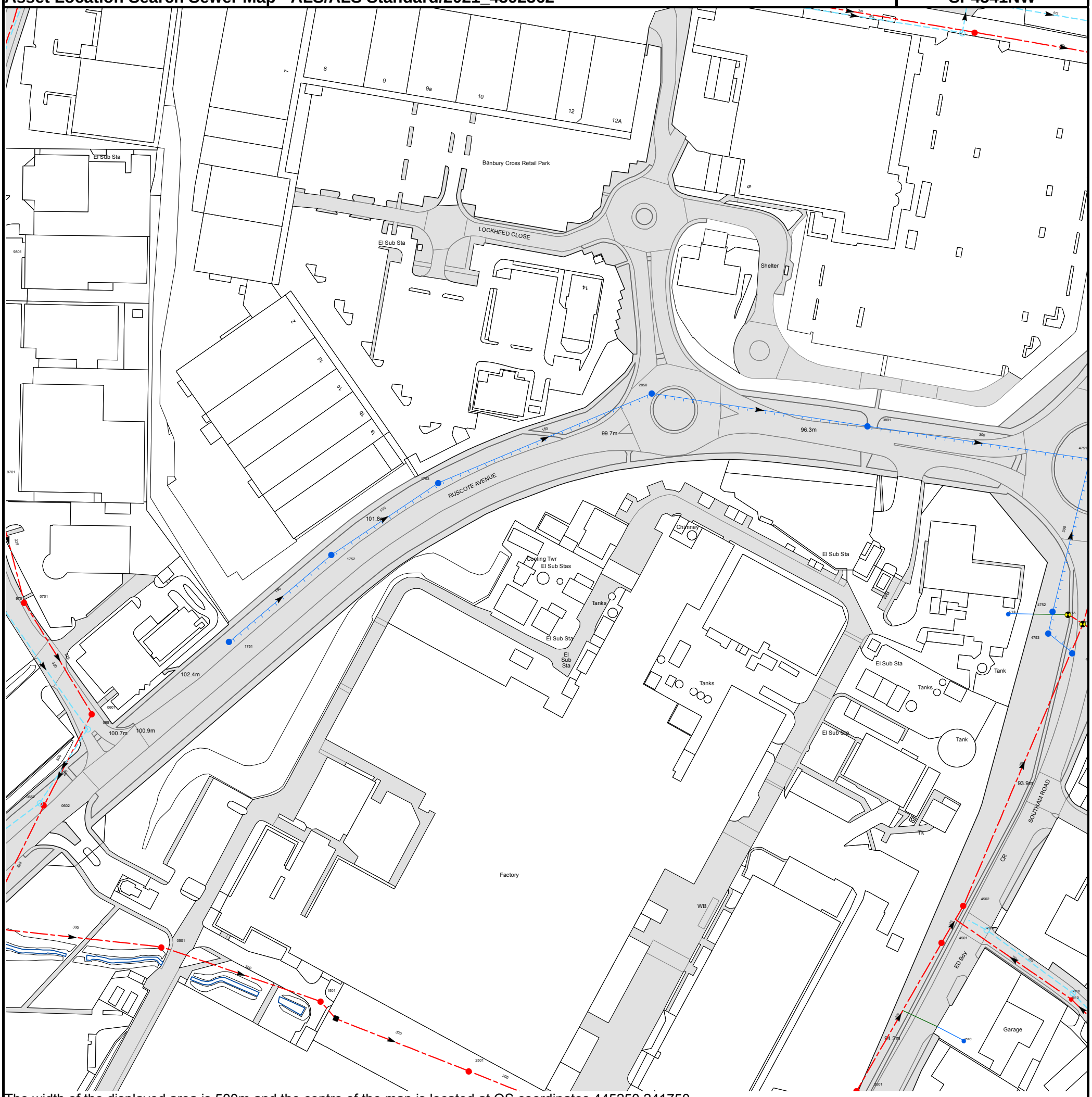
Asset Location Search Sewer Map - ALS/ALS Standard/2021_4392362

SP4541NW



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 445250,241750

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Based on the Ordnance Survey Map with the Sanction of the controller of H.M. Stationery Office, License no. 100019345 Crown Copyright Reserved.

NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
491A	n/a	n/a
491B	n/a	n/a
391A	n/a	n/a
4502	93.74	88.42
451C	n/a	n/a
451A	n/a	n/a
471B	n/a	n/a
4753	93.76	91.92
4752	93.99	91.84
471A	n/a	n/a
451D	n/a	n/a
4754	93.01	91.91
451B	n/a	n/a
4794	92.829	n/a
4751	93.67	91.14
3501	94.07	89.35
2501	96.93	91.58
1501	96.79	92.39
0701	102.44	100.55
0652	99.04	97.49
0602	99.03	97.18
0651	100.65	98.86
0601	100.78	98.61
0501	97.04	93.23
1751	102.73	101.35
1752	102.43	100.37
1753	101.52	99.34
2850	n/a	n/a
3891	99.18	96.23
4501	93.98	88.96

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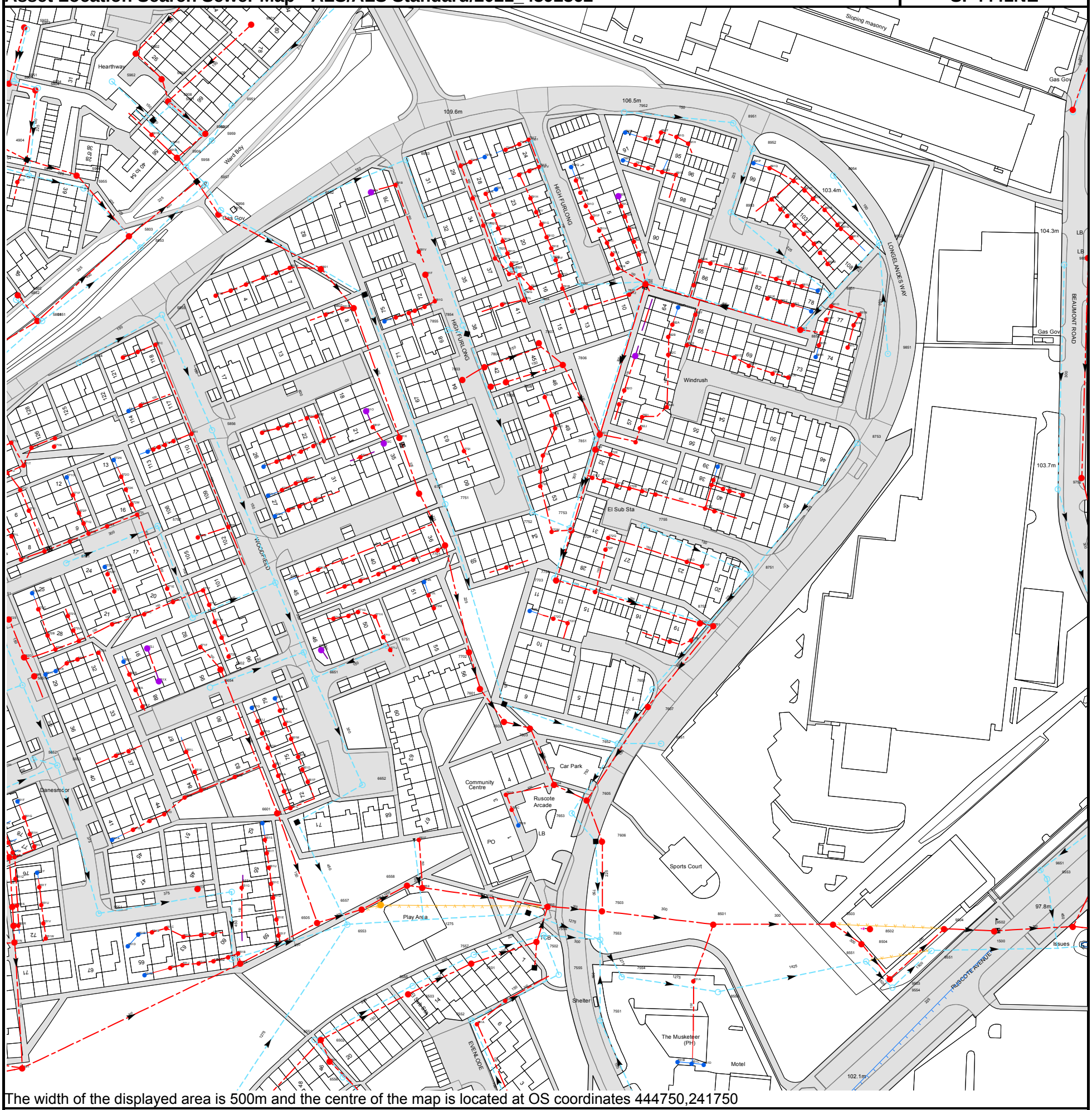
Asset Location Search Sewer Map - ALS/ALS Standard/2021_4392362

