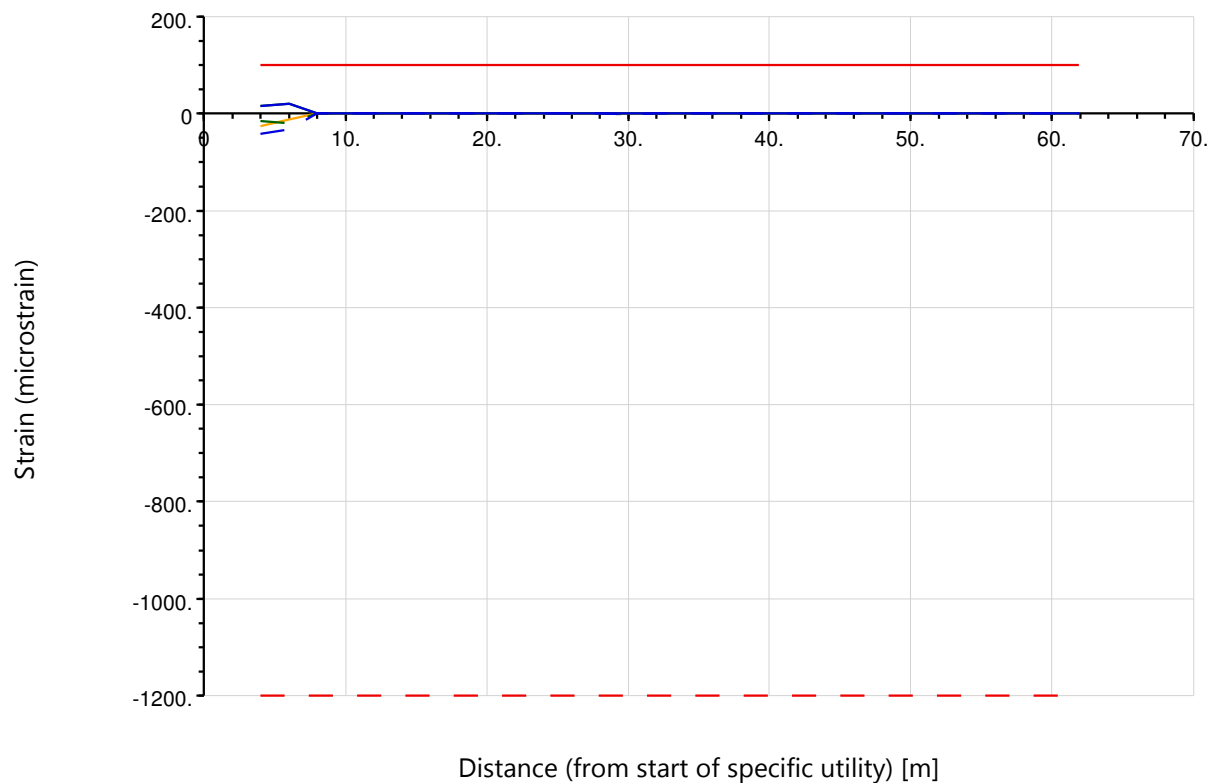
— Rotation Limit



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 8: TW Fresh Water (c) - St Pancras/1

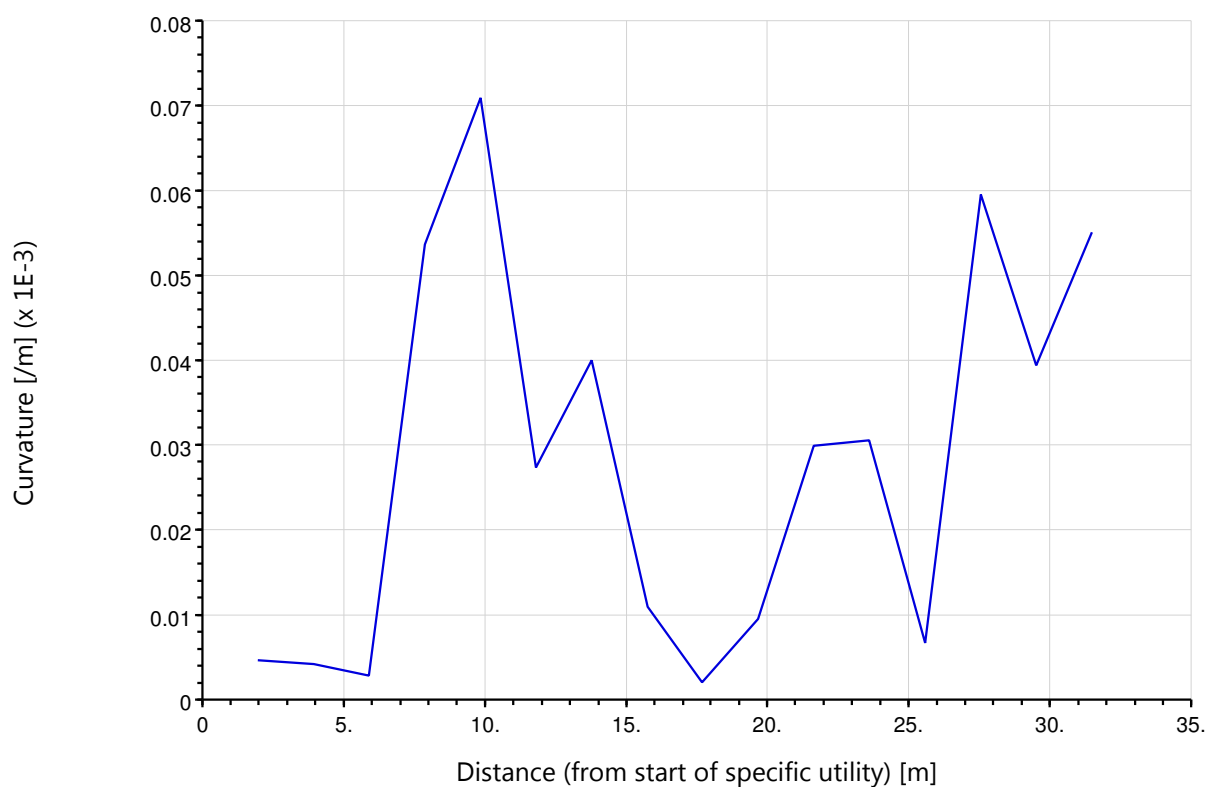
- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 9: TW Fresh Water (d) - St Pancras/1

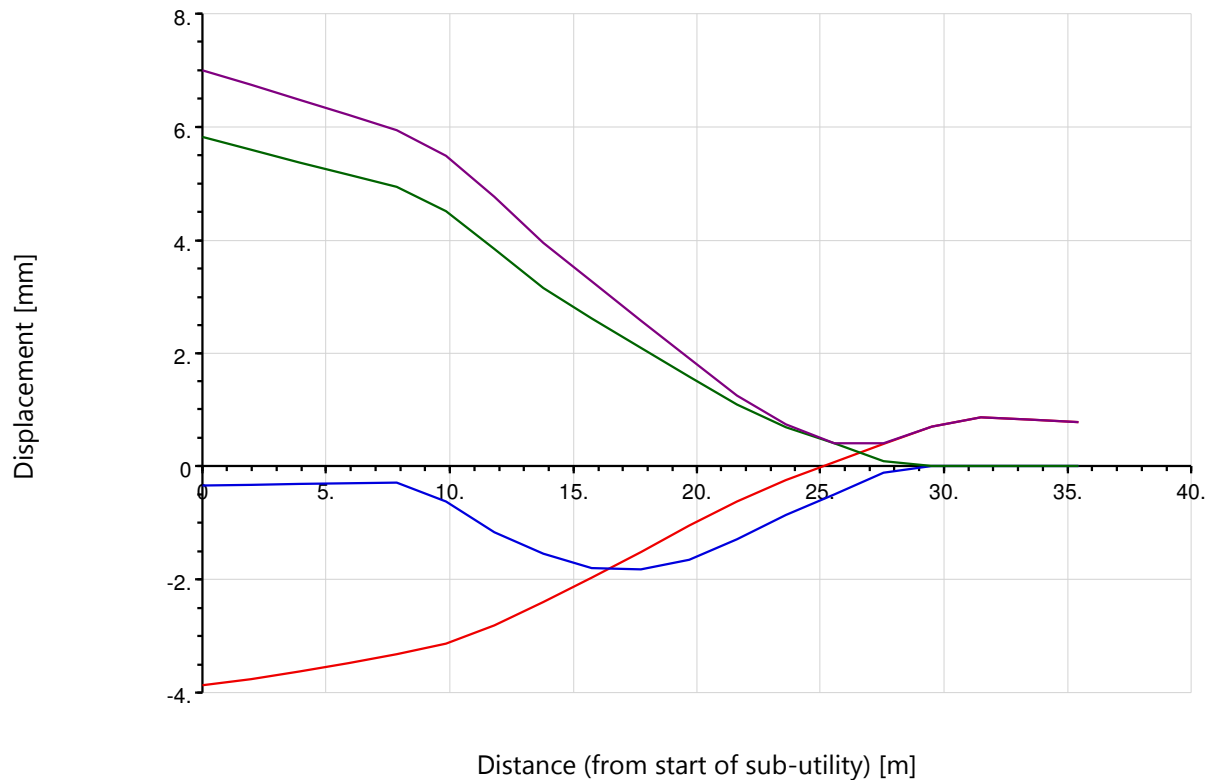
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 9: TW Fresh Water (d) - St Pancras/1

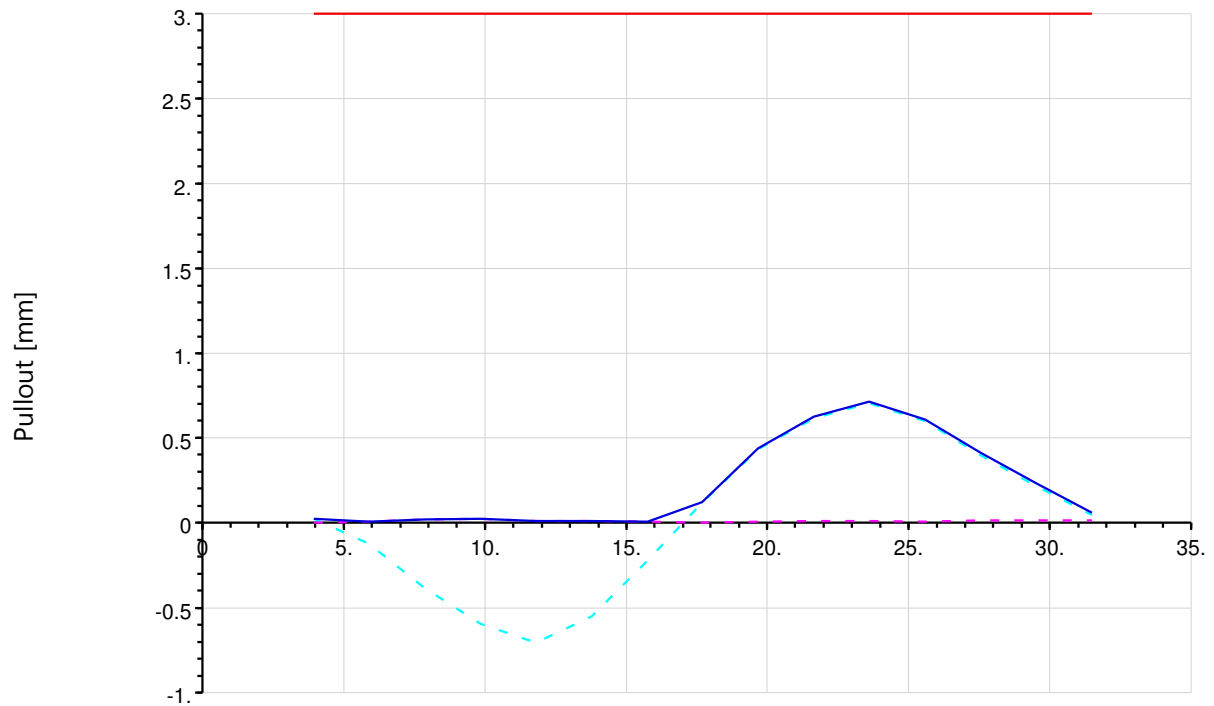
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - Pullout Chart

Stage: Base model, Specific Utility 9: TW Fresh Water (d) - St Pancras/1

- - - Axial Pullout (factored)
- - - Flexural Pullout (factored)
- Total Pullout (factored)
- Total Pullout Limit



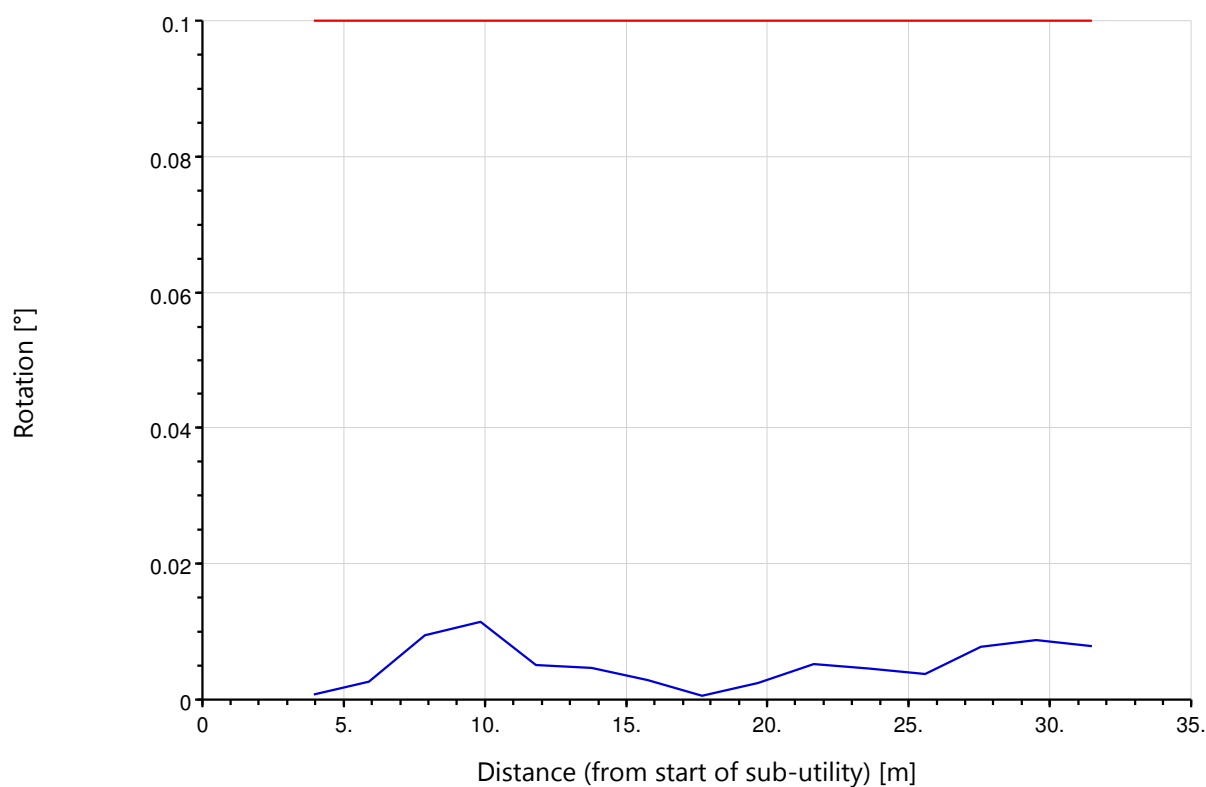
Distance (from start of sub-utility) [m] Note: Total pullout ignores the axial component where this is negative (i.e. comp

Specific Utility - Rotation Chart

Stage: Base model, Specific Utility 9: TW Fresh Water (d) - St Pancras/1

— Rotation (factored)

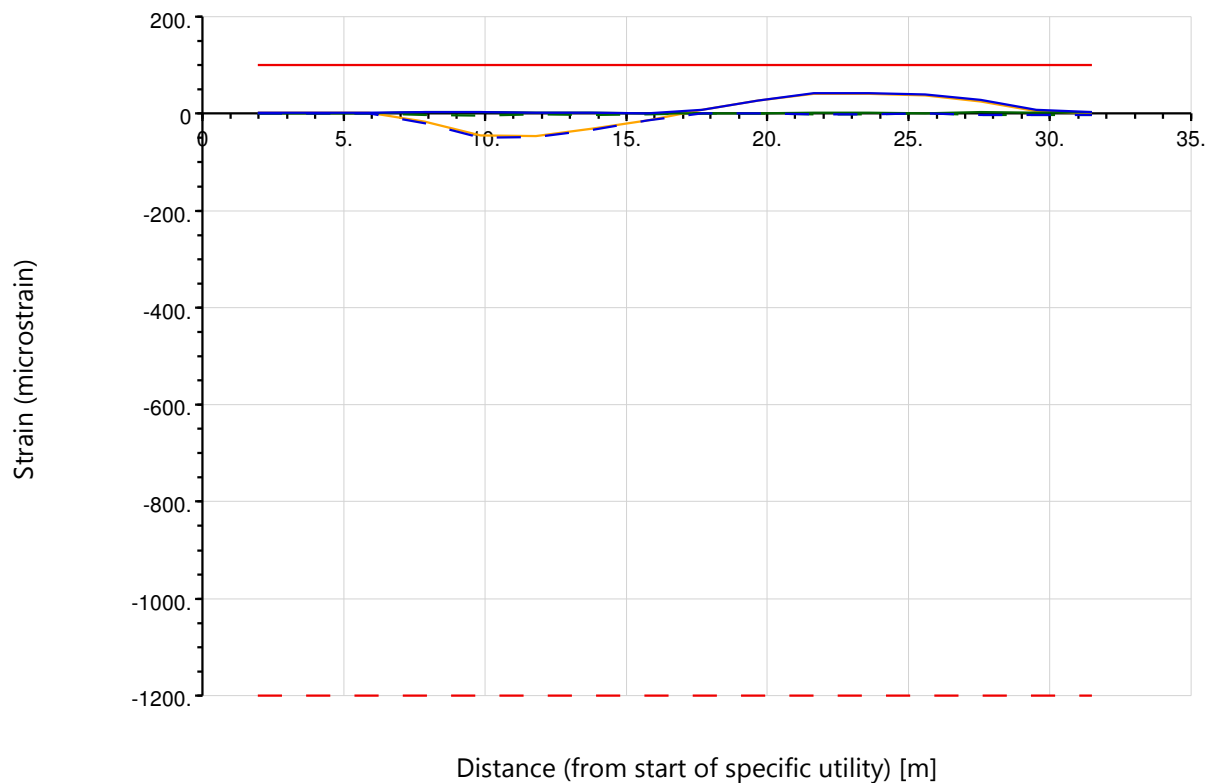
— Rotation Limit



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 9: TW Fresh Water (d) - St Pancras/1

- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



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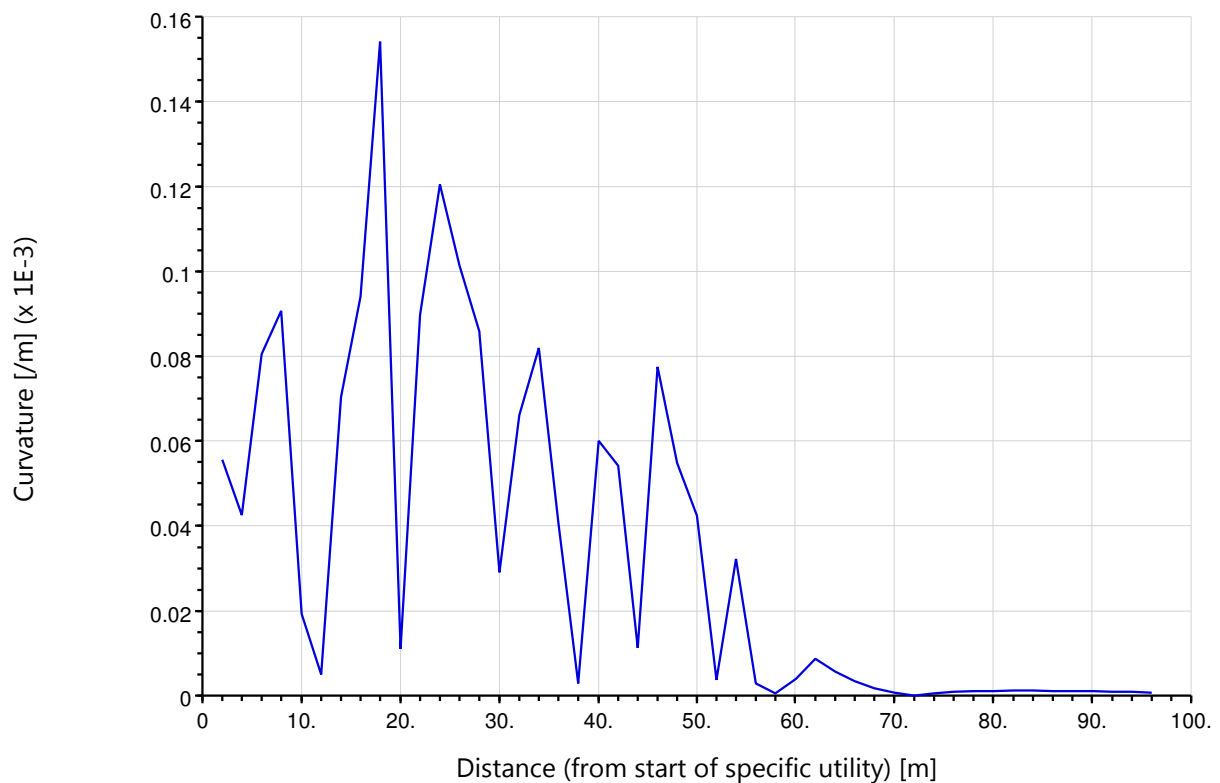
TW Sewer Assessment

(PLt A RES-Sm) + PLt B&C (DEMO+WALL+EXC-Sm)+New Load ST

Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 1: TWS(1)_1/1

— Curvature

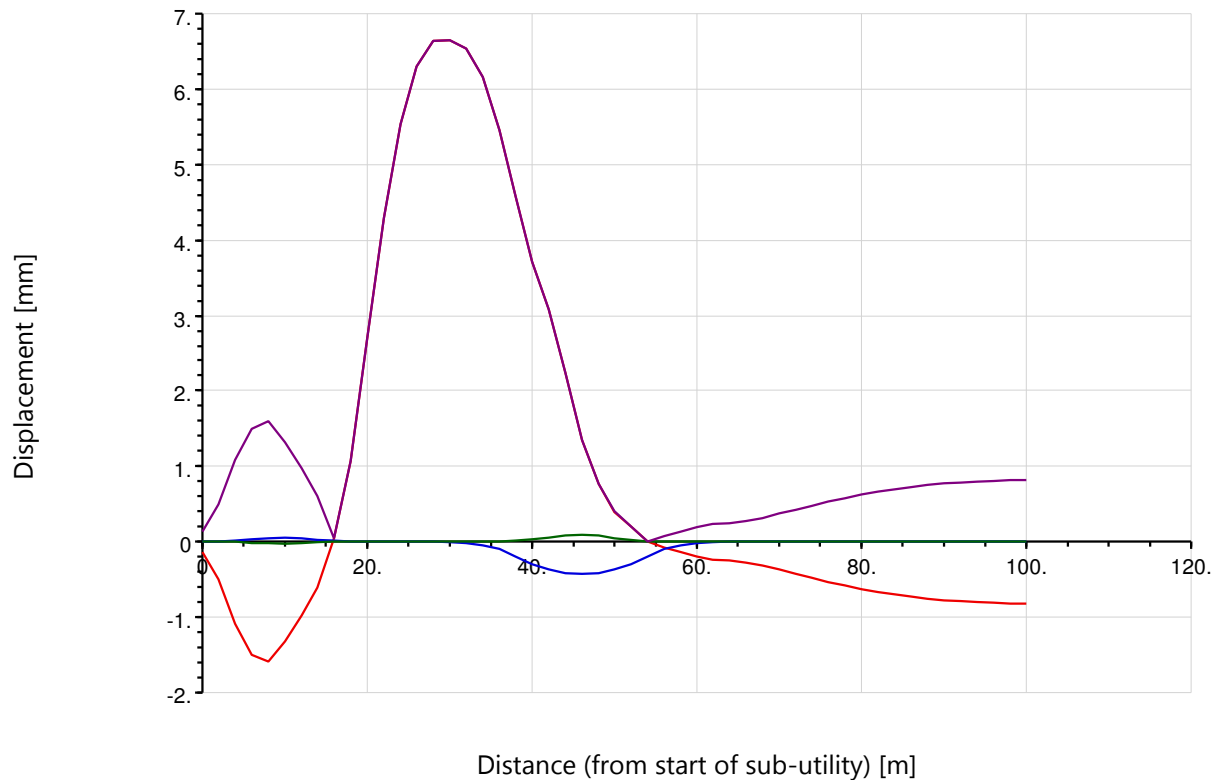


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Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 1: TWS(1)_1/1

- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



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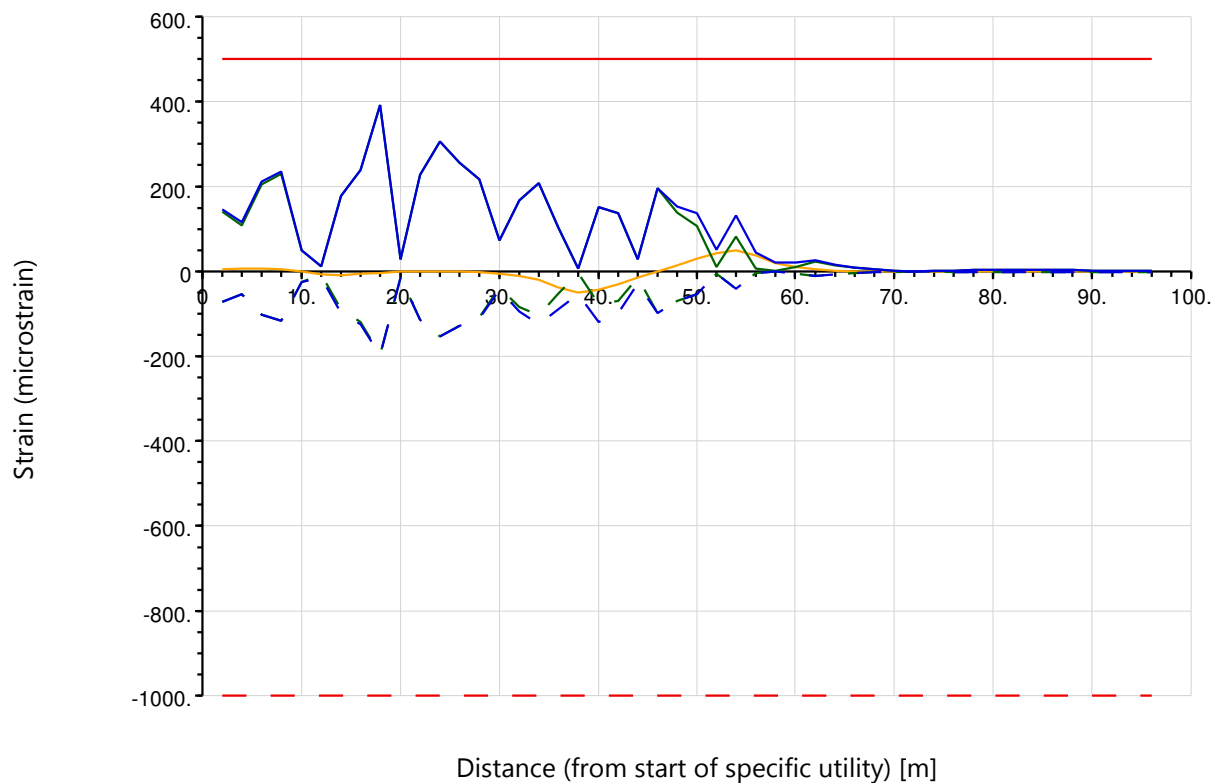
TW Sewer Assessment

(PLt A RES-Sm) + PLt B&C (DEMO+WALL+EXC-Sm)+New Load ST

Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 1: TWS(1)_1/1

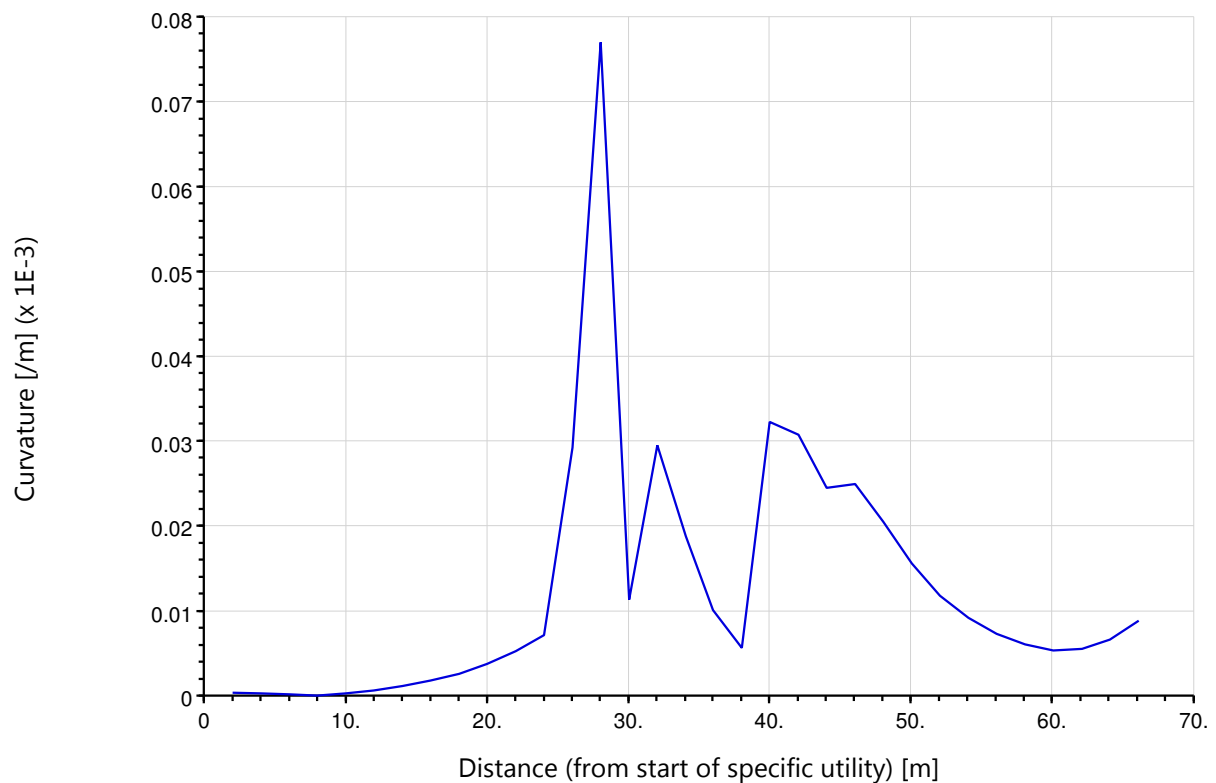
- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 2: TWS(2)_1/1

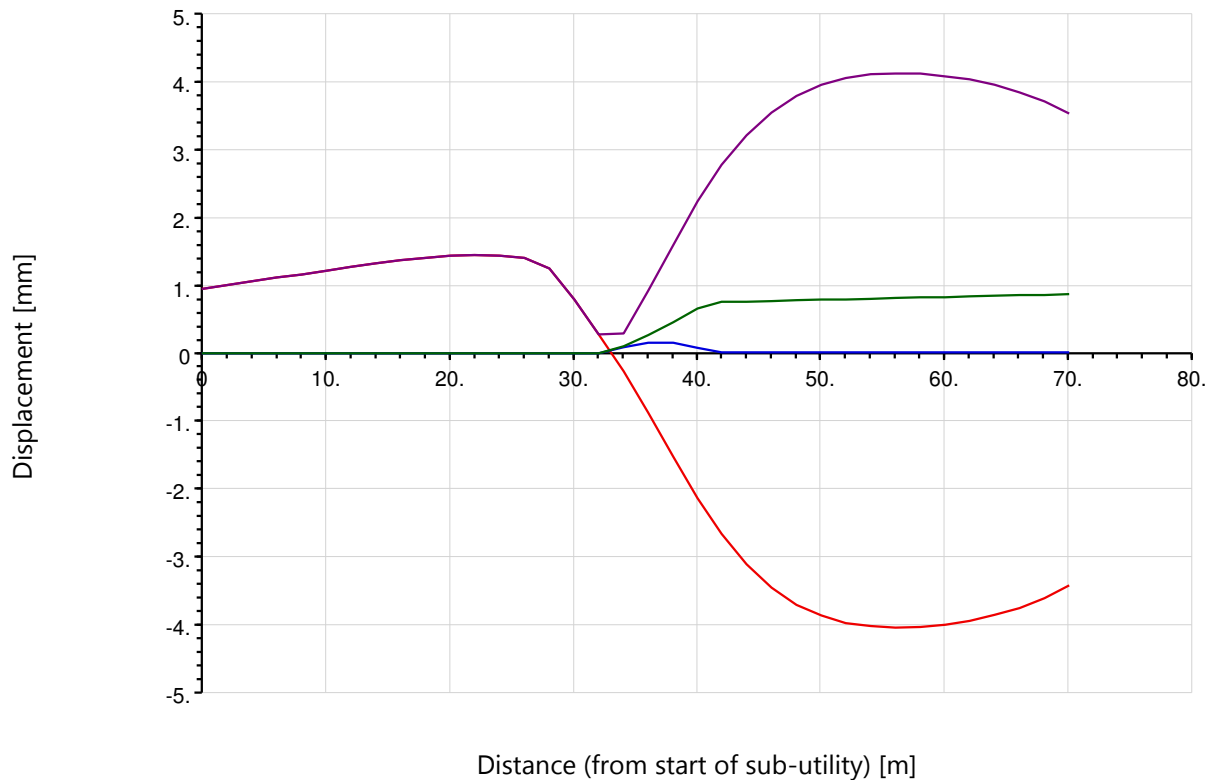
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 2: TWS(2)_1/1

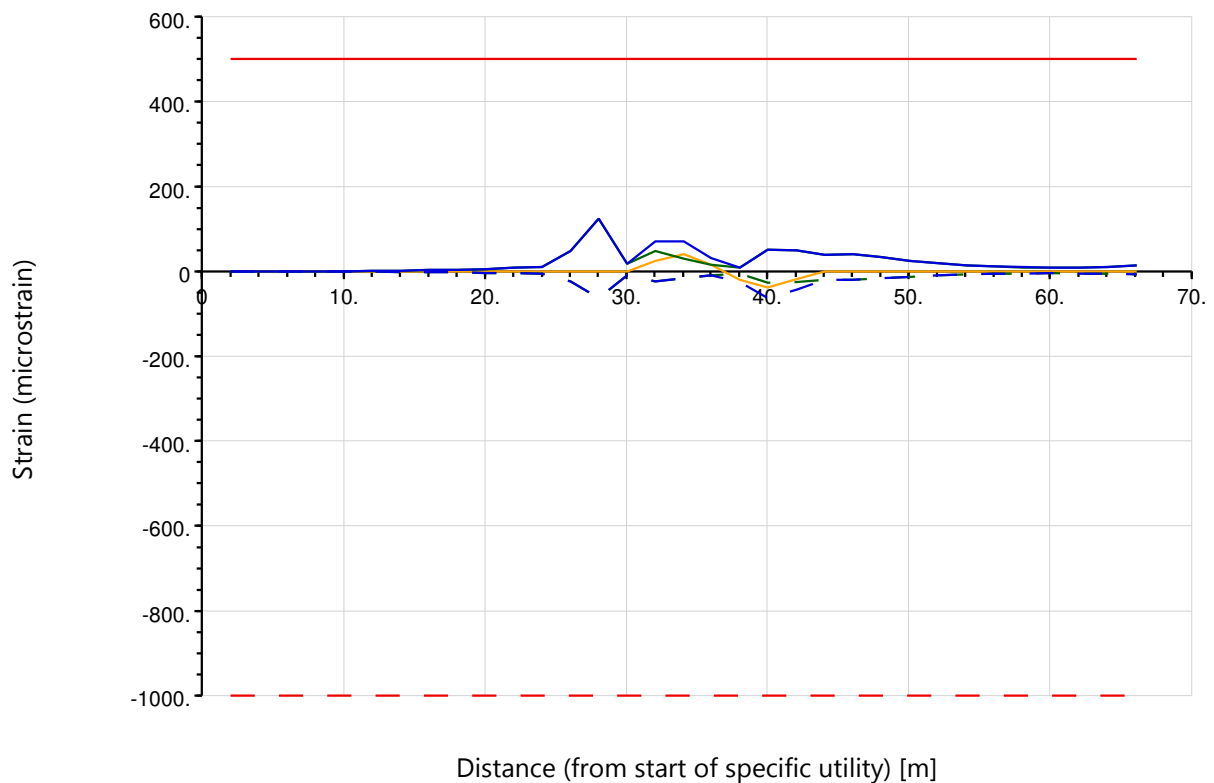
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 2: TWS(2)_1/1

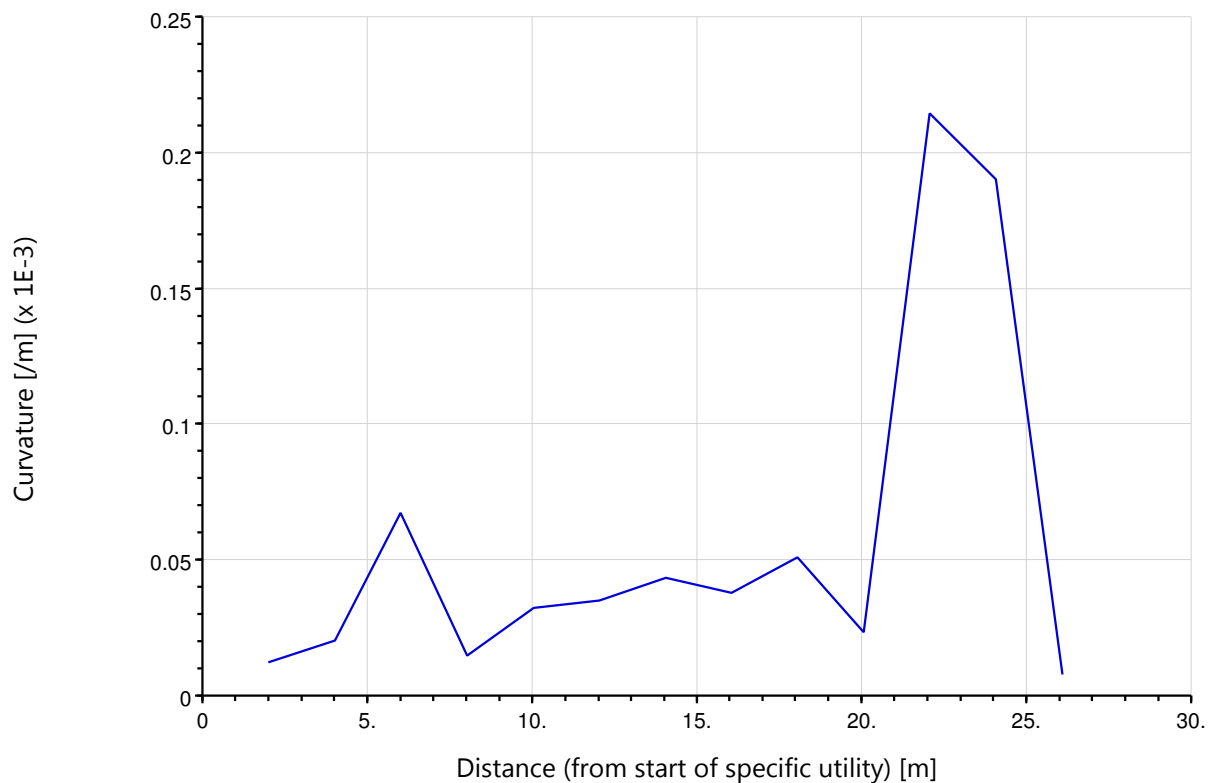
- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 3: TWS(2)_2/1

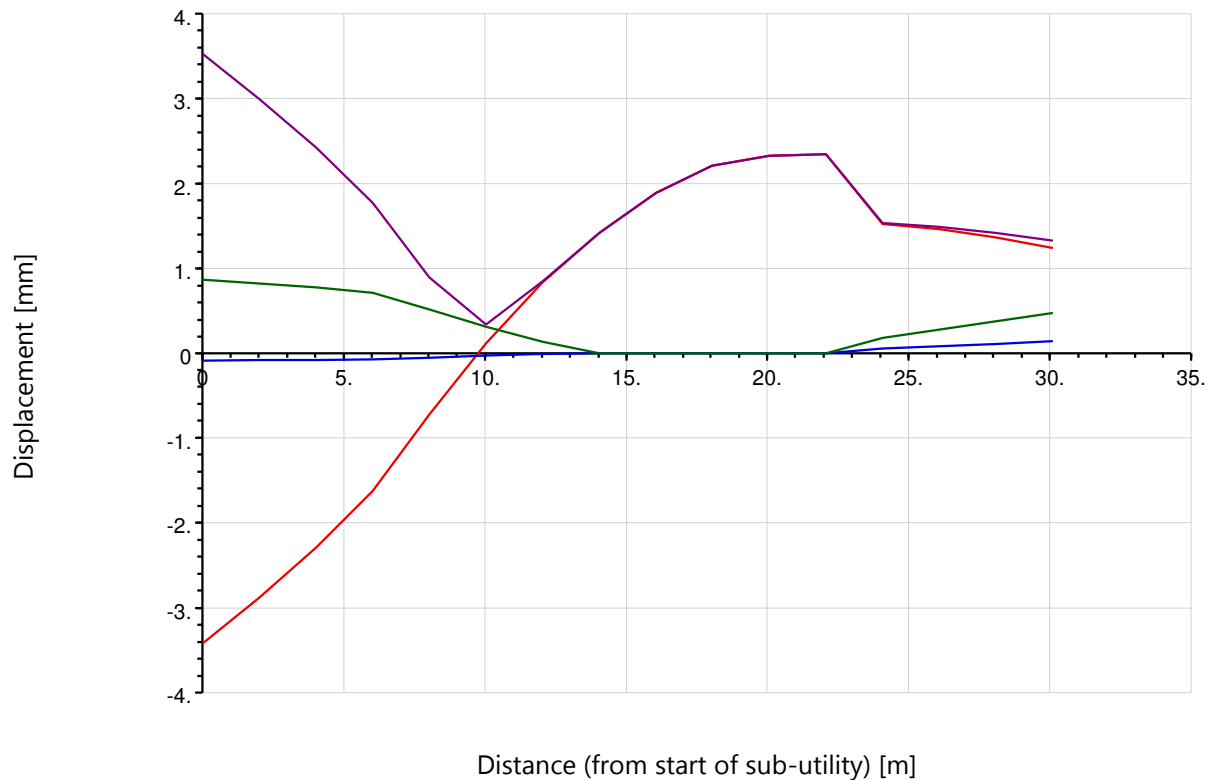
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 3: TWS(2)_2/1

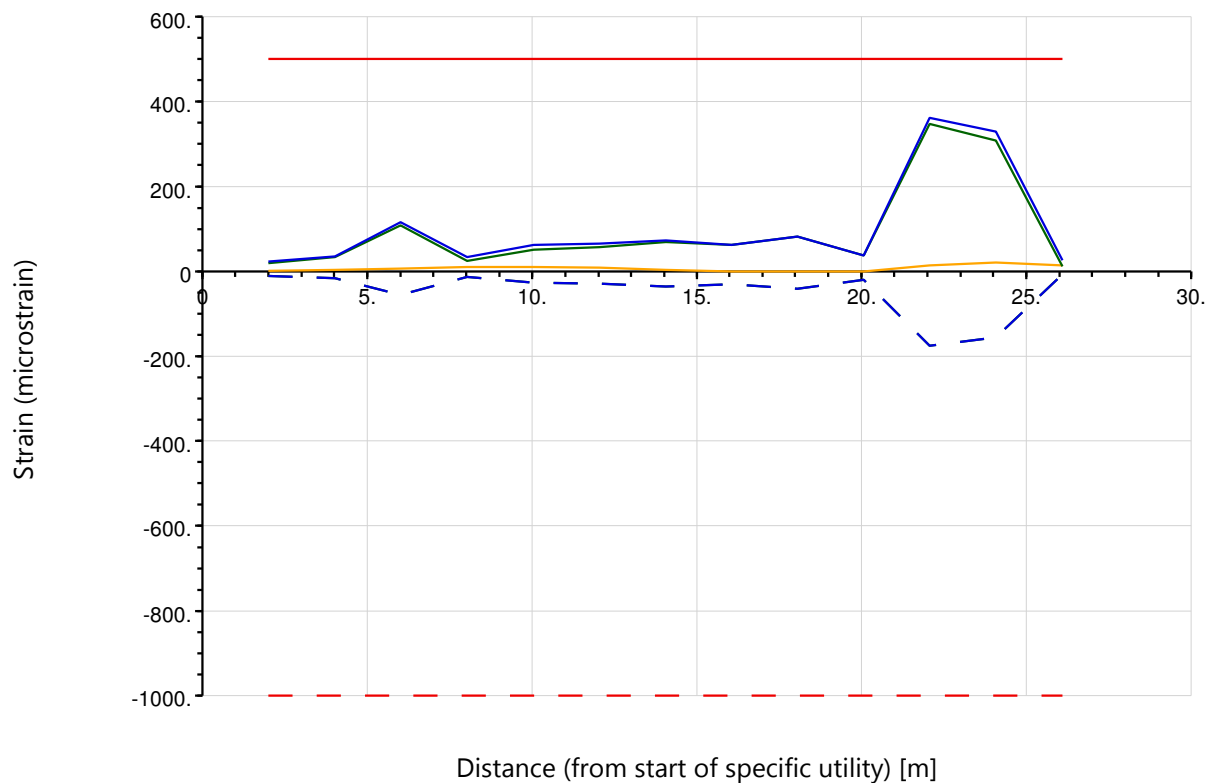
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 3: TWS(2)_2/1

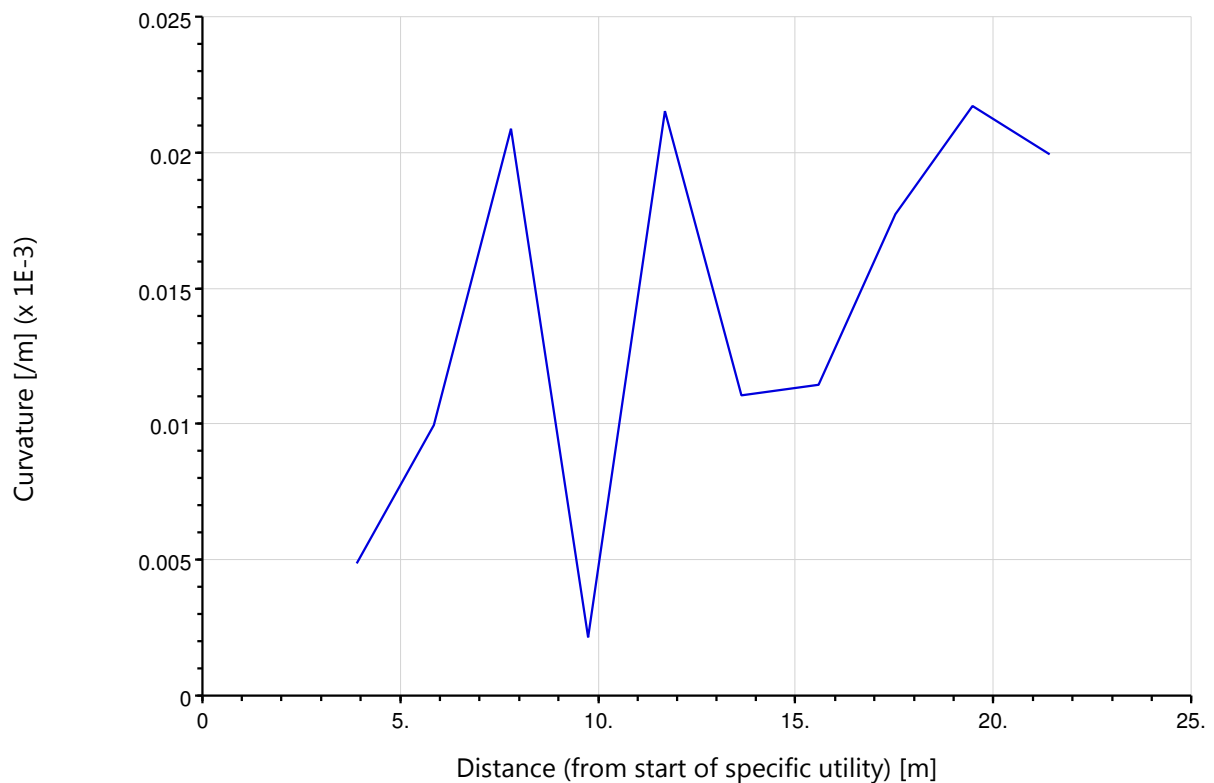
- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 4: TWS(2)_3/1

— Curvature



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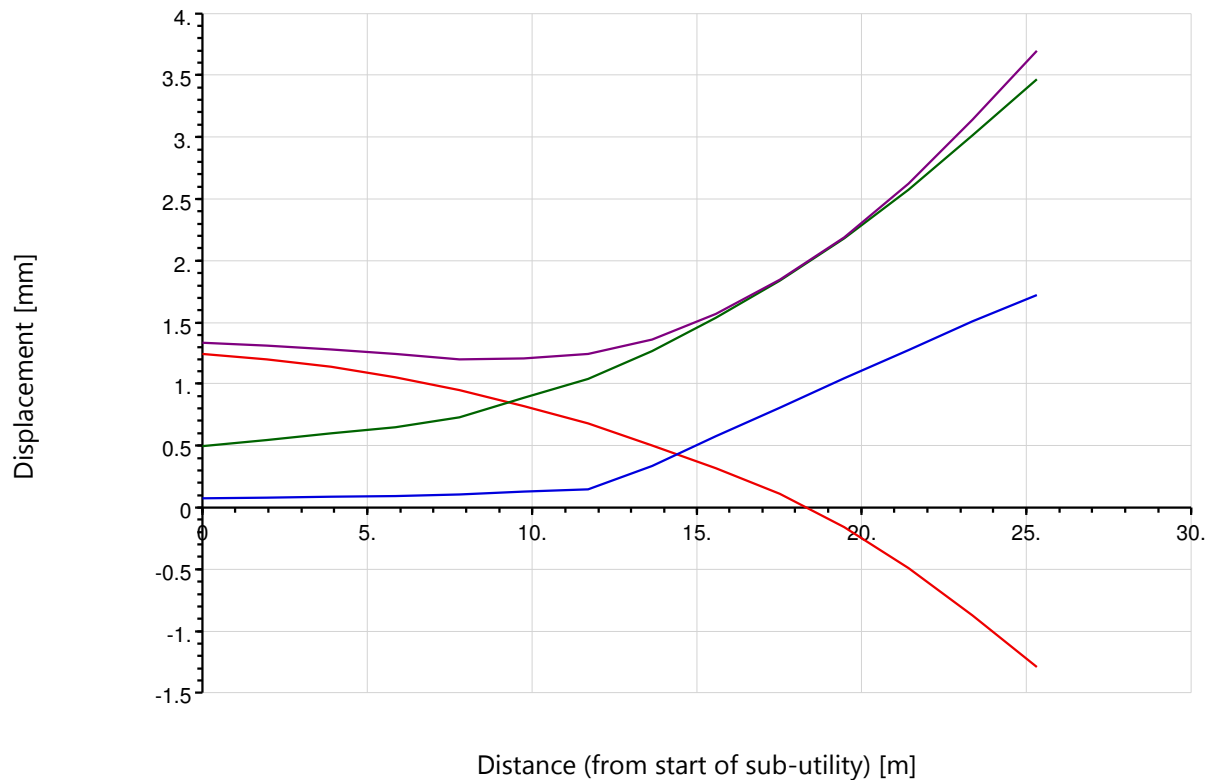
TW Sewer Assessment

(PLt A RES-Sm) + PLt B&C (DEMO+WALL+EXC-Sm)+New Load ST

Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 4: TWS(2)_3/1

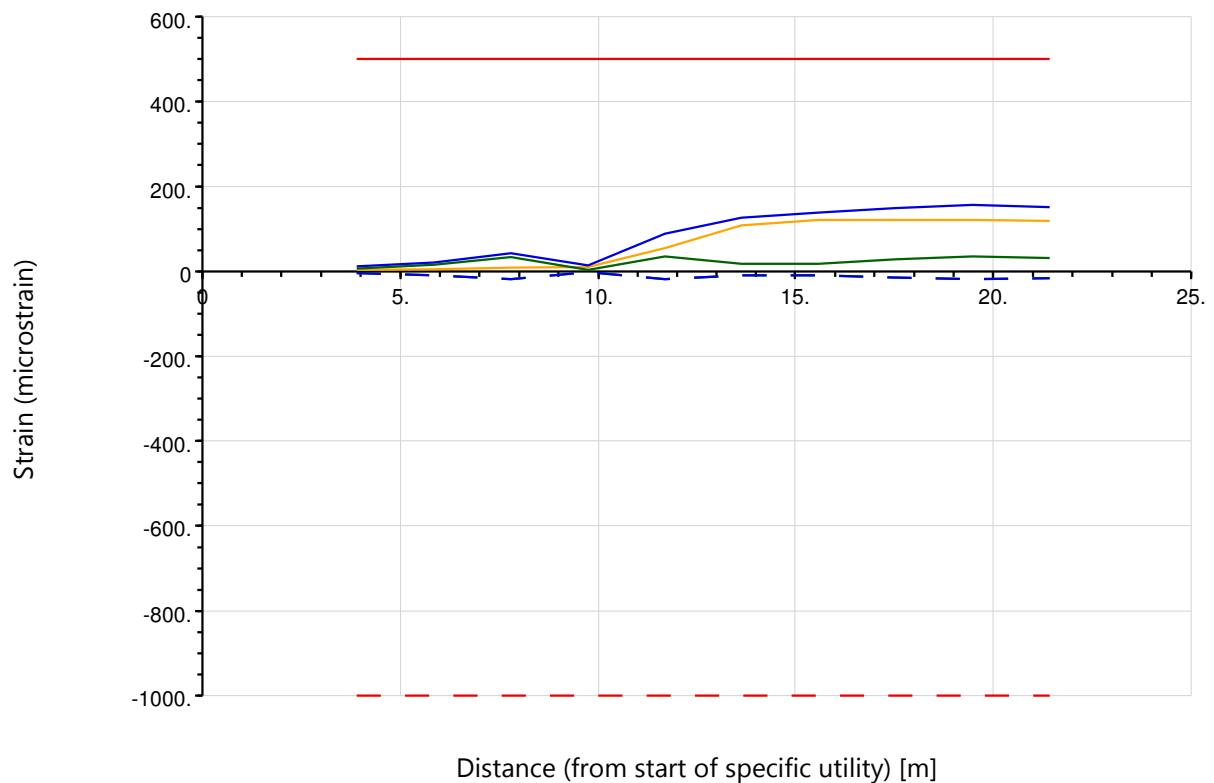
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 4: TWS(2)_3/1

- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



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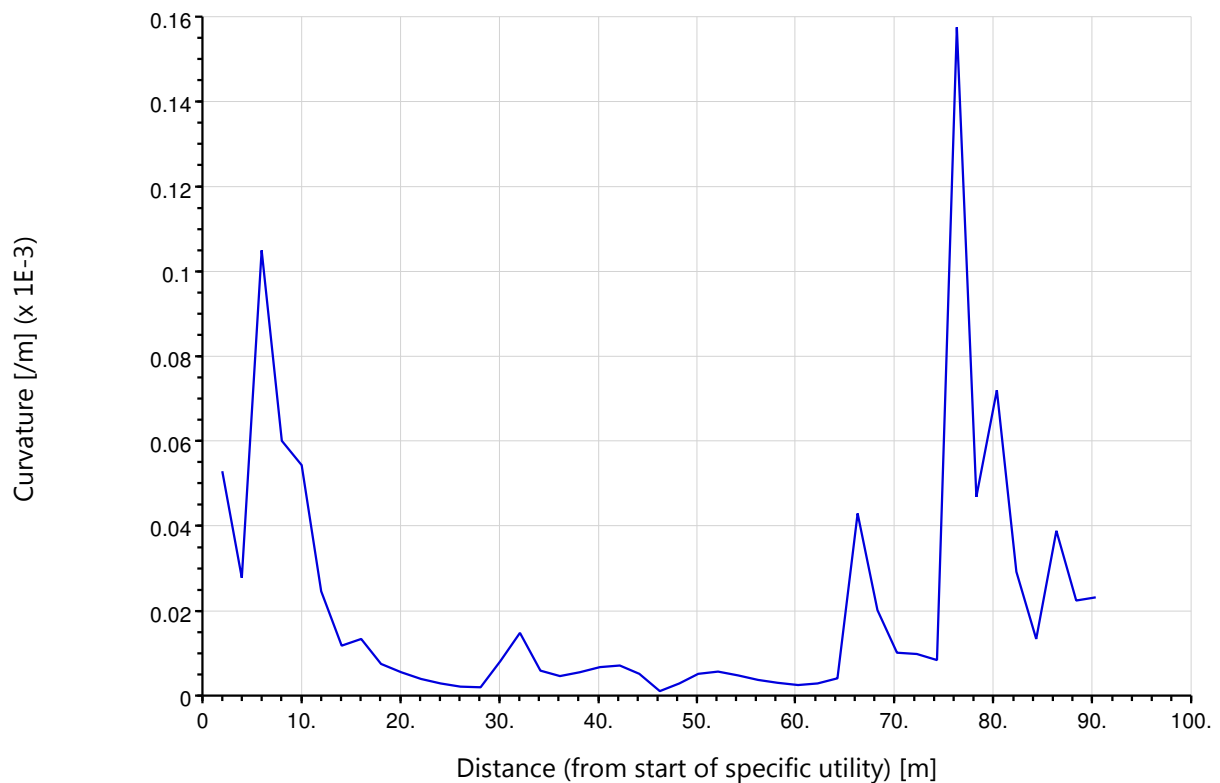
TW Sewer Assessment

(PLt A RES-Sm) + PLt B&C (DEMO+WALL+EXC-Sm)+New Load ST

Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 5: TWS(2)_4/1

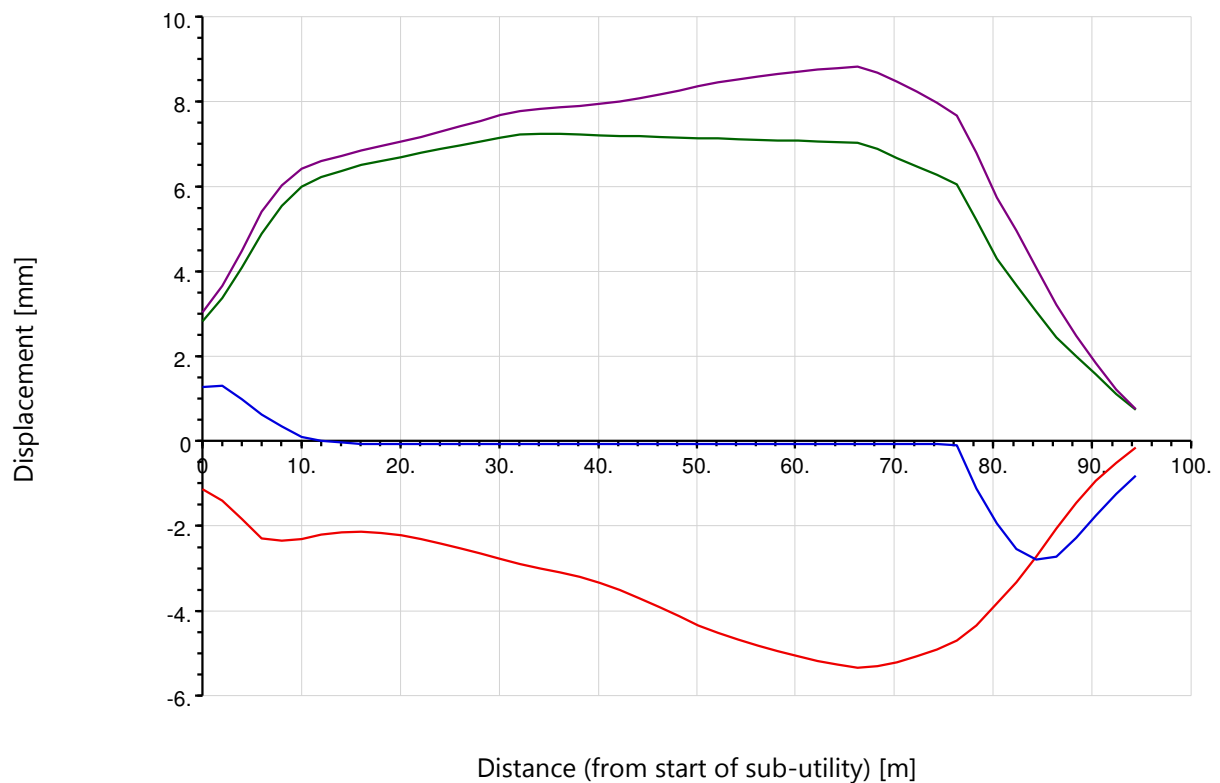
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 5: TWS(2)_4/1

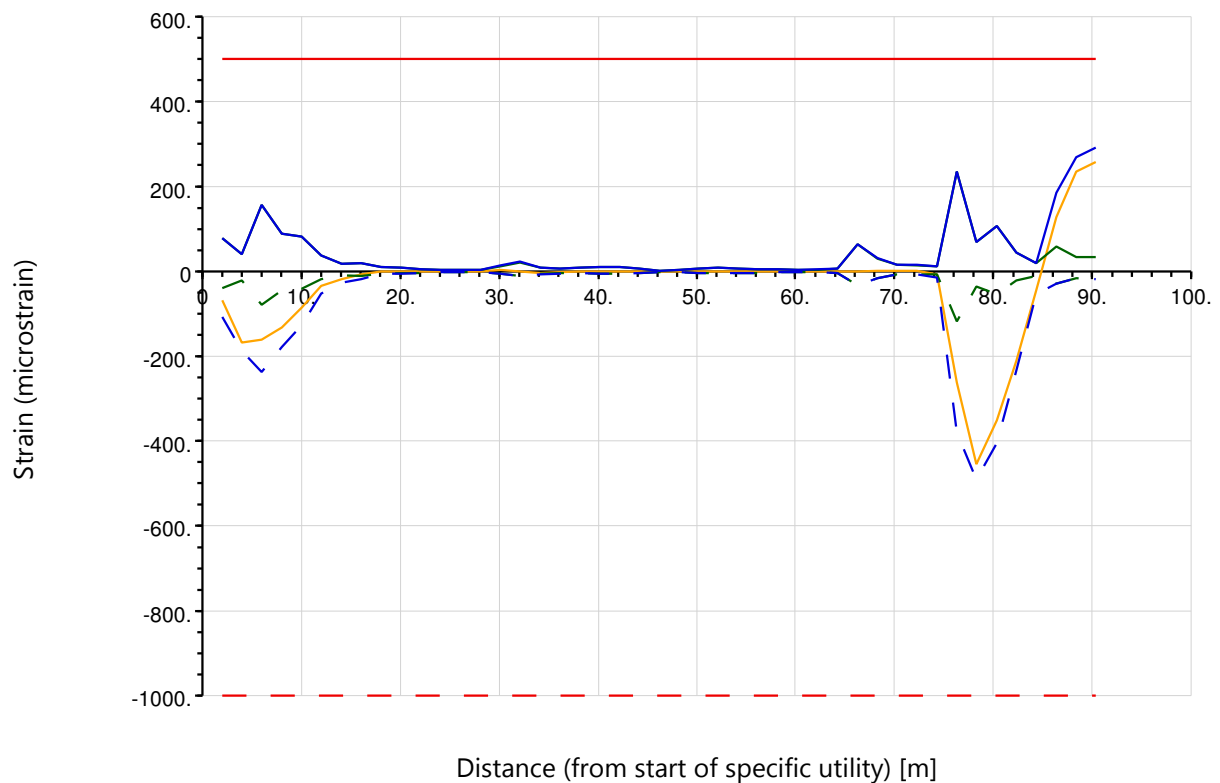
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 5: TWS(2)_4/1

- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



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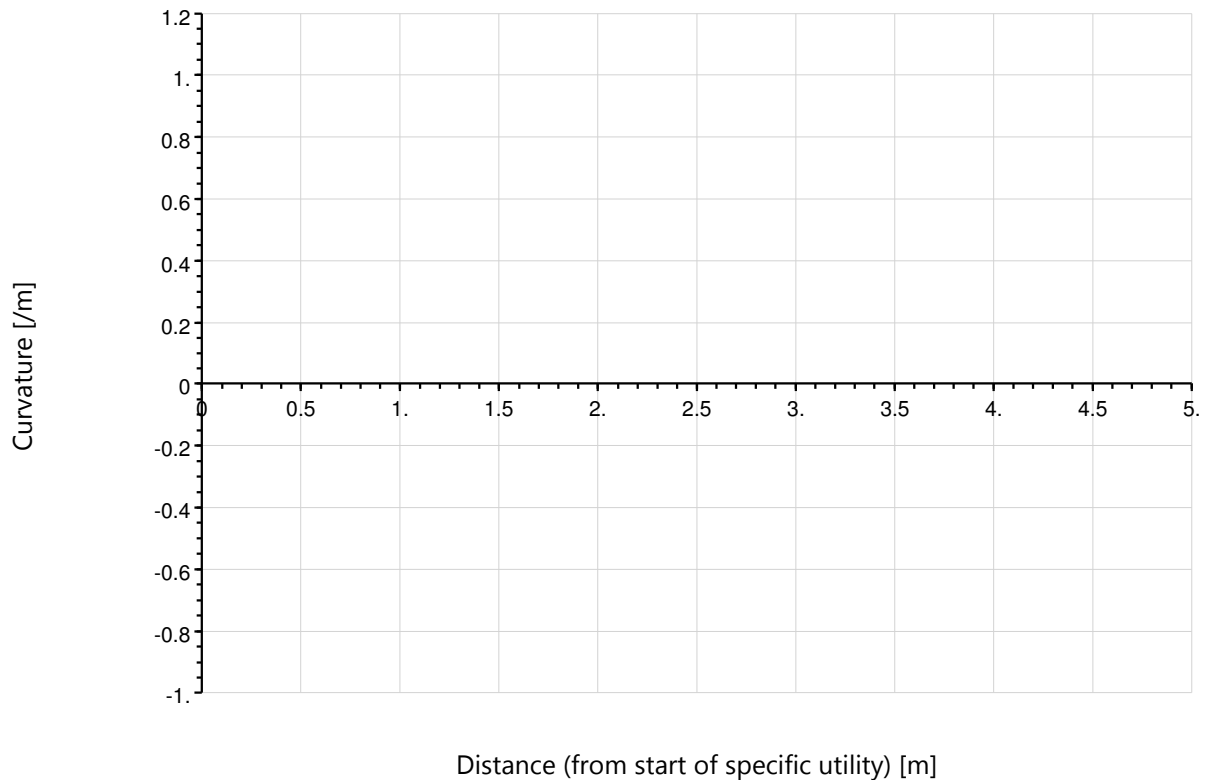
TW Sewer Assessment

(PLt A RES-Sm) + PLt B&C (DEMO+WALL+EXC-S)+New Load ST

Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 10: Assumed FW400 connection to TW2_1/1

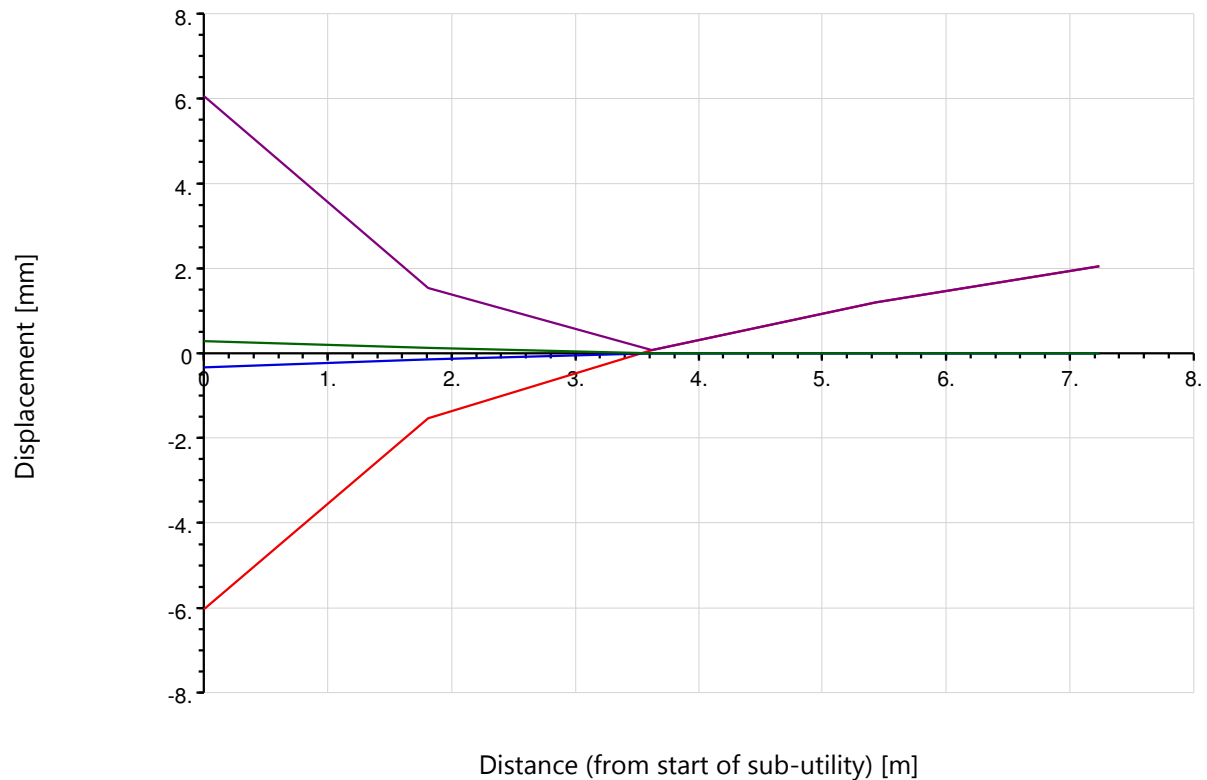
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 10: Assumed FW400 connection to TW2_1/1

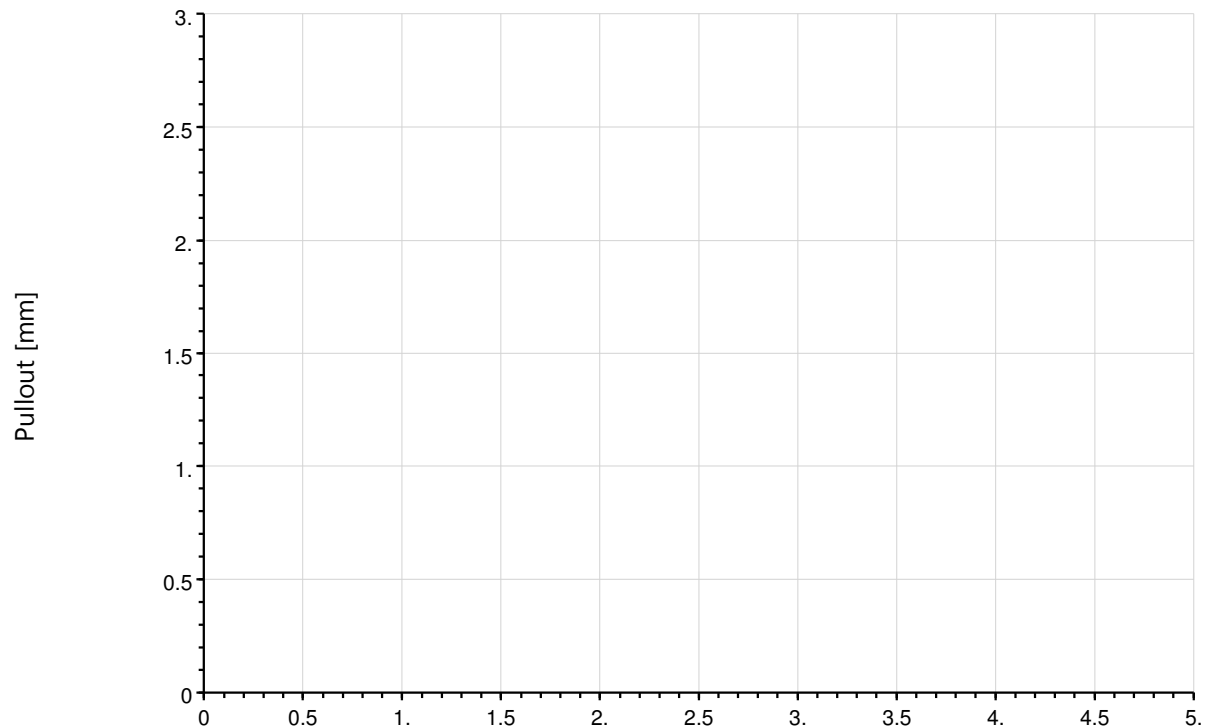
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - Pullout Chart

Stage: Base model, Specific Utility 10: Assumed FW400 connection to TW2_1/1

- - - Axial Pullout (factored)
- - - Flexural Pullout (factored)
- Total Pullout (factored)
- Total Pullout Limit

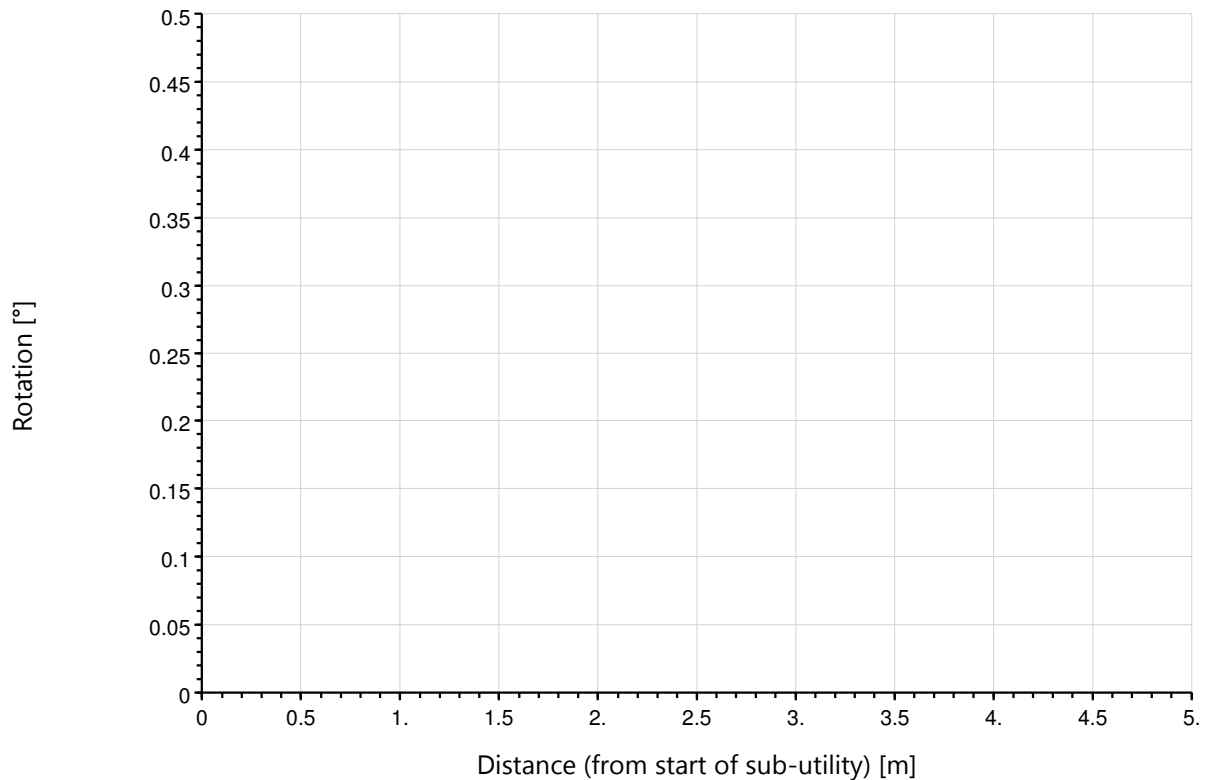


Distance (from start of sub-utility) [m] Note: Total pullout ignores the axial component where this is negative (i.e. comp

Specific Utility - Rotation Chart

Stage: Base model, Specific Utility 10: Assumed FW400 connection to TW2_1/1

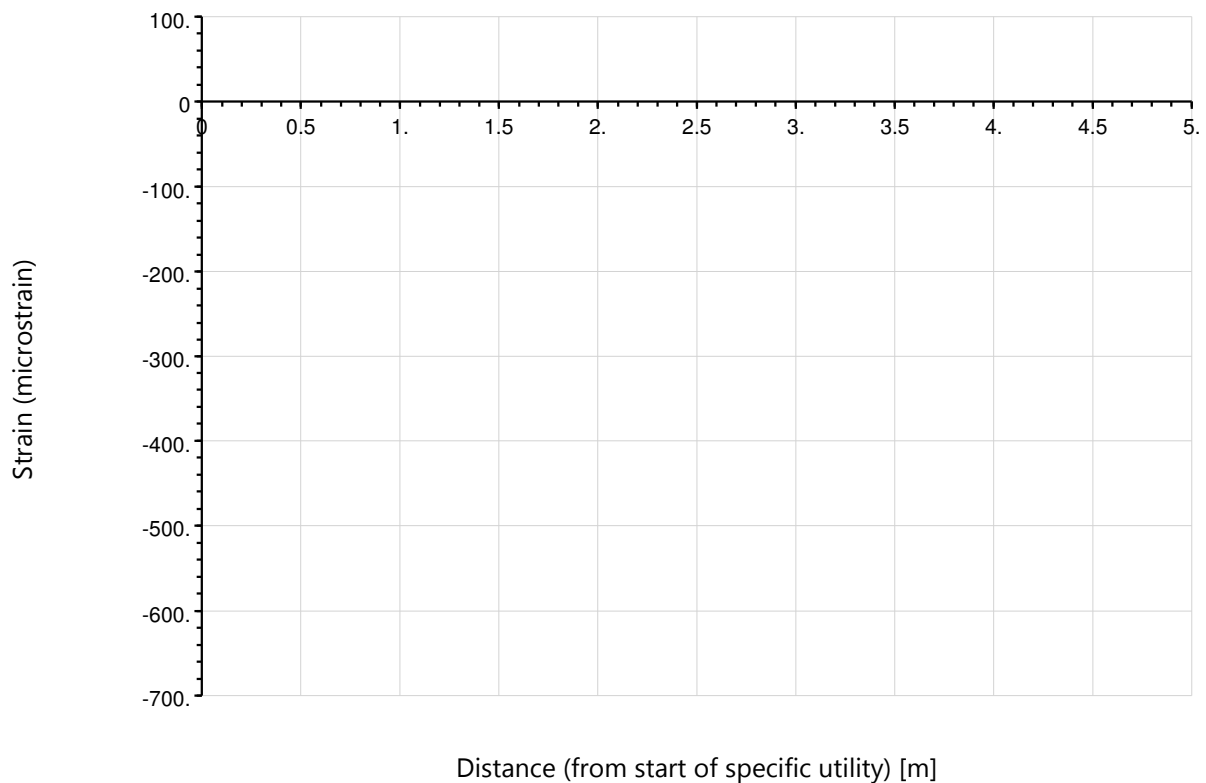
— Rotation (factored)
— Rotation Limit



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 10: Assumed FW400 connection to TW2, 1/1

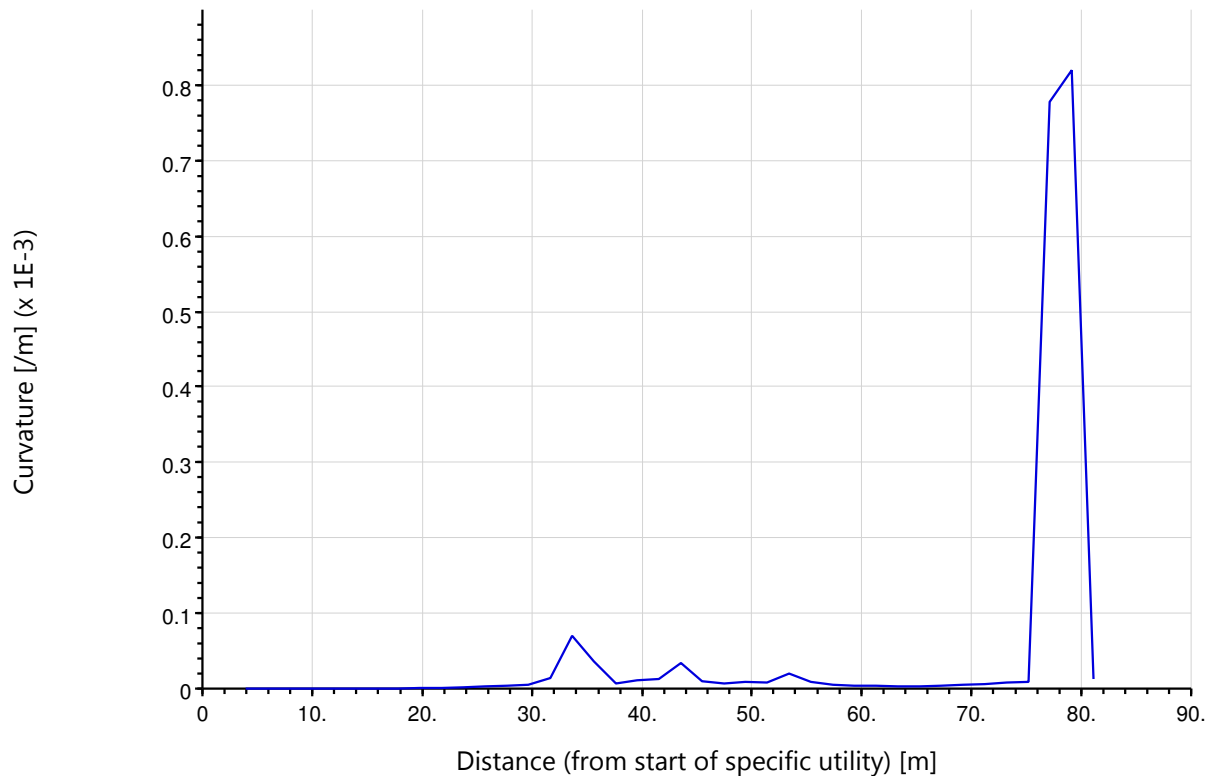
- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- Combined Compressive Strain (factored)
- Allowable Tensile Strain
- Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 6: TW Fresh Water (a) - St Pancras/1