SP4441NE



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 444750,241750

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NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
791G	n/a	n/a
791F	n/a	n/a
891G	n/a	n/a
791E	n/a	n/a
891F	n/a	n/a
8951	104.82	103.29
9951	102.23	99.14
7952	106.73	104.9
9901	102.16	99.46
6901	118.93	116.1
6952	111.36	109.39
691A	n/a	n/a
691B	n/a	n/a
6953	109.85	108.21
791C	n/a	n/a
791B	n/a	n/a
791L	n/a	n/a
791A	n/a	n/a
791R	n/a	n/a
791U	n/a	n/a
791K	n/a	n/a
791W	n/a	n/a
791J	n/a	n/a
791X	n/a	n/a
791T	n/a	n/a
791Y	n/a	n/a
791H	n/a	n/a
7951	107.84	105.69
791I	n/a	n/a
791S	n/a	n/a
781G	n/a	n/a
791V	n/a	n/a
5962	121.18	119.03
5902	121.45	118.55
591D	n/a	n/a
591B	n/a	n/a
5909	120.69	116.59
5908	119.52	115.85
591A	n/a	n/a
5961	119.31	116.23
591C	n/a	n/a
5906	117.28	113.28
5958	117.02	111.31
5960	117.6	114.14
5957	114.36	111.16
5907	117.54	114.36
5959	117.47	111.62
5910	113.3	110.86
5956	113.34	110.98
6951	118.12	112.47
8504	100.41	95.74
8551	100.66	95.46
8502	101.31	95.74
9851	104.62	103
9503	100.35	95.54
9554	100.44	95.39
9551	99.82	95.42
9504	99.79	95.19
9502	98.53	94.97
9651	98.39	96.51
9553	98.11	96.55
9752	103.72	101.2
9501	97.89	95.44
9701	103.62	101.18
9751	102.75	100.56
5901	123.01	121.01
5951	122.9	121.25
591E	n/a	n/a
5903	123.72	121.19
5953	123.73	121.87
5952	121.26	118.44
5904	121.73	120.08
5954	121.65	119.69
5905	119.81	117.24
5955	119.35	115.92
882K	n/a	n/a
881Y	n/a	n/a
8953	103.93	102.81
882J	n/a	n/a
8952	104.29	102.99
891P	n/a	n/a
891Q	n/a	n/a
891K	n/a	n/a
881V	n/a	n/a
891J	n/a	n/a
891I	n/a	n/a
882I	n/a	n/a
891L	n/a	n/a
881Z	n/a	n/a
882H	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
891C	n/a	n/a
891B	n/a	n/a
882G	n/a	n/a
882F	n/a	n/a
891A	n/a	n/a
882M	n/a	n/a
8954	103.75	102.8
881W	n/a	n/a
881G	n/a	n/a
881X	n/a	n/a
9852	103.78	102.32
9850	104.38	101.77
9801	104.28	101.76
781F	n/a	n/a
781Q	n/a	n/a
791Q	n/a	n/a
791M	n/a	n/a
791N	n/a	n/a
7853	104.67	102.86
791O	n/a	n/a
791P	n/a	n/a
781H	n/a	n/a
781I	n/a	n/a
781J	n/a	n/a
781K	n/a	n/a
792B	n/a	n/a
791Z	n/a	n/a
792C	n/a	n/a
792A	n/a	n/a
782K	n/a	n/a
782L	n/a	n/a
791D	n/a	n/a
782M	n/a	n/a
7802	104.39	101.49
7852	104.41	101.56
792D	n/a	n/a
891D	n/a	n/a
891E	n/a	n/a
891H	n/a	n/a
882L	n/a	n/a
672O	n/a	n/a
671U	n/a	n/a
671V	n/a	n/a
772I	n/a	n/a
671W	n/a	n/a
672C	n/a	n/a
671X	n/a	n/a
681X	n/a	n/a
681P	n/a	n/a
681C	n/a	n/a
681E	n/a	n/a
681O	n/a	n/a
7803	104.86	103.42
7855	105.54	104.45
7854	105.54	104.16
681K	n/a	n/a
681J	n/a	n/a
681R	n/a	n/a
681I	n/a	n/a
681N	n/a	n/a
681S	n/a	n/a
6802	107.64	105.4
681H	n/a	n/a
681G	n/a	n/a
681F	n/a	n/a
6801	108.99	106.85
681W	n/a	n/a
681V	n/a	n/a
5854	113.44	112.37
572N	n/a	n/a
581A	n/a	n/a
581F	n/a	n/a
5803	115.69	111.94
581B	n/a	n/a
5853	115.29	112.15
581H	n/a	n/a
572I	n/a	n/a
572F	n/a	n/a
581C	n/a	n/a
572G	n/a	n/a
5855	112.71	111.21
572T	n/a	n/a
572H	n/a	n/a
581I	n/a	n/a
5856	108.89	107.11
581E	n/a	n/a
681L	n/a	n/a
681M	n/a	n/a
681D	n/a	n/a
681T	n/a	n/a
671Y	n/a	n/a
681U	n/a	n/a
671T	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
681A	n/a	n/a
681B	n/a	n/a
772K	n/a	n/a
772A	n/a	n/a
781B	n/a	n/a
781A	n/a	n/a
7805	104.67	102.98
7808	104.63	102.96
7804	105	103.15
7807	104.51	102.9
782Q	n/a	n/a
782A	n/a	n/a
781L	n/a	n/a
782G	n/a	n/a
781S	n/a	n/a
781T	n/a	n/a
781U	n/a	n/a
782E	n/a	n/a
782F	n/a	n/a
781P	n/a	n/a
782B	n/a	n/a
781V	n/a	n/a
781O	n/a	n/a
782D	n/a	n/a
781E	n/a	n/a
781N	n/a	n/a
781D	n/a	n/a
781M	n/a	n/a
781W	n/a	n/a
782C	n/a	n/a
781C	n/a	n/a
781R	n/a	n/a
7806	104.26	102.59
781X	n/a	n/a
781Y	n/a	n/a
771Z	n/a	n/a
772F	n/a	n/a
7851	103.49	101.22
7801	103.59	100.91
772D	n/a	n/a
772E	n/a	n/a
771Y	n/a	n/a
782P	n/a	n/a
782O	n/a	n/a
782H	n/a	n/a
781Z	n/a	n/a
772B	n/a	n/a
782N	n/a	n/a
772J	n/a	n/a
782J	n/a	n/a
782I	n/a	n/a
882E	n/a	n/a
882C	n/a	n/a
882B	n/a	n/a
882A	n/a	n/a
882D	n/a	n/a
881E	n/a	n/a
881F	n/a	n/a
871G	n/a	n/a
871H	n/a	n/a
871I	n/a	n/a
871F	n/a	n/a
881D	n/a	n/a
881C	n/a	n/a
881D	n/a	n/a
881C	n/a	n/a
881K	n/a	n/a
881B	n/a	n/a
881J	n/a	n/a
881A	n/a	n/a
881I	n/a	n/a
8801	104.39	102.13
881U	n/a	n/a
8852	104.45	101.91
881H	n/a	n/a
881R	n/a	n/a
881T	n/a	n/a
881S	n/a	n/a
881Q	n/a	n/a
881P	n/a	n/a
8851	104.24	101.99
881O	n/a	n/a
881L	n/a	n/a
881M	n/a	n/a
8753	104.68	101.91
881N	n/a	n/a
7703	102.11	100.07
7753	102.73	101.03
7704	102.68	100.45
772H	n/a	n/a
772P	n/a	n/a
772Q	n/a	n/a
772C	n/a	n/a
7755	102.35	101.6
771X	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
871O	n/a	n/a
871P	n/a	n/a
871K	n/a	n/a
871L	n/a	n/a
871E	n/a	n/a
871J	n/a	n/a
8751	102.77	100.79
572D	n/a	n/a
572B	n/a	n/a
572S	n/a	n/a
572V	n/a	n/a
572C	n/a	n/a
572E	n/a	n/a
5751	108.5	107.01
571M	n/a	n/a
571H	n/a	n/a
571G	n/a	n/a
571L	n/a	n/a
571I	n/a	n/a
571P	n/a	n/a
571J	n/a	n/a
571O	n/a	n/a
571U	n/a	n/a
571T	n/a	n/a
5654	106.58	105.5
6651	102.63	101.29
5602	103.87	101.74
672D	n/a	n/a
6752	103.01	101.68
671L	n/a	n/a
571F	n/a	n/a
571V	n/a	n/a
571W	n/a	n/a
671E	n/a	n/a
671H	n/a	n/a
671F	n/a	n/a
671G	n/a	n/a
571Z	n/a	n/a
571Y	n/a	n/a
671N	n/a	n/a
6753	104.29	102.57
671O	n/a	n/a
671M	n/a	n/a
672N	n/a	n/a
672H	n/a	n/a
672I	n/a	n/a
672J	n/a	n/a
672E	n/a	n/a
671Z	n/a	n/a
672A	n/a	n/a
672B	n/a	n/a
672P	n/a	n/a
562A	n/a	n/a
561X	n/a	n/a
562B	n/a	n/a
562C	n/a	n/a
562F	n/a	n/a
572A	n/a	n/a
572J	n/a	n/a
571A	n/a	n/a
572U	n/a	n/a
571B	n/a	n/a
5753	105	103.29
571C	n/a	n/a
571D	n/a	n/a
572Q	n/a	n/a
571E	n/a	n/a
572P	n/a	n/a
572R	n/a	n/a
572W	n/a	n/a
571R	n/a	n/a
572X	n/a	n/a
5752	107.55	105.27
571Q	n/a	n/a
572L	n/a	n/a
572P	n/a	n/a
572M	n/a	n/a
572K	n/a	n/a
572O	n/a	n/a
671P	n/a	n/a
671I	n/a	n/a
6751	102.25	101.59
671J	n/a	n/a
671Q	n/a	n/a

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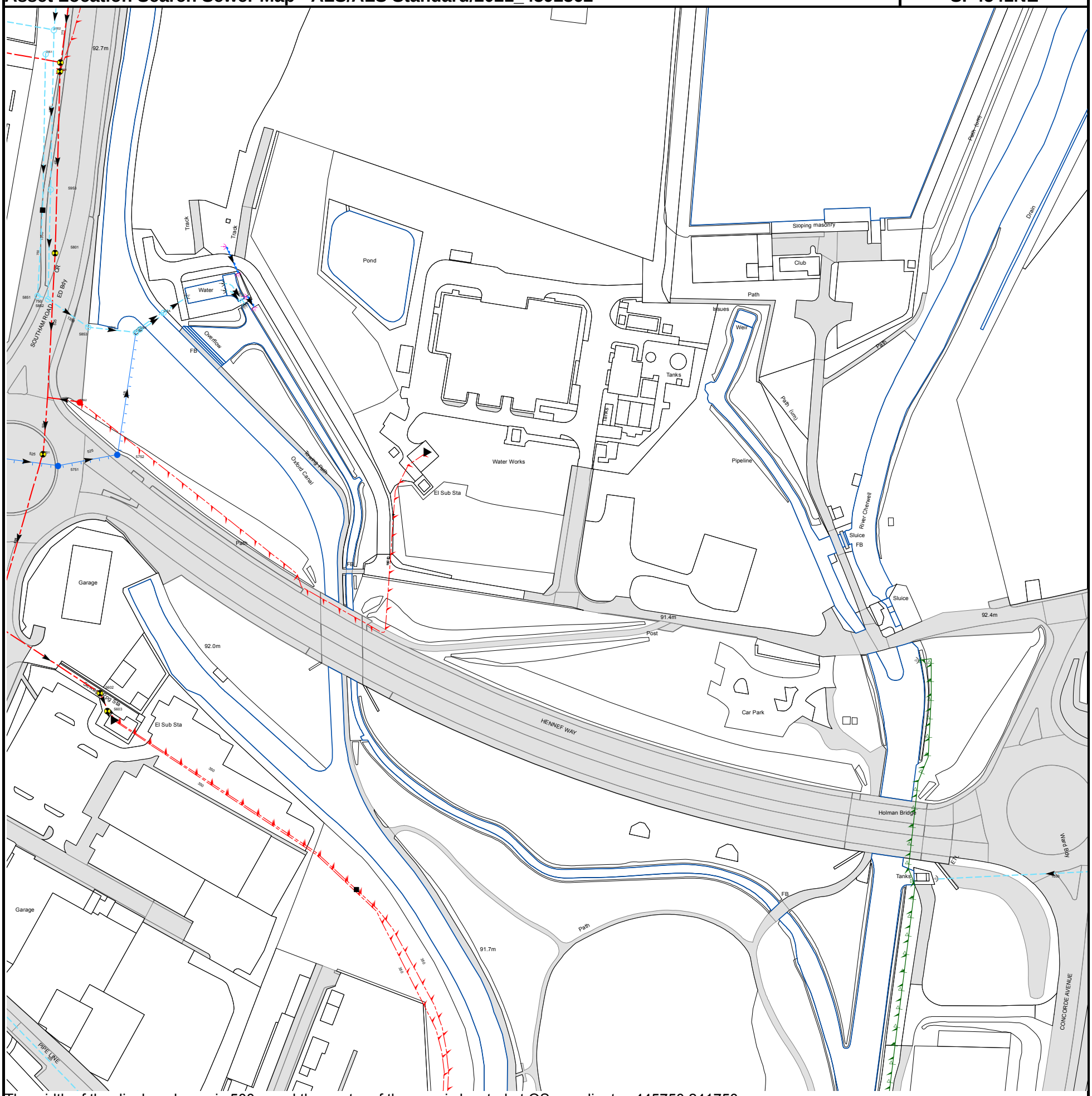
SP4541NE



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 445750,241750

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NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
5801	93.11	88.81
5953	92.86	90.16
5901	92.579	88.949
591A	n/a	n/a
5951	93	91.11
5952	92.46	90.41
5851	93.26	90.76
5701	93.74	88.47
5852	92.86	89.84
5751	93.88	90.58
5892	n/a	n/a
5853	92.54	89.84
5602	n/a	n/a
5603	n/a	n/a
5752	93.63	90.53
5854	93.27	89.82
5855	93.26	89.83
581A	n/a	n/a

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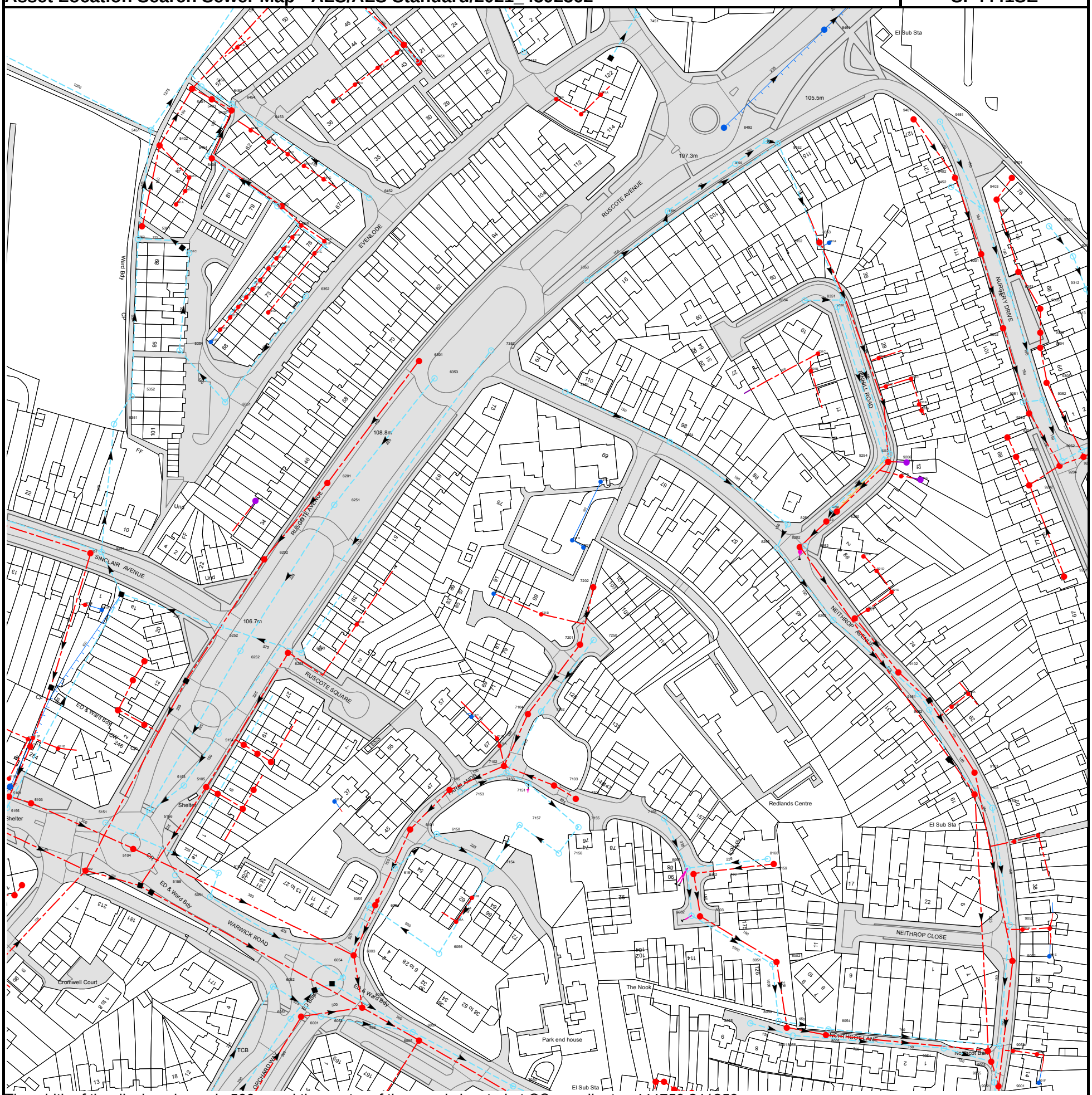
Asset Location Search Sewer Map - ALS/ALS Standard/2021_4392362