— Curvature



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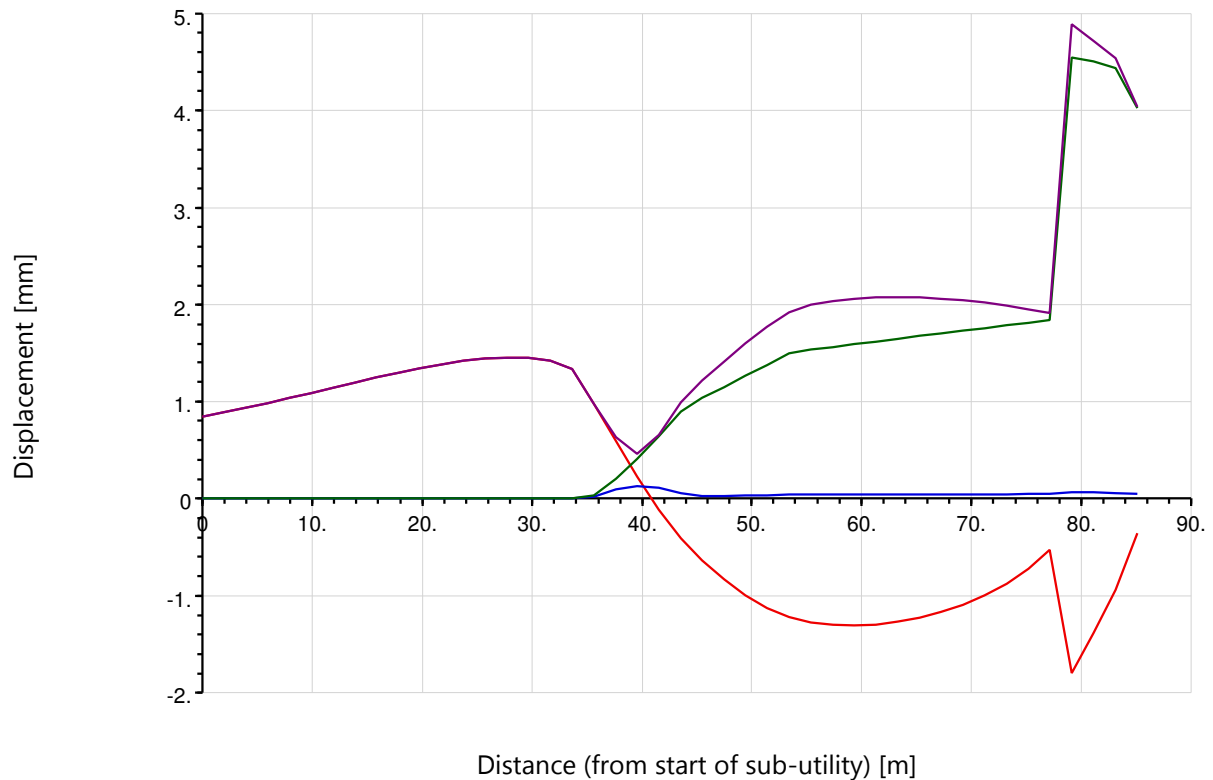
TW Sewer Assessment

(PLt A RES-Sm) + PLt B&C (DEMO+WALL+EXC-S)+New Load ST

Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 6: TW Fresh Water (a) - St Pancras/1

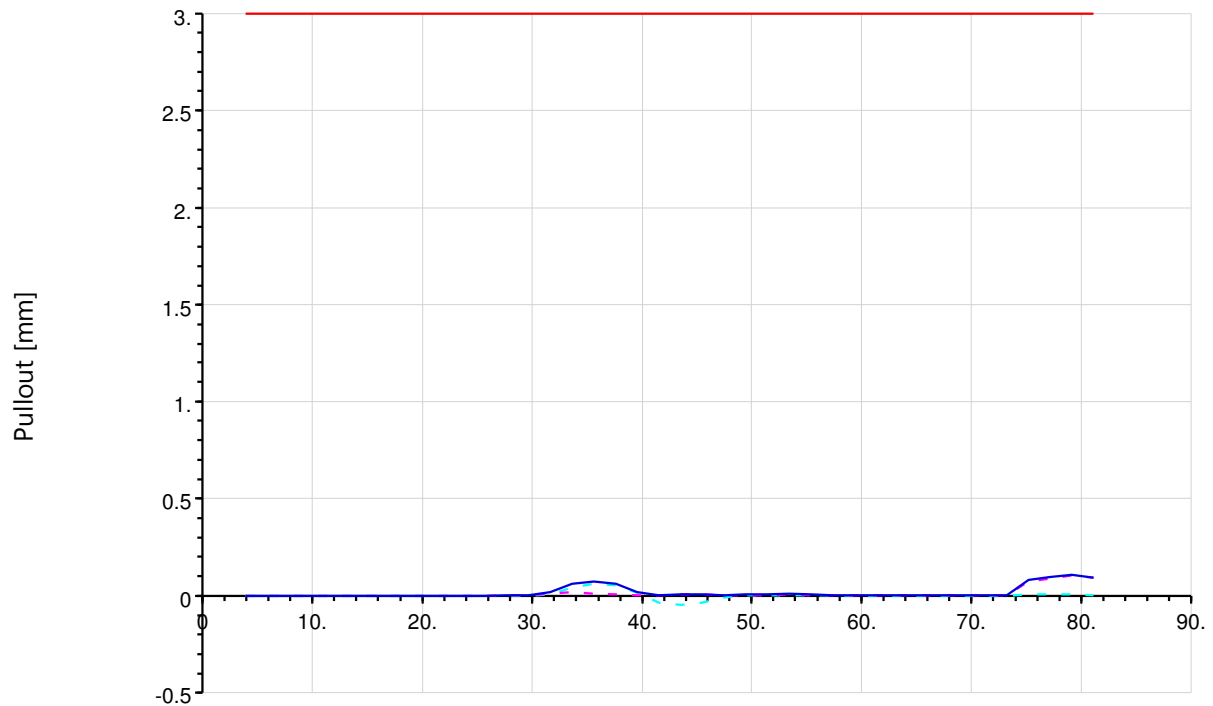
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - Pullout Chart

Stage: Base model, Specific Utility 6: TW Fresh Water (a) - St Pancras/1

- - - Axial Pullout (factored)
- - - Flexural Pullout (factored)
- Total Pullout (factored)
- Total Pullout Limit



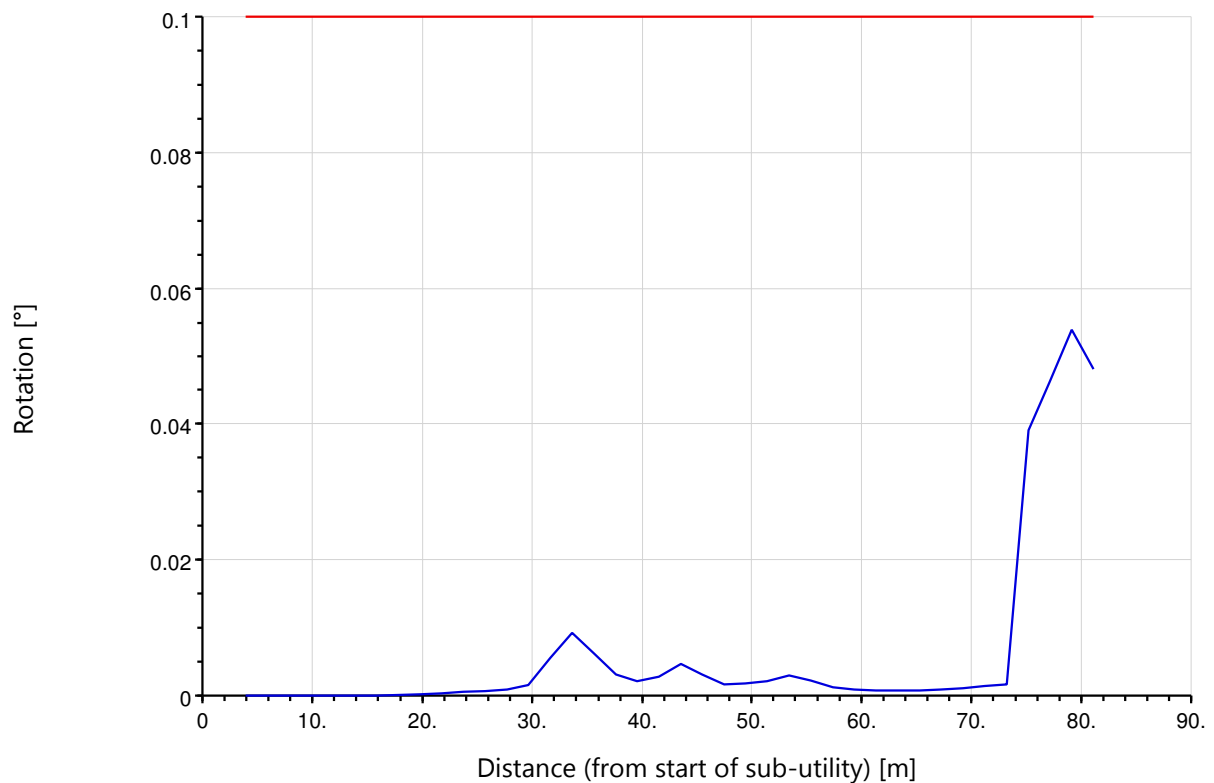
Distance (from start of sub-utility) [m] Note: Total pullout ignores the axial component where this is negative (i.e. comp

Specific Utility - Rotation Chart

Stage: Base model, Specific Utility 6: TW Fresh Water (a) - St Pancras/1

— Rotation (factored)

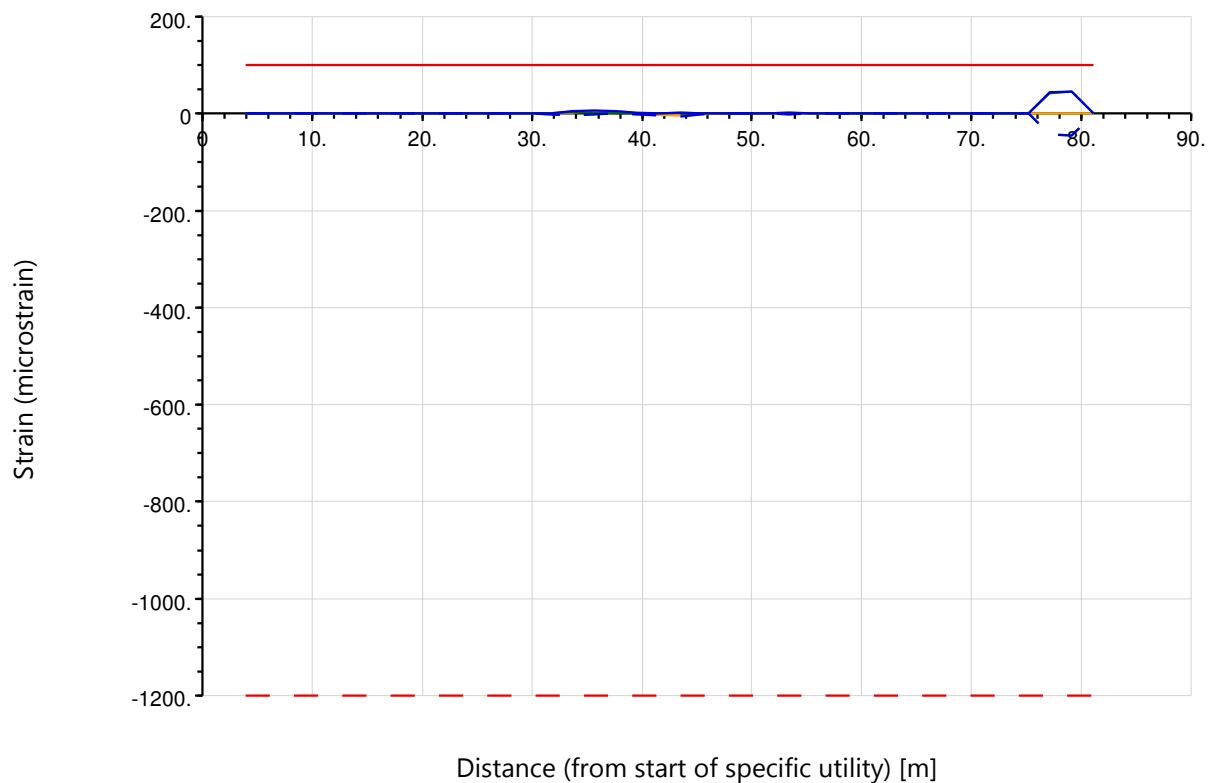
— Rotation Limit



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 6: TW Fresh Water (a) - St Pancras/1

- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



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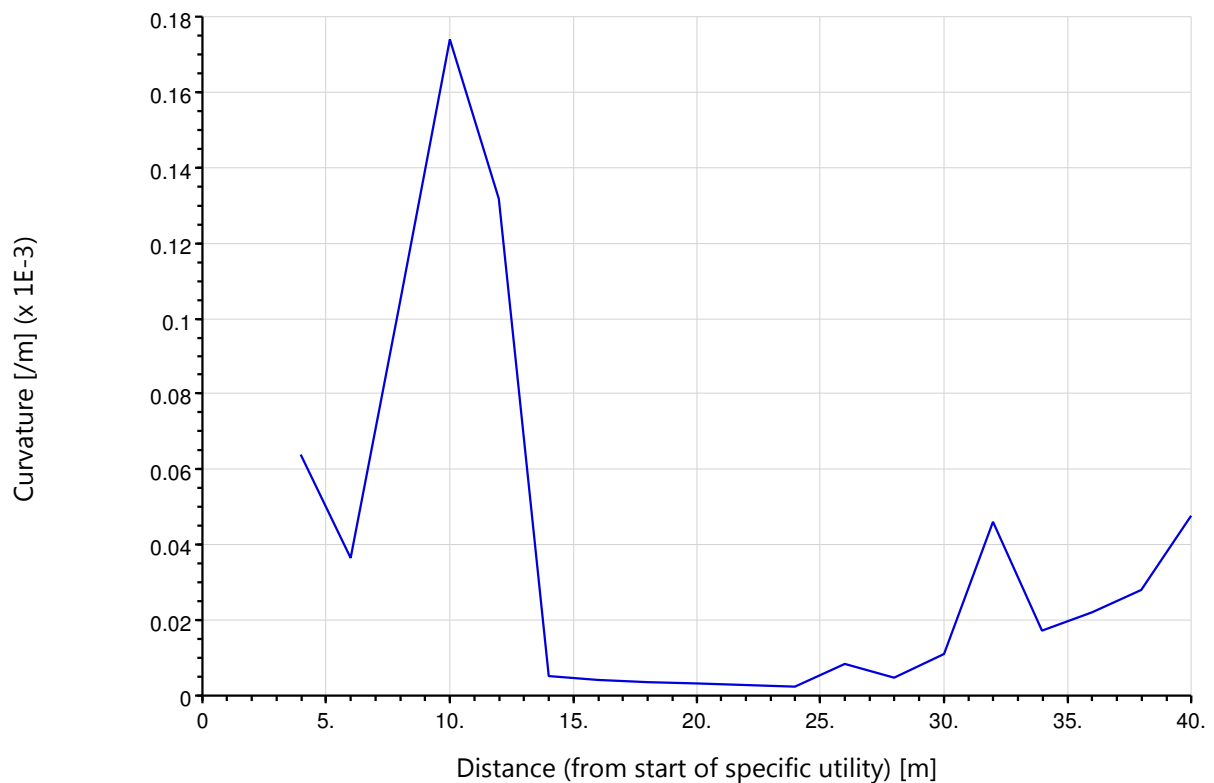
TW Sewer Assessment

(PLt A RES-Sm) + PLt B&C (DEMO+WALL+EXC-S)+New Load ST

Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 7: TW Fresh Water (b) - St Pancras/1

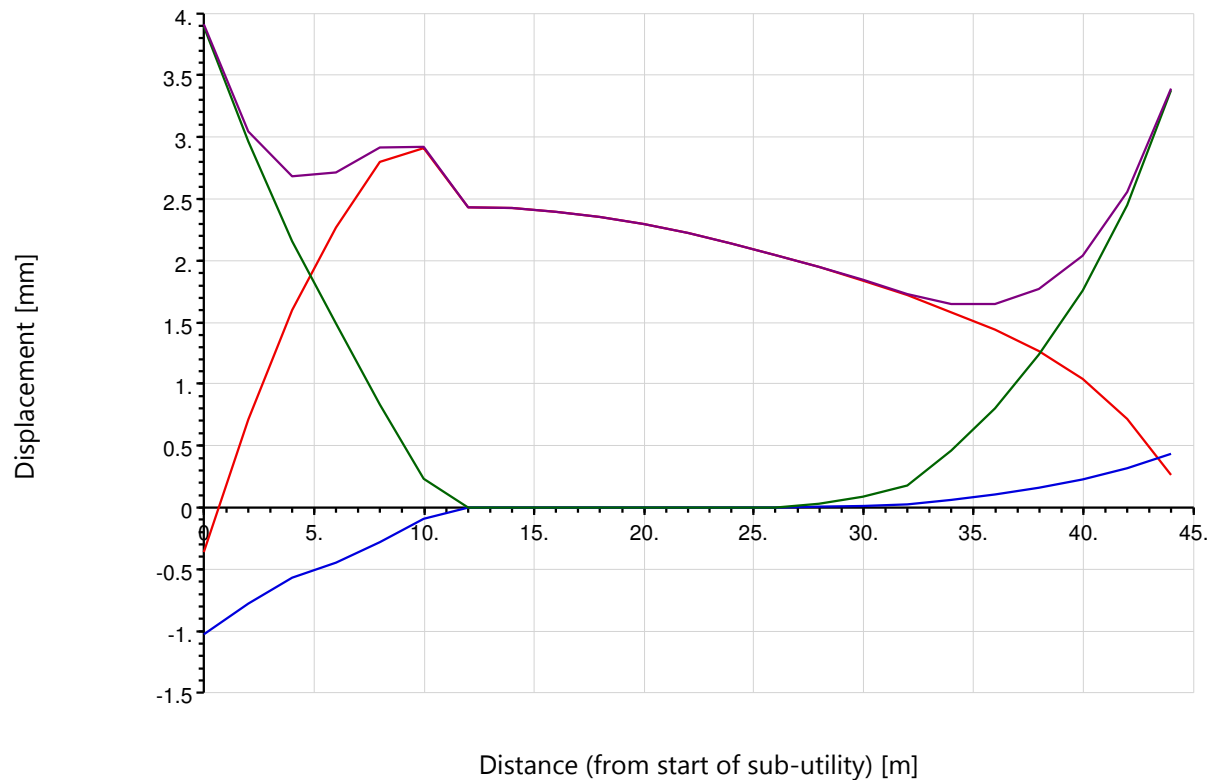
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 7: TW Fresh Water (b) - St Pancras/1

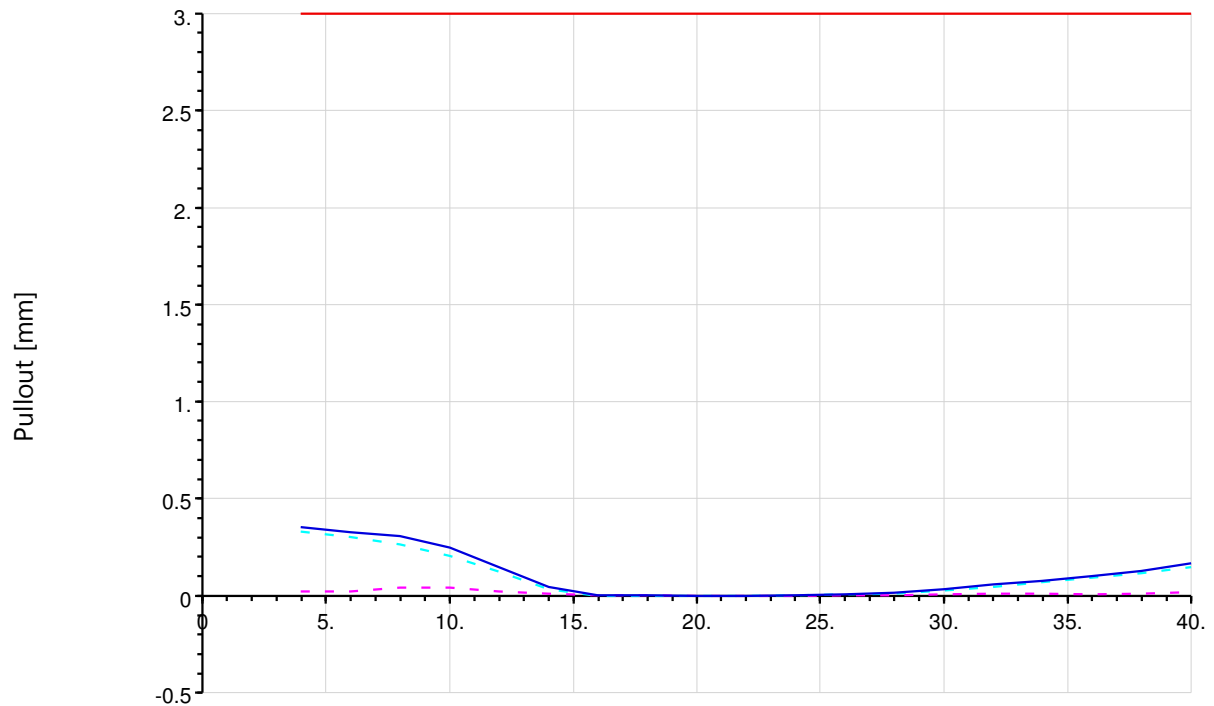
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - Pullout Chart

Stage: Base model, Specific Utility 7: TW Fresh Water (b) - St Pancras/1

- - - Axial Pullout (factored)
- - - Flexural Pullout (factored)
- Total Pullout (factored)
- Total Pullout Limit



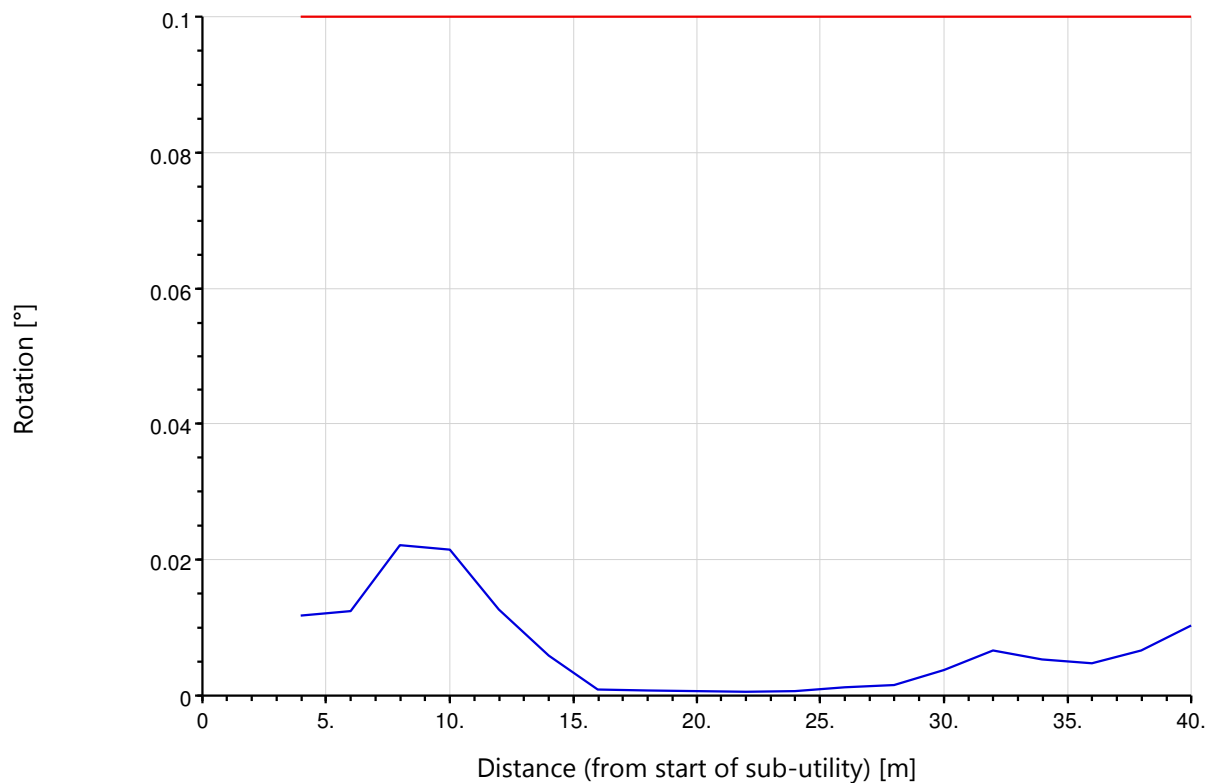
Distance (from start of sub-utility) [m] Note: Total pullout ignores the axial component where this is negative (i.e. comp

Specific Utility - Rotation Chart

Stage: Base model, Specific Utility 7: TW Fresh Water (b) - St Pancras/1

— Rotation (factored)

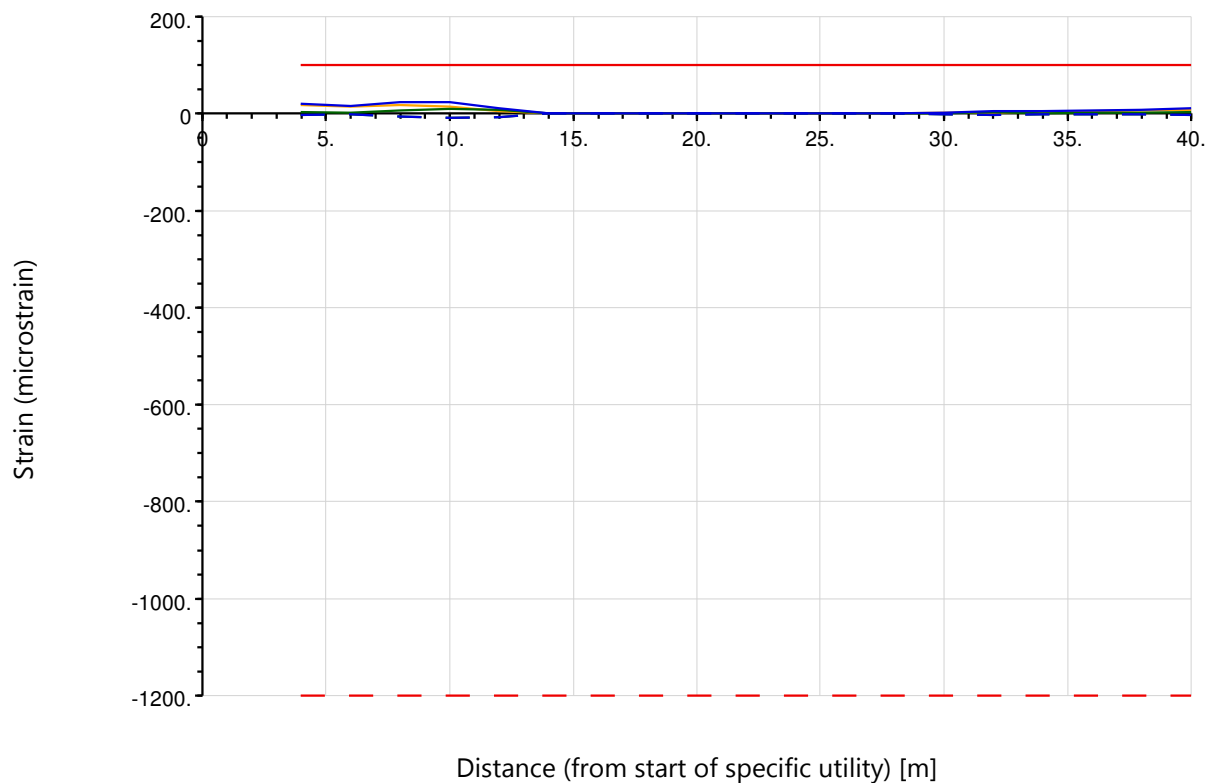
— Rotation Limit



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 7: TW Fresh Water (b) - St Pancras/1

- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain

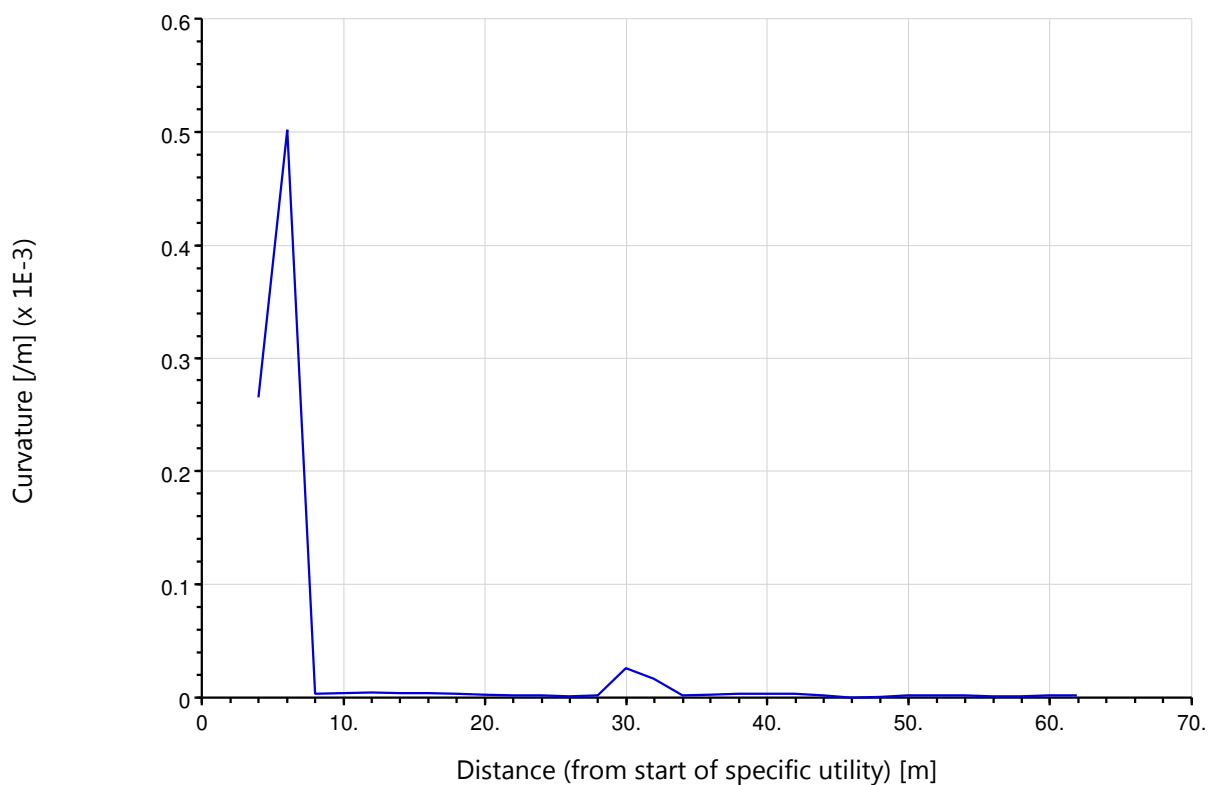


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Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 8: TW Fresh Water (c) - St Pancras/1

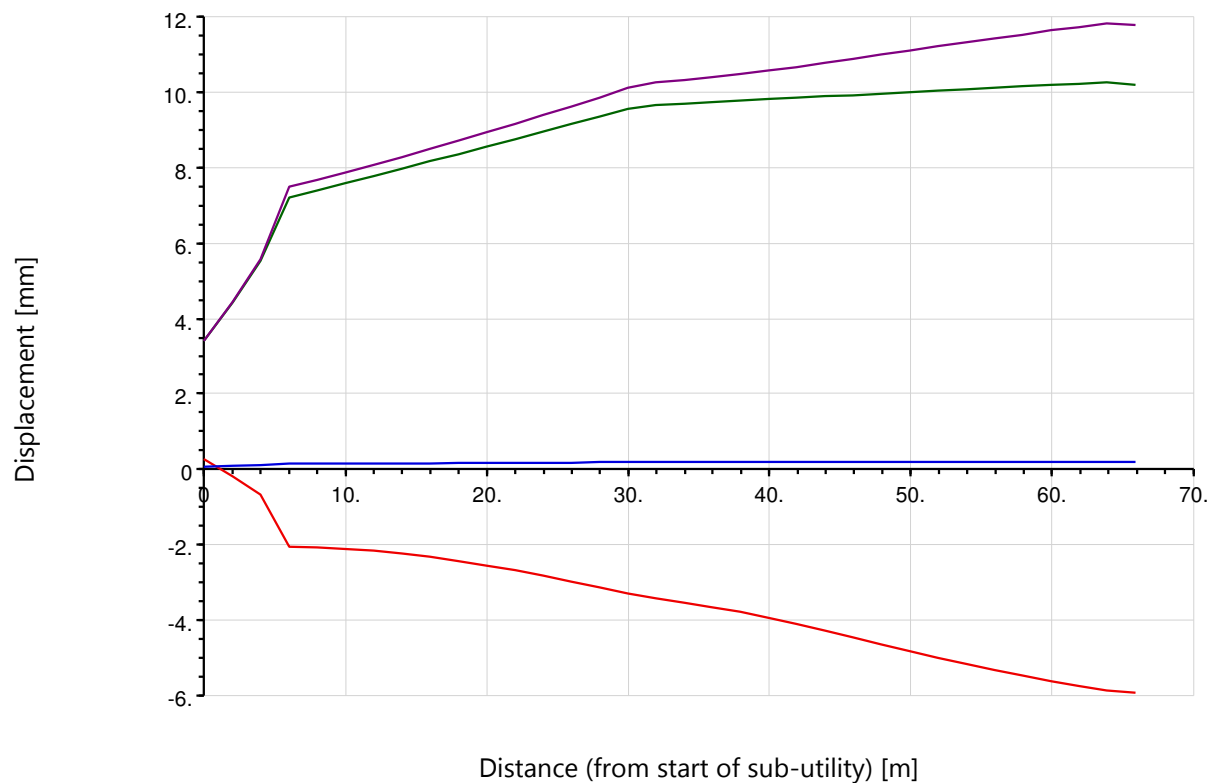
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 8: TW Fresh Water (c) - St Pancras/1

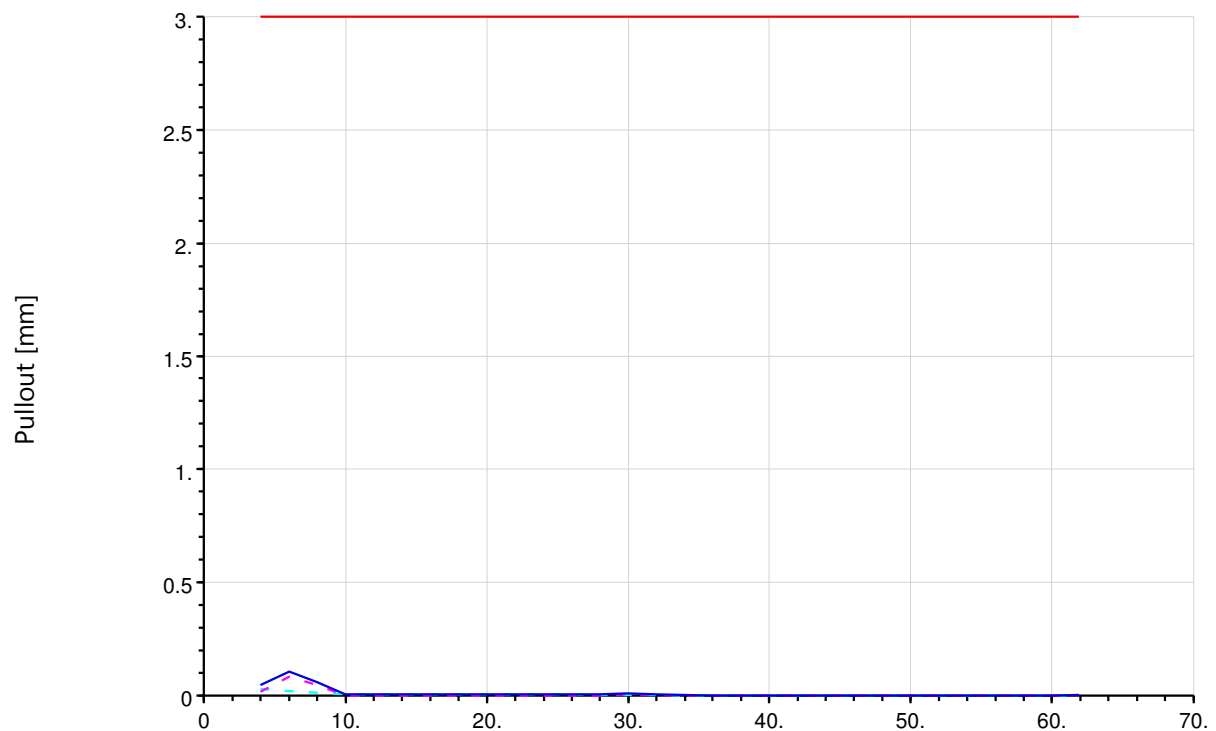
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - Pullout Chart

Stage: Base model, Specific Utility 8: TW Fresh Water (c) - St Pancras/1

- - - Axial Pullout (factored)
- - - Flexural Pullout (factored)
- Total Pullout (factored)
- Total Pullout Limit



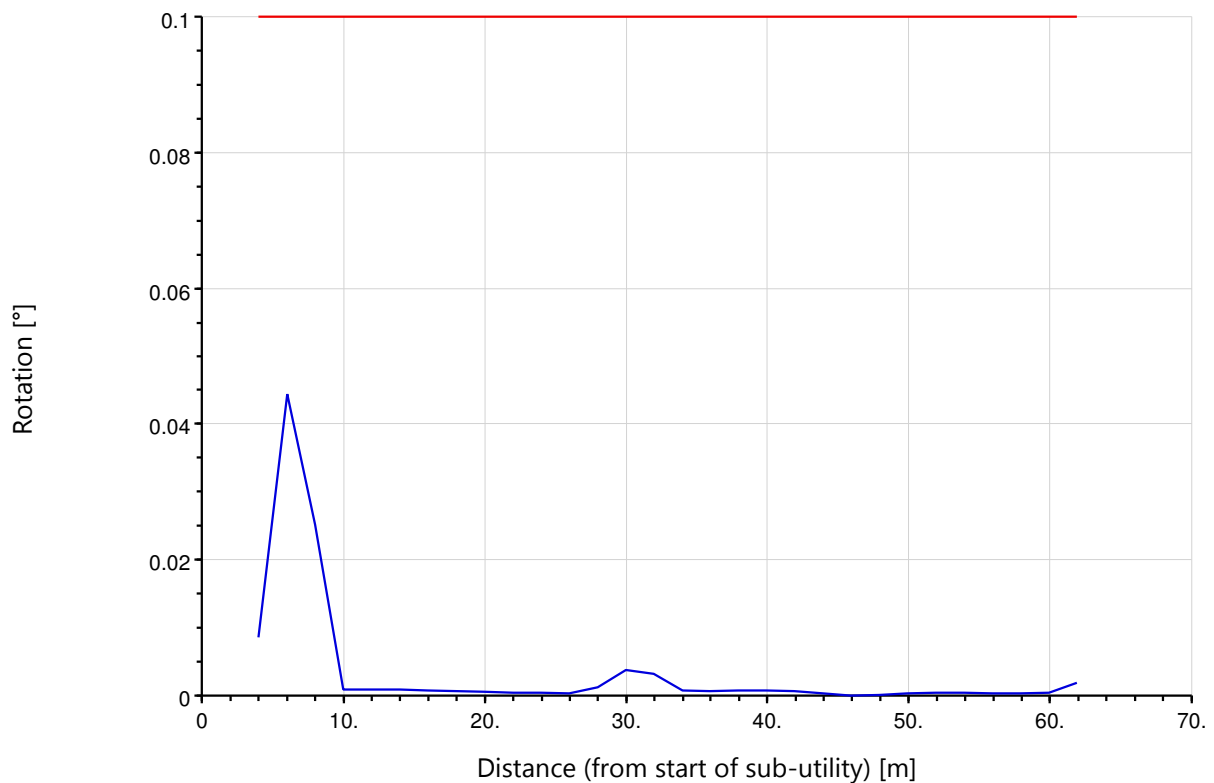
Distance (from start of sub-utility) [m] Note: Total pullout ignores the axial component where this is negative (i.e. comp

Specific Utility - Rotation Chart

Stage: Base model, Specific Utility 8: TW Fresh Water (c) - St Pancras/1

— Rotation (factored)

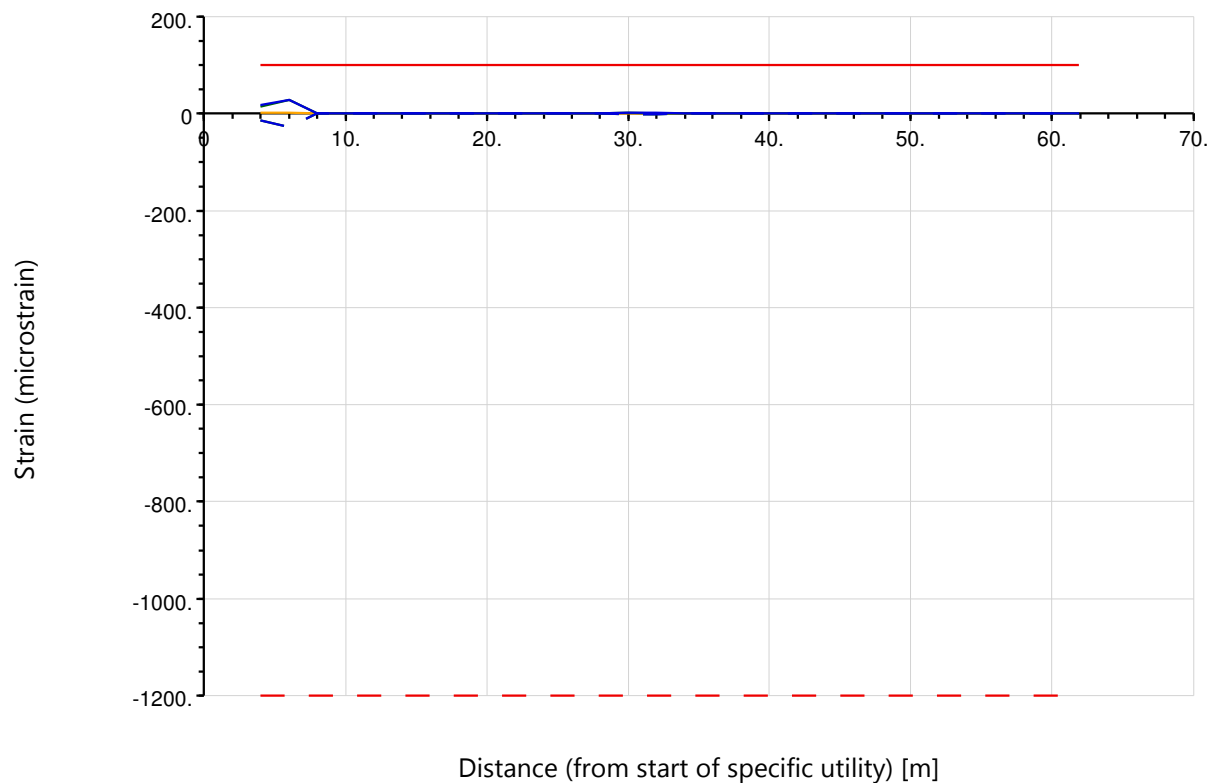
— Rotation Limit



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 8: TW Fresh Water (c) - St Pancras/1

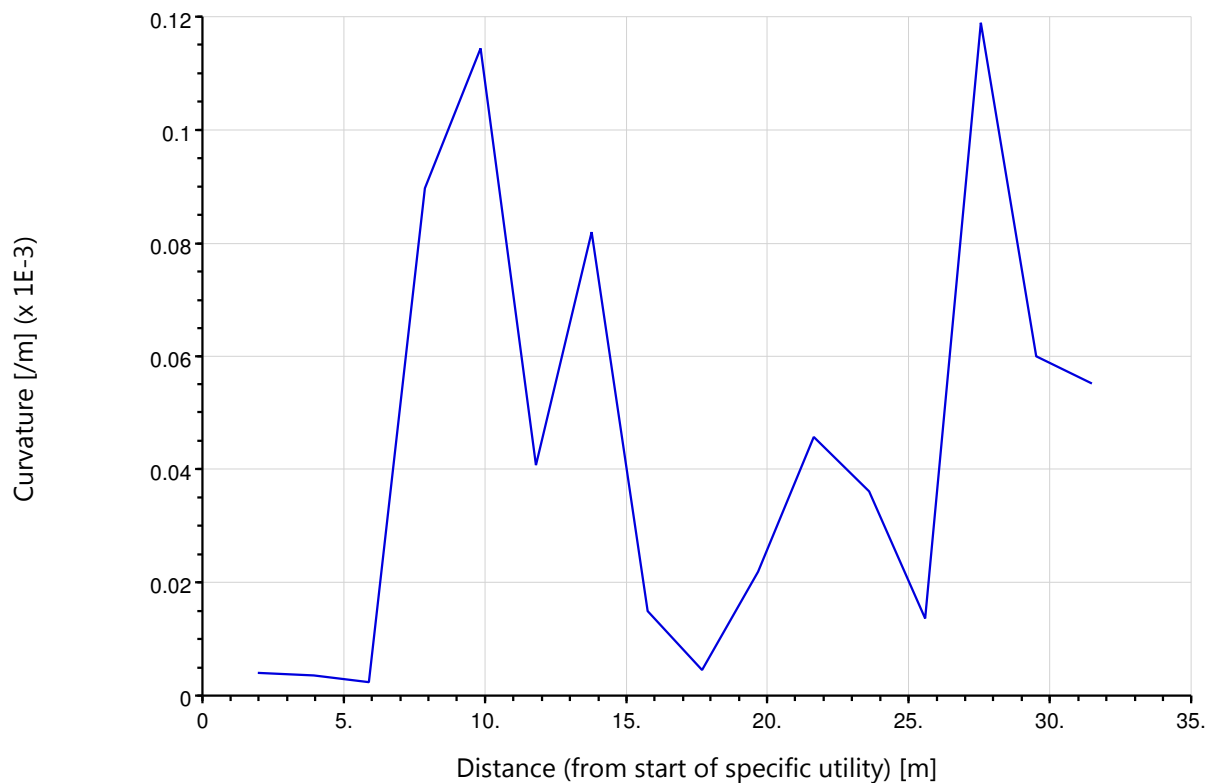
- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 9: TW Fresh Water (d) - St Pancras/1

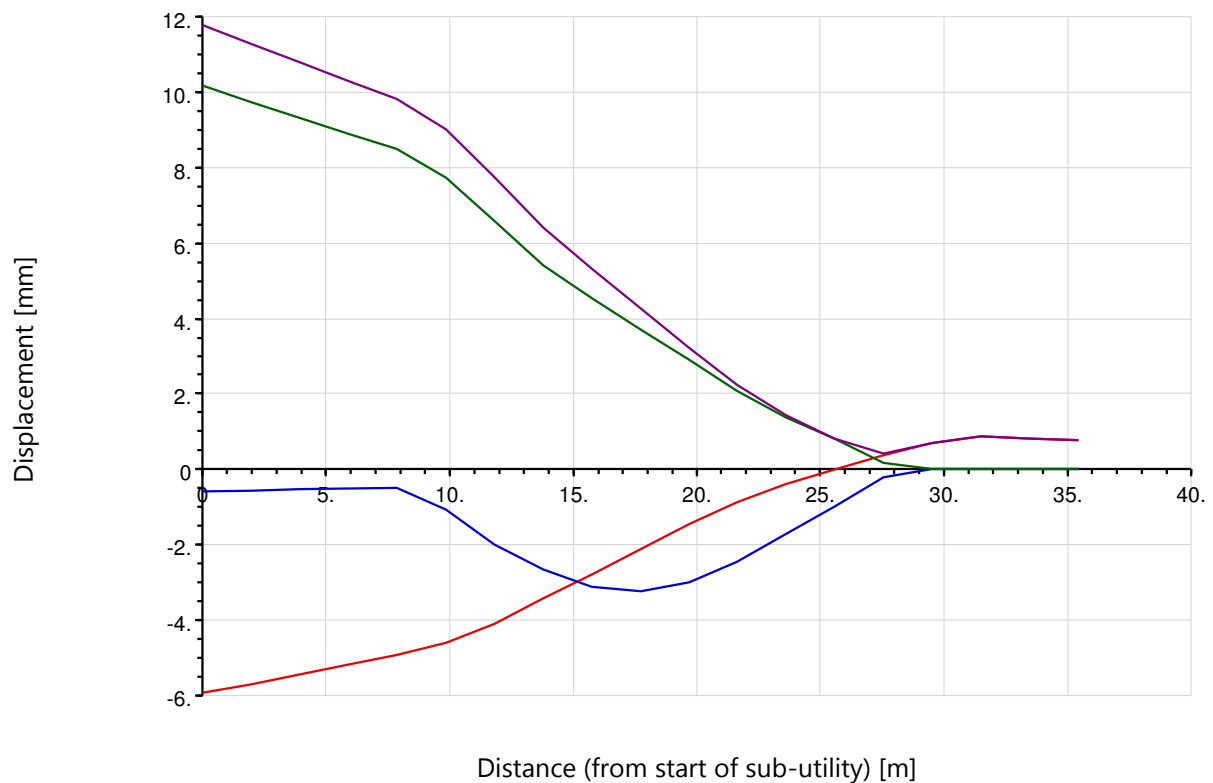
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 9: TW Fresh Water (d) - St Pancras/1

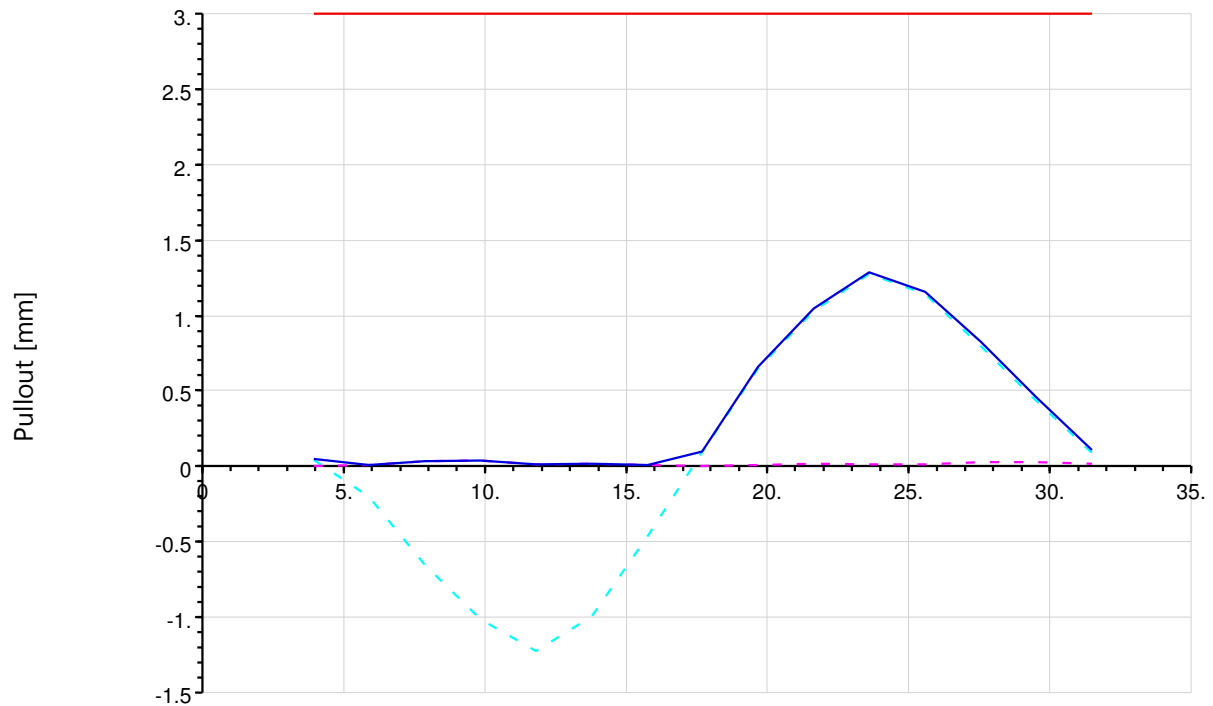
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - Pullout Chart

Stage: Base model, Specific Utility 9: TW Fresh Water (d) - St Pancras/1

- - - Axial Pullout (factored)
- - - Flexural Pullout (factored)
- Total Pullout (factored)
- Total Pullout Limit



Distance (from start of sub-utility) [m] Note: Total pullout ignores the axial component where this is negative (i.e. comp

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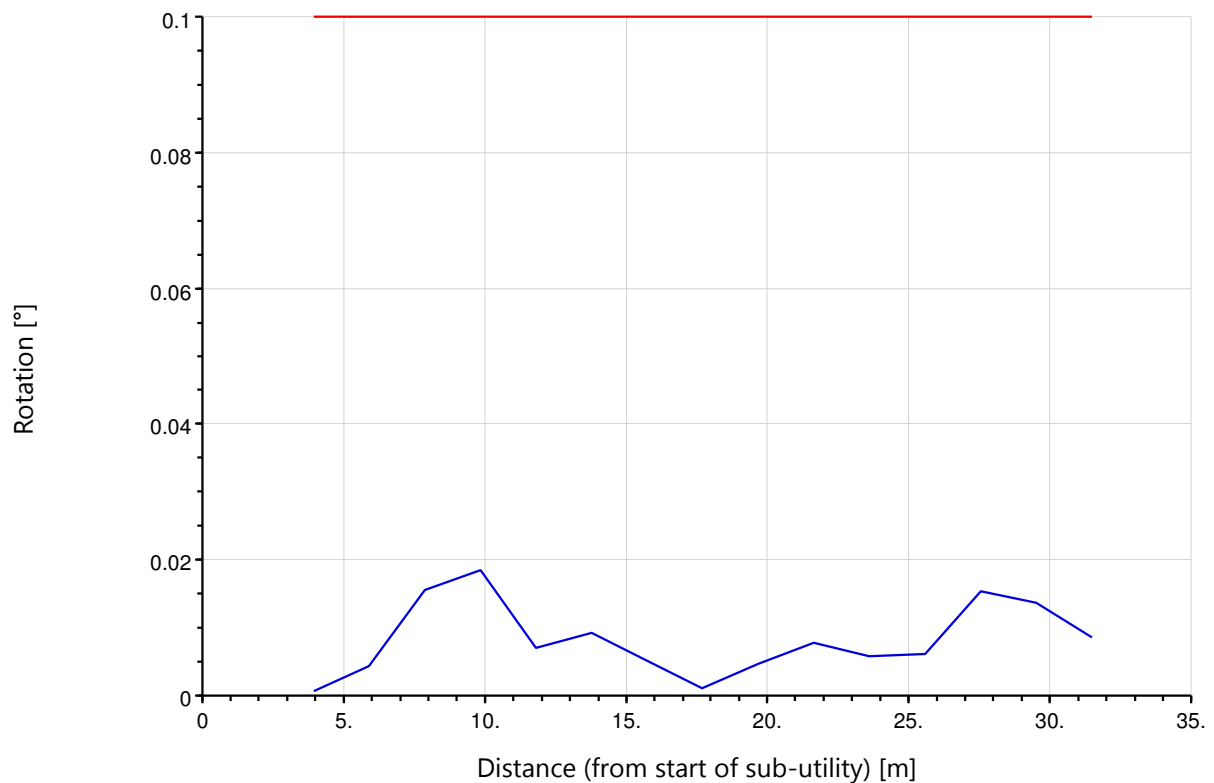
(PLt A RES-Sm) + PLt B&C (DEMO+WALL+EXC-S)+New Load ST

Specific Utility - Rotation Chart

Stage: Base model, Specific Utility 9: TW Fresh Water (d) - St Pancras/1

— Rotation (factored)

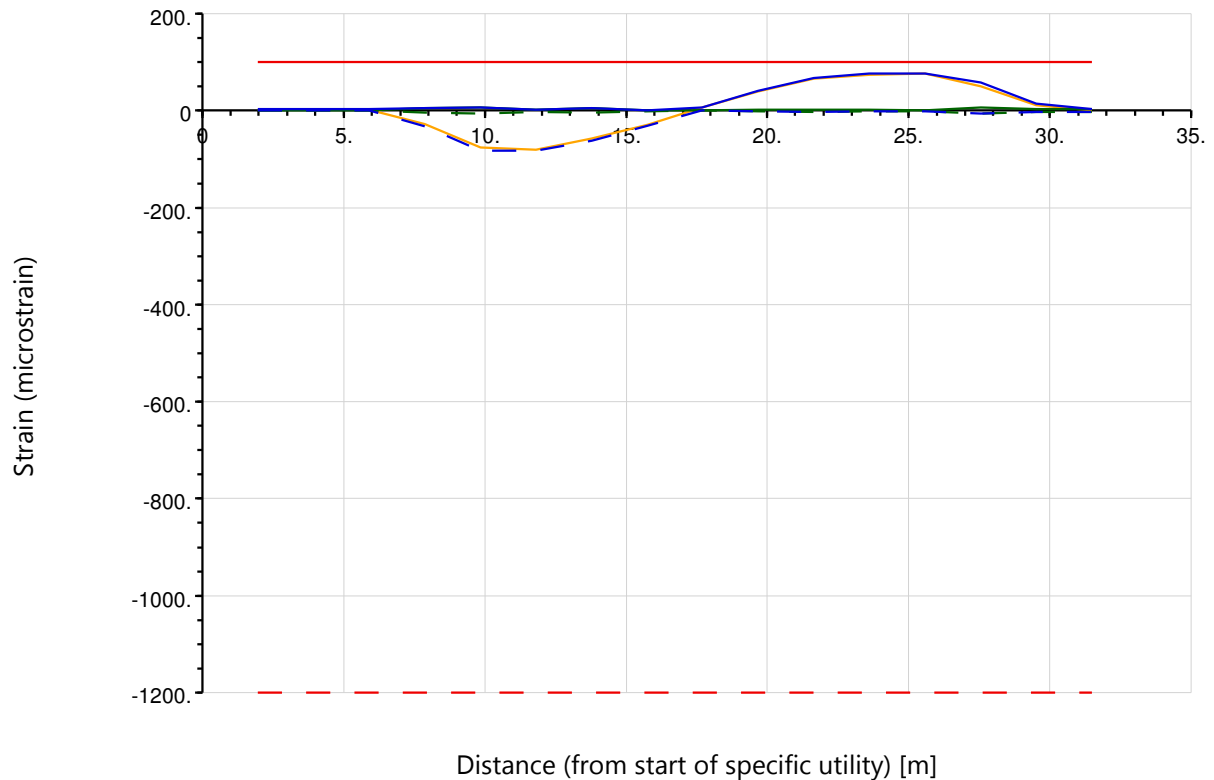
— Rotation Limit



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 9: TW Fresh Water (d) - St Pancras/1

- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain

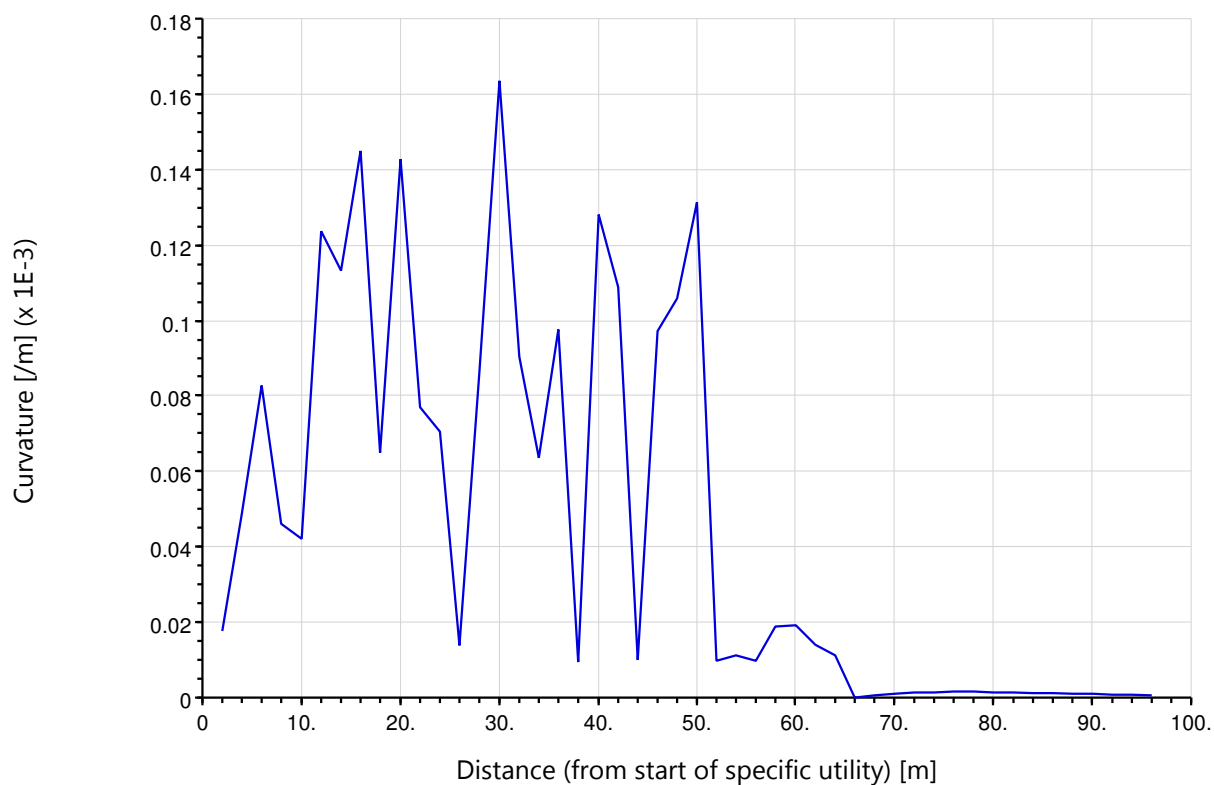


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Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 1: TWS(1)_1/1

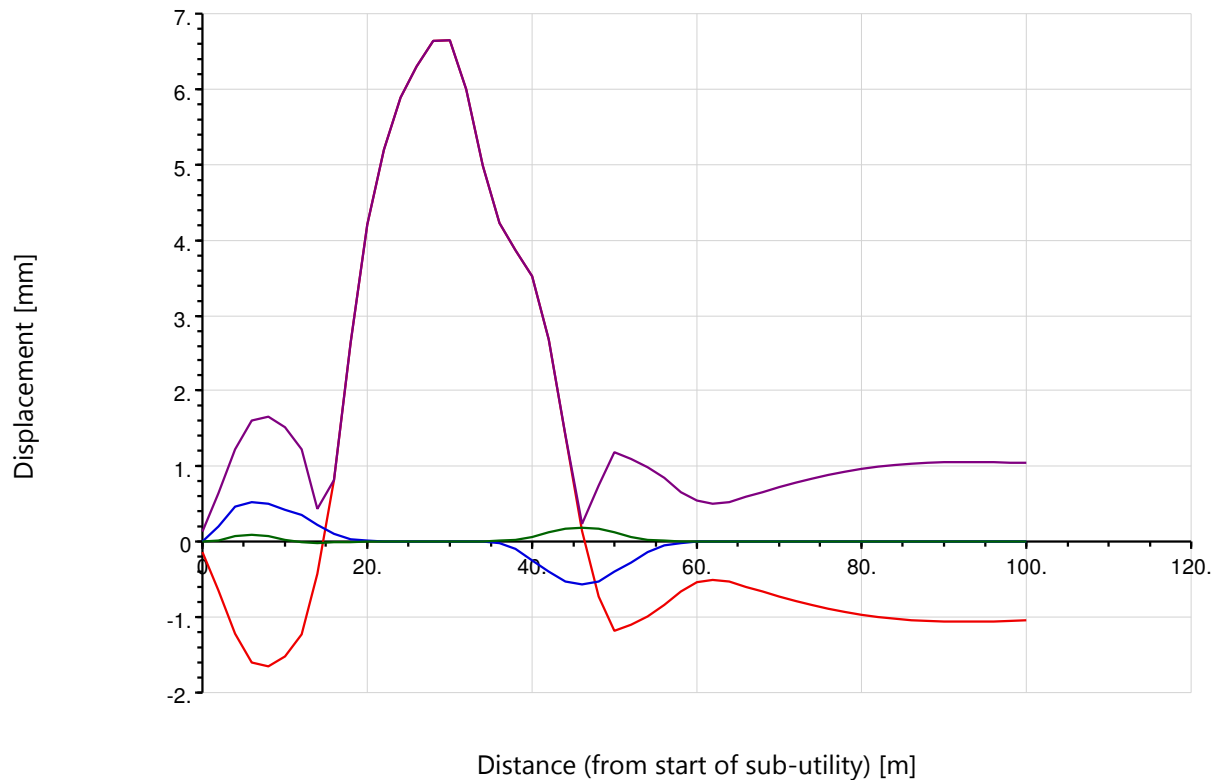
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 1: TWS(1)_1/1

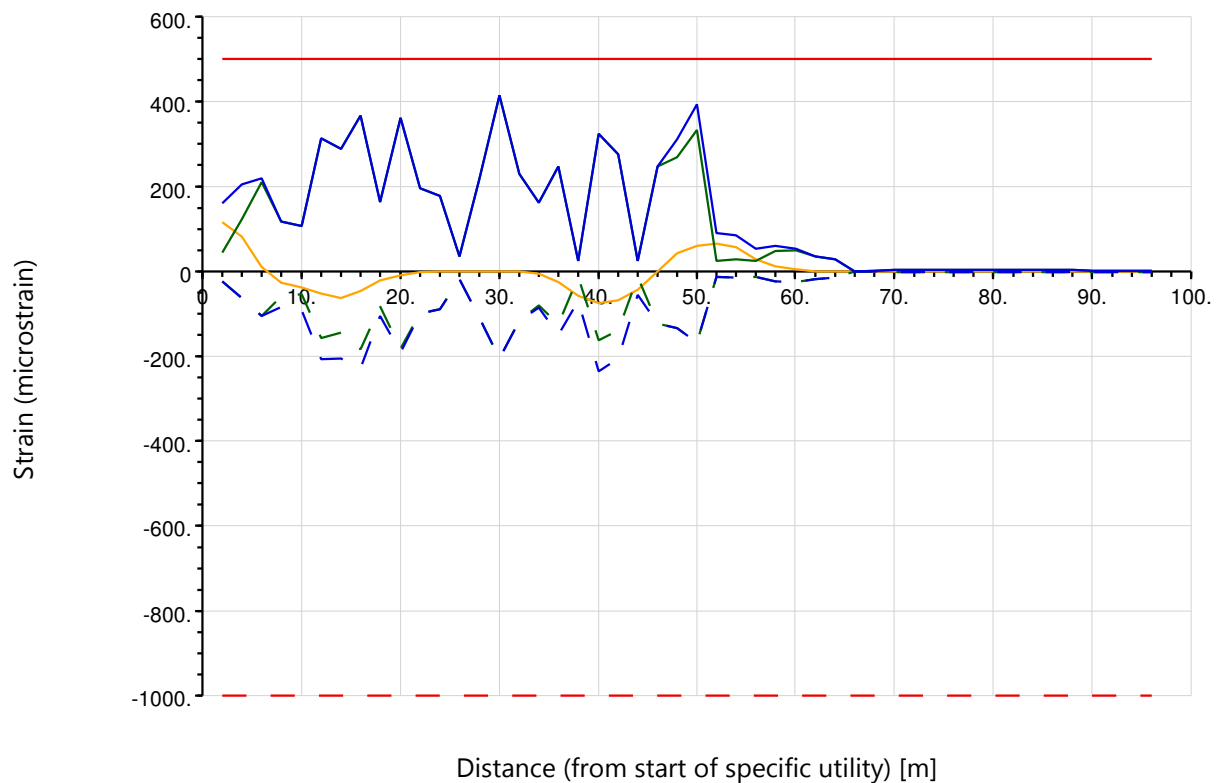
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 1: TWS(1)_1/1

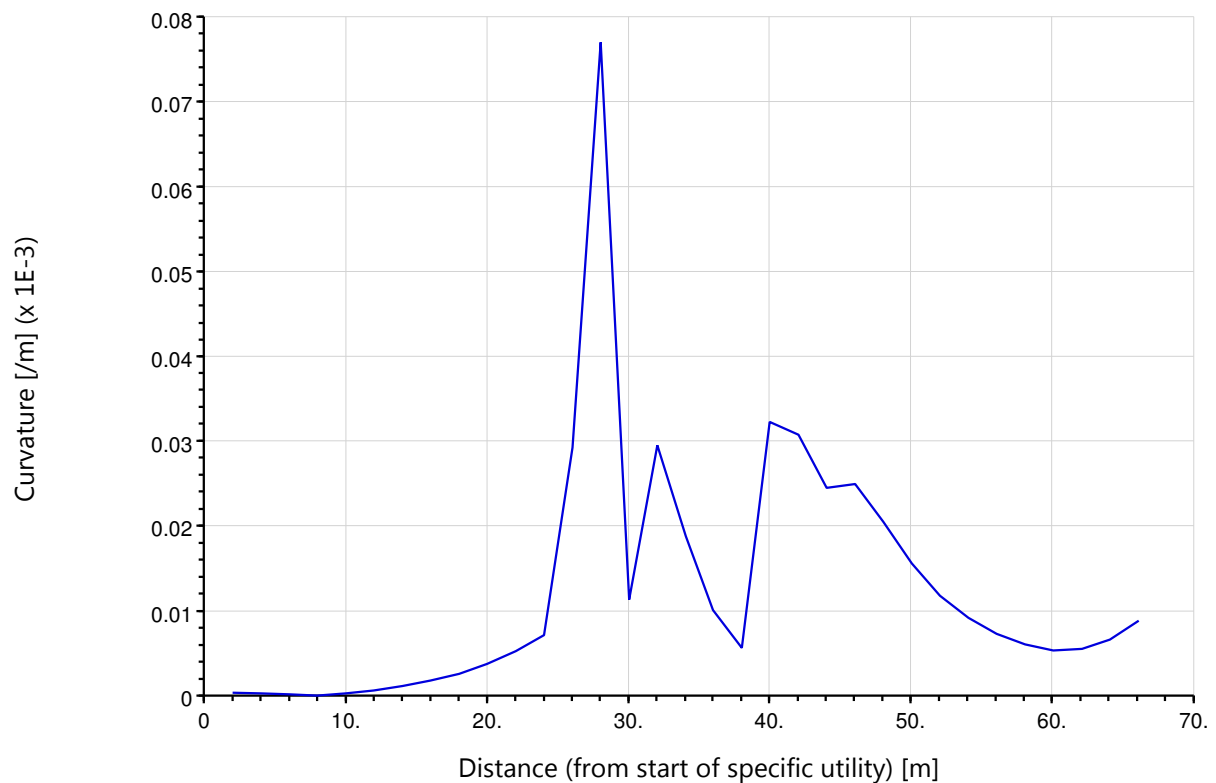
- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 2: TWS(2)_1/1

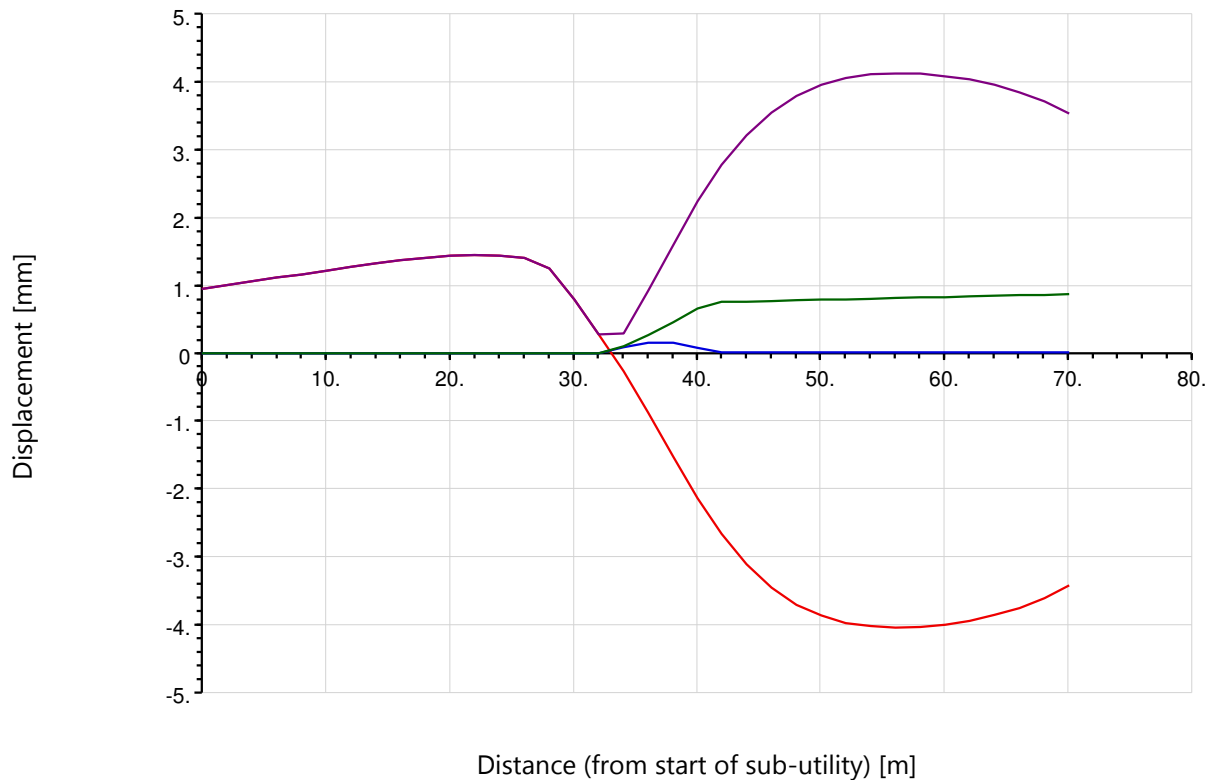
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 2: TWS(2)_1/1

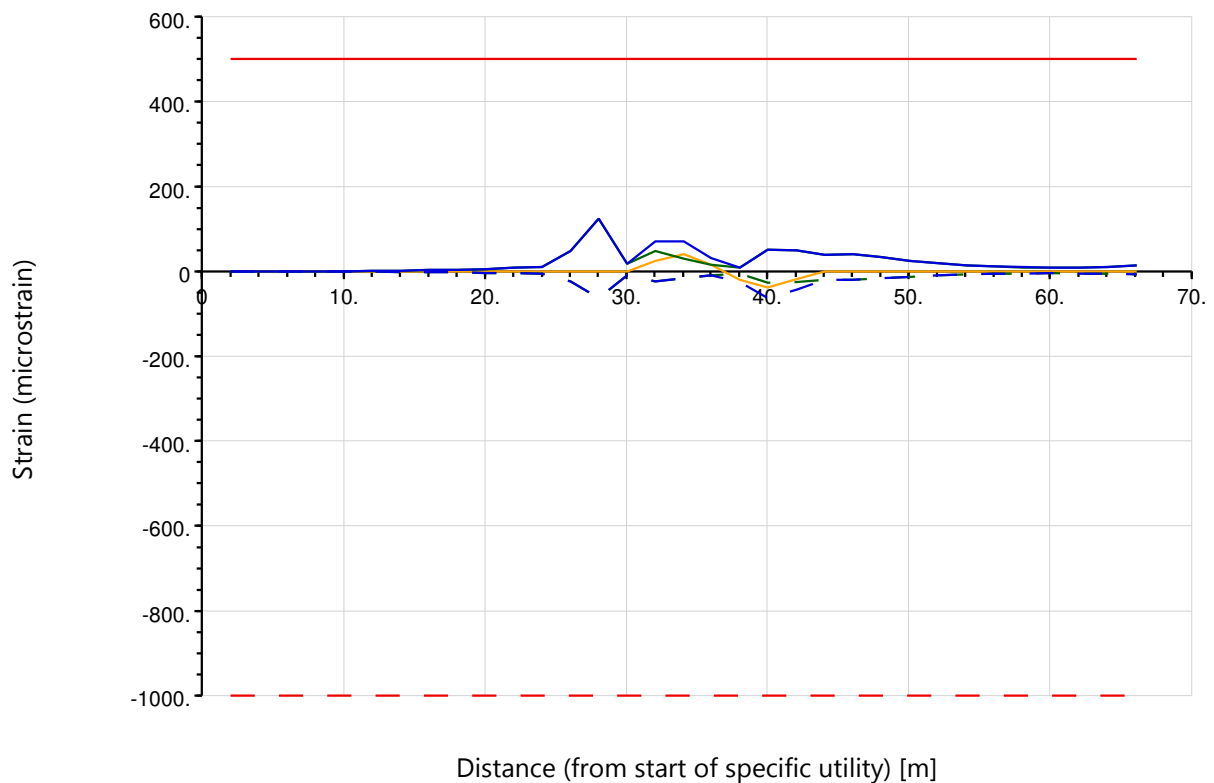
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 2: TWS(2)_1/1

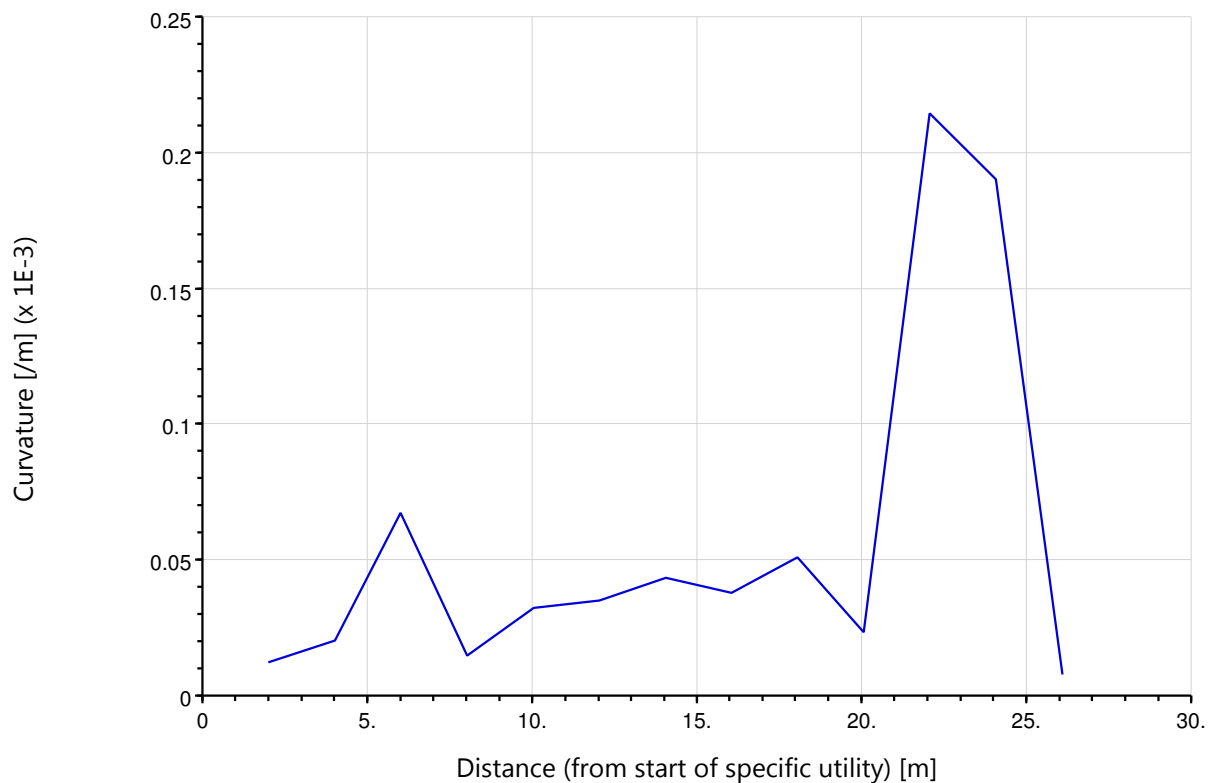
- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 3: TWS(2)_2/1

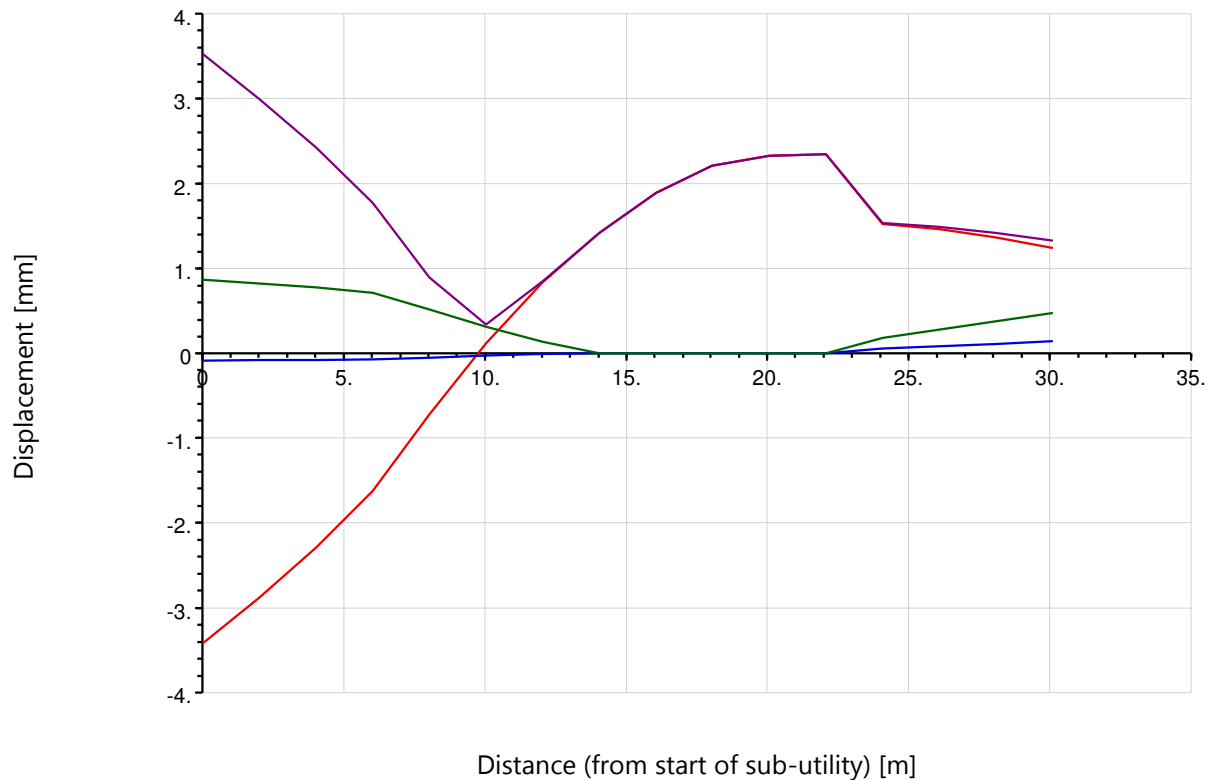
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 3: TWS(2)_2/1