SP4441SE



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Manhole Reference	Manhole Cover Level	Manhole Invert Level
9309	101.41	100.76
9302	102.08	100.7
9313	n/a	n/a
9305	101.56	100.86
9353	102.09	100.3
9312	n/a	n/a
9306	101.91	101.11
9311	n/a	n/a
9301	102.36	101.08
9310	n/a	n/a
9453	102.78	101
9403	102.51	101.7
9452	103.14	102.4
9402	103.01	101.58
9404	102.51	101.97
9451	103.66	102.03
9401	104.23	102.4
641G	n/a	n/a
541C	n/a	n/a
641H	n/a	n/a
5404	102.56	100.88
5454	102.59	101.23
641I	n/a	n/a
5402	102.32	100.32
641J	n/a	n/a
5451	102.32	99.49
641K	n/a	n/a
6453	102.71	101.33
6402	102.62	100.71
6454	102.54	101.04
641B	n/a	n/a
5403	102.2	100.37
5453	102.26	100.83
5401	102.18	100.05
5452	102.18	100.73
641D	n/a	n/a
641E	n/a	n/a
6401	103.21	101.85
6451	103.41	102.41
641F	n/a	n/a
7452	104.58	103
641A	n/a	n/a
641C	n/a	n/a
8356	105.68	103.89
8354	106.56	105.52
8351	105.72	104.74
7353	109.28	108.23
8352	n/a	n/a
831A	n/a	n/a
8353	111.01	110.12
8494	107.72	105.34
8495	106.71	105.26
8452	106.12	105.19
8496	106.26	105.22
8492	n/a	n/a
741B	n/a	n/a
741C	n/a	n/a
741A	n/a	n/a
8451	103.67	101.14
7451	104.41	102.93
531A	n/a	n/a
631E	n/a	n/a
631D	n/a	n/a
531D	n/a	n/a
631F	n/a	n/a
631G	n/a	n/a
6352	105.08	103.6
631M	n/a	n/a
631N	n/a	n/a
631L	n/a	n/a
631K	n/a	n/a
631J	n/a	n/a
631C	n/a	n/a
531C	n/a	n/a
631I	n/a	n/a
631P	n/a	n/a
631A	n/a	n/a
5353	103.1	100.15
631H	n/a	n/a
5301	103.08	100.88
631O	n/a	n/a
631B	n/a	n/a
6403	103.85	101.76
6455	103.85	102.05
541A	n/a	n/a
6452	105.37	103.72
541B	n/a	n/a
6301	108.9	106.88
6353	109.6	107.84
7352	110.21	107.5

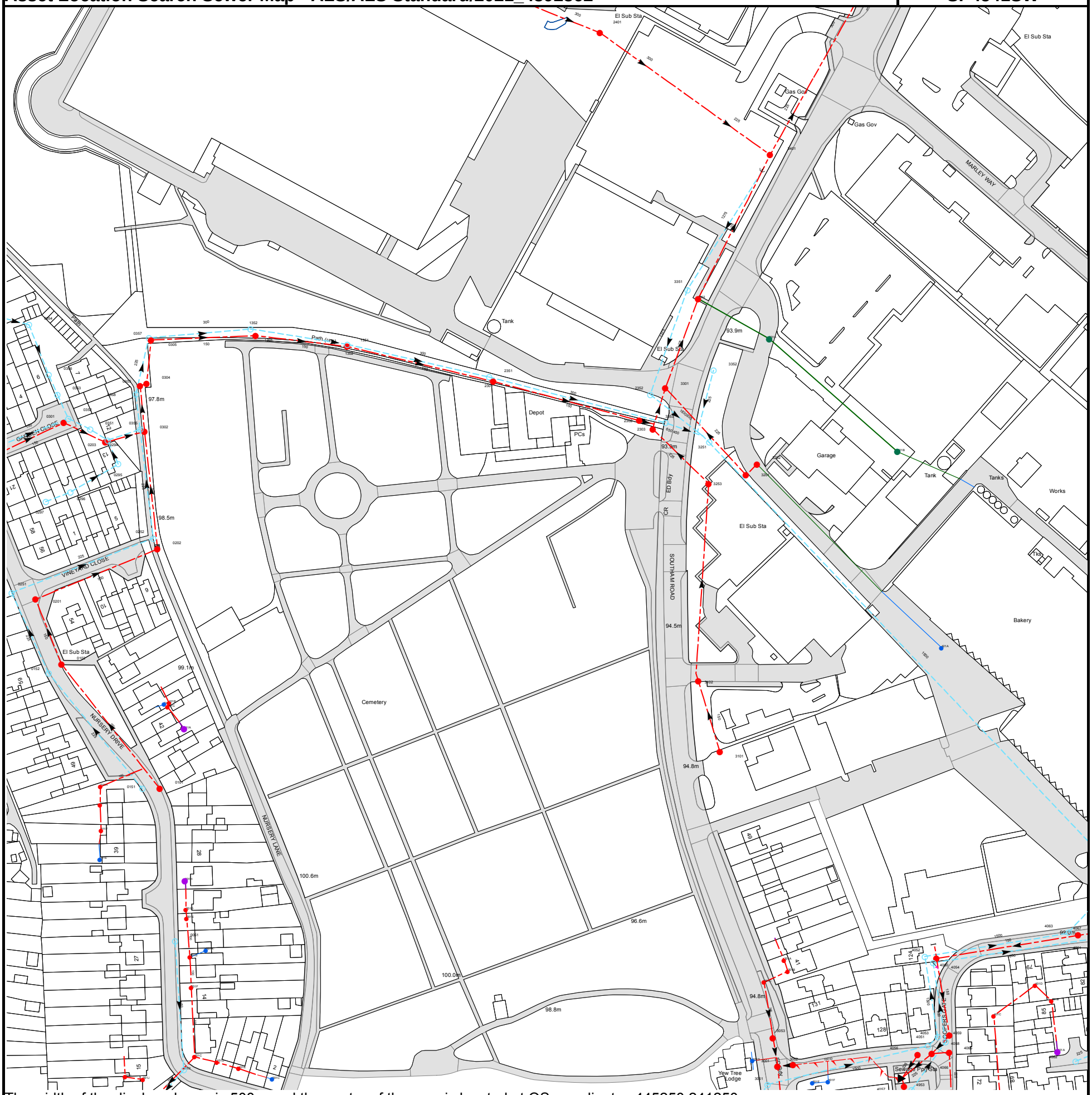
Manhole Reference	Manhole Cover Level	Manhole Invert Level
721A	n/a	n/a
721B	n/a	n/a
7351	111.04	110.16
721D	n/a	n/a
721E	n/a	n/a
7202	111.26	109.3
721C	n/a	n/a
8254	110.99	109.4
8255	109.84	108.29
8251	109.71	108.47
8202	109.21	103.39
8252	106.34	104.8
831B	n/a	n/a
831C	n/a	n/a
8259	108.25	103.66
8258	107.98	103.7
8260	n/a	n/a
821A	n/a	n/a
821B	n/a	n/a
921D	n/a	n/a
931E	n/a	n/a
9254	106.66	103.73
931D	n/a	n/a
9206	106.68	104.06
9253	106.58	104.97
921E	n/a	n/a
9205	101.46	99.43
9251	101.43	99.19
511A	n/a	n/a
511F	n/a	n/a
521B	n/a	n/a
5201	105.05	104.36
5251	105.11	103.09
521A	n/a	n/a
5351	103.43	101.64
5195	n/a	n/a
5352	103.42	100.82
5194	n/a	n/a
5193	n/a	n/a
5196	n/a	n/a
5354	103.95	102.09
531E	n/a	n/a
5154	105.76	104.27
5252	106.97	105.7
6351	104.53	102.58
6252	107.63	106.19
621A	n/a	n/a
6202	107.68	104.19
6203	108.36	106.26
6253	108.63	106.89
6201	108.51	106.35
6251	109.32	107.53
621B	n/a	n/a
9102	107.84	105.06
921B	n/a	n/a
921A	n/a	n/a
931C	n/a	n/a
9151	107.43	105.34
931B	n/a	n/a
921C	n/a	n/a
931A	n/a	n/a
9152	107.19	105.43
911B	n/a	n/a
911A	n/a	n/a
9101	105.99	104.41
9103	106.61	103.96
9153	105.34	104.28
9307	102.57	101.75
911D	n/a	n/a
9203	102.5	101.64
9351	102.25	100.64
9202	102.72	101.38
9303	101.94	100.17
911C	n/a	n/a
9304	101.52	100.71
9352	101.82	99.8
9308	101.42	100.41
9204	101.69	99.89
9252	101.72	99.53
9201	102.71	102.18
8053	106.02	103.7
6151	106.25	105.07
7154	105.28	102.86
8159	n/a	n/a
8160	n/a	n/a
7156	n/a	n/a
6150	107.79	104.83
6101	107.73	106.03
7155	n/a	n/a
7157	n/a	n/a
7158	106.61	104.15
7101	109.42	107.56
7153	109.38	108.39

Manhole Reference	Manhole Cover Level	Manhole Invert Level
7105	109.24	106.94
7103	109.64	107.43
7151	109.8	107.77
7150	109.93	108.2
7102	109.89	107.22
711A	n/a	n/a
711B	n/a	n/a
711C	n/a	n/a
7104	110.63	108.61
7152	110.68	109
7201	111.11	109.04
7250	111.1	109.15
8253	109.15	107.57
8201	108.59	105.16
5152	104.26	103
5102	104.91	103.53
5104	104.81	101.34
5151	105.11	103.93
5156	105.13	104.16
6155	n/a	n/a
5155	105.5	104.23
5103	105.37	102.4
611A	n/a	n/a
5101	105.47	102.67
5197	n/a	n/a
6156	n/a	n/a
5105	105.04	103.32
511C	n/a	n/a
5153	105.05	103.77
511B	n/a	n/a
6152	n/a	n/a
6153	n/a	n/a
511E	n/a	n/a
511D	n/a	n/a
6154	n/a	n/a
9054	n/a	n/a
9003	100.41	98.66
9055	n/a	n/a
9051	99.92	98.63
9001	99.67	97.99
9053	100.26	98.75
9052	102.6	101.67
9002	101.83	100.36
901B	n/a	n/a
901D	n/a	n/a
901A	n/a	n/a
901F	n/a	n/a
901E	n/a	n/a
901C	n/a	n/a
8060	n/a	n/a
7051	n/a	n/a
8059	n/a	n/a
8056	n/a	n/a
8005	n/a	n/a
8054	n/a	n/a
8001	102.06	99.99
8055	n/a	n/a
8050	102.05	100.06
8051	102.93	100.48
8002	102.91	100.16
8003	104.19	100.48
8052	104.34	101
8102	105.95	103.4
6057	101.22	n/a
6005	101.1	n/a
6056	104.15	102.16
701A	n/a	n/a
701B	n/a	n/a
7050	99.79	n/a
5051	103.71	102.66
6052	103.24	101.46
6051	103.44	99.88
6001	103.45	100.43
6053	102.8	100.94
6054	102.38	101.22
6003	103.16	100.77
6002	102.43	100.32
6055	104.46	102.02
6004	104.52	101.47
5093	n/a	n/a
5094	n/a	n/a
5158	104.28	n/a

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

Asset Location Search Sewer Map - ALS/ALS Standard/2021_4392362

SP4541SW



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 445250,241250

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NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
4953	93.32	90.82
4056	92.72	89.44
4052	92.34	90.66
4051	92.77	90.11
4066	92.7	89.34
4054	92.56	90.57
4060	n/a	89.86
4053	92.72	90.1
421A	n/a	n/a
4058	92.6	90.71
4065	92.57	n/a
4059	92.55	89.43
401C	n/a	n/a
401D	n/a	n/a
401B	n/a	n/a
401A	n/a	n/a
4063	91.03	n/a
4062	92	91
4067	92.15	90.19
4061	n/a	n/a
1301	96.68	94.87
1352	n/a	n/a
0354	99.09	98.61
3302	95.03	90.43
3351	95.15	91.77
3401	94.57	89.69
2401	95.85	90.83
2351	94.48	93.56
2301	94.23	93.08
2302	93.93	92.5
2352	94.45	91.1
2303	94.07	90.7
3301	94.47	90.56
3353	94.17	92.71
3102	n/a	n/a
3253	n/a	n/a
3251	93.89	90.1
3352	93.99	93.16
3101	94.39	91.81
3201	93.41	91.14
301D	n/a	n/a
3202	93.27	91.15
301C	n/a	n/a
3051	94.71	90.46
331A	n/a	n/a
3053	n/a	n/a
3001	94.63	93.42
301A	n/a	n/a
301B	n/a	n/a
3052	94.33	93.58
301E	n/a	n/a
301F	n/a	n/a
421B	n/a	n/a
4057	93.43	92.1
0152	101.49	99.94
0102	101.44	99.1
0201	101.09	98.74
0251	101.17	99.62
0202	98.31	97.2
0252	98.37	97.5
0297	n/a	n/a
0296	n/a	n/a
0295	n/a	n/a
0203	98.53	97.17
0294	n/a	n/a
0302	97.77	96.53
0351	98.93	97.29
0355	97.77	96.75
0301	99.31	97.85
0352	99.21	97.71
0353	99.12	97.97
0358	n/a	n/a
0303	97.58	96.18
0304	97.52	96.01
0356	99.17	98.49
1302	95.52	93.66
1351	95.55	94.31
0305	97.51	95.85
0357	97.5	96.27
001J	n/a	n/a
001C	n/a	n/a
001I	n/a	n/a
0052	100.72	98.85
101E	n/a	n/a
101D	n/a	n/a
101C	n/a	n/a
001F	n/a	n/a
001G	n/a	n/a
001K	n/a	n/a
0051	101	99.83

Manhole Reference	Manhole Cover Level	Manhole Invert Level
001E	n/a	n/a
001D	n/a	n/a
001H	n/a	n/a
011E	n/a	n/a
011F	n/a	n/a
011G	n/a	n/a
0151	101.22	100.14
0101	101.26	99.97
011H	n/a	n/a
011A	n/a	n/a
011C	n/a	n/a
011D	n/a	n/a
011B	n/a	n/a

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ALS Sewer Map Key

Public Sewer Types (Operated & Maintained by Thames Water)

Foul: A sewer designed to convey waste water from domestic and industrial sources to a treatment works.