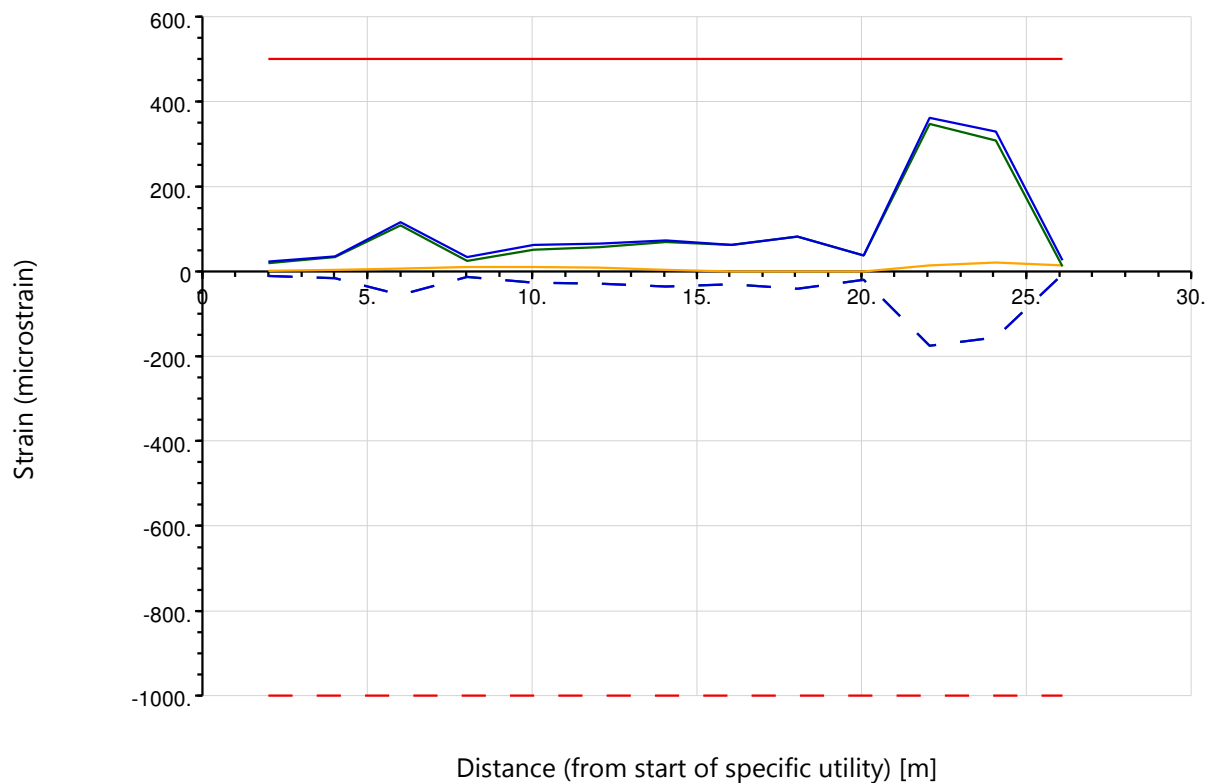
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 3: TWS(2)_2/1

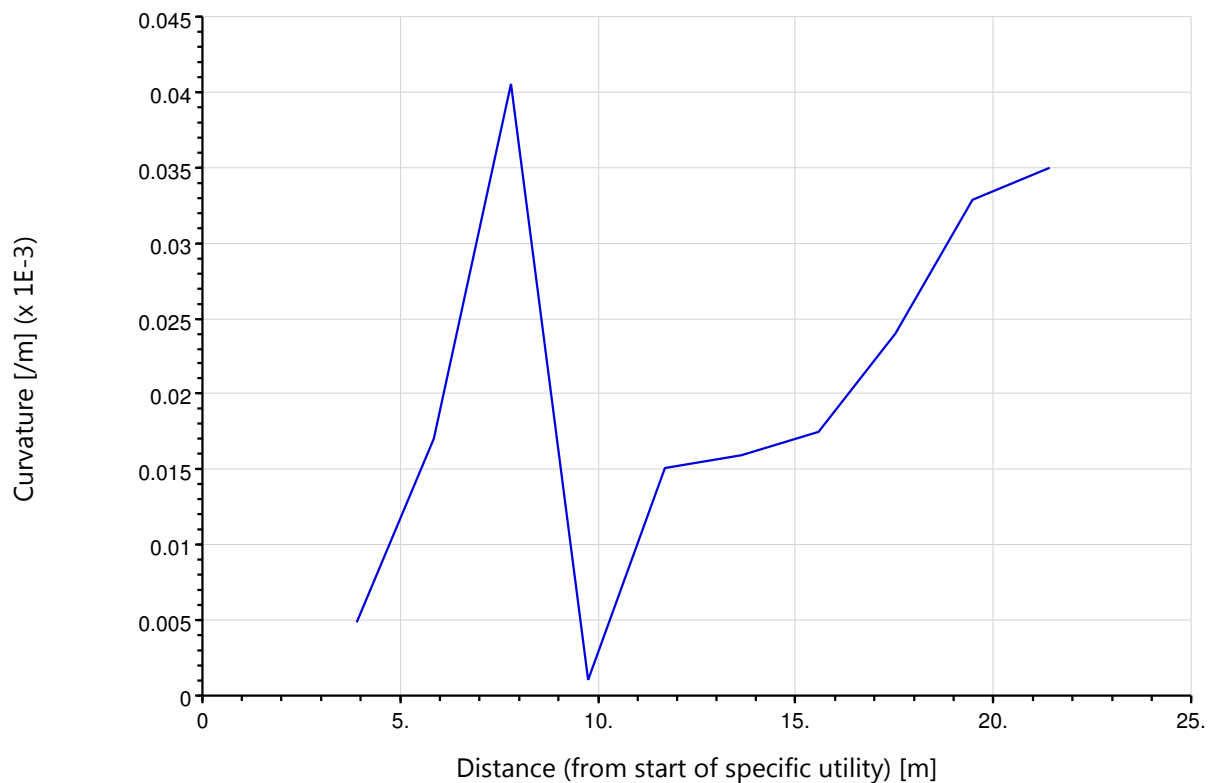
- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 4: TWS(2)_3/1

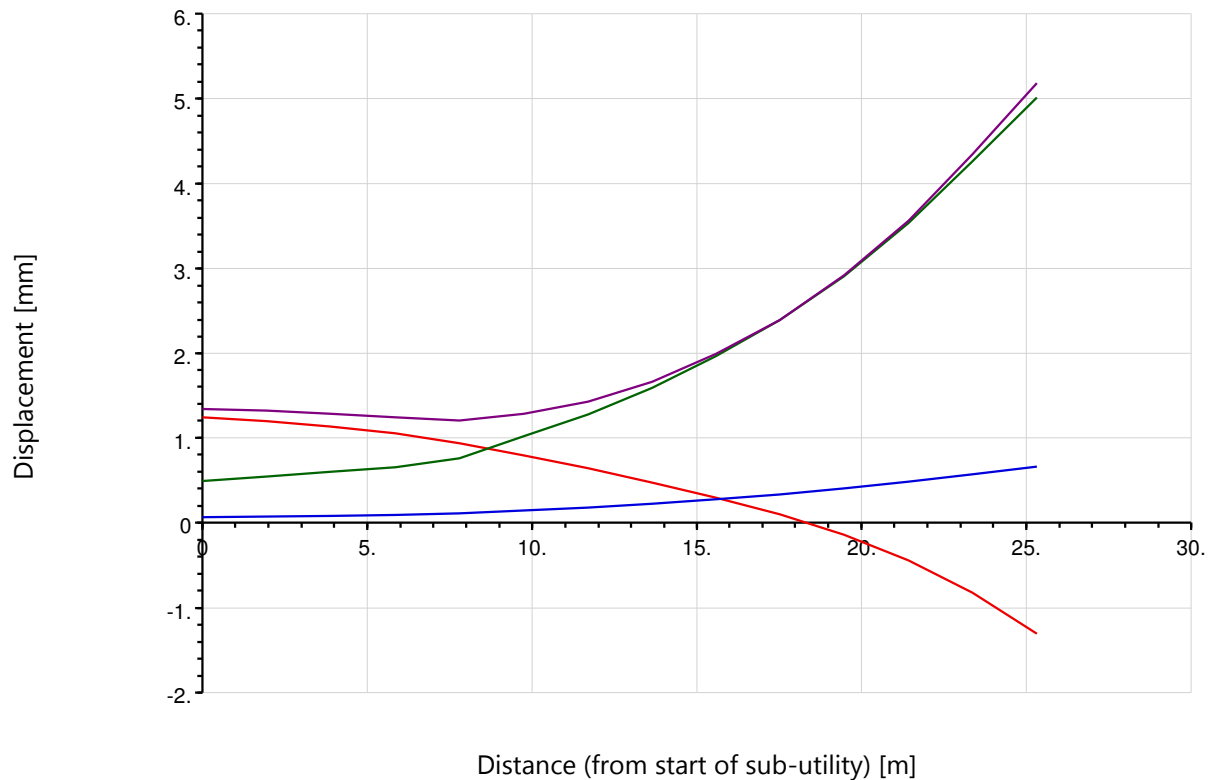
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 4: TWS(2)_3/1

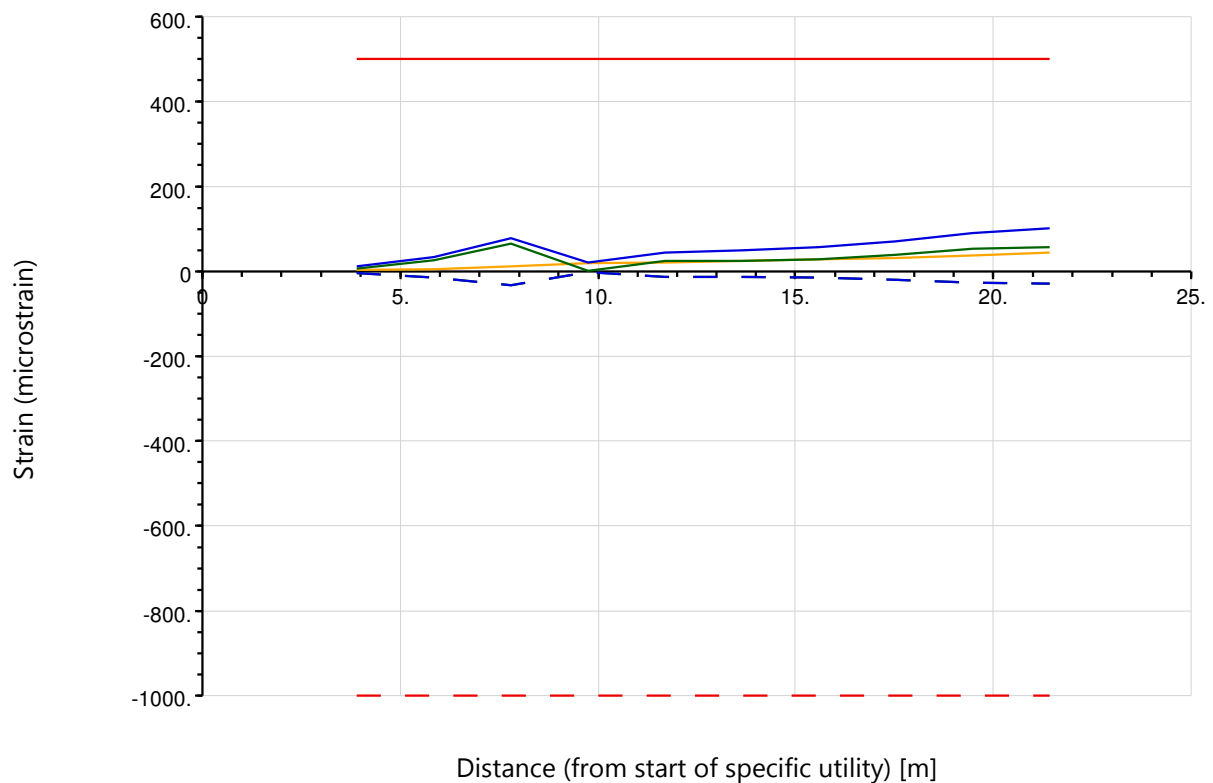
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 4: TWS(2)_3/1

- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- Combined Compressive Strain (factored)
- Allowable Tensile Strain
- Allowable Compressive Strain

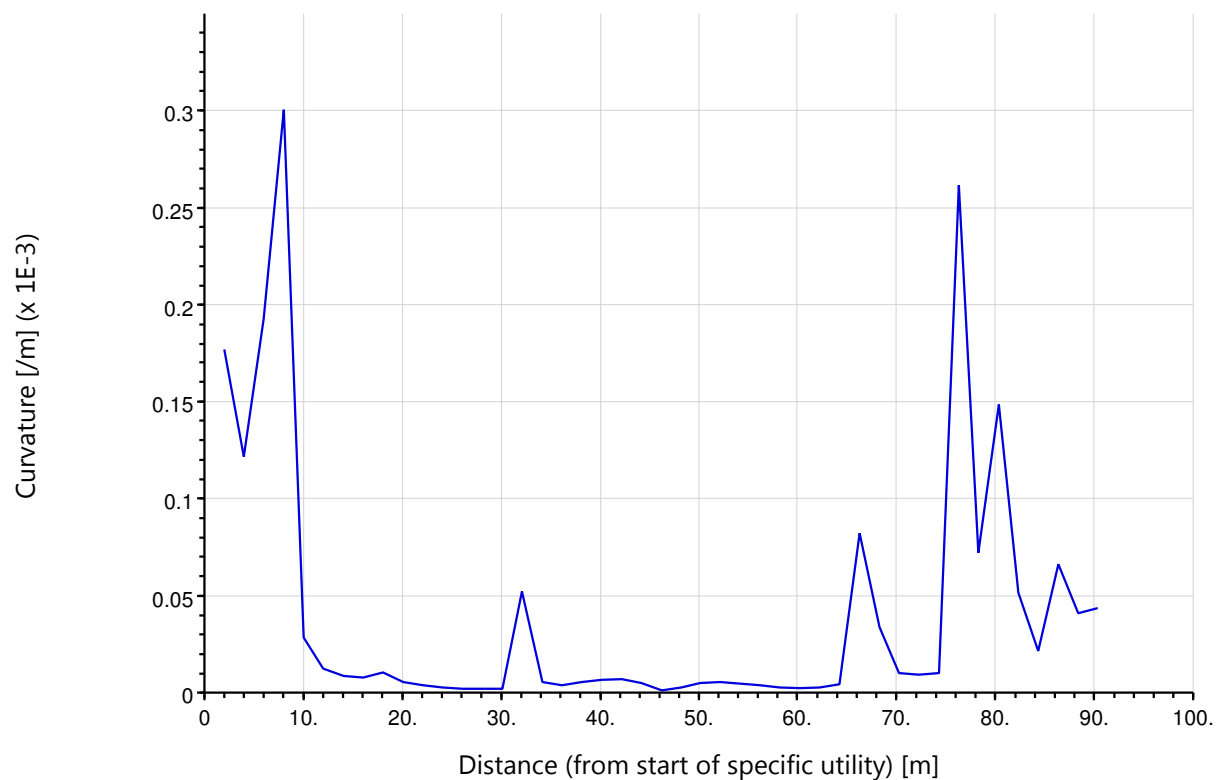


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Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 5: TWS(2)_4/1

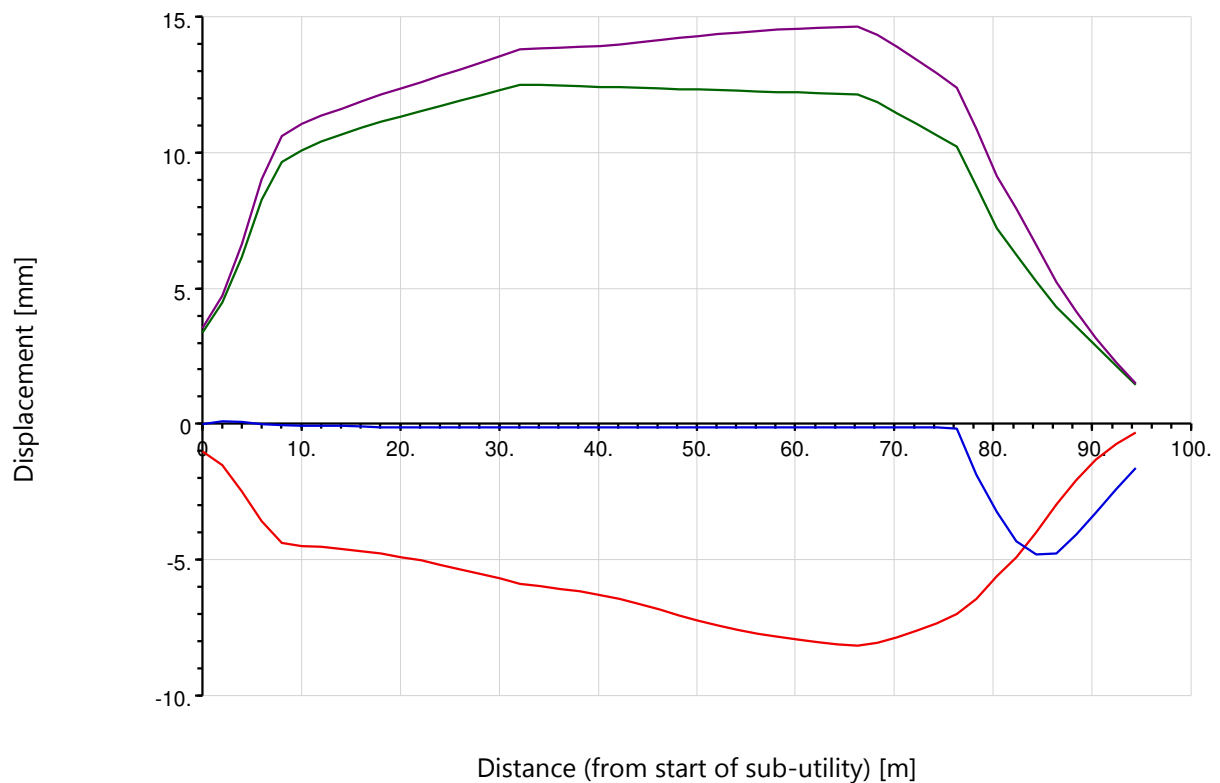
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 5: TWS(2)_4/1

- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 5: TWS(2)_4/1

- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain

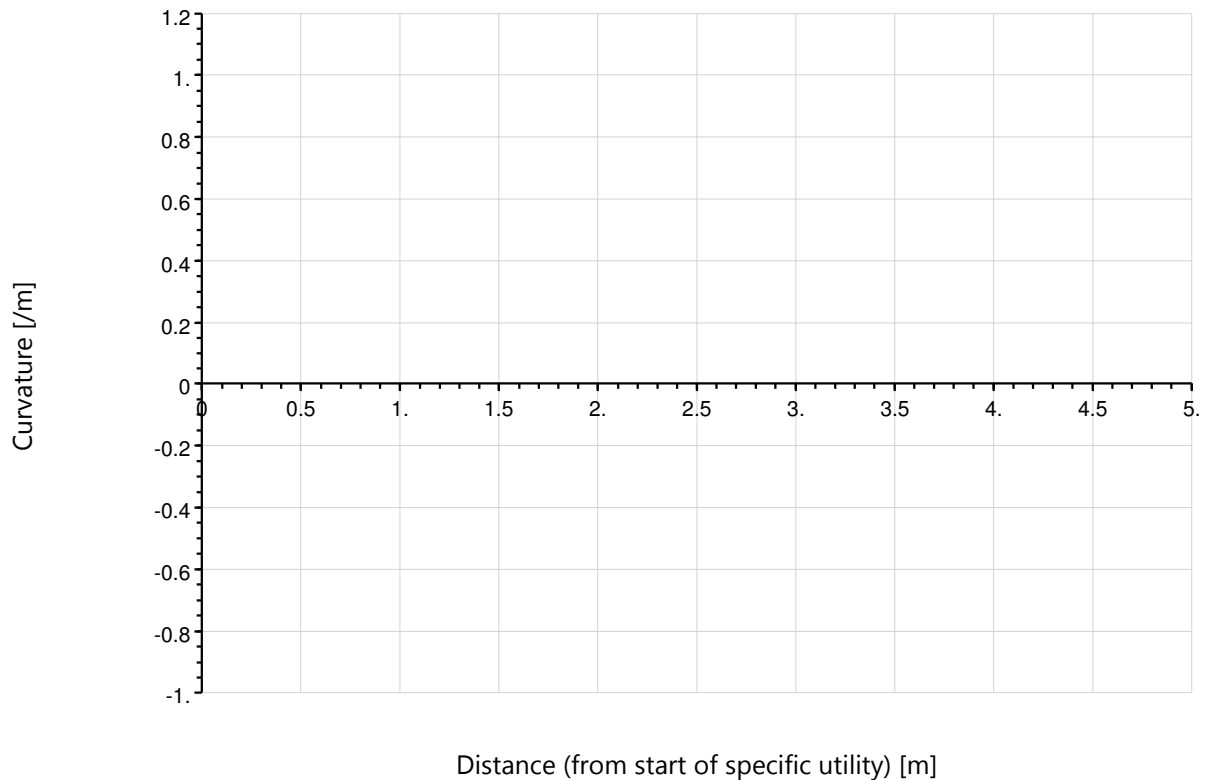


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Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 10: Assumed FW400 connection to TW2_1/1

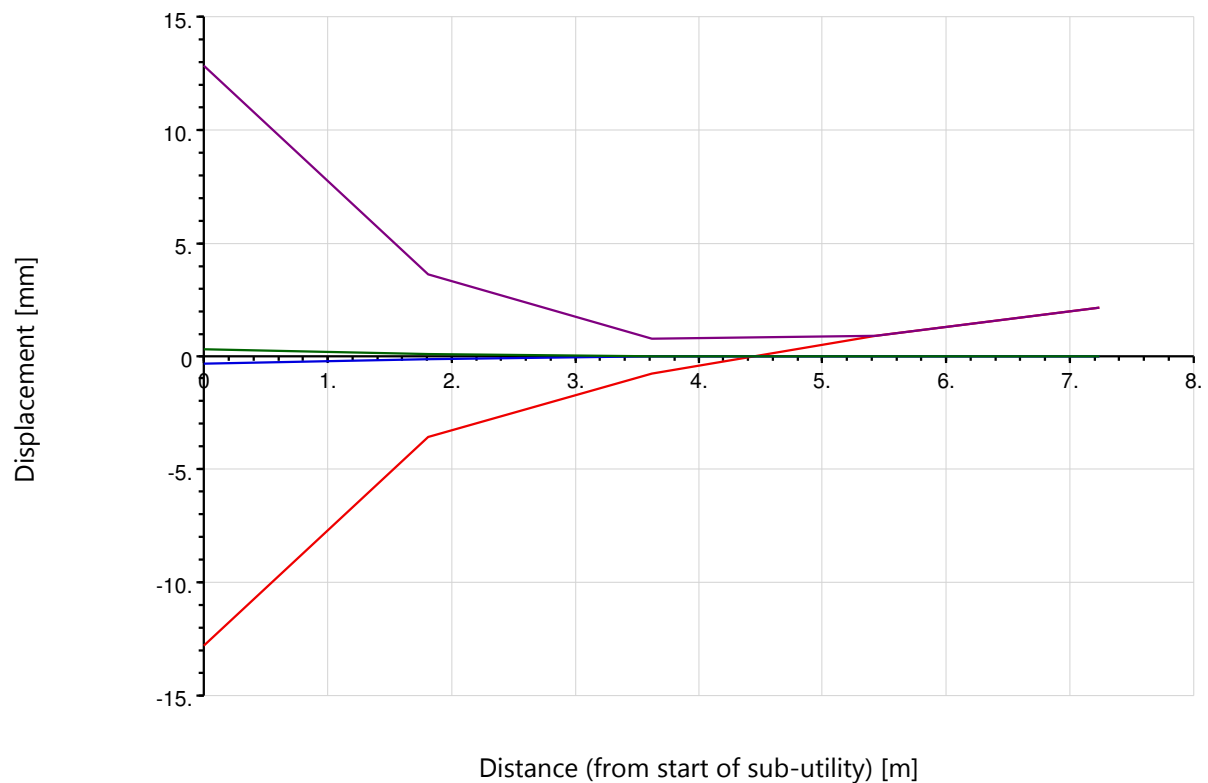
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 10: Assumed FW400 connection to TW2_1/1

- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)

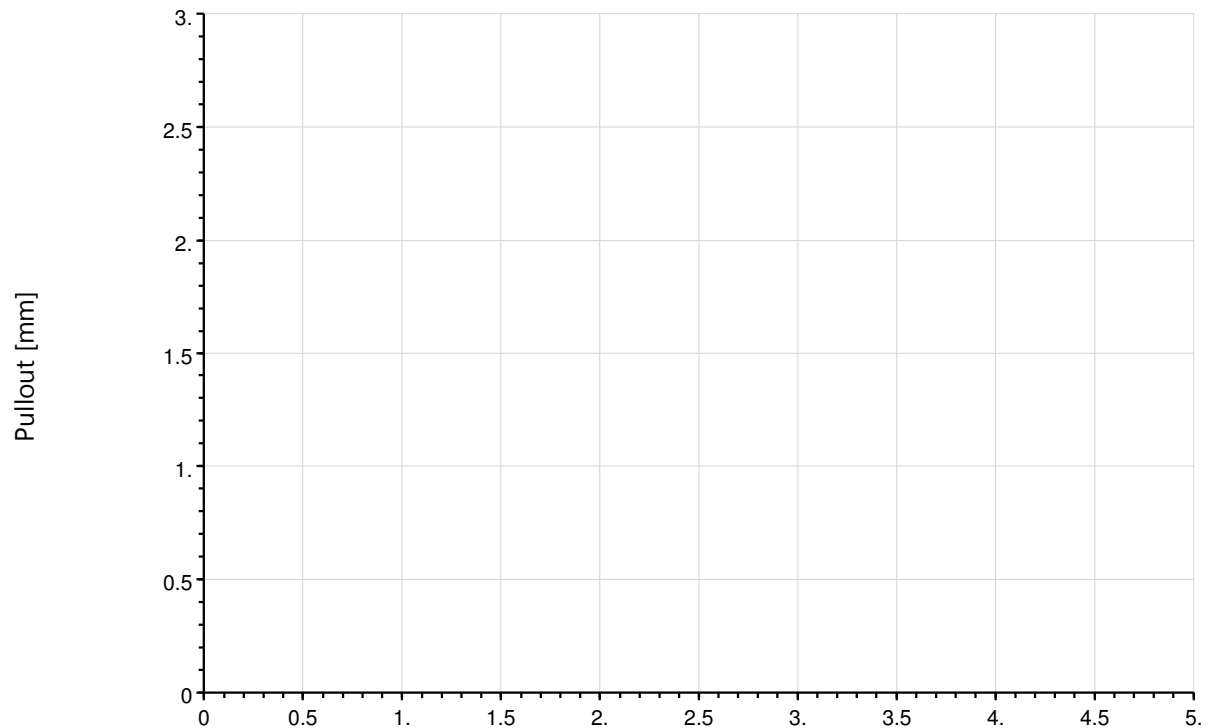


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Specific Utility - Pullout Chart

Stage: Base model, Specific Utility 10: Assumed FW400 connection to TW2_1/1

- - - Axial Pullout (factored)
- - - Flexural Pullout (factored)
- Total Pullout (factored)
- Total Pullout Limit



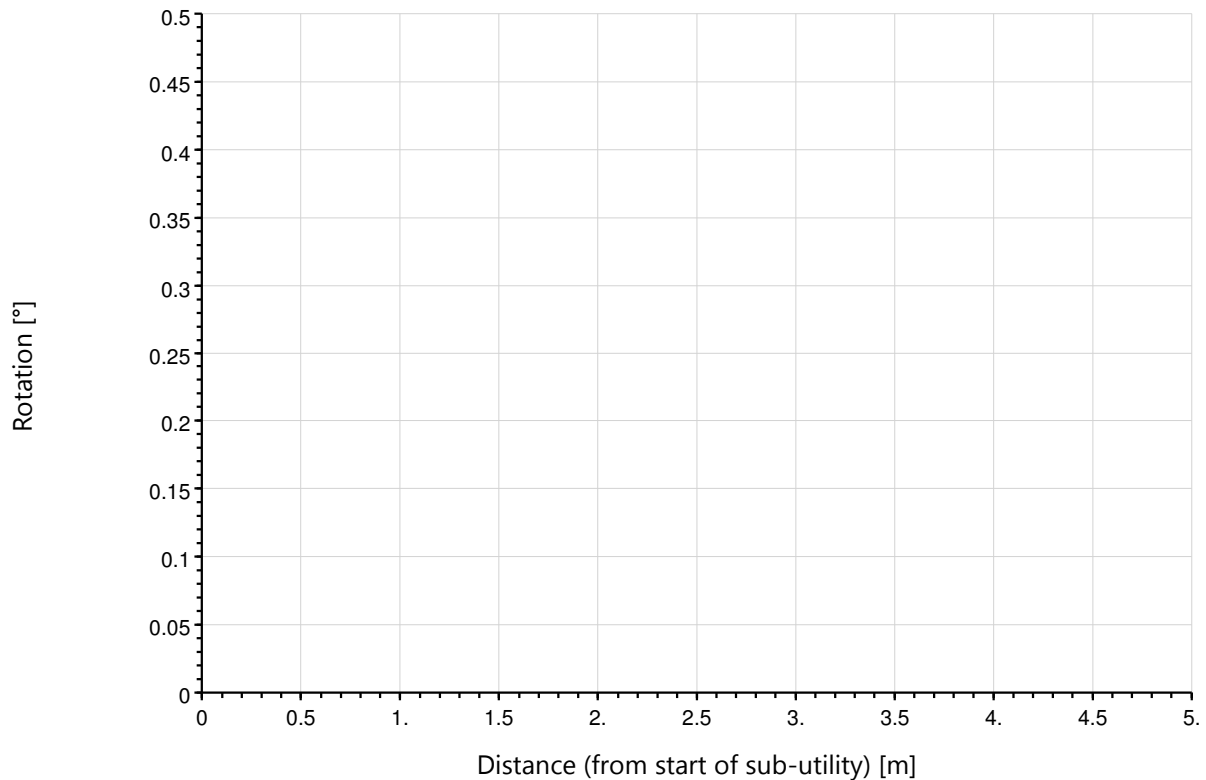
Distance (from start of sub-utility) [m] Note: Total pullout ignores the axial component where this is negative (i.e. comp

Specific Utility - Rotation Chart

Stage: Base model, Specific Utility 10: Assumed FW400 connection to TW2_1/1

— Rotation (factored)

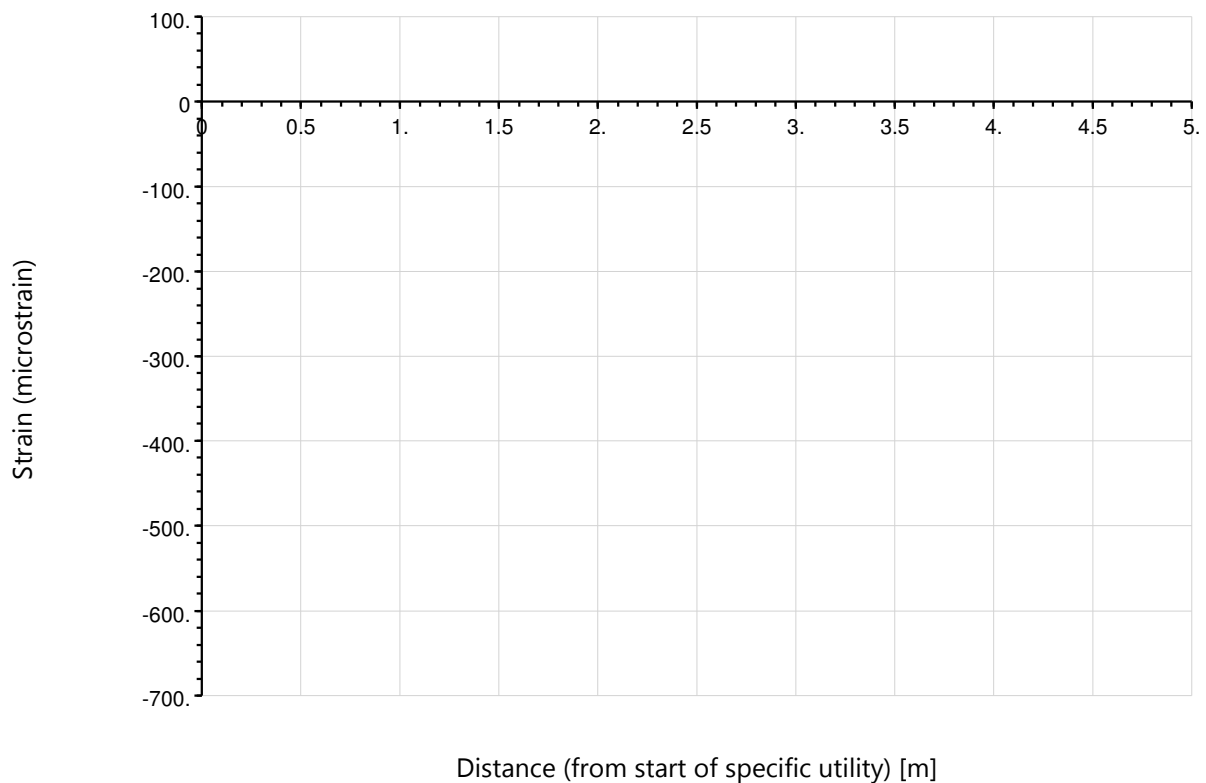
— Rotation Limit



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 10: Assumed FW400 connection to TW2, 1/1

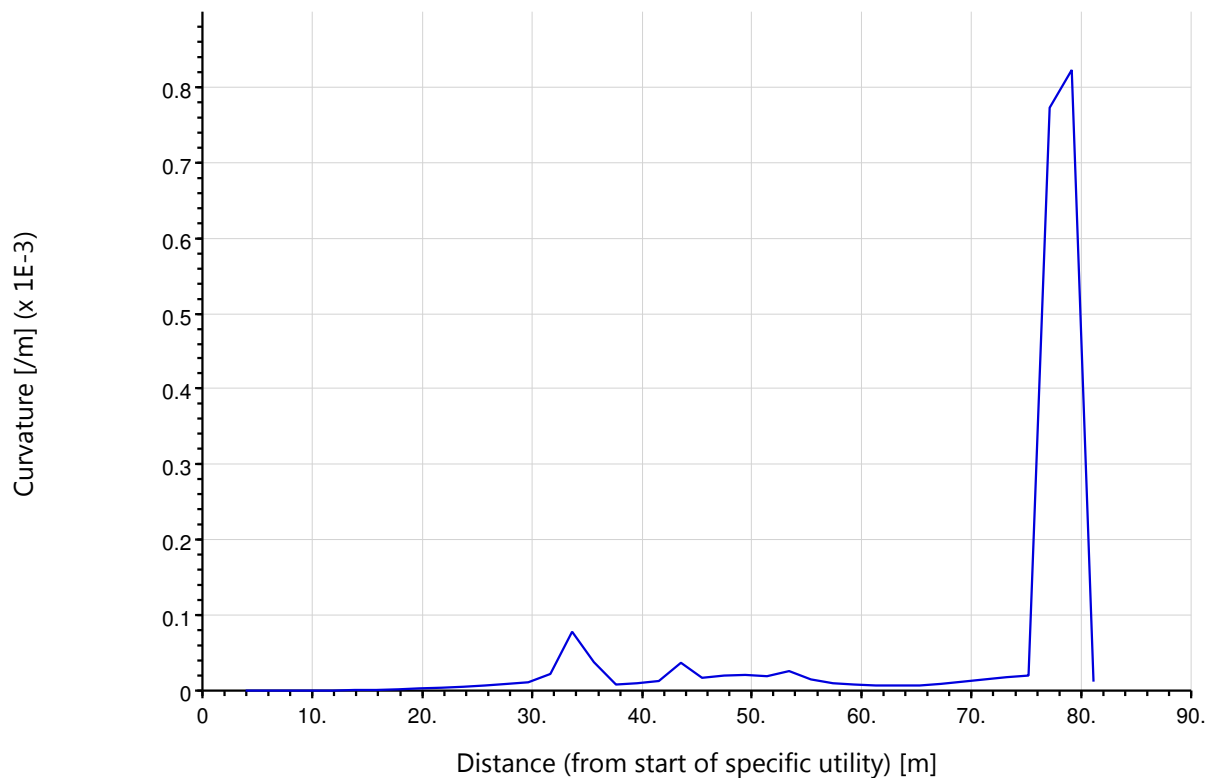
- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- Combined Compressive Strain (factored)
- Allowable Tensile Strain
- Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 6: TW Fresh Water (a) - St Pancras/1

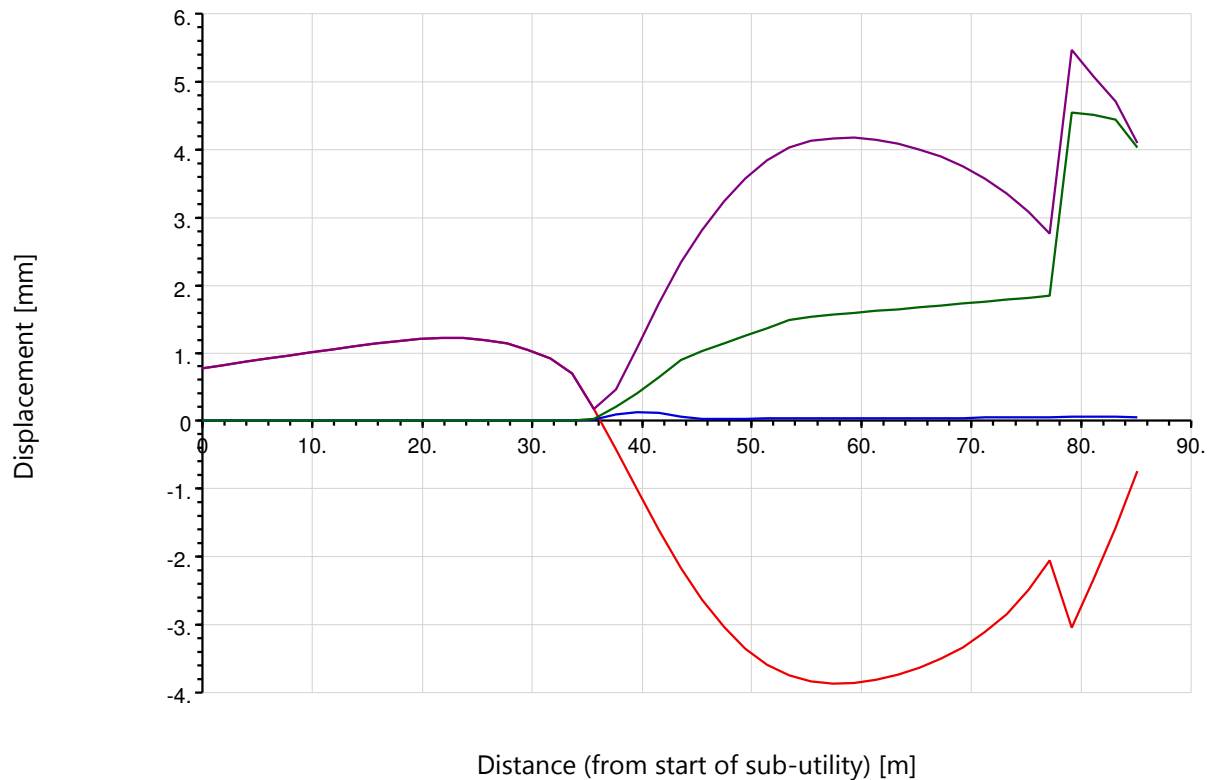
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 6: TW Fresh Water (a) - St Pancras/1

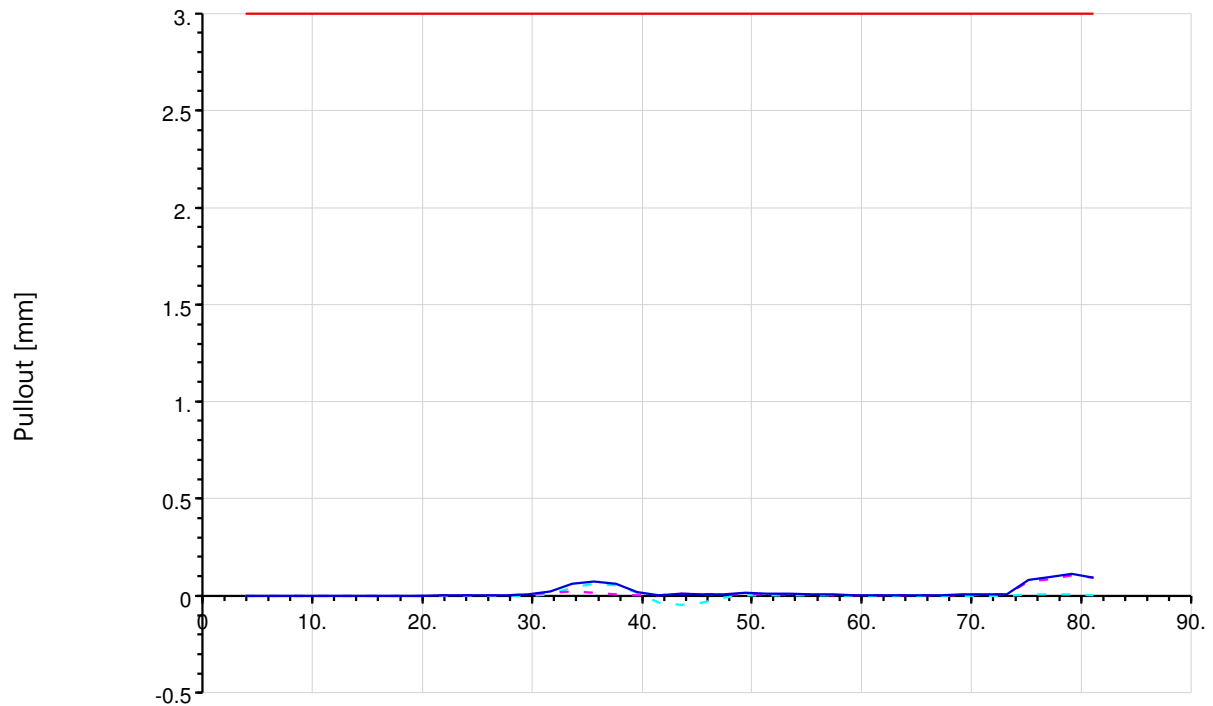
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - Pullout Chart

Stage: Base model, Specific Utility 6: TW Fresh Water (a) - St Pancras/1

- - - Axial Pullout (factored)
- - - Flexural Pullout (factored)
- Total Pullout (factored)
- Total Pullout Limit



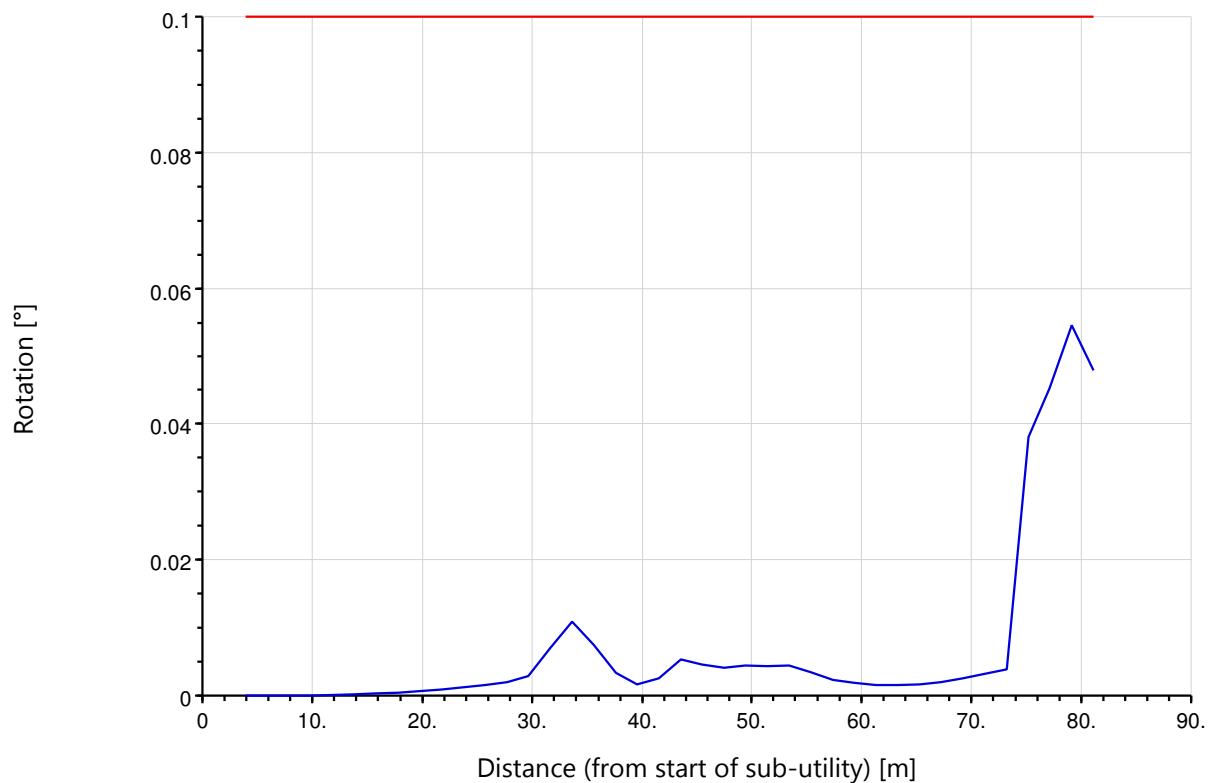
Distance (from start of sub-utility) [m] Note: Total pullout ignores the axial component where this is negative (i.e. comp

Specific Utility - Rotation Chart

Stage: Base model, Specific Utility 6: TW Fresh Water (a) - St Pancras/1

— Rotation (factored)

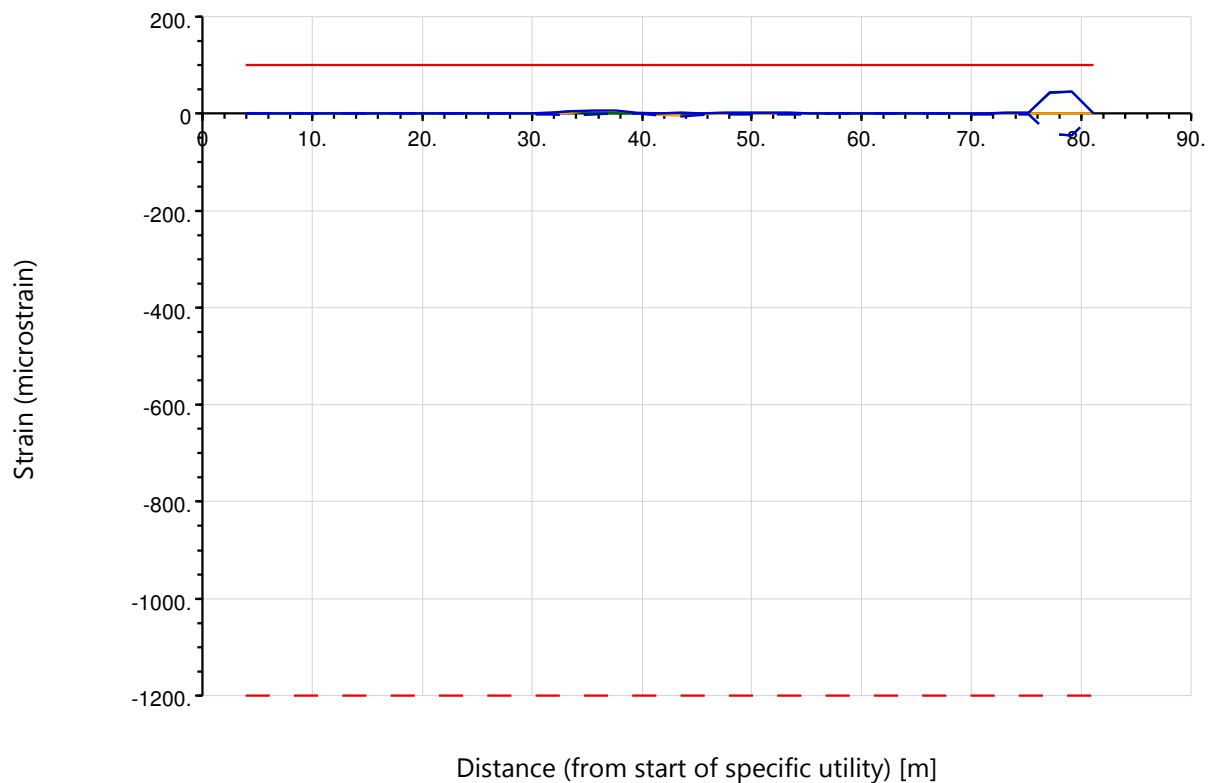
— Rotation Limit



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 6: TW Fresh Water (a) - St Pancras/1

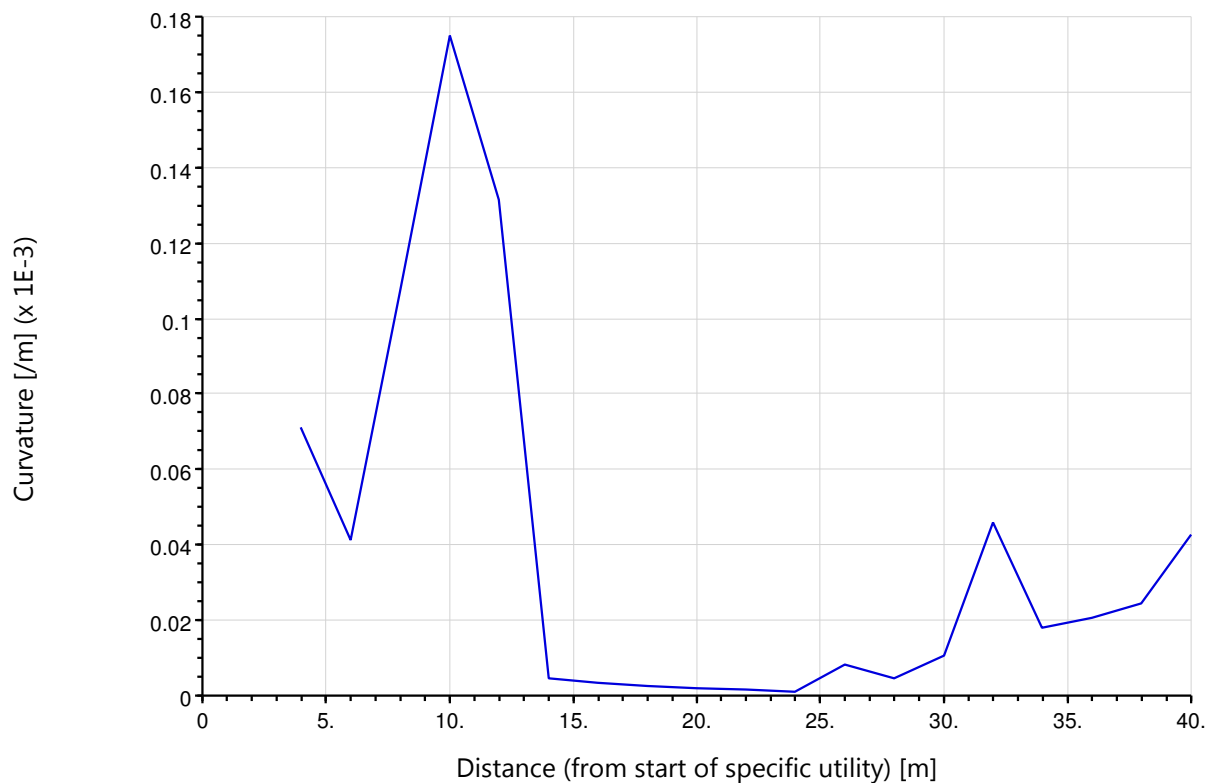
- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 7: TW Fresh Water (b) - St Pancras/1

— Curvature

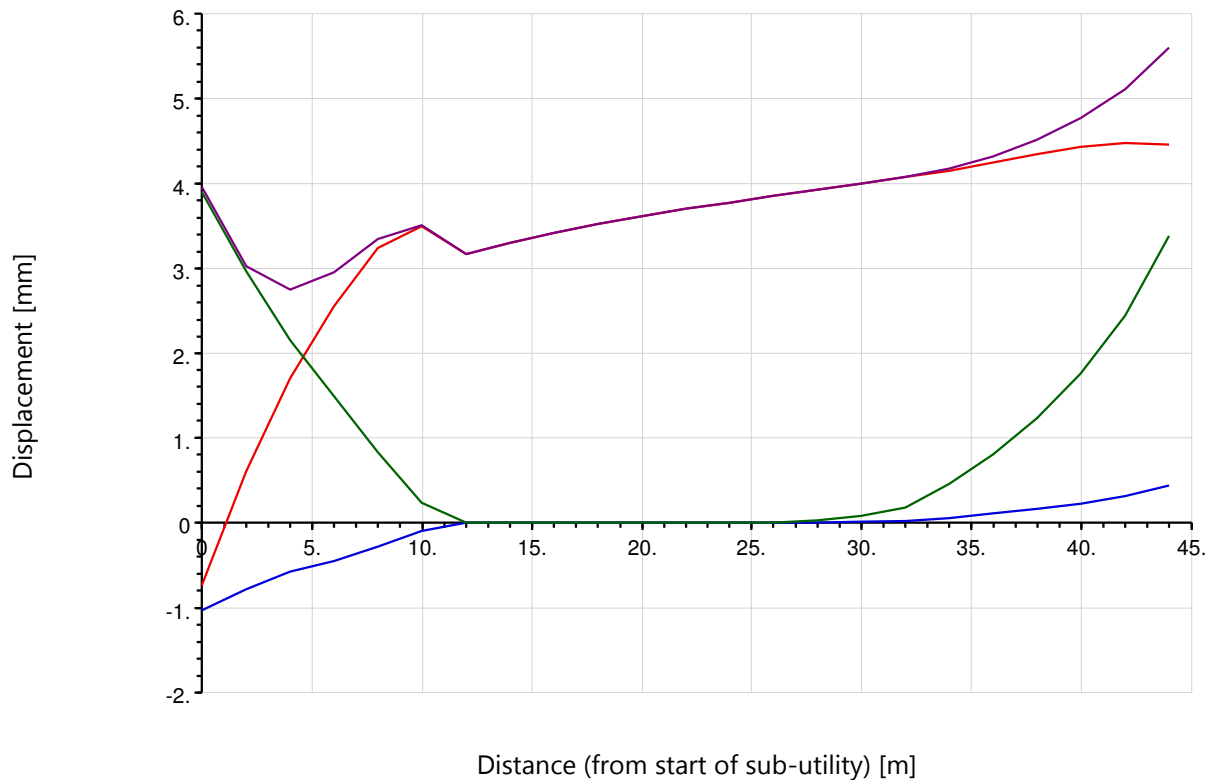


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Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 7: TW Fresh Water (b) - St Pancras/1

- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)

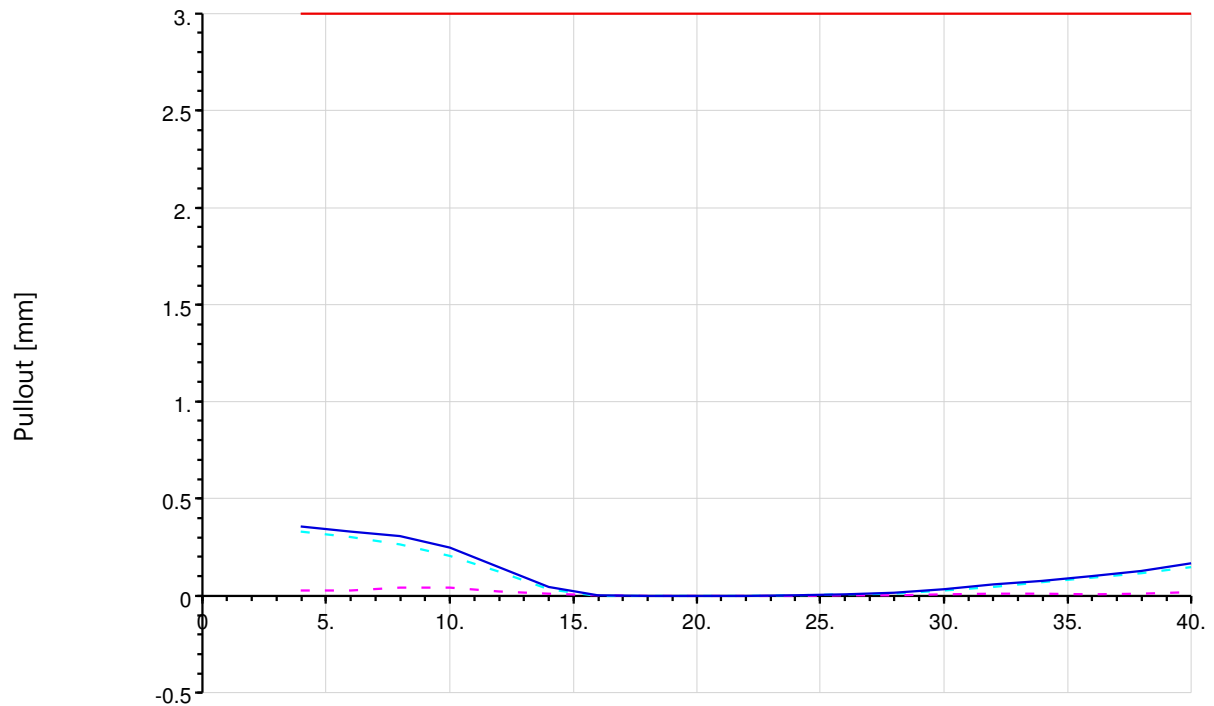


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Specific Utility - Pullout Chart

Stage: Base model, Specific Utility 7: TW Fresh Water (b) - St Pancras/1

- - - Axial Pullout (factored)
- - - Flexural Pullout (factored)
- Total Pullout (factored)
- Total Pullout Limit



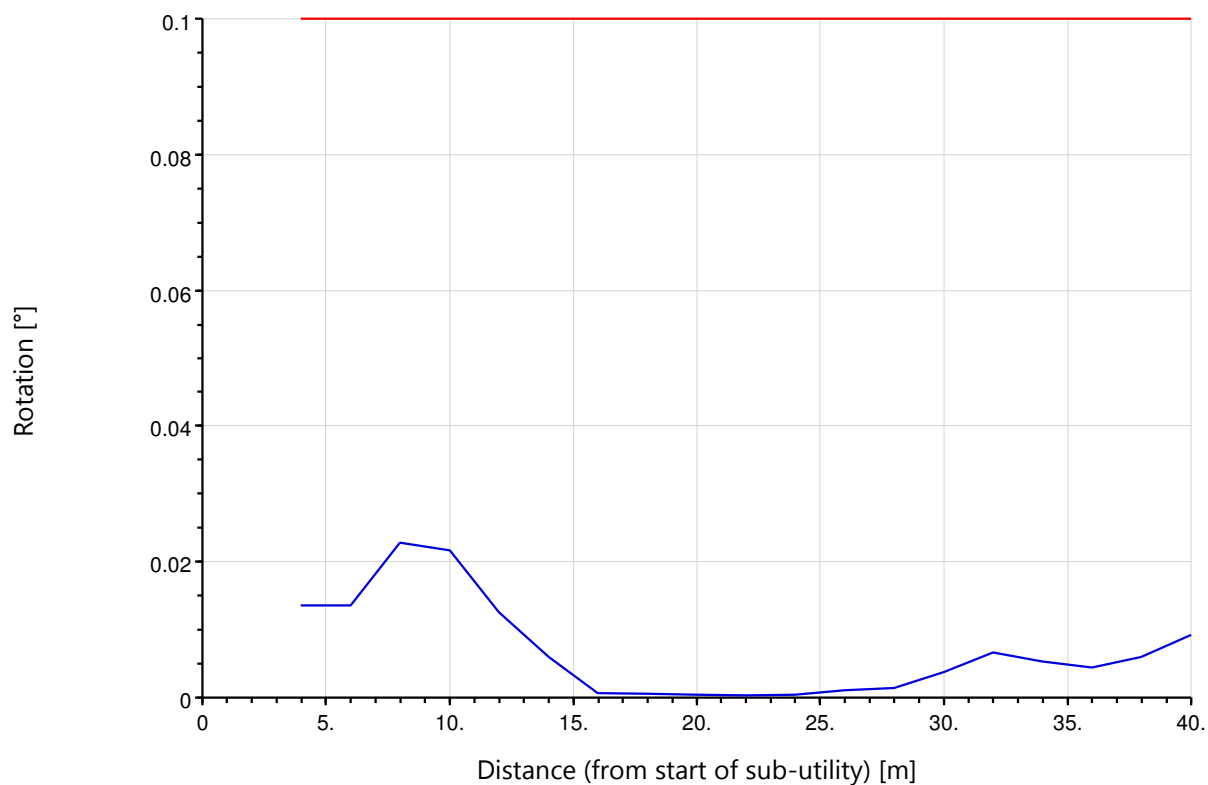
Distance (from start of sub-utility) [m] Note: Total pullout ignores the axial component where this is negative (i.e. comp

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Specific Utility - Rotation Chart

Stage: Base model, Specific Utility 7: TW Fresh Water (b) - St Pancras/1

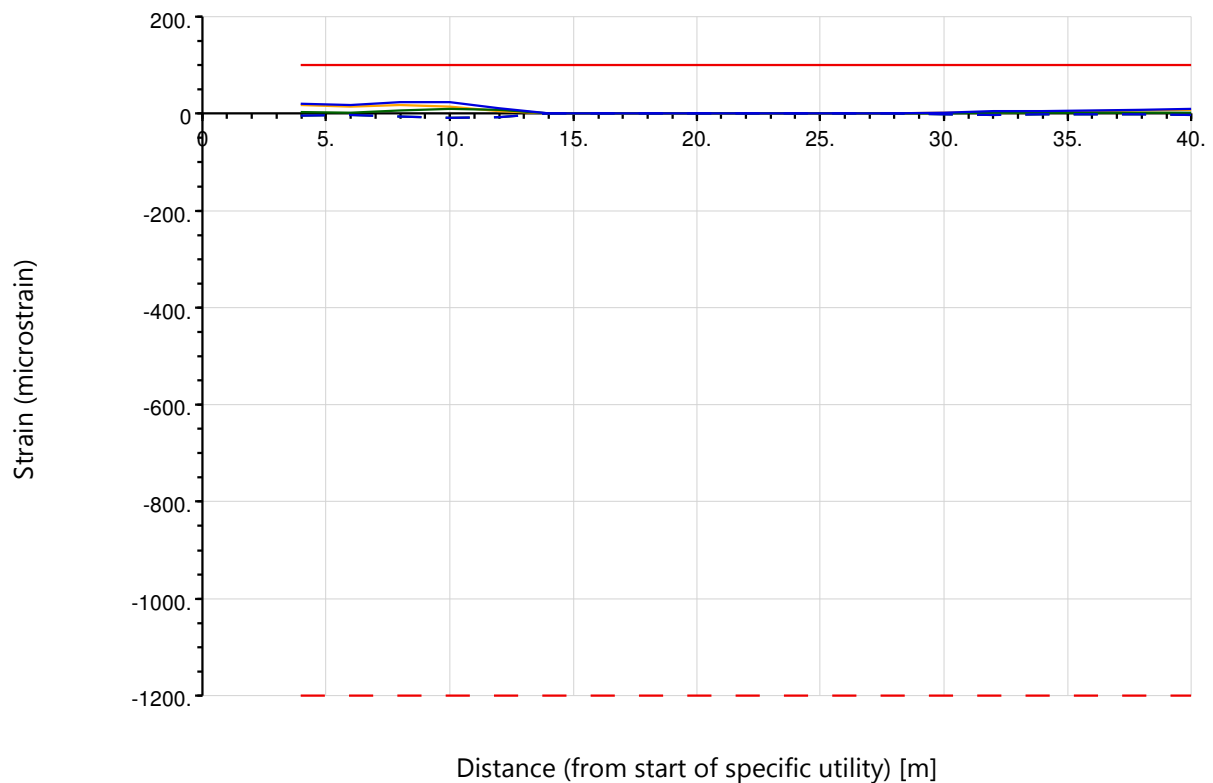
— Rotation (factored)
— Rotation Limit



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 7: TW Fresh Water (b) - St Pancras/1

- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain

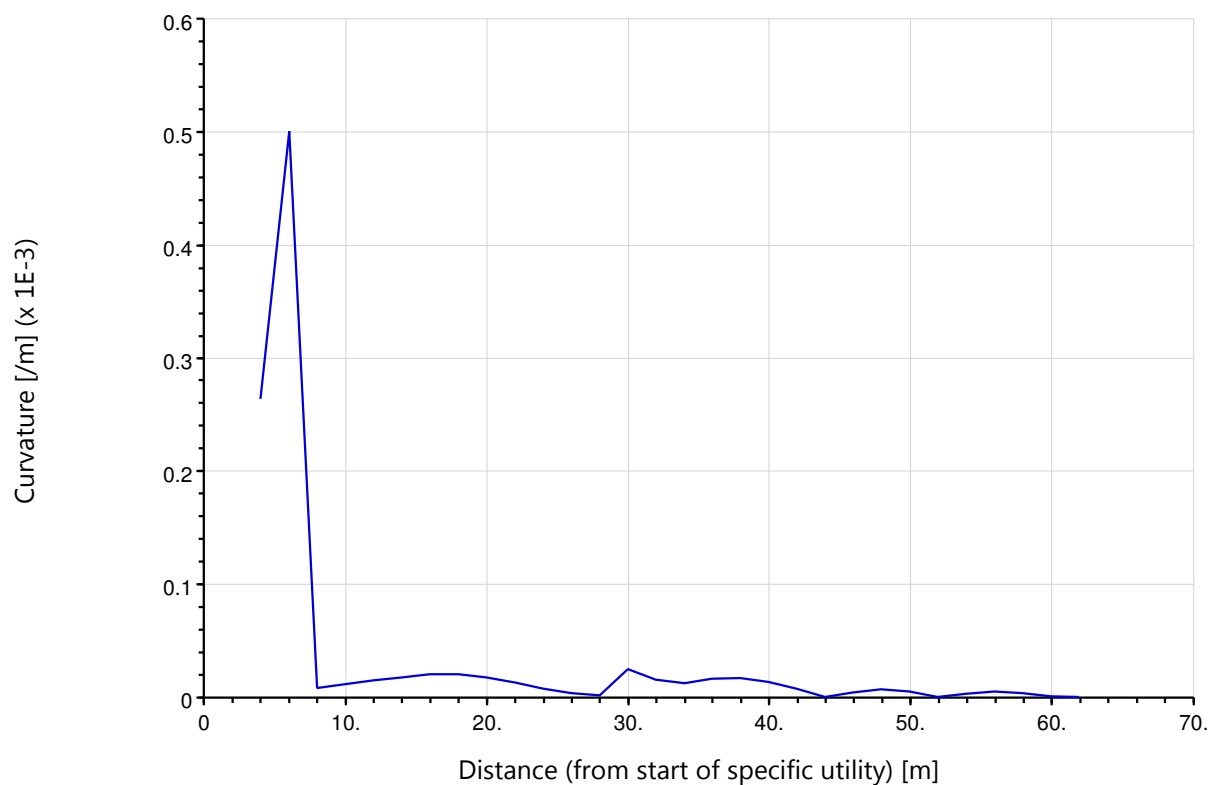


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Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 8: TW Fresh Water (c) - St Pancras/1

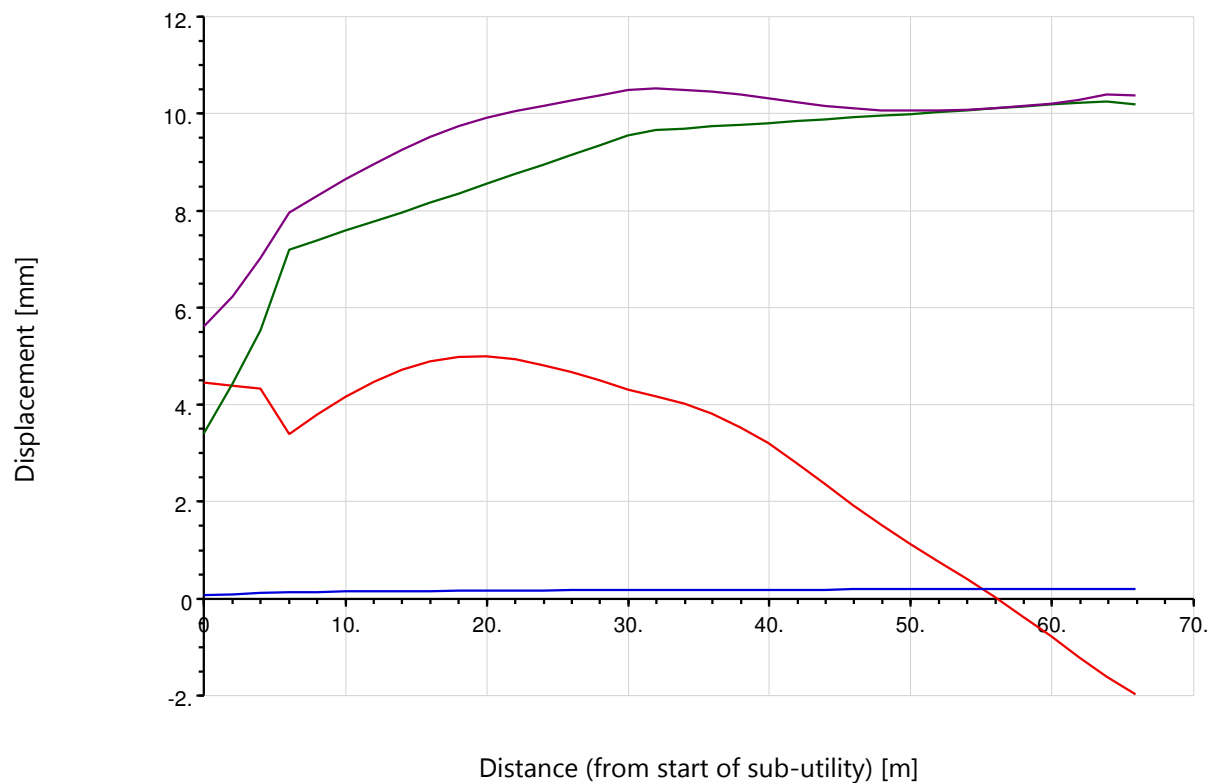
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 8: TW Fresh Water (c) - St Pancras/1

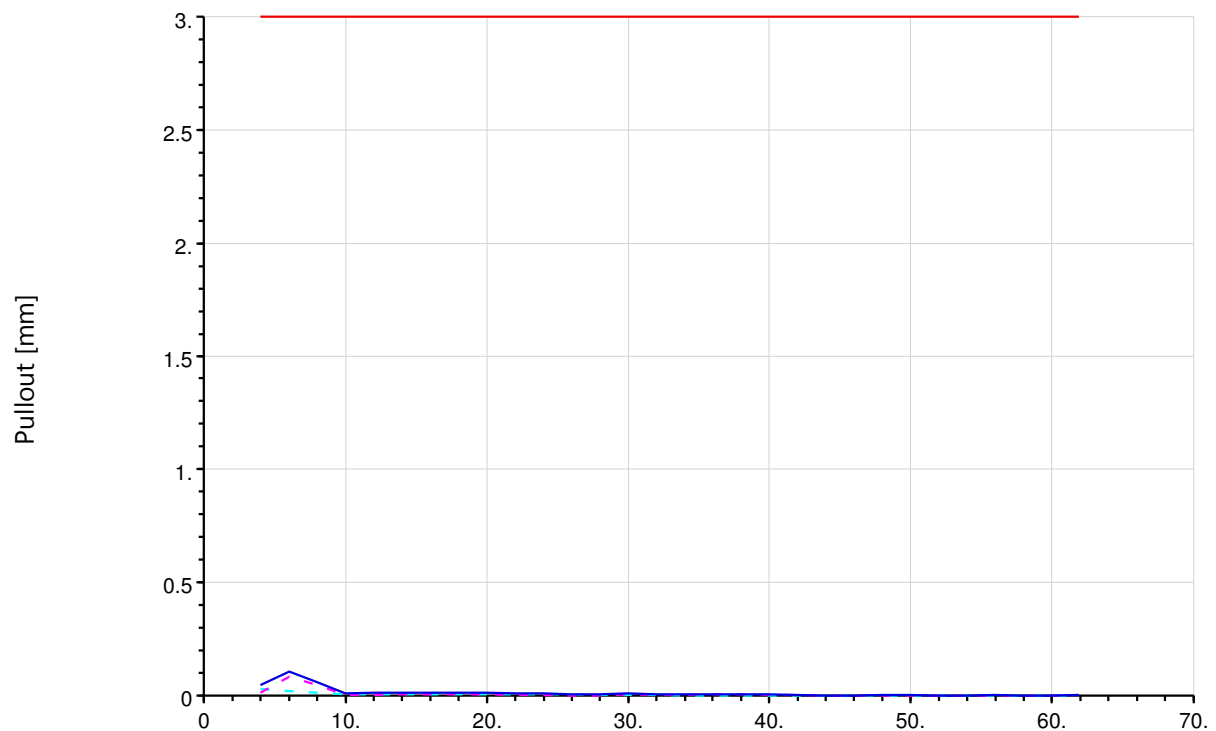
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - Pullout Chart

Stage: Base model, Specific Utility 8: TW Fresh Water (c) - St Pancras/1

- - - Axial Pullout (factored)
- - - Flexural Pullout (factored)
- Total Pullout (factored)
- Total Pullout Limit



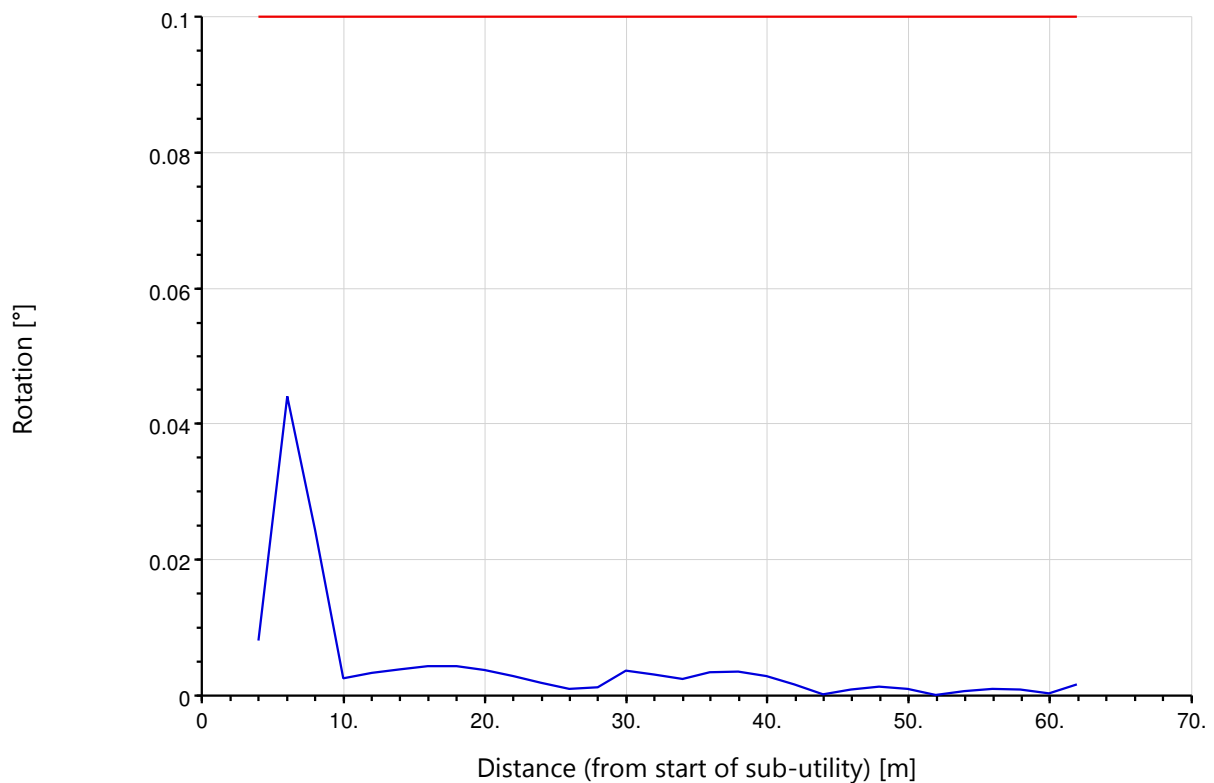
Distance (from start of sub-utility) [m] Note: Total pullout ignores the axial component where this is negative (i.e. comp

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Specific Utility - Rotation Chart

Stage: Base model, Specific Utility 8: TW Fresh Water (c) - St Pancras/1

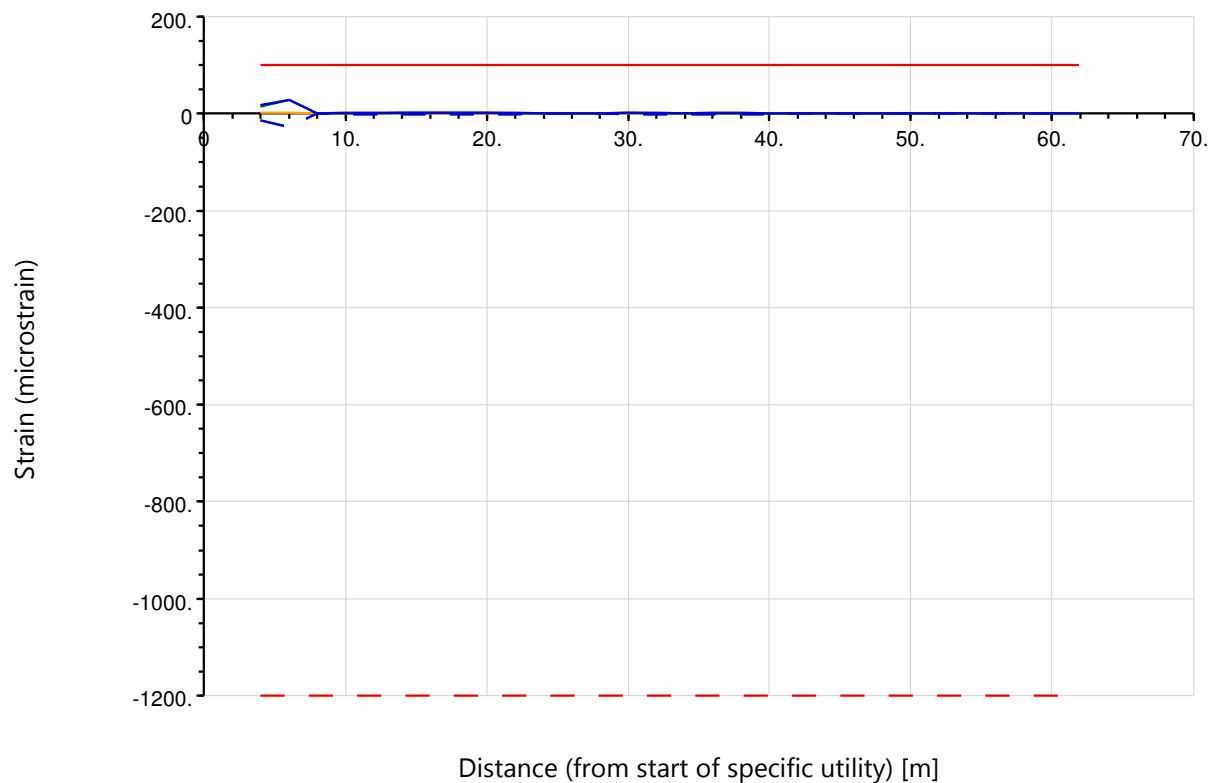
— Rotation (factored)
— Rotation Limit



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 8: TW Fresh Water (c) - St Pancras/1

- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain

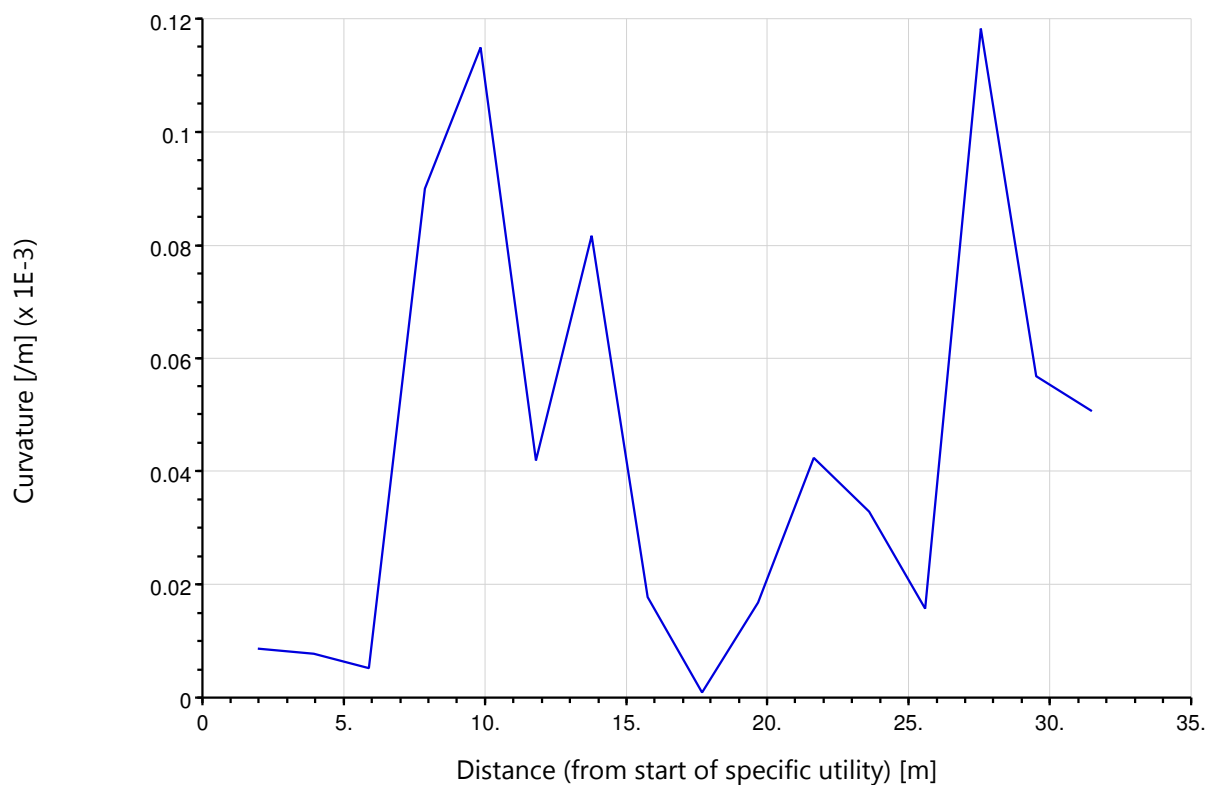


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Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 9: TW Fresh Water (d) - St Pancras/1