Surface Water: A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses.

Combined: A sewer designed to convey both waste water and surface water from domestic and industrial sources to a treatment works.

Trunk Surface Water

Trunk Foul

Storm Relief

Trunk Combined

Vent Pipe

Bio-solids (Sludge)

Proposed Thames Surface Water Sewer

Proposed Thames Water Foul Sewer

Gallery

Foul Rising Main

Surface Water Rising Main

Combined Rising Main

Sludge Rising Main

Proposed Thames Water Rising Main

Vacuum

Sewer Fittings

A feature in a sewer that does not affect the flow in the pipe. Example: a vent is a fitting as the function of a vent is to release excess gas.

Air Valve

Dam Chase

Fitting

Meter

Vent Column

Operational Controls

A feature in a sewer that changes or diverts the flow in the sewer. Example: A hydrobrake limits the flow passing downstream.

Control Valve

Drop Pipe

Ancillary

Weir

End Items

End symbols appear at the start or end of a sewer pipe. Examples: an Undefined End at the start of a sewer indicates that Thames Water has no knowledge of the position of the sewer upstream of that symbol, Outfall on a surface water sewer indicates that the pipe discharges into a stream or river.

Outfall

Undefined End

Inlet

Other Symbols

Symbols used on maps which do not fall under other general categories

Public/Private Pumping Station

Change of characteristic indicator (C.O.C.I.)

Invert Level

Summit

Areas

Lines denoting areas of underground surveys, etc.

Agreement

Operational Site

Chamber

Tunnel

Conduit Bridge

Other Sewer Types (Not Operated or Maintained by Thames Water)

Foul Sewer

Surface Water Sewer

Combined Sewer

Gulley

Culverted Watercourse

Proposed

Abandoned Sewer

Notes:

1) All levels associated with the plans are to Ordnance Datum Newlyn.

2) All measurements on the plans are metric.

3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate direction of flow.

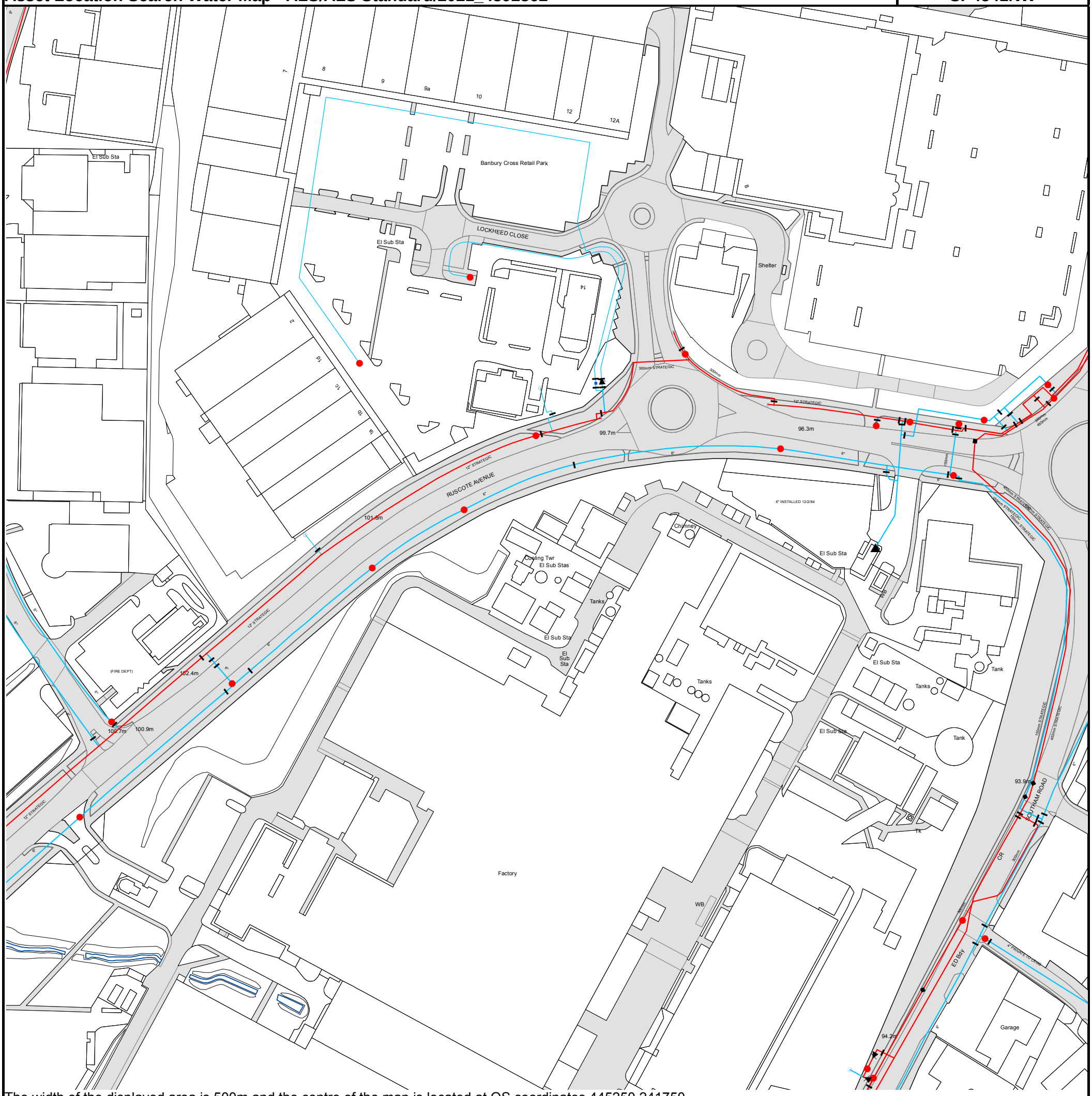
4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.

5) 'na' or '0' on a manhole level indicates that data is unavailable.

6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in milimetres. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement. If you are unsure about any text or symbology present on the plan, please contact a member of Property Searches on 0800 009 4540.

Asset Location Search Water Map - ALS/ALS Standard/2021_4392362

SP4541NW



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 445250,241750

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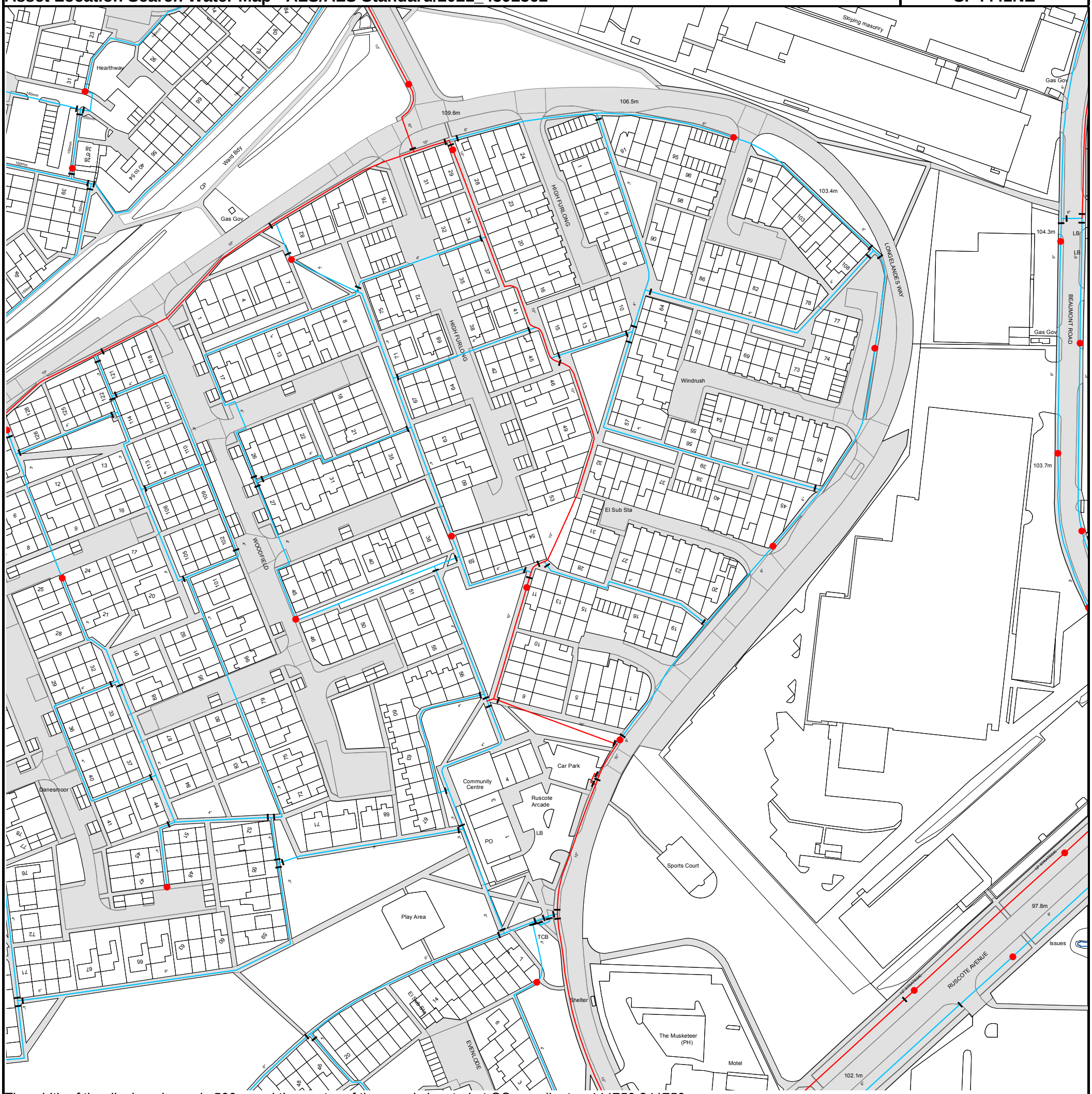
Asset Location Search Water Map - ALS/ALS Standard/2021_4392362

SP4441NE



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 444750,241750

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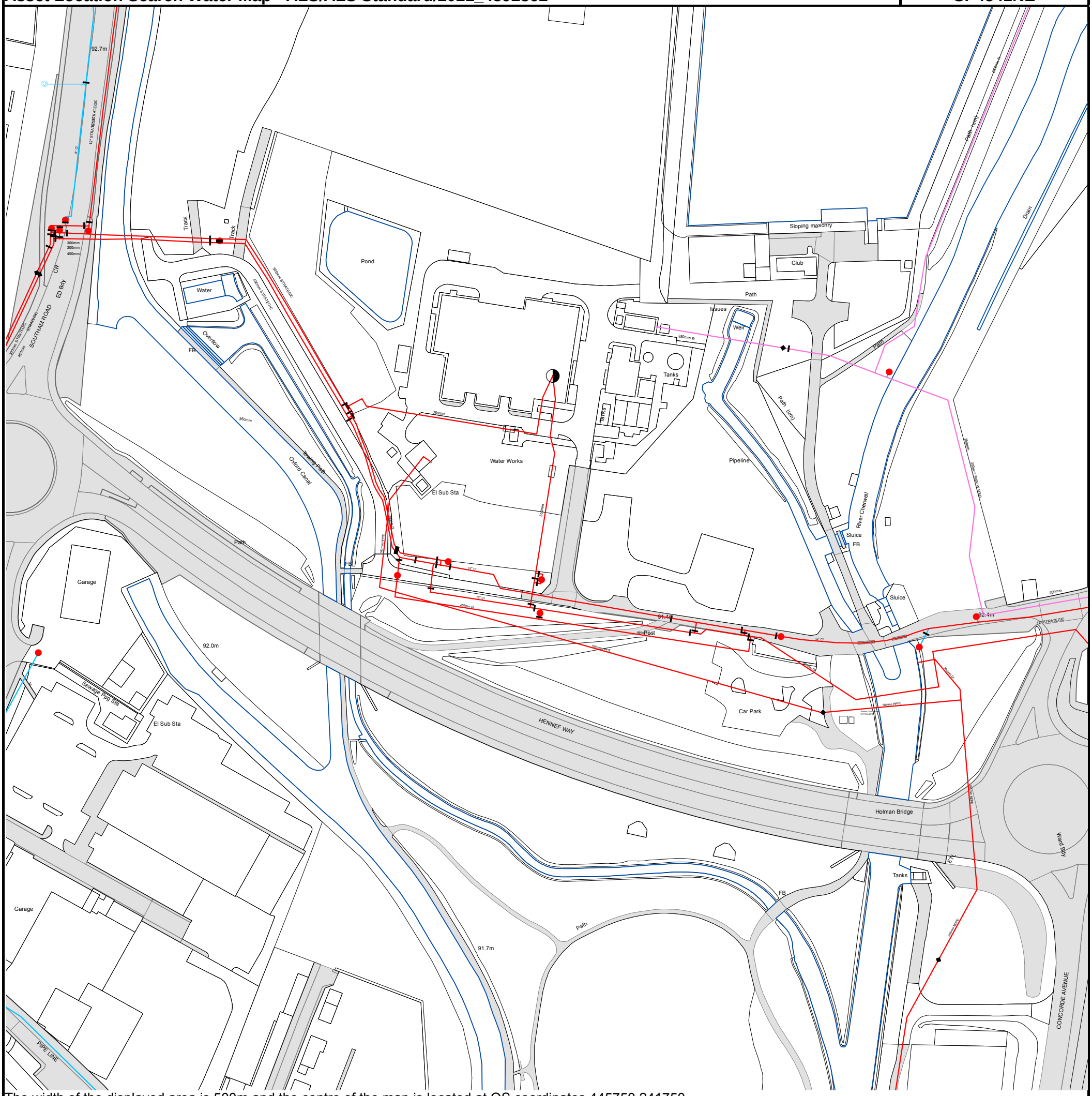
Asset Location Search Water Map - ALS/ALS Standard/2021_4392362

SP4541NE



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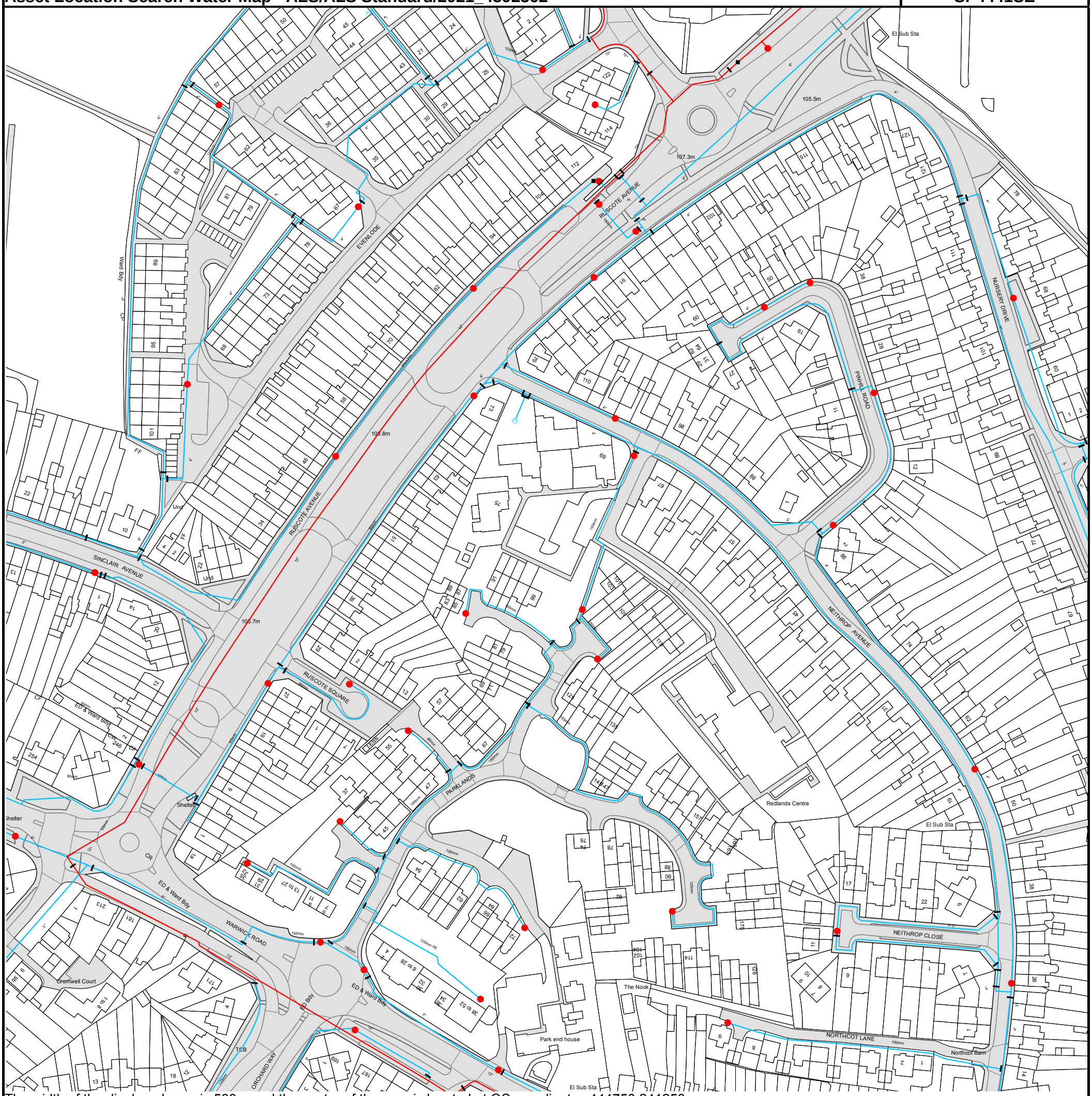
Asset Location Search Water Map - ALS/ALS Standard/2021_4392362

SP4441SE



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 444750,241250

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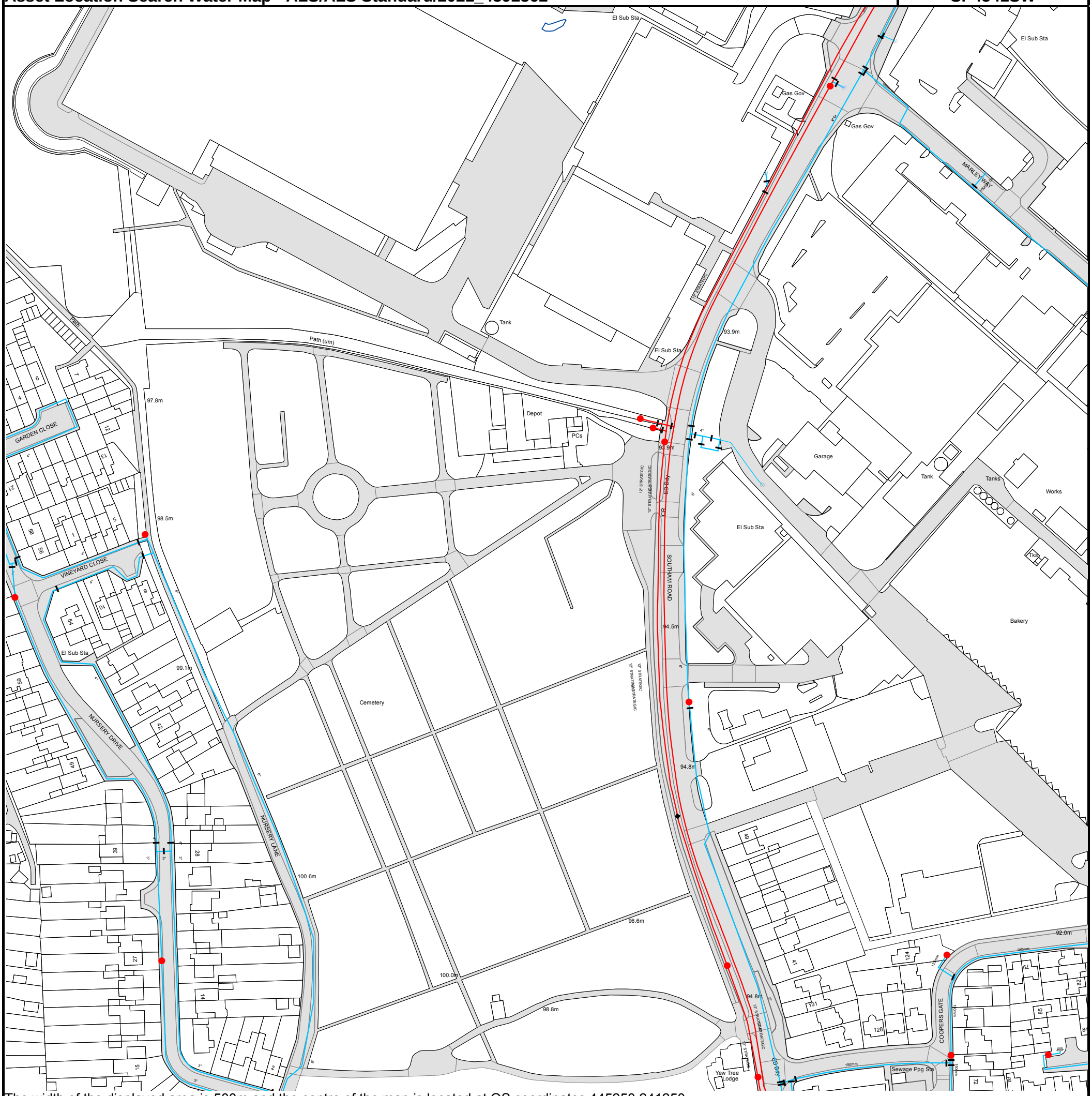
Asset Location Search Water Map - ALS/ALS Standard/2021_4392362

SP4541SW



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 445250,241250

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ALS Water Map Key

Water Pipes (Operated & Maintained by Thames Water)

4"

Distribution Main: The most common pipe shown on water maps. With few exceptions, domestic connections are only made to distribution mains.

16"

Trunk Main: A main carrying water from a source of supply to a treatment plant or reservoir, or from one treatment plant or reservoir to another. Also a main transferring water in bulk to smaller water mains used for supplying individual customers.

3" SUPPLY

Supply Main: A supply main indicates that the water main is used as a supply for a single property or group of properties.

3" FIRE

Fire Main: Where a pipe is used as a fire supply, the word FIRE will be displayed along the pipe.

3" METERED

Metered Pipe: A metered main indicates that the pipe in question supplies water for a single property or group of properties and that quantity of water passing through the pipe is metered even though there may be no meter symbol shown.

Transmission Tunnel: A very large diameter water pipe. Most tunnels are buried very deep underground. These pipes are not expected to affect the structural integrity of buildings shown on the map provided.

Proposed Main: A main that is still in the planning stages or in the process of being laid. More details of the proposed main and its reference number are generally included near the main.

Valves

- General Purpose Valve
- Air Valve
- Pressure Control Valve
- Customer Valve

Hydrants

- Single Hydrant

Meters

- Meter

End Items

Symbol indicating what happens at the end of a water main.

- Blank Flange
- Capped End
- Emptying Pit
- Undefined End
- Manifold
- Customer Supply
- Fire Supply

Operational Sites

- Booster Station
- Other
- Other (Proposed)
- Pumping Station
- Service Reservoir
- Shaft Inspection
- Treatment Works
- Unknown
- Water Tower

Other Symbols

- Data Logger

PIPE DIAMETER	DEPTH BELOW GROUND
Up to 300mm (12")	900mm (3')
300mm - 600mm (12" - 24")	1100mm (3' 8")
600mm and bigger (24" plus)	1200mm (4')

Other Water Pipes (Not Operated or Maintained by Thames Water)

Other Water Company Main: Occasionally other water company water pipes may overlap the border of our clean water coverage area. These mains are denoted in purple and in most cases have the owner of the pipe displayed along them.

Private Main: Indiates that the water main in question is not owned by Thames Water. These mains normally have text associated with them indicating the diameter and owner of the pipe.

Terms and Conditions

All sales are made in accordance with Thames Water Utilities Limited (TWUL) standard terms and conditions unless previously agreed in writing.

1. All goods remain in the property of Thames Water Utilities Ltd until full payment is received.
2. Provision of service will be in accordance with all legal requirements and published TWUL policies.
3. All invoices are strictly due for payment 14 days from due date of the invoice. Any other terms must be accepted/agreed in writing prior to provision of goods or service, or will be held to be invalid.
4. Thames Water does not accept post-dated cheques-any cheques received will be processed for payment on date of receipt.
5. In case of dispute TWUL`s terms and conditions shall apply.
6. Penalty interest may be invoked by TWUL in the event of unjustifiable payment delay. Interest charges will be in line with UK Statute Law 'The Late Payment of Commercial Debts (Interest) Act 1998'.
7. Interest will be charged in line with current Court Interest Charges, if legal action is taken.
8. A charge may be made at the discretion of the company for increased administration costs.

A copy of Thames Water's standard terms and conditions are available from the Commercial Billing Team (cashoperations@thameswater.co.uk).

We publish several Codes of Practice including a guaranteed standards scheme. You can obtain copies of these leaflets by calling us on 0800 316 9800

If you are unhappy with our service you can speak to your original goods or customer service provider. If you are not satisfied with the response, your complaint will be reviewed by the Customer Services Director. You can write to her at: Thames Water Utilities Ltd. PO Box 492, Swindon, SN38 8TU.

If the Goods or Services covered by this invoice falls under the regulation of the 1991 Water Industry Act, and you remain dissatisfied you can refer your complaint to Consumer Council for Water on 0121 345 1000 or write to them at Consumer Council for Water, 1st Floor, Victoria Square House, Victoria Square, Birmingham, B2 4AJ.

Ways to pay your bill

Credit Card	**BACS Payment**	**Telephone Banking**	**Cheque**
Call **0800 009 4540** quoting your invoice number starting CBA or ADS / OSS	Account number **90478703** Sort code **60-00-01** A remittance advice must be sent to: **Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW.** or email **ps.billing@thameswater.co.uk**	By calling your bank and quoting: Account number **90478703** Sort code **60-00-01** and your invoice number	Made payable to '**Thames Water Utilities Ltd**' Write your Thames Water account number on the back. Send to: **Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW** or by DX to **151280 Slough 13**

Thames Water Utilities Ltd Registered in England & Wales No. 2366661 Registered Office Clearwater Court, Vastern Rd, Reading, Berks, RG1 8DB.