— Curvature

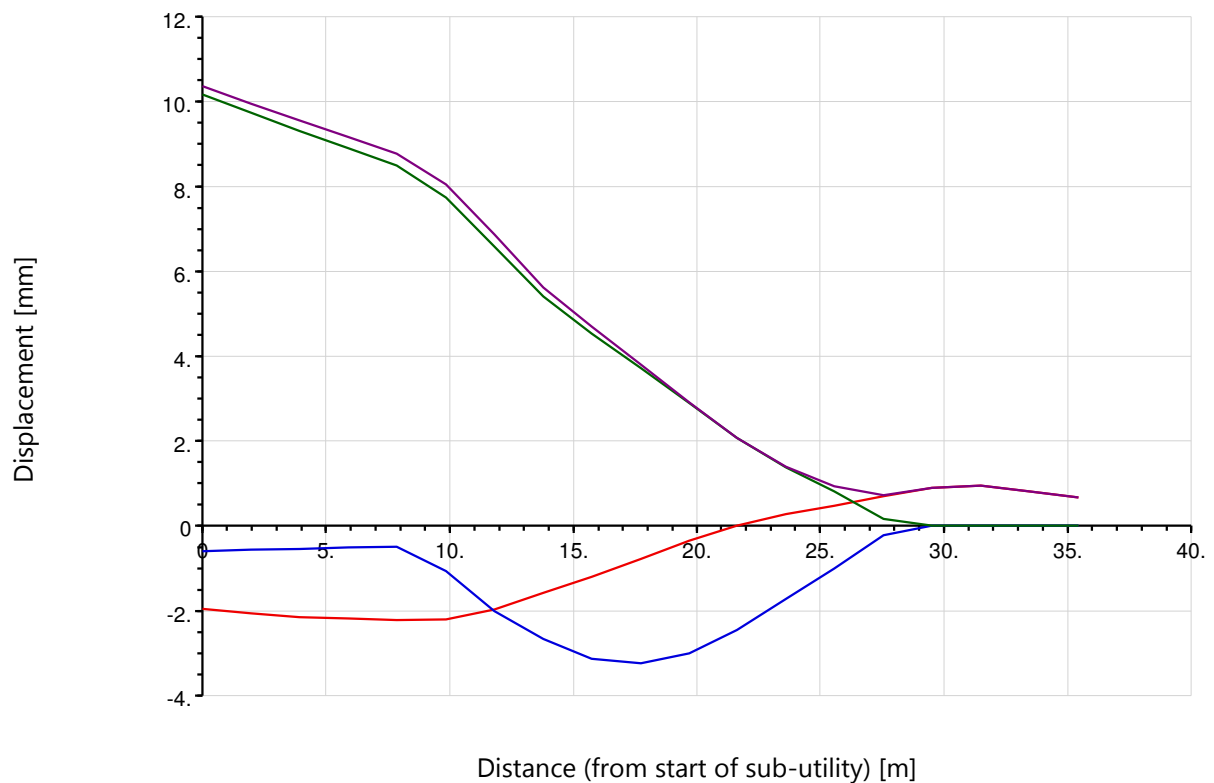


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Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 9: TW Fresh Water (d) - St Pancras/1

- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)

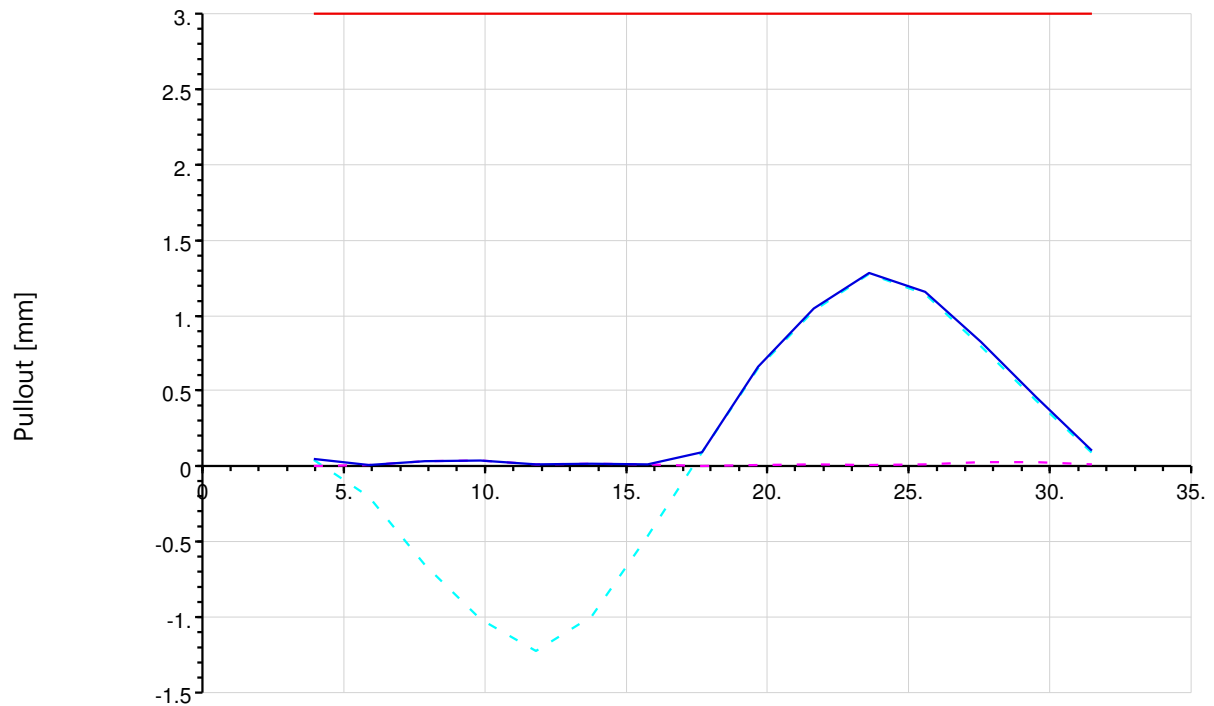


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Specific Utility - Pullout Chart

Stage: Base model, Specific Utility 9: TW Fresh Water (d) - St Pancras/1

- - - Axial Pullout (factored)
- - - Flexural Pullout (factored)
- Total Pullout (factored)
- Total Pullout Limit



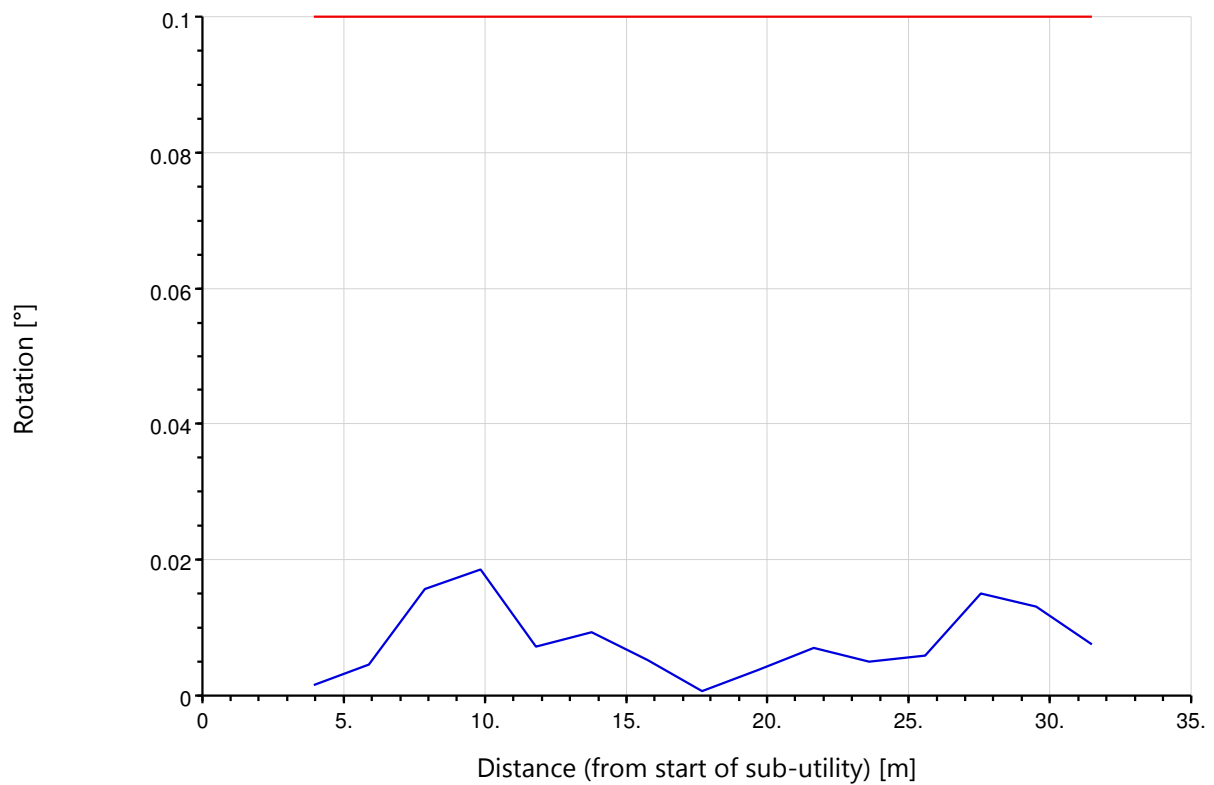
Distance (from start of sub-utility) [m] Note: Total pullout ignores the axial component where this is negative (i.e. comp

Specific Utility - Rotation Chart

Stage: Base model, Specific Utility 9: TW Fresh Water (d) - St Pancras/1

— Rotation (factored)

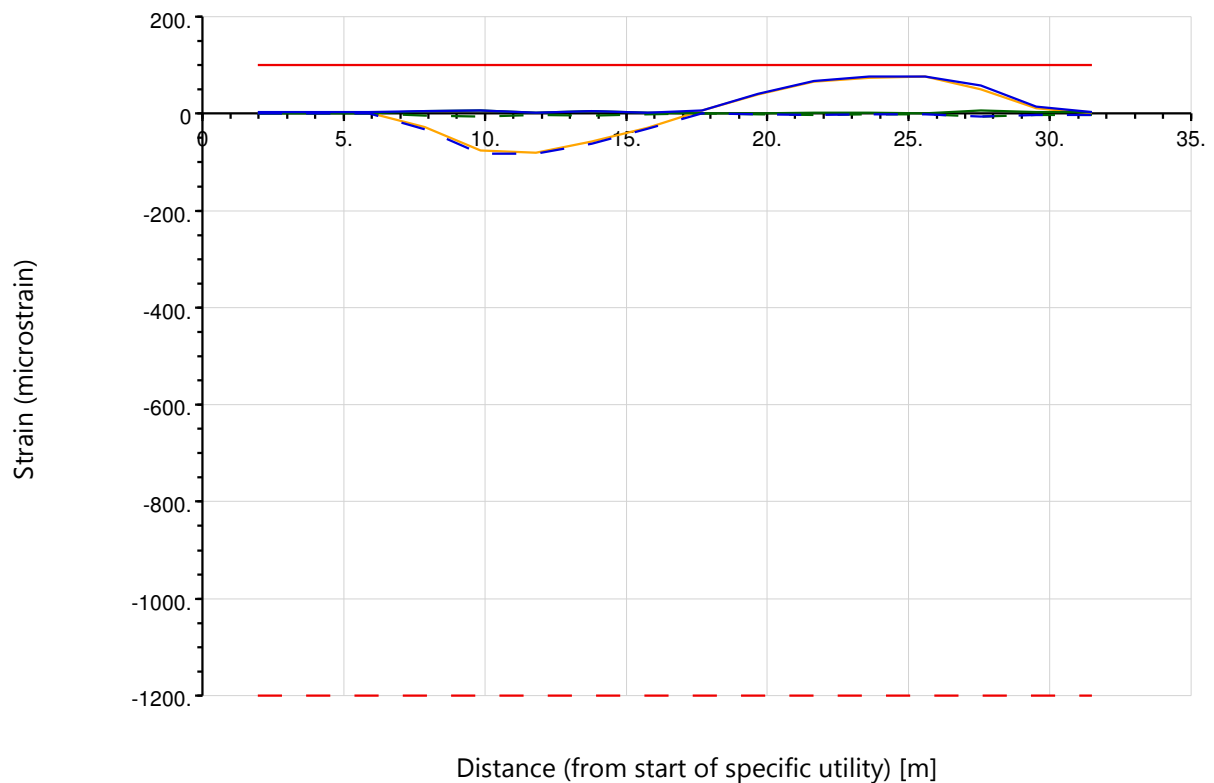
— Rotation Limit



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 9: TW Fresh Water (d) - St Pancras/1

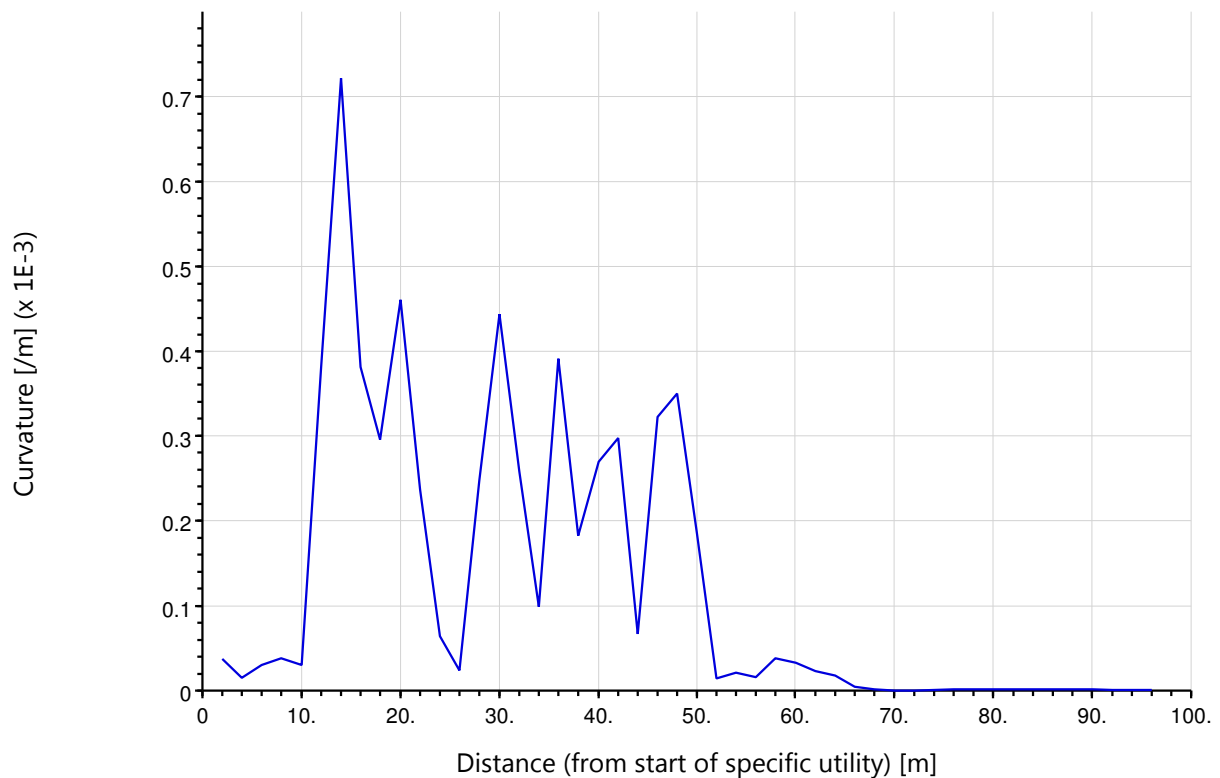
- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 1: TWS(1)_1/1

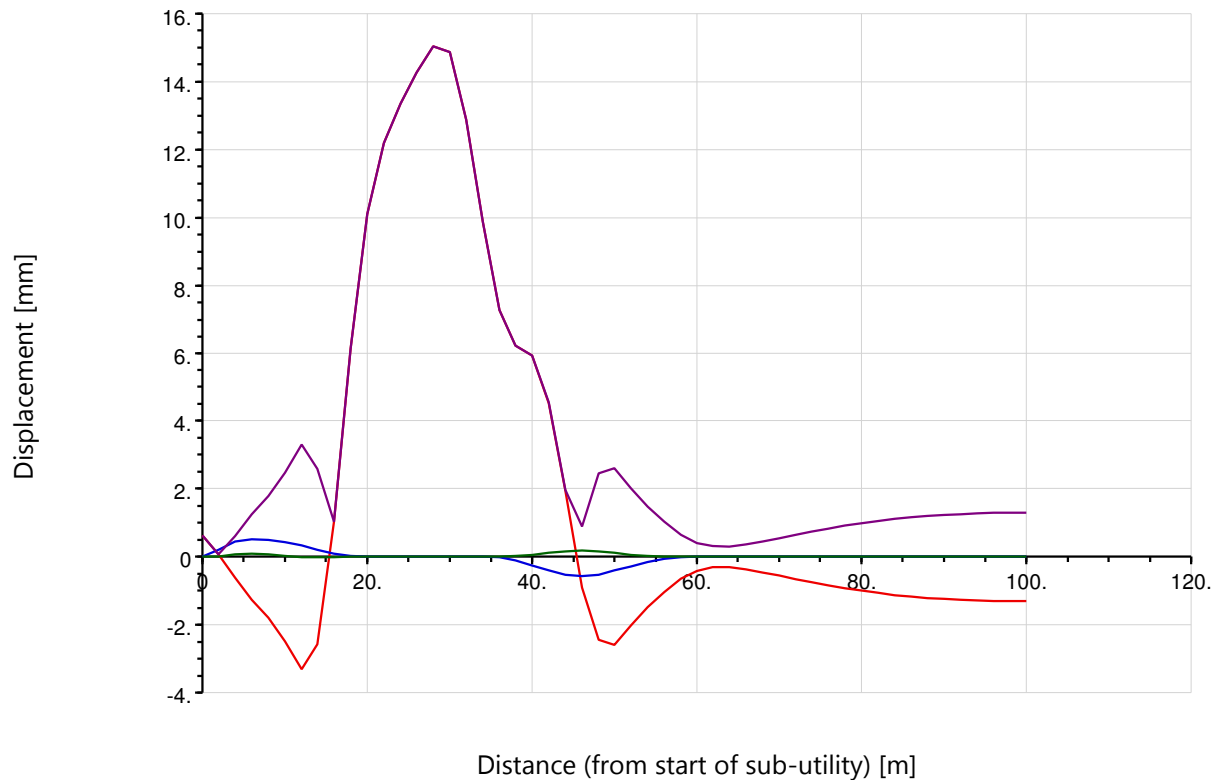
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 1: TWS(1)_1/1

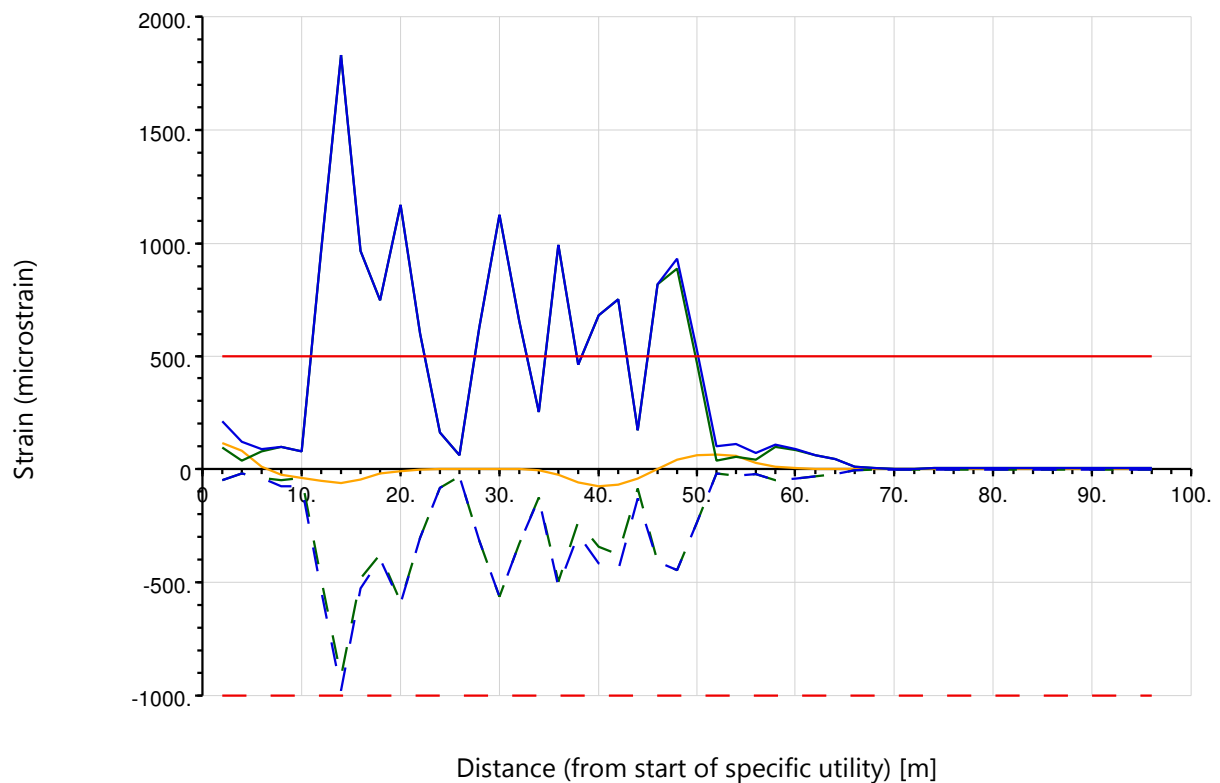
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 1: TWS(1)_1/1

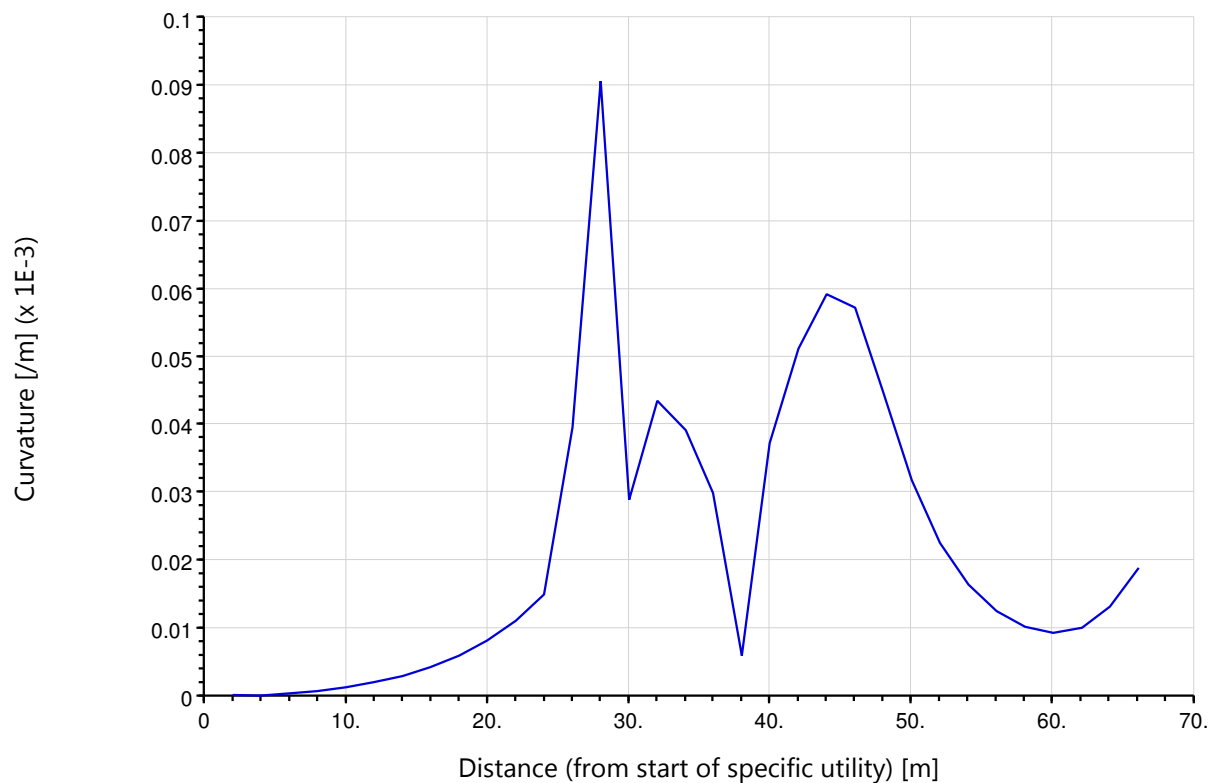
- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 2: TWS(2)_1/1

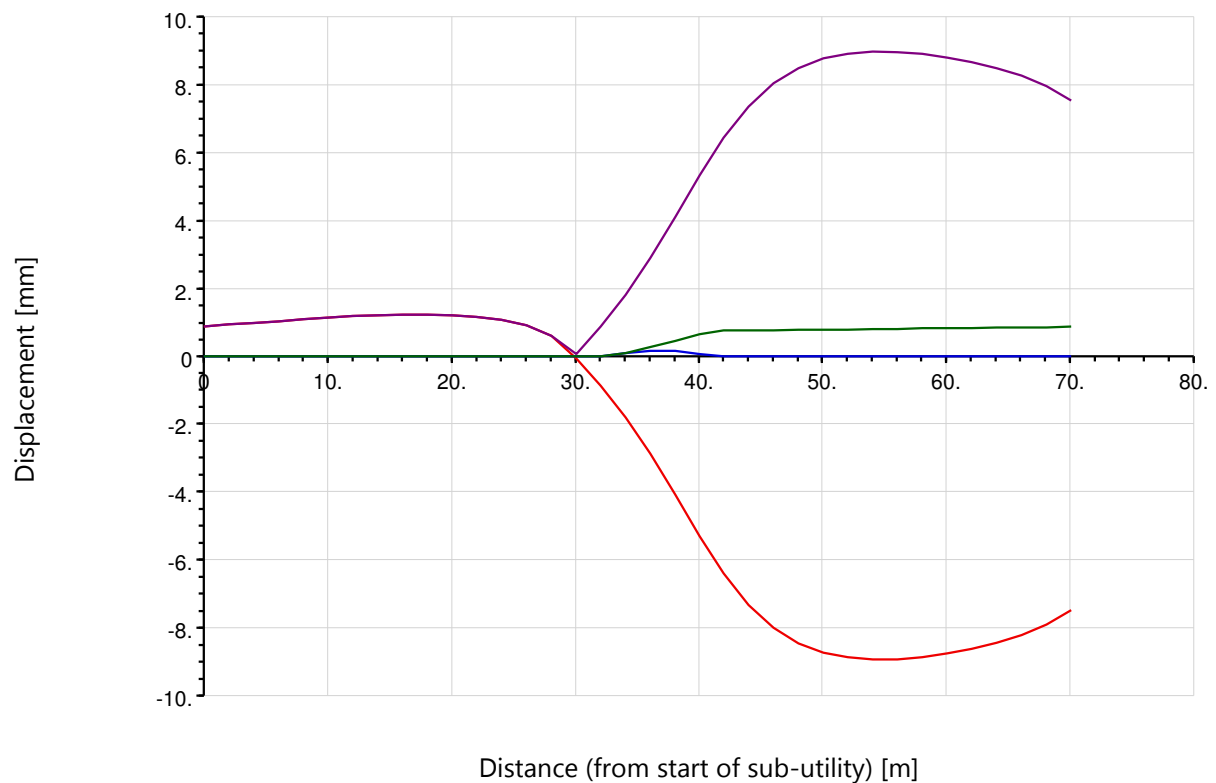
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 2: TWS(2)_1/1

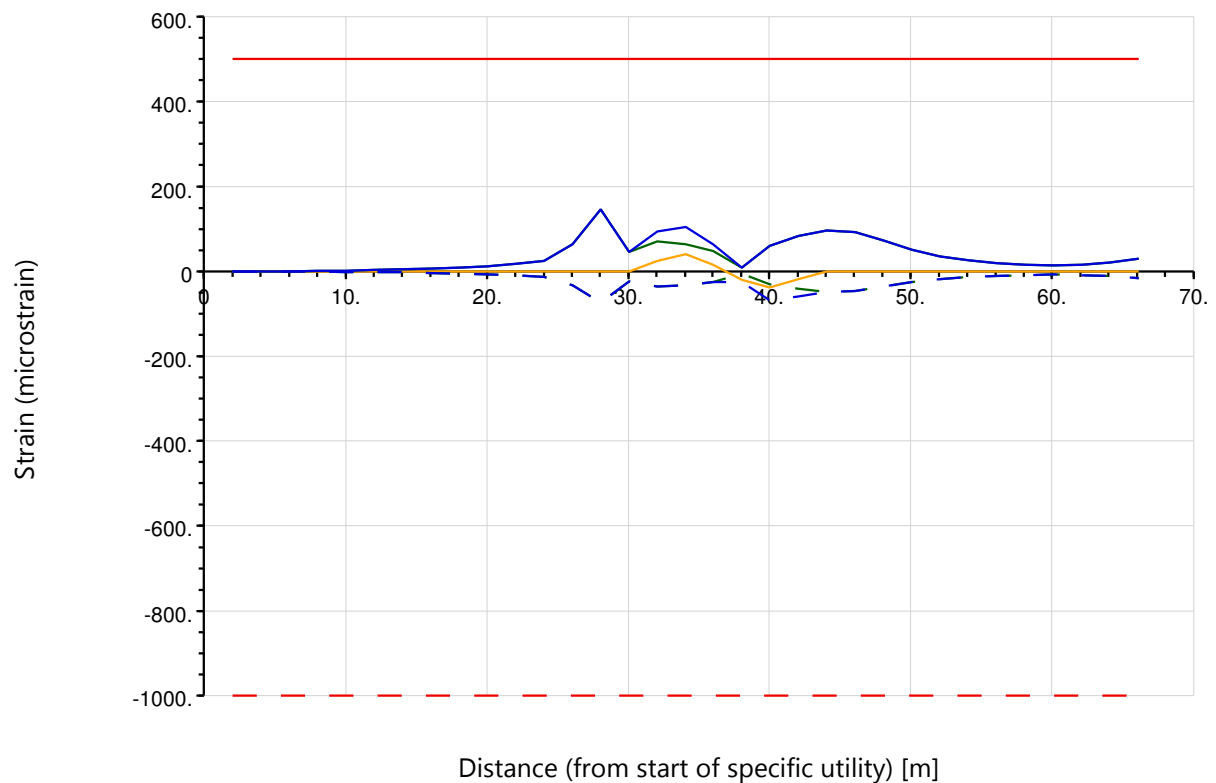
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 2: TWS(2)_1/1

- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain

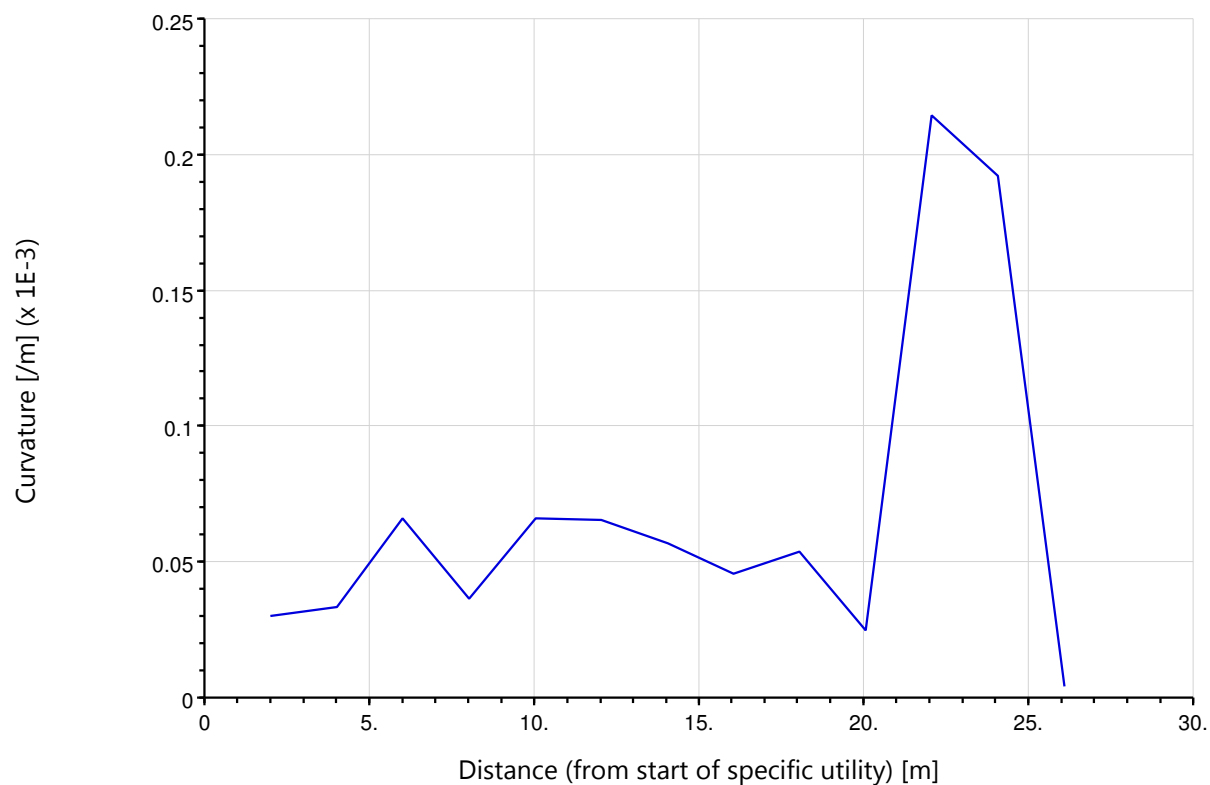


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Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 3: TWS(2)_2/1

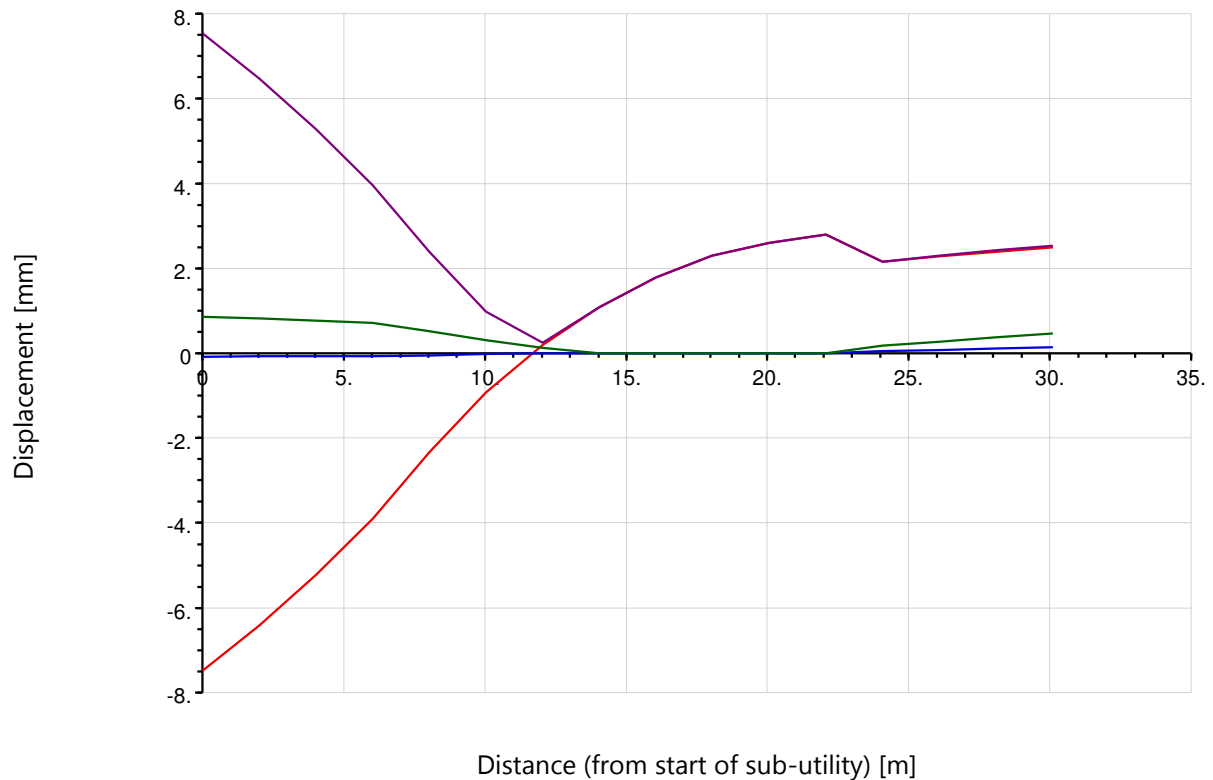
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 3: TWS(2)_2/1

- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



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Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 3: TWS(2)_2/1

- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain

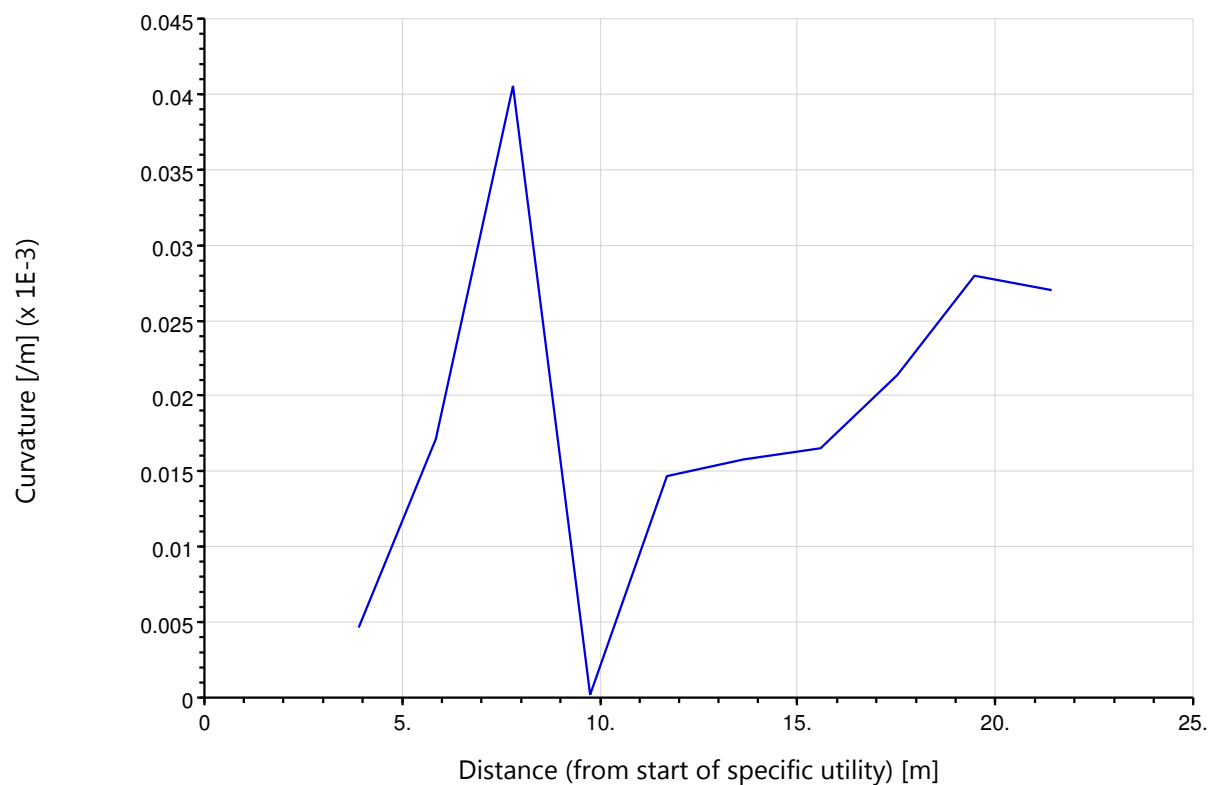


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Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 4: TWS(2)_3/1

— Curvature

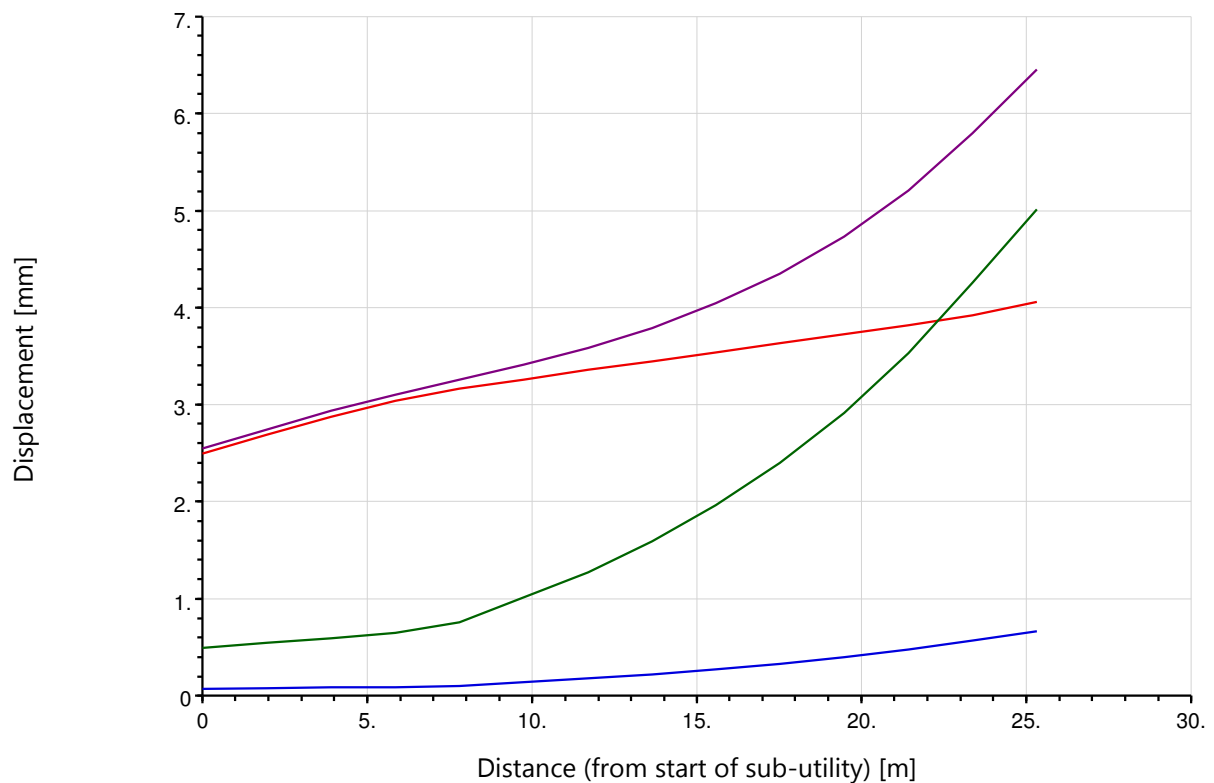


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Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 4: TWS(2)_3/1