Appendix D – Proposed Drainage Layout

GENERAL:

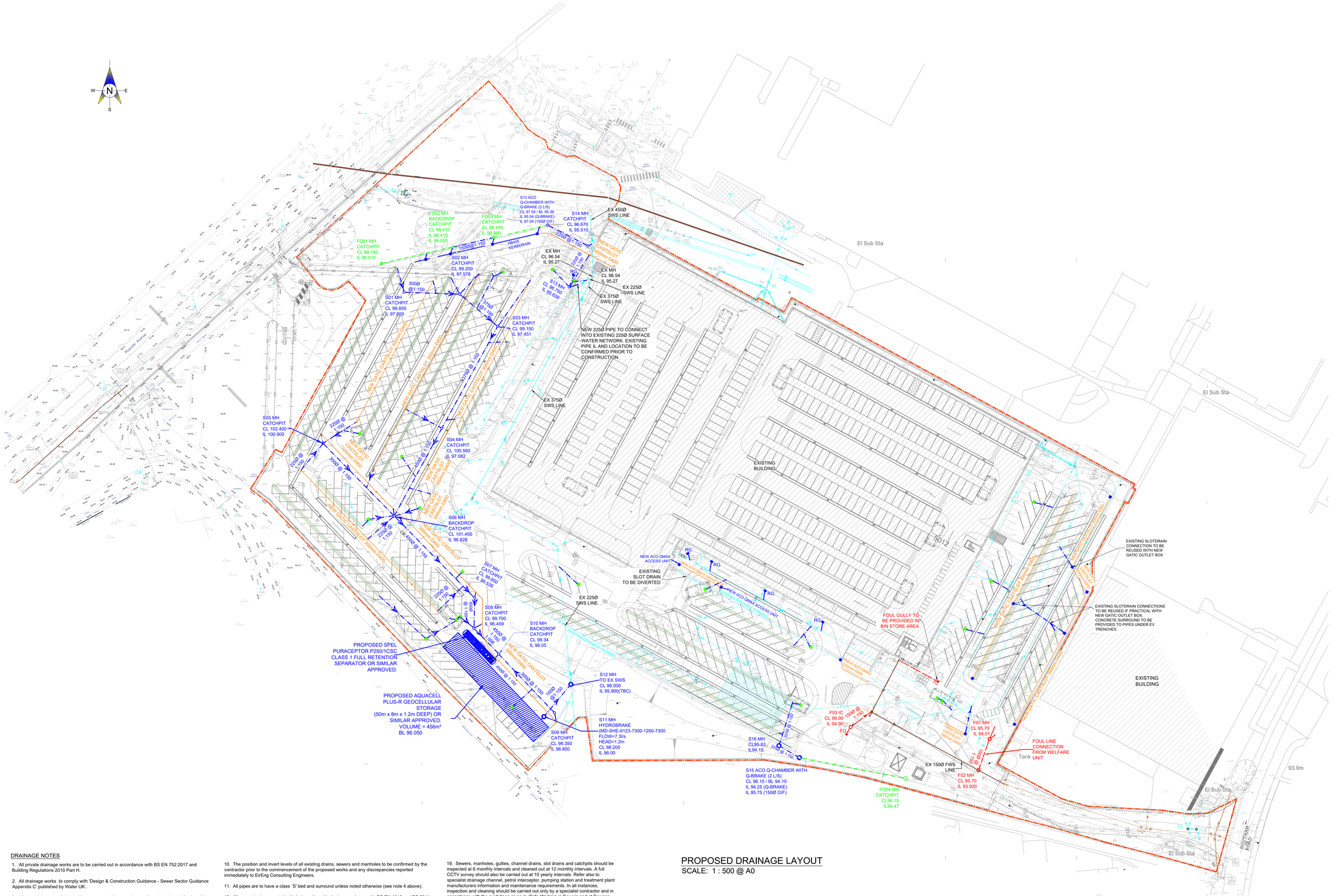
1. IF THIS DRAWING HAS BEEN RECEIVED ELECTRONICALLY IT IS THE RECIPIENTS RESPONSIBILITY TO PRINT THE DOCUMENT TO THE CORRECT SCALE.
2. ALL DIMENSIONS ARE IN (m) UNLESS OTHERWISE NOTED.
3. ALL LEVELS ARE IN METRES ABOVE DATUM UNLESS OTHERWISE NOTED.
4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL THE RELEVANT ENGINEERS' SERVICES ENGINEERS, MANUFACTURERS & ARCHITECTS DRAWINGS AND SPECIFICATIONS.

LEGEND:

- SITE BOUNDARY LINE
- EXISTING BUILDING
- PROPOSED SURFACE WATER SEWER
- PROPOSED SURFACE WATER SLOTDRAIN
- RG PROPOSED ROAD GULLY
- PROPOSED SLOTDRAIN ACCESS/OUTLET UNIT
- PROPOSED KERBDRAIN
- PROPOSED FILTER DRAIN

UTILITY LINETYPES

- Air Line
- British Telecom
- British Telecom Overhead
- CCTV / Cable Television
- Communication Cable
- Drainage - Combined Water (150)
- Drainage - Foul Water (150)
- Drainage - Storm Water (150)
- Earth Cable
- Empty Duct
- Electric Cable
- Electric Low Voltage
- Electric High Voltage
- Electric Overhead
- Fibre Optic
- Fuel
- Fuel Diesel
- Fuel Petrol
- Gas Line
- Gauge Line
- GPR Line
- Heating Pipes
- Multiple Services Route
- Offset Fills
- Oil Pipe
- Rising Main
- Telecom
- Traffic Light Signals
- Unknown
- Vapour Recovery
- Vent Line
- Water



DRAINAGE NOTES

1. All private drainage works are to be carried out in accordance with BS EN 752:2017 and Building Regulations 2010 Part H.
2. All drainage works to comply with 'Design & Construction Guidance - Sewer Sector Guidance Appendix C' published by Water UK .
3. All connections to existing public sewers to be in accordance with and to the satisfaction of the Local Authority.
4. Concrete protection (bedding class 'Z') to pipework to be provided as follows;
(i) all pipework within soft areas with a cover of less than 500mm.
(ii) all pipework beneath roads, car parks and all other trafficked hardstanding areas with a cover less than 1200mm.
(iii)all pipework adjacent to existing and proposed trees/dense vegetation in landscaped areas. An expansion joint shall be provided at all joint locations.
5. All below ground foul drainage from within building footprint to be 100mm dia. unless noted otherwise. All below ground drainage from road gullies to be 150mm dia. unless noted otherwise.
6. All pipework in manholes are to be laid soffit to soffit unless noted otherwise. All chamber invert levels, shown on the drawing, are for the outgoing pipe.
7. All internal drainage to be to Architect's and M&E Engineer's drawings and details.
8. For setting out of foul and rainwater outlets refer to the Architect's drawings. Contractor is responsible for all coordination of pipework on site.
9. This drawing to be read in conjunction with all other relevant Engineer's and Architect's drawings, specifications and documentation.
10. The position and invert levels of all existing drains, sewers and manholes to be confirmed by the contractor prior to the commencement of the proposed works and any discrepancies reported immediately to EirEng Consulting Engineers.
11. All pipes are to have a class 'S' bed and surround unless noted otherwise (see note 4 above).
12. All concrete pipes are to be high strength and to be in accordance with BS EN 1916 and BS 5911.
13. All vitrified clay pipes are to be in accordance with BS EN 295.
14. Drainage channels, slot drains and catchpits to be designed by specialist manufacturer for critical storms of 75mm rainfall depth, to suit site conditions and in accordance with load class requirements as shown on the plan. Location of all rodding access, inspection chambers and outlets to be as per specialist manufacturers design. Design to be submitted for comment to EirEng Consulting Engineers prior to ordering.
15. All external finished levels and manhole cover levels shown on this drawing are indicative and subject to adjustment on site to suit the finished ground levels. All existing manhole covers to be amended to suit finished ground levels and converted to trafficable where required including manhole build up and surround.
16. All levels are in metres and all dimensions are in millimetres unless noted otherwise.
17. Any coordinates provided for manholes or inspection chambers are relevant to the centre of the manhole.
18. A CCTV drainage survey is to be carried out both at the pre-commencement of construction and at the completion of the contract to prove the integrity of the as-built drainage systems. At the completion of the contract this is to be carried out prior to the issue of the practical completion certificate.
19. Sewers, manholes, gullies, channel drains, slot drains and catchpits should be inspected at 6 monthly intervals and cleaned out at 12 monthly intervals. A full CCTV survey should also be carried out at 10 yearly intervals. Refer also to specialist drainage channel, petrol interceptor, pumping station and treatment plant manufacturers information and maintenance requirements. In all instances, inspection and cleaning should be carried out only by a specialist contractor and in accordance with the guidelines given in `Safe Working in Sewers and at Sewage Works' published by National Joint Health and Safety Committee for the Water Services.
20. All covers to be in accordance with BS EN124 and the following load class;
- F900 - Service Yards
- D400 - Carriageways, Service Roads and Car Parks. Class F900 cover to be used if located in direct wheel track on service roads.
21. Contractor to allow for underground utility survey of existing site foul and surface water drainage network to confirm information provided. Survey to be carried out and issued to EirEng Consulting Engineers at the outset of works.
22. Petrol Interceptors to be installed to manufacturers requirements and must comply with BS EN 858:1 and BS EN 858:2 with appropriate silt capacity and oil & water level monitor and alarm systems. All vent pipes for interceptors to be 110mm dia. and terminate 2.4m above ground, location to Architects details.
23. Petrol Interceptors located in trafficable areas must be installed with a reinforced concrete slab beneath pavement finish designed to take vehicle loading.
24. Contractor to allow for dewatering during excavation works due to groundwater expected at a depth of approx. 1m bgl.

PROPOSED DRAINAGE LAYOUT

SCALE: 1 : 500 @ A0

1:500 0 10.0 20.0 30.0 40.0 50.0m

1:1 0 10 20 30 40 50 60 70 80 90 100

REV	DATE	BY	DESCRIPTION
PL9	23.02.22	LL	PLANNING ISSUE
PL8	21.02.22	LL	PLANNING ISSUE
PL7	10.11.21	PH	PLANNING ISSUE
PL6	05.11.21	PH	PLANNING ISSUE
PL5	04.11.21	PH	PLANNING ISSUE
PL4	22.08.21	LL	PLANNING ISSUE
PL3	17.08.21	PH	PLANNING ISSUE
PL2	13.08.21	PH	PLANNING ISSUE
PL1	09.08.21	PH	PLANNING ISSUE

REVISIONS

CLIENT: LYSANDER

PROJECT TITLE: BANBURY 200 SOUTHAM ROAD BANBURY

DRAWING TITLE: PROPOSED DRAINAGE LAYOUT

eIReNG CONSULTING ENGINEERS
48a Patrick Street, Dun Laoghaire, Co.Dublin, Ireland.
Tel: +353 1 6638957 Email: info@eireng.ie

DRAWN BY: P Herangi	DATE: 09-08-2021
ENG CHECK: M Allen	DATE: 09-08-2021
APPROVED: E Deasy	DATE: 09-08-2021
SCALE: 1:500	SHEET: A0
STATUS: PLANNING	
JOB NO.: 212088	DRAWING NUMBER: C002
	REVISION: PL9

Appendix E – MicroDrainage Calculations

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FEH Rainfall Model

Return Period (years)	2
FEH Rainfall Version	2013
Site Location	GB 445153 241444 SP 45153 41444
Data Type	Point
Maximum Rainfall (mm/hr)	150
Maximum Time of Concentration (mins)	15
Foul Sewage (l/s/ha)	0.000
Volumetric Runoff Coeff.	0.750
PIMP (%)	100
Add Flow / Climate Change (%)	0
Minimum Backdrop Height (m)	0.000
Maximum Backdrop Height (m)	1.500
Min Design Depth for Optimisation (m)	1.200
Min Vel for Auto Design only (m/s)	1.00
Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.102	4-8	0.660	8-12	0.042

Total Area Contributing (ha) = 0.804

Total Pipe Volume (m³) = 34.876

Network Design Table for Storm

- Indicates pipe length does not match coordinates
« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	22.035#	0.147	150.0	0.123	5.00	0.0	0.600	o	300	Pipe/Conduit	
S1.001	19.130#	0.128	150.0	0.083	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.002	43.975#	0.293	150.0	0.142	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.003	38.158	0.254	150.0	0.107	0.00	0.0	0.600	o	450	Pipe/Conduit	
S2.000	38.814	0.259	150.0	0.048	5.00	0.0	0.600	o	300	Pipe/Conduit	
S1.004	43.882	0.293	150.0	0.202	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.005	11.535	0.077	150.0	0.020	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.006	12.114	0.081	150.0	0.017	0.00	0.0	0.600	o	450	Pipe/Conduit	
S3.000	32.557	0.217	150.0	0.062	5.00	0.0	0.600	o	300	Pipe/Conduit	
S1.007	15.226	0.102	150.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.008	45.000	0.045	1000.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.009	16.076	0.100	160.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	67.29	5.29	97.800	0.123	0.0	0.0	0.0	1.28	90.6	22.4
S1.001	66.13	5.50	97.578	0.206	0.0	0.0	0.0	1.48	163.1	36.9
S1.002	63.60	6.00	97.451	0.348	0.0	0.0	0.0	1.48	163.1	59.9
S1.003	61.78	6.38	97.082	0.455	0.0	0.0	0.0	1.66	263.6	76.1
S2.000	66.12	5.50	100.900	0.048	0.0	0.0	0.0	1.28	90.6	8.6
S1.004	59.82	6.82	96.828	0.705	0.0	0.0	0.0	1.66	263.6	114.2
S1.005	59.32	6.94	96.535	0.725	0.0	0.0	0.0	1.66	263.6	116.5
S1.006	58.81	7.06	96.459	0.742	0.0	0.0	0.0	1.66	263.6	118.2
S3.000	66.55	5.42	96.850	0.062	0.0	0.0	0.0	1.28	90.6	11.2
S1.007	58.19	7.21	96.378	0.804	0.0	0.0	0.0	1.66	263.6	126.7
S1.008	51.63	9.06	96.050	0.804	0.0	0.0	0.0	0.41	16.1«	126.7
S1.009	50.61	9.40	96.000	0.804	0.0	0.0	0.0	0.79	14.0«	126.7