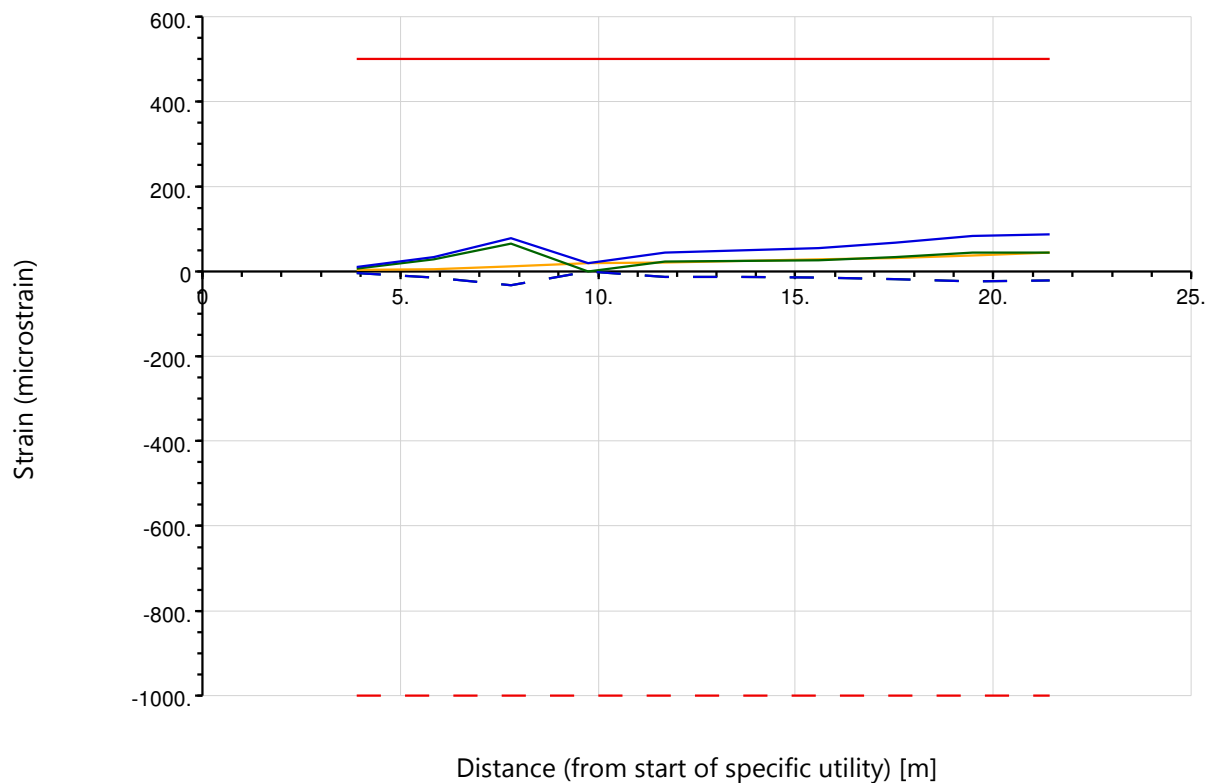
- Vertical Displacement
- Horizontal Displacement (along sub-utility)
- Horizontal Displacement (perp. to sub-utility)
- Flexural Displacement (resultant of Horizontal perp. and Vertical)



Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 4: TWS(2)_3/1

- Axial Strain (factored)
- Flexural Strain in Tension (factored)
- - Flexural Strain in Compression (factored)
- Combined Tensile Strain (factored)
- - Combined Compressive Strain (factored)
- Allowable Tensile Strain
- - Allowable Compressive Strain

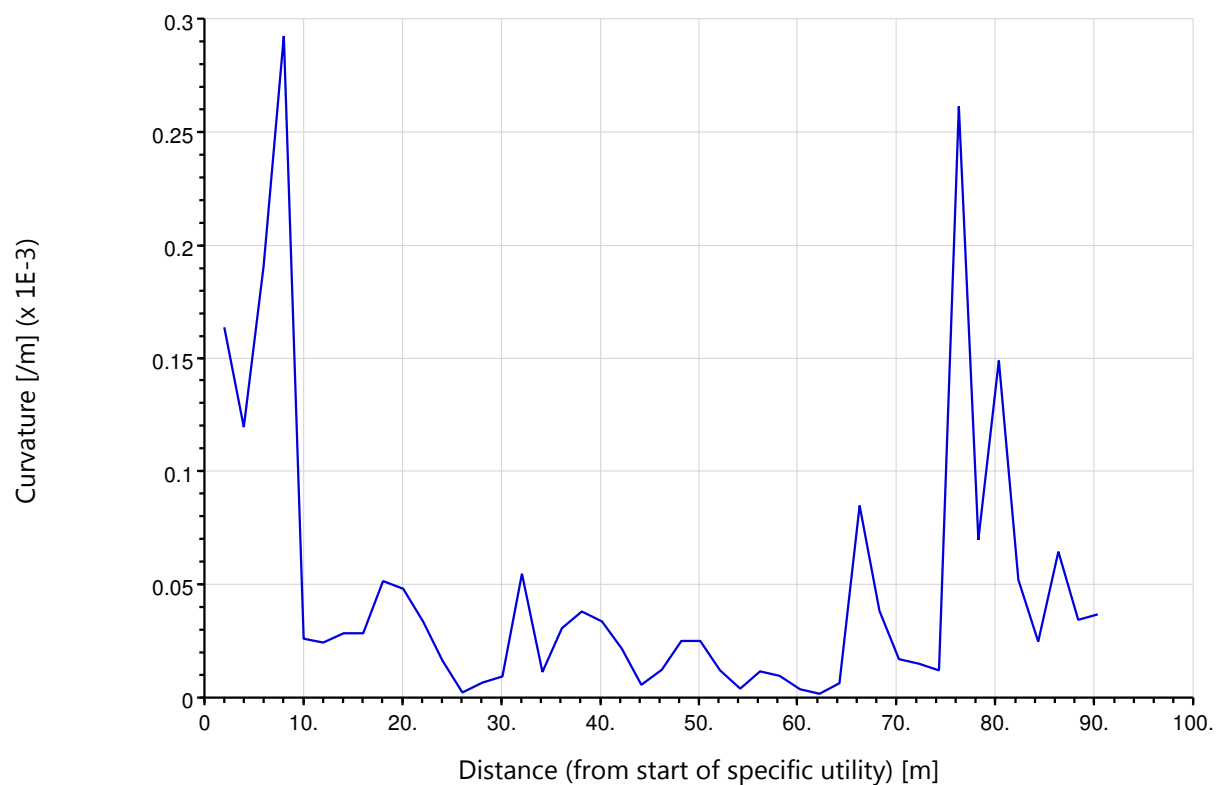


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Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 5: TWS(2)_4/1

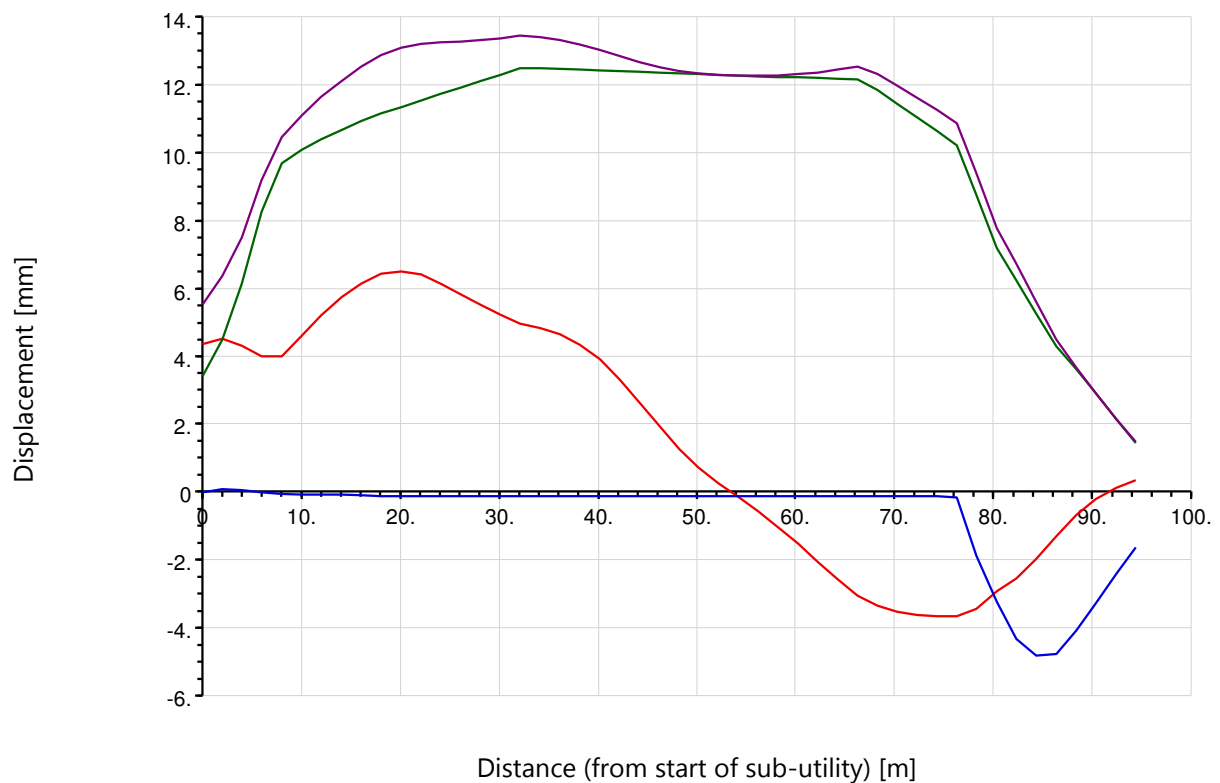
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 5: TWS(2)_4/1

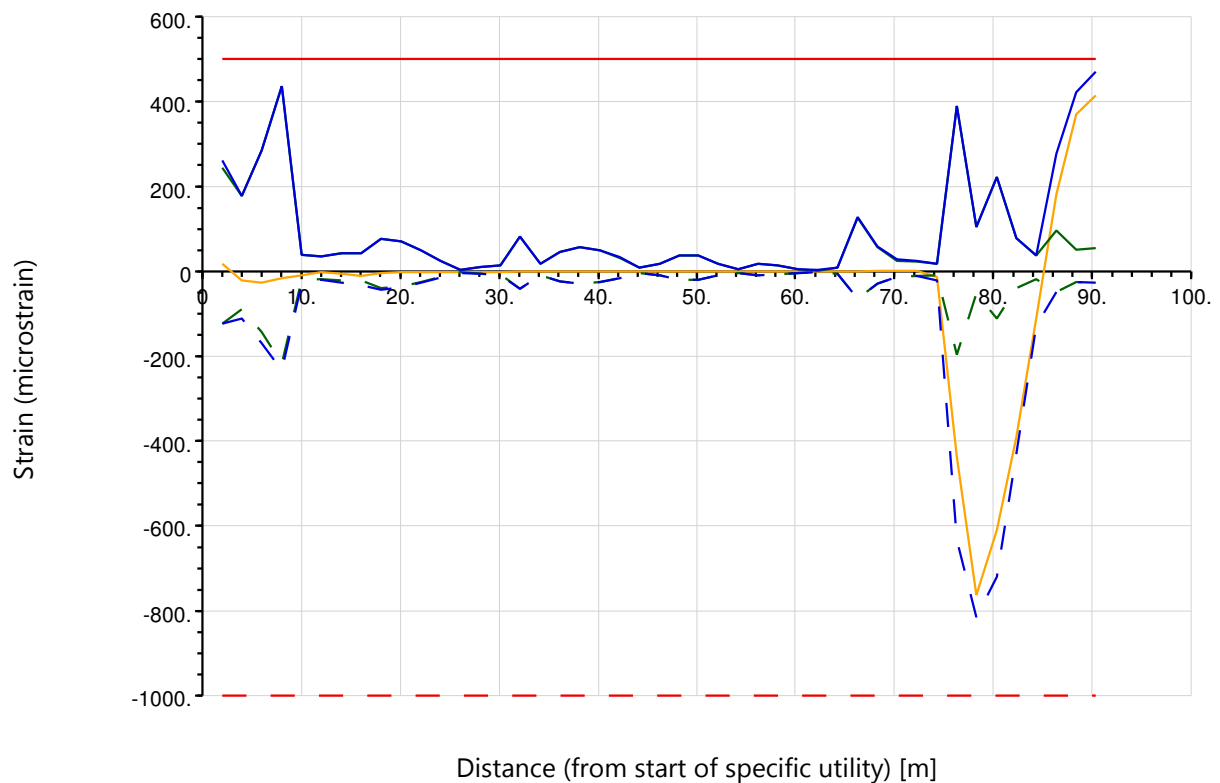
- Vertical Displacement
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Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 5: TWS(2)_4/1

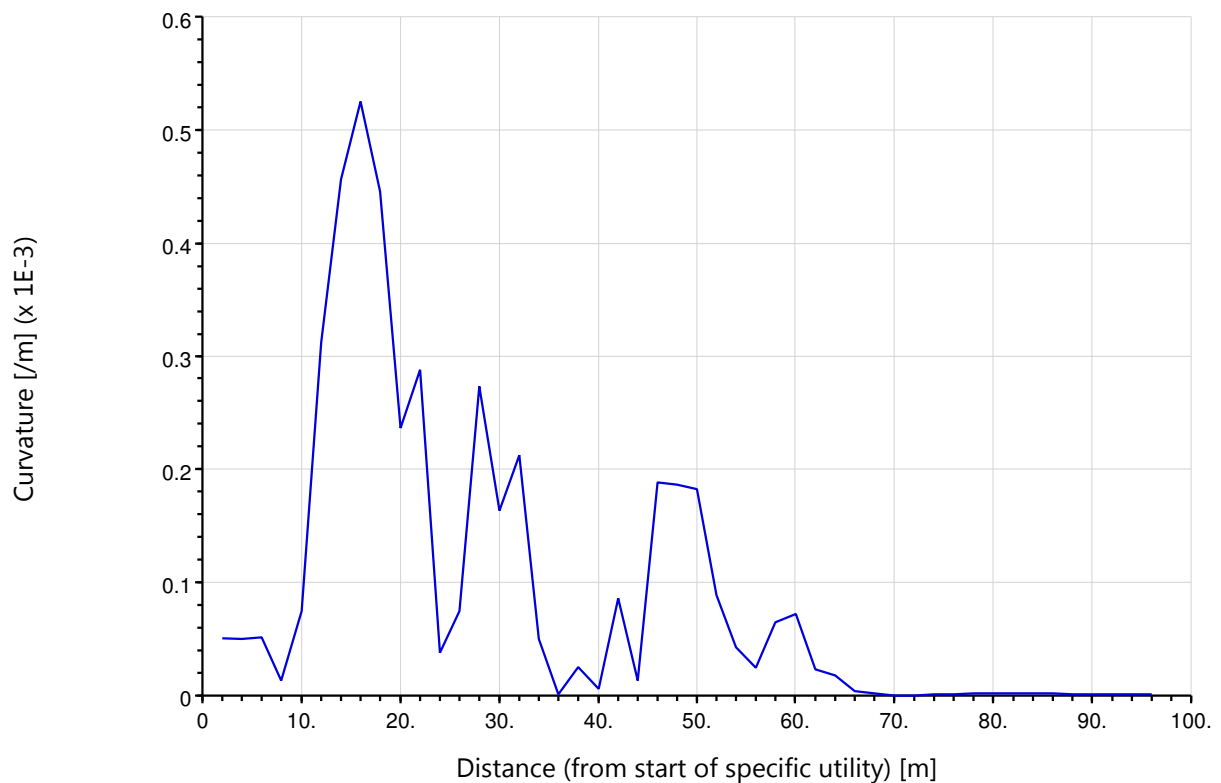
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- Allowable Tensile Strain
- - Allowable Compressive Strain



Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 1: TWS(1)_1/1

— Curvature

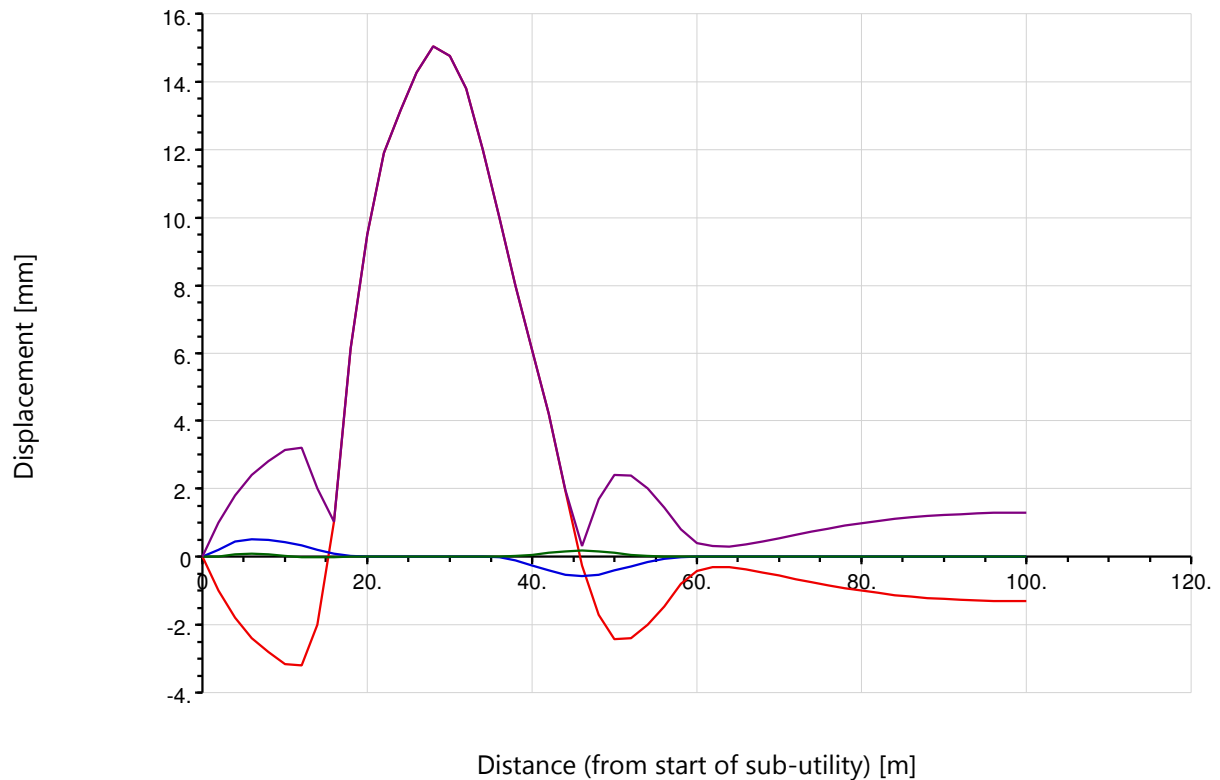


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Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 1: TWS(1)_1/1

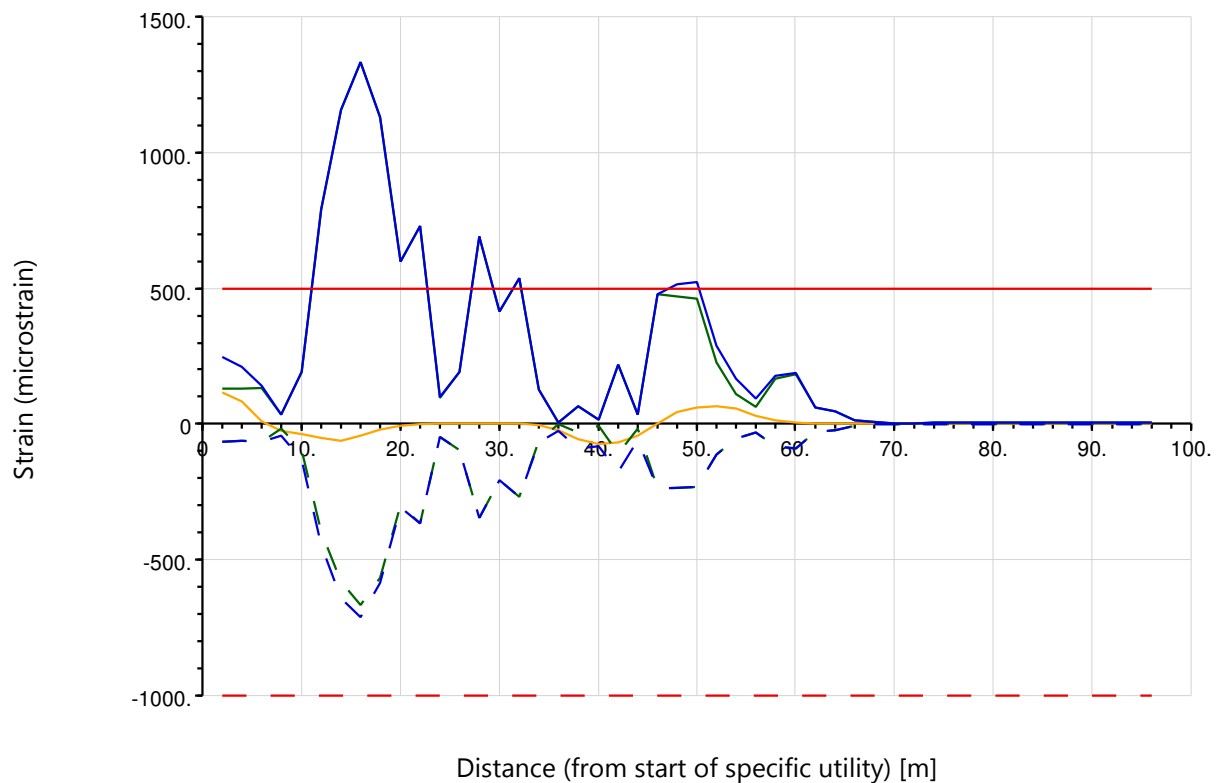
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Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 1: TWS(1)_1/1

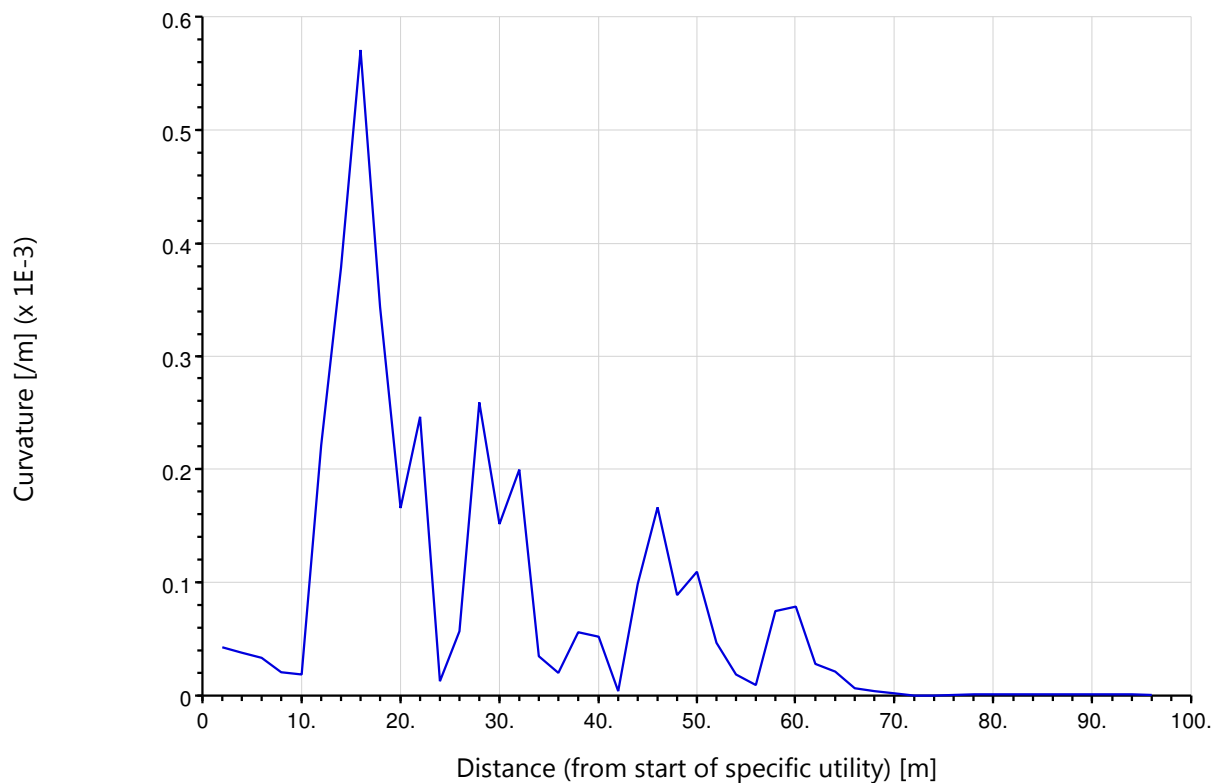
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Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 1: TWS(1)_1/1

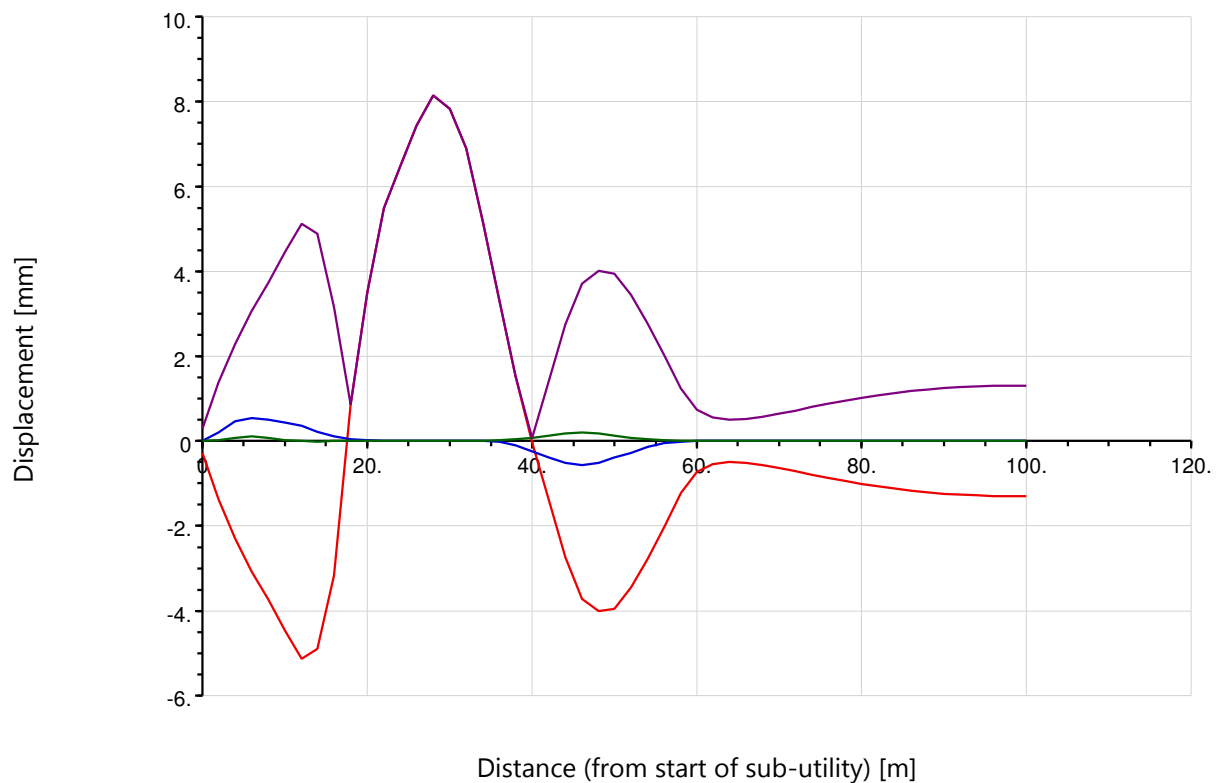
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 1: TWS(1)_1/1

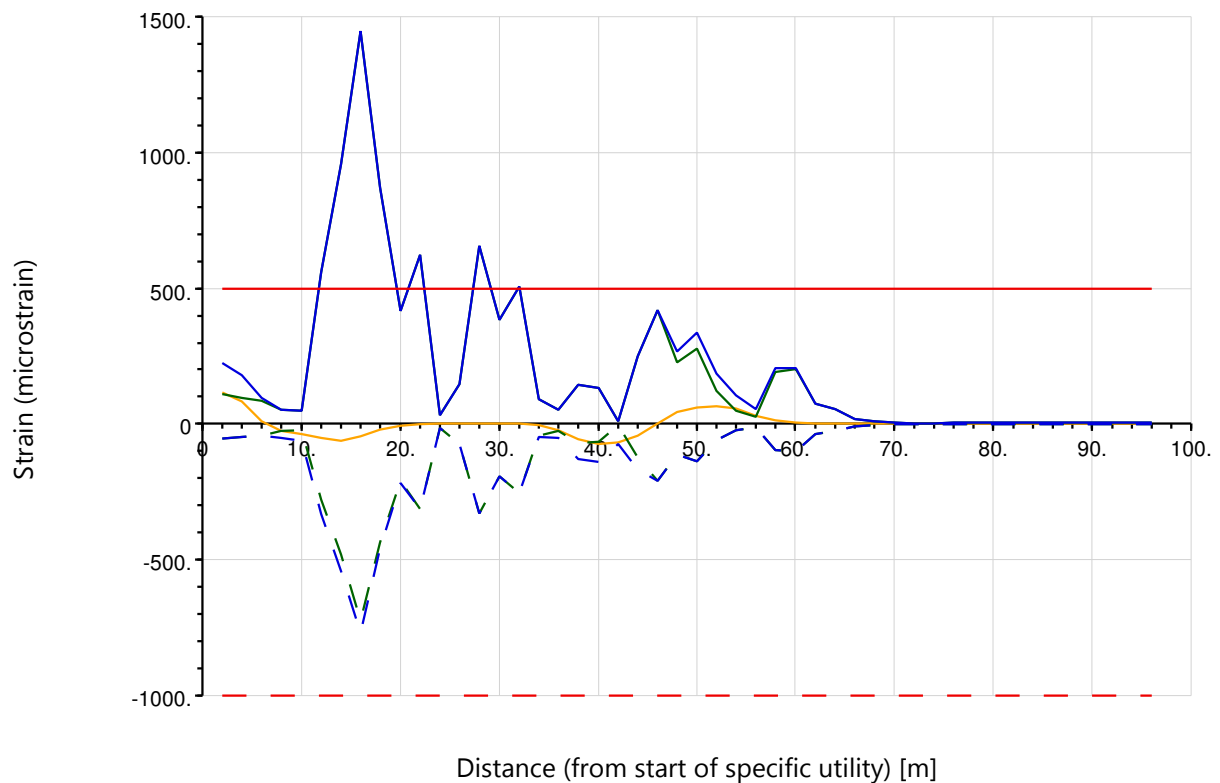
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Specific Utility - All Strains Chart

Stage: Base model, Specific Utility 1: TWS(1)_1/1

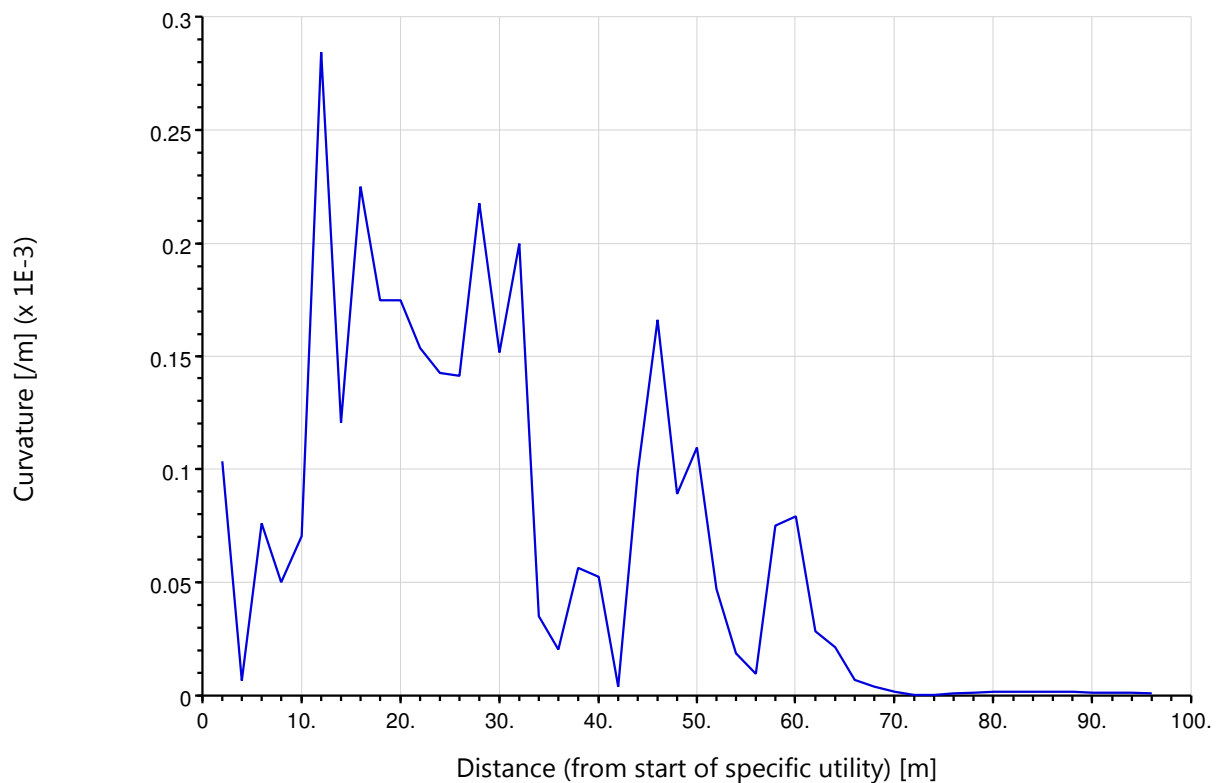
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Specific Utility - Curvature Chart

Stage: Base model, Specific Utility 1: TWS(1)_1/1

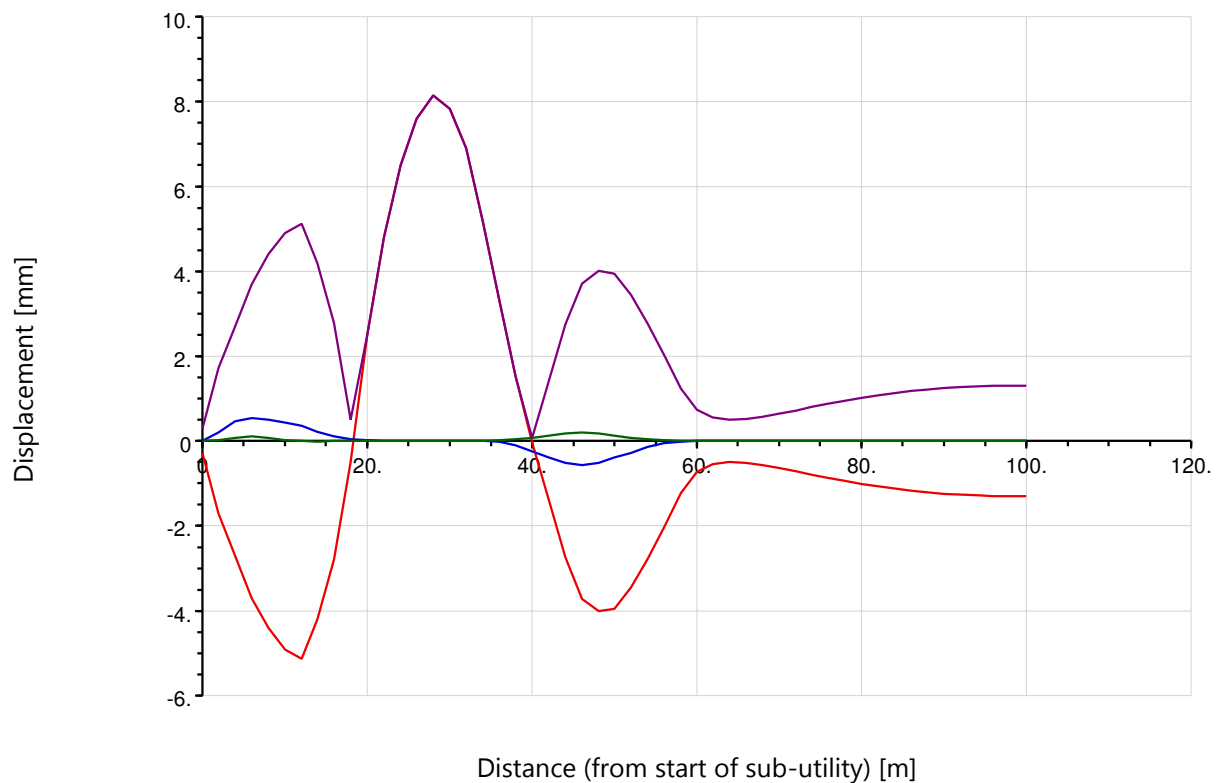
— Curvature



Specific Utility - Displacement Chart

Stage: Base model, Specific Utility 1: TWS(1)_1/1

- Vertical Displacement
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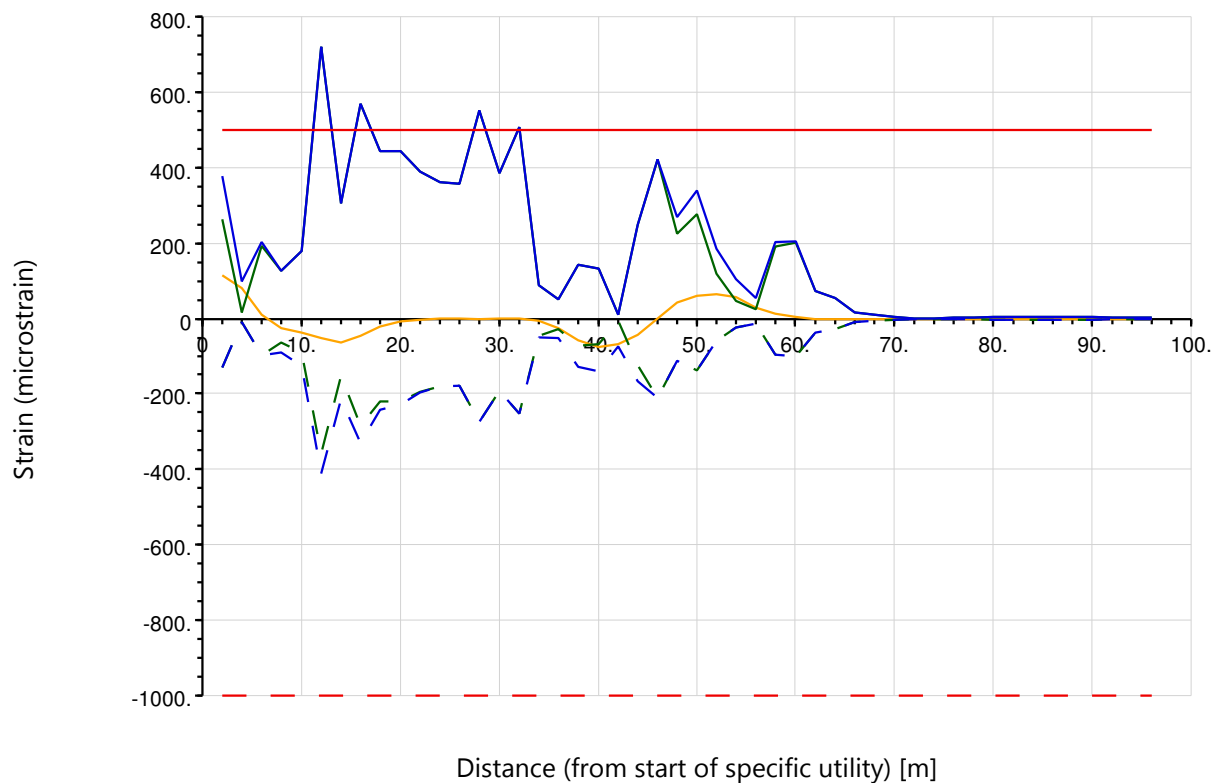


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Specific Utility - All Strains Chart

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APPENDIX F

CPR CALCULATIONS

Confinement Ratio for Thames Water Sewer Beneath Site and Surge Required During Temporary Works

Input Data

Invert of Sewer (mOD)	13.61
Diameter (m)	2.16
Centre Line of Sewer (mOD)	14.69
Confinement ratio required	1.33
Level at top of slab (mOD)	18
Thickness of Slab (m)	0.5
Density of concrete (kN/m3)	40
Groundwater level (mOD)	20.5

Nearest Manhole Covers	Level (mOD)
5701	21.24
7802	26.5

Results

Water Pressure in Sewer (kN/m2)	65.5
Vertical pressure required at CL of sewer (kN/m2)	87.115
Vertical pressure due to soil (kN/m2)	53.39
Vertical water pressure on base of slab (kN/m2)	30
Vertical pressure to be resisted by slab (kN/m2)	63.725
Weight of Slab (kN/m2)	20
Vertical stress to be resisted by flexure of slab (kN/m2)	43.725
Vertical pressure to be resisted in temp case (kN/m2)	33.725

Calculation of Surge Blocks Required

Width of Section to be removed (m)	6
Length of Section to be removed (m)	8
Vertical pressure to be resisted (kN/m2)	33.725
Total force to be resisted (kN)	1618.8
Weight of block (kN)	23
No of blocks required	71
Number of blocks stacked	2
Number of loading locations required (m)	36
Spacing across width (m)	0.83
Spacing along length (m)	1.17

Assumes outer blocks on edge of excavated area

Assumes outer blocks on edge of excavated area