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.123	0.123	0.123
1.001	-	-	100	0.083	0.083	0.083
1.002	-	-	100	0.142	0.142	0.142
1.003	-	-	100	0.107	0.107	0.107
2.000	-	-	100	0.048	0.048	0.048
1.004	-	-	100	0.202	0.202	0.202
1.005	-	-	100	0.020	0.020	0.020
1.006	-	-	100	0.017	0.017	0.017
3.000	-	-	100	0.062	0.062	0.062
1.007	-	-	100	0.000	0.000	0.000
1.008	-	-	100	0.000	0.000	0.000
1.009	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.804	0.804	0.804

Network Classifications for Storm

PN	USMH Name	Pipe Dia (mm)	Min Cover Depth (m)	Max Cover Depth (m)	Pipe Type	MH Dia (mm)	MH Width (mm)	MH Ring Depth (m)	MH Type
S1.000	SMH1	300	1.247	1.750	Unclassified	1200	0	1.750	Unclassified
S1.001	SMH2	375	1.247	1.324	Unclassified	1350	0	1.247	Unclassified
S1.002	SMH3	375	1.324	3.028	Unclassified	1350	0	1.324	Unclassified
S1.003	SMH4	450	3.028	4.172	Unclassified	1350	0	3.028	Unclassified
S2.000	SMH5	300	0.509	1.200	Unclassified	1200	0	1.200	Unclassified
S1.004	SMH6	450	2.865	4.172	Unclassified	1350	0	4.172	Unclassified
S1.005	SMH7	450	2.791	2.865	Unclassified	1350	0	2.865	Unclassified
S1.006	SMH8	450	2.512	2.791	Unclassified	1350	0	2.791	Unclassified
S3.000	SMH9	300	1.200	2.407	Unclassified	1200	0	1.200	Unclassified
S1.007	SMH10	450	1.774	2.512	Unclassified	1350	0	2.512	Unclassified
S1.008	STank	225	1.970	2.225	Unclassified	1350	0	2.225	Unclassified
S1.009	SMH11 HB	150	1.950	2.050	Unclassified	1500	0	2.050	Unclassified

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S1.009	SMH12	98.000	95.900	0.000	1200	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Storage Structures	1
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	2	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.700	Storm Duration (mins)	30
Ratio R	0.409		

Online Controls for Storm

Hydro-Brake® Optimum Manhole: SMH11 HB, DS/PN: S1.009, Volume (m³): 5.6

Unit Reference	MD-SHE-0123-7300-1200-7300
Design Head (m)	1.200
Design Flow (l/s)	7.3
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	123
Invert Level (m)	96.000
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.200	7.3
Flush-Flo™	0.354	7.3
Kick-Flo®	0.759	5.9
Mean Flow over Head Range	-	6.3

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	4.4	1.200	7.3	3.000	11.2	7.000	16.8
0.200	6.9	1.400	7.8	3.500	12.1	7.500	17.4
0.300	7.3	1.600	8.4	4.000	12.9	8.000	17.9
0.400	7.3	1.800	8.8	4.500	13.6	8.500	18.5
0.500	7.1	2.000	9.3	5.000	14.3	9.000	19.0
0.600	6.9	2.200	9.7	5.500	15.0	9.500	19.5
0.800	6.0	2.400	10.1	6.000	15.6		
1.000	6.7	2.600	10.5	6.500	16.2		

Storage Structures for Storm

Cellular Storage Manhole: STank, DS/PN: S1.008

Invert Level (m) 96.050 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	400.0	0.0	1.201	0.0	0.0
1.200	400.0	0.0			

2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs	0	Number of Storage Structures	1
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location	GB 445153 241444 SP 45153 41444
Data Type	Point
Cv (Summer)	0.750
Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600
Return Period(s) (years)	2, 30, 100
Climate Change (%)	0, 0, 20

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	SMH1	15 Winter	2	+0%	100/15 Summer			
S1.001	SMH2	15 Winter	2	+0%	100/15 Summer			
S1.002	SMH3	15 Winter	2	+0%	100/15 Summer			
S1.003	SMH4	15 Winter	2	+0%	30/15 Summer			
S2.000	SMH5	15 Winter	2	+0%				
S1.004	SMH6	15 Winter	2	+0%	30/15 Summer			
S1.005	SMH7	15 Winter	2	+0%	30/15 Summer			
S1.006	SMH8	15 Winter	2	+0%	30/15 Summer			
S3.000	SMH9	15 Winter	2	+0%	100/15 Summer			
S1.007	SMH10	15 Winter	2	+0%	30/15 Summer			
S1.008	STank	240 Winter	2	+0%	2/120 Summer			
S1.009	SMH11 HB	240 Winter	2	+0%	2/15 Summer			

2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S1.000	SMH1	97.906	-0.194	0.000	0.26			21.0	OK
S1.001	SMH2	97.705	-0.249	0.000	0.24			33.2	OK
S1.002	SMH3	97.607	-0.219	0.000	0.36			53.4	OK
S1.003	SMH4	97.249	-0.283	0.000	0.29			67.7	OK
S2.000	SMH5	100.963	-0.237	0.000	0.10			8.2	OK
S1.004	SMH6	97.038	-0.240	0.000	0.44			103.5	OK
S1.005	SMH7	96.794	-0.192	0.000	0.62			105.4	OK
S1.006	SMH8	96.721	-0.187	0.000	0.64			107.4	OK
S3.000	SMH9	96.922	-0.228	0.000	0.13			10.6	OK
S1.007	SMH10	96.643	-0.185	0.000	0.65			116.2	OK
S1.008	STank	96.331	0.056	0.000	0.56		171	8.2	SURCHARGED
S1.009	SMH11 HB	96.316	0.166	0.000	0.56			7.3	SURCHARGED

PN	US/MH Name	Level Exceeded
S1.000	SMH1	
S1.001	SMH2	
S1.002	SMH3	
S1.003	SMH4	
S2.000	SMH5	
S1.004	SMH6	
S1.005	SMH7	
S1.006	SMH8	
S3.000	SMH9	
S1.007	SMH10	
S1.008	STank	
S1.009	SMH11 HB	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs	0	Number of Storage Structures	1
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location	GB 445153 241444 SP 45153 41444
Data Type	Point
Cv (Summer)	0.750
Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600
Return Period(s) (years)	2, 30, 100
Climate Change (%)	0, 0, 20

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	SMH1	15 Winter	30	+0%	100/15 Summer			
S1.001	SMH2	15 Winter	30	+0%	100/15 Summer			
S1.002	SMH3	15 Winter	30	+0%	100/15 Summer			
S1.003	SMH4	15 Winter	30	+0%	30/15 Summer			
S2.000	SMH5	15 Winter	30	+0%				
S1.004	SMH6	15 Winter	30	+0%	30/15 Summer			
S1.005	SMH7	15 Winter	30	+0%	30/15 Summer			
S1.006	SMH8	15 Winter	30	+0%	30/15 Summer			
S3.000	SMH9	15 Winter	30	+0%	100/15 Summer			
S1.007	SMH10	15 Winter	30	+0%	30/15 Summer			
S1.008	STank	240 Winter	30	+0%	2/120 Summer			
S1.009	SMH11 HB	240 Winter	30	+0%	2/15 Summer			

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S1.000	SMH1	97.967	-0.133	0.000	0.58			46.2	OK
S1.001	SMH2	97.792	-0.161	0.000	0.58			78.7	OK
S1.002	SMH3	97.748	-0.078	0.000	0.87			130.6	OK
S1.003	SMH4	97.601	0.069	0.000	0.65			152.6	SURCHARGED
S2.000	SMH5	100.995	-0.205	0.000	0.22			18.1	OK
S1.004	SMH6	97.475	0.197	0.000	0.91			215.6	SURCHARGED
S1.005	SMH7	97.222	0.236	0.000	1.31			221.4	SURCHARGED
S1.006	SMH8	97.064	0.155	0.000	1.34			225.8	SURCHARGED
S3.000	SMH9	96.959	-0.191	0.000	0.28			23.1	OK
S1.007	SMH10	96.900	0.072	0.000	1.37			246.1	SURCHARGED
S1.008	STank	96.693	0.418	0.000	0.67		307	9.8	SURCHARGED
S1.009	SMH11 HB	96.714	0.564	0.000	0.56			7.3	SURCHARGED

PN	US/MH Name	Level Exceeded
S1.000	SMH1	
S1.001	SMH2	
S1.002	SMH3	
S1.003	SMH4	
S2.000	SMH5	
S1.004	SMH6	
S1.005	SMH7	
S1.006	SMH8	
S3.000	SMH9	
S1.007	SMH10	
S1.008	STank	
S1.009	SMH11 HB	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs	0	Number of Storage Structures	1
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location	GB 445153 241444 SP 45153 41444
Data Type	Point
Cv (Summer)	0.750
Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600
Return Period(s) (years)	2, 30, 100
Climate Change (%)	0, 0, 20

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	SMH1	15 Winter	100	+20%	100/15 Summer			
S1.001	SMH2	15 Winter	100	+20%	100/15 Summer			
S1.002	SMH3	15 Winter	100	+20%	100/15 Summer			
S1.003	SMH4	15 Winter	100	+20%	30/15 Summer			
S2.000	SMH5	15 Winter	100	+20%				
S1.004	SMH6	15 Winter	100	+20%	30/15 Summer			
S1.005	SMH7	15 Winter	100	+20%	30/15 Summer			
S1.006	SMH8	15 Winter	100	+20%	30/15 Summer			
S3.000	SMH9	15 Winter	100	+20%	100/15 Summer			
S1.007	SMH10	15 Winter	100	+20%	30/15 Summer			
S1.008	STank	360 Winter	100	+20%	2/120 Summer			
S1.009	SMH11 HB	360 Winter	100	+20%	2/15 Summer			

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S1.000	SMH1	99.156	1.056	0.000	0.76			60.4	SURCHARGED
S1.001	SMH2	99.070	1.116	0.000	0.72			98.0	FLOOD RISK
S1.002	SMH3	98.959	1.134	0.000	1.06			158.7	FLOOD RISK
S1.003	SMH4	98.614	1.082	0.000	0.87			202.7	SURCHARGED
S2.000	SMH5	101.021	-0.179	0.000	0.33			28.1	OK
S1.004	SMH6	98.418	1.140	0.000	1.34			318.1	SURCHARGED
S1.005	SMH7	97.852	0.867	0.000	1.94			328.7	SURCHARGED
S1.006	SMH8	97.503	0.594	0.000	1.99			337.0	SURCHARGED
S3.000	SMH9	97.249	0.099	0.000	0.39			32.1	SURCHARGED
S1.007	SMH10	97.140	0.312	0.000	2.05			368.8	SURCHARGED
S1.008	STank	97.131	0.856	0.000	0.69		569	10.1	SURCHARGED
S1.009	SMH11 HB	97.148	0.998	0.000	0.56			7.3	SURCHARGED

PN	US/MH Name	Level Exceeded
S1.000	SMH1	
S1.001	SMH2	
S1.002	SMH3	
S1.003	SMH4	
S2.000	SMH5	
S1.004	SMH6	
S1.005	SMH7	
S1.006	SMH8	
S3.000	SMH9	
S1.007	SMH10	
S1.008	STank	
S1.009	SMH11 HB	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FEH Rainfall Model

Return Period (years)	2
FEH Rainfall Version	2013
Site Location	GB 445153 241444 SP 45153 41444
Data Type	Point
Maximum Rainfall (mm/hr)	150
Maximum Time of Concentration (mins)	15
Foul Sewage (l/s/ha)	0.000
Volumetric Runoff Coeff.	0.750
PIMP (%)	100
Add Flow / Climate Change (%)	0
Minimum Backdrop Height (m)	0.000
Maximum Backdrop Height (m)	1.500
Min Design Depth for Optimisation (m)	1.200
Min Vel for Auto Design only (m/s)	1.00
Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.102	4-8	0.660	8-12	0.042

Total Area Contributing (ha) = 0.804

Total Pipe Volume (m³) = 34.876

Network Design Table for Storm

- Indicates pipe length does not match coordinates
« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	22.035#	0.147	150.0	0.123	5.00	0.0	0.600	o	300	Pipe/Conduit	
S1.001	19.130#	0.128	150.0	0.083	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.002	43.975#	0.293	150.0	0.142	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.003	38.158	0.254	150.0	0.107	0.00	0.0	0.600	o	450	Pipe/Conduit	
S2.000	38.814	0.259	150.0	0.048	5.00	0.0	0.600	o	300	Pipe/Conduit	
S1.004	43.882	0.293	150.0	0.202	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.005	11.535	0.077	150.0	0.020	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.006	12.114	0.081	150.0	0.017	0.00	0.0	0.600	o	450	Pipe/Conduit	
S3.000	32.557	0.217	150.0	0.062	5.00	0.0	0.600	o	300	Pipe/Conduit	
S1.007	15.226	0.102	150.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.008	45.000	0.045	1000.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.009	16.076	0.100	160.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	67.29	5.29	97.800	0.123	0.0	0.0	0.0	1.28	90.6	22.4
S1.001	66.13	5.50	97.578	0.206	0.0	0.0	0.0	1.48	163.1	36.9
S1.002	63.60	6.00	97.451	0.348	0.0	0.0	0.0	1.48	163.1	59.9
S1.003	61.78	6.38	97.082	0.455	0.0	0.0	0.0	1.66	263.6	76.1
S2.000	66.12	5.50	100.900	0.048	0.0	0.0	0.0	1.28	90.6	8.6
S1.004	59.82	6.82	96.828	0.705	0.0	0.0	0.0	1.66	263.6	114.2
S1.005	59.32	6.94	96.535	0.725	0.0	0.0	0.0	1.66	263.6	116.5
S1.006	58.81	7.06	96.459	0.742	0.0	0.0	0.0	1.66	263.6	118.2
S3.000	66.55	5.42	96.850	0.062	0.0	0.0	0.0	1.28	90.6	11.2
S1.007	58.19	7.21	96.378	0.804	0.0	0.0	0.0	1.66	263.6	126.7
S1.008	51.63	9.06	96.050	0.804	0.0	0.0	0.0	0.41	16.1«	126.7
S1.009	50.61	9.40	96.000	0.804	0.0	0.0	0.0	0.79	14.0«	126.7

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.123	0.123	0.123
1.001	-	-	100	0.083	0.083	0.083
1.002	-	-	100	0.142	0.142	0.142
1.003	-	-	100	0.107	0.107	0.107
2.000	-	-	100	0.048	0.048	0.048
1.004	-	-	100	0.202	0.202	0.202
1.005	-	-	100	0.020	0.020	0.020
1.006	-	-	100	0.017	0.017	0.017
3.000	-	-	100	0.062	0.062	0.062
1.007	-	-	100	0.000	0.000	0.000
1.008	-	-	100	0.000	0.000	0.000
1.009	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.804	0.804	0.804

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S1.009	SMH12	98.000	95.900	0.000	1200	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Storage Structures	1
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	2	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.700	Storm Duration (mins)	30
Ratio R	0.409		

Online Controls for Storm

Hydro-Brake® Optimum Manhole: SMH11 HB, DS/PN: S1.009, Volume (m³): 5.6

Unit Reference	MD-SHE-0123-7300-1200-7300
Design Head (m)	1.200
Design Flow (l/s)	7.3
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	123
Invert Level (m)	96.000
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.200	7.3
Flush-Flo™	0.354	7.3
Kick-Flo®	0.759	5.9
Mean Flow over Head Range	-	6.3

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	4.4	1.200	7.3	3.000	11.2	7.000	16.8
0.200	6.9	1.400	7.8	3.500	12.1	7.500	17.4
0.300	7.3	1.600	8.4	4.000	12.9	8.000	17.9
0.400	7.3	1.800	8.8	4.500	13.6	8.500	18.5
0.500	7.1	2.000	9.3	5.000	14.3	9.000	19.0
0.600	6.9	2.200	9.7	5.500	15.0	9.500	19.5
0.800	6.0	2.400	10.1	6.000	15.6		
1.000	6.7	2.600	10.5	6.500	16.2		

Storage Structures for Storm

Cellular Storage Manhole: STank, DS/PN: S1.008

Invert Level (m) 96.050 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	400.0	0.0	1.201	0.0	0.0
1.200	400.0	0.0			

Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs	0	Number of Storage Structures	1
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location	GB 445153 241444 SP 45153 41444
Data Type	Point
Cv (Summer)	0.750
Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600
Return Period(s) (years)	100
Climate Change (%)	40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	SMH1	15 Winter	100	+40%	100/15 Summer			
S1.001	SMH2	15 Winter	100	+40%	100/15 Summer	100/15 Summer		
S1.002	SMH3	15 Winter	100	+40%	100/15 Summer	100/15 Summer		
S1.003	SMH4	15 Winter	100	+40%	100/15 Summer			
S2.000	SMH5	15 Winter	100	+40%				
S1.004	SMH6	15 Winter	100	+40%	100/15 Summer			
S1.005	SMH7	360 Winter	100	+40%	100/15 Summer			
S1.006	SMH8	360 Winter	100	+40%	100/15 Summer			
S3.000	SMH9	360 Winter	100	+40%	100/15 Summer			
S1.007	SMH10	360 Winter	100	+40%	100/15 Summer			
S1.008	STank	360 Winter	100	+40%	100/15 Summer			
S1.009	SMH11 HB	360 Winter	100	+40%	100/15 Summer			

Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S1.000	SMH1	99.381	1.281	0.000	1.00			80.2	SURCHARGED
S1.001	SMH2	99.206	1.253	6.163	0.83			113.4	FLOOD
S1.002	SMH3	99.155	1.329	4.880	1.24			185.4	FLOOD
S1.003	SMH4	98.989	1.457	0.000	0.94			220.2	SURCHARGED
S2.000	SMH5	101.031	-0.169	0.000	0.39			32.7	OK
S1.004	SMH6	98.803	1.525	0.000	1.51			357.7	SURCHARGED
S1.005	SMH7	98.188	1.202	0.000	0.39			65.8	SURCHARGED
S1.006	SMH8	98.185	1.277	0.000	0.39			66.5	SURCHARGED
S3.000	SMH9	98.183	1.033	0.000	0.07			5.9	FLOOD RISK
S1.007	SMH10	98.183	1.355	0.000	0.40			71.0	SURCHARGED
S1.008	STank	98.179	1.904	0.000	0.84		692	12.3	SURCHARGED
S1.009	SMH11 HB	98.150	2.000	0.000	0.74			9.6	FLOOD RISK

PN	US/MH Name	Level Exceeded
S1.000	SMH1	
S1.001	SMH2	2
S1.002	SMH3	2
S1.003	SMH4	
S2.000	SMH5	
S1.004	SMH6	
S1.005	SMH7	
S1.006	SMH8	
S3.000	SMH9	
S1.007	SMH10	
S1.008	STank	
S1.009	SMH11 HB	

Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 60 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	97.406	1.866	0.0	2.2	25.3	27.5	12.6	Flood Risk
30 min Summer	97.461	1.921	0.0	2.2	27.6	29.9	12.9	Flood Risk
60 min Summer	97.382	1.842	0.0	2.2	24.3	26.5	12.4	Flood Risk
120 min Summer	97.249	1.709	0.0	2.1	16.9	19.0	11.4	Flood Risk
180 min Summer	97.208	1.668	0.0	2.1	12.4	14.5	11.1	O K
240 min Summer	97.184	1.644	0.0	2.1	9.6	11.7	10.9	O K
360 min Summer	97.152	1.612	0.0	2.1	6.5	8.5	10.6	O K
480 min Summer	97.130	1.590	0.0	2.0	4.7	6.7	10.4	O K
600 min Summer	97.117	1.577	0.0	2.0	3.4	5.4	10.3	O K
720 min Summer	97.104	1.564	0.0	2.0	2.3	4.3	10.2	O K
960 min Summer	97.078	1.538	0.0	2.0	0.9	2.9	9.9	O K
1440 min Summer	96.696	1.156	0.0	2.0	0.0	2.0	6.5	O K
2160 min Summer	95.786	0.246	0.0	2.0	0.0	2.0	0.3	O K
2880 min Summer	95.677	0.137	0.0	1.6	0.0	1.6	0.1	O K
4320 min Summer	95.609	0.069	0.0	1.1	0.0	1.1	0.0	O K
5760 min Summer	95.583	0.043	0.0	0.9	0.0	0.9	0.0	O K
7200 min Summer	95.571	0.031	0.0	0.7	0.0	0.7	0.0	O K
8640 min Summer	95.565	0.025	0.0	0.7	0.0	0.7	0.0	O K
10080 min Summer	95.560	0.020	0.0	0.6	0.0	0.6	0.0	O K
15 min Winter	97.492	1.952	0.0	2.3	28.8	31.1	13.1	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Summer	153.586	0.0	19.6	7.6	12
30 min Summer	100.544	0.0	25.7	12.1	19
60 min Summer	62.881	0.0	32.1	15.4	34
120 min Summer	37.049	0.0	37.8	14.8	64
180 min Summer	27.223	0.0	41.7	13.6	94
240 min Summer	21.864	0.0	44.6	12.7	124
360 min Summer	16.006	0.0	49.0	10.9	186
480 min Summer	12.773	0.0	52.2	9.0	248
600 min Summer	10.685	0.0	54.5	7.0	312
720 min Summer	9.213	0.0	56.4	5.1	378
960 min Summer	7.255	0.0	59.2	1.6	522
1440 min Summer	5.134	0.0	62.8	0.0	808
2160 min Summer	3.605	0.0	66.1	0.0	1100
2880 min Summer	2.808	0.0	68.6	0.0	1448
4320 min Summer	1.987	0.0	72.7	0.0	2188
5760 min Summer	1.569	0.0	76.1	0.0	2856
7200 min Summer	1.326	0.0	80.4	0.0	616
8640 min Summer	1.166	0.0	85.0	0.0	1392
10080 min Summer	1.054	0.0	89.6	0.0	7160
15 min Winter	153.586	0.0	21.9	9.9	12

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Overflow (l/s)	Max Outflow Σ (l/s)	Max Volume (m³)	Status
30 min Winter	97.477	1.937	0.0	2.3	28.3	30.5	13.0	Flood Risk
60 min Winter	97.322	1.782	0.0	2.2	21.4	23.5	12.0	Flood Risk
120 min Winter	97.210	1.670	0.0	2.1	12.6	14.7	11.1	O K
180 min Winter	97.176	1.636	0.0	2.1	8.8	10.9	10.8	O K
240 min Winter	97.155	1.615	0.0	2.1	6.7	8.7	10.6	O K
360 min Winter	97.126	1.586	0.0	2.0	4.4	6.4	10.4	O K
480 min Winter	97.114	1.574	0.0	2.0	3.1	5.1	10.3	O K
600 min Winter	97.102	1.562	0.0	2.0	2.2	4.2	10.2	O K
720 min Winter	97.091	1.551	0.0	2.0	1.5	3.5	10.0	O K
960 min Winter	97.055	1.515	0.0	2.0	0.2	2.2	9.7	O K
1440 min Winter	95.836	0.296	0.0	2.0	0.0	2.0	0.5	O K
2160 min Winter	95.658	0.118	0.0	1.4	0.0	1.4	0.1	O K
2880 min Winter	95.612	0.072	0.0	1.1	0.0	1.1	0.0	O K
4320 min Winter	95.576	0.036	0.0	0.8	0.0	0.8	0.0	O K
5760 min Winter	95.563	0.023	0.0	0.6	0.0	0.6	0.0	O K
7200 min Winter	95.558	0.018	0.0	0.6	0.0	0.6	0.0	O K
8640 min Winter	95.553	0.013	0.0	0.5	0.0	0.5	0.0	O K
10080 min Winter	95.550	0.010	0.0	0.4	0.0	0.4	0.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
30 min Winter	100.544	0.0	28.7	15.2	20
60 min Winter	62.881	0.0	35.9	19.3	34
120 min Winter	37.049	0.0	42.4	19.5	64
180 min Winter	27.223	0.0	46.7	17.9	94
240 min Winter	21.864	0.0	50.0	16.6	124
360 min Winter	16.006	0.0	54.9	13.9	184
480 min Winter	12.773	0.0	58.4	10.9	244
600 min Winter	10.685	0.0	61.0	7.9	314
720 min Winter	9.213	0.0	63.2	5.0	386
960 min Winter	7.255	0.0	66.3	0.2	576
1440 min Winter	5.134	0.0	70.4	0.0	752
2160 min Winter	3.605	0.0	74.1	0.0	1100
2880 min Winter	2.808	0.0	76.9	0.0	1436
4320 min Winter	1.987	0.0	81.7	0.0	2172
5760 min Winter	1.569	0.0	85.8	0.0	344
7200 min Winter	1.326	0.0	89.8	0.0	6000
8640 min Winter	1.166	0.0	94.8	0.0	6776
10080 min Winter	1.054	0.0	100.1	0.0	8280

Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 445153 241444 SP 45153 41444
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.068

Time (mins) From:	To:	Area (ha)
0	4	0.068

Model Details

Storage is Online Cover Level (m) 97.540

Filter Drain Structure

Infiltration Coefficient Base (m/hr)	0.00000	Pipe Diameter (m)	0.150
Infiltration Coefficient Side (m/hr)	0.00000	Pipe Depth above Invert (m)	0.075
Safety Factor	2.0	Slope (1:X)	50.0
Porosity	0.30	Cap Volume Depth (m)	1.500
Invert Level (m)	95.540	Cap Infiltration Depth (m)	0.000
Trench Width (m)	0.6	Number of Pipes	1
Trench Length (m)	49.4		

ACO Q-Brake Outflow Control

Design Head (m)	1.500	Diameter (mm)	62
Design Flow (l/s)	2.0	Invert Level (m)	95.540

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.3	1.200	1.8	3.000	2.8	7.000	4.3
0.200	1.9	1.400	1.9	3.500	3.0	7.500	4.4
0.300	2.0	1.600	2.1	4.000	3.2	8.000	4.6
0.400	1.8	1.800	2.2	4.500	3.4	8.500	4.7
0.500	1.1	2.000	2.3	5.000	3.6	9.000	4.9
0.600	1.3	2.200	2.4	5.500	3.8	9.500	5.0
0.800	1.5	2.400	2.5	6.000	4.0		
1.000	1.6	2.600	2.6	6.500	4.1		

Orifice Overflow Control

Diameter (m) 0.150 Discharge Coefficient 0.600 Invert Level (m) 97.040

Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 66 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	95.918	1.668	0.0	2.1	17.8	19.9	11.6	Flood Risk
30 min Summer	95.976	1.726	0.0	2.1	28.7	30.8	11.7	Flood Risk
60 min Summer	95.933	1.683	0.0	2.1	20.1	22.2	11.6	Flood Risk
120 min Summer	95.893	1.643	0.0	2.1	14.1	16.2	11.5	Flood Risk
180 min Summer	95.859	1.609	0.0	2.1	8.1	10.2	11.3	Flood Risk
240 min Summer	95.843	1.593	0.0	2.0	6.0	8.1	11.2	O K
360 min Summer	95.822	1.572	0.0	2.0	3.6	5.7	11.1	O K
480 min Summer	95.803	1.553	0.0	2.0	2.1	4.1	11.0	O K
600 min Summer	95.784	1.534	0.0	2.0	0.8	2.8	10.8	O K
720 min Summer	95.692	1.442	0.0	2.0	0.0	2.0	10.1	O K
960 min Summer	95.356	1.106	0.0	2.0	0.0	2.0	7.6	O K
1440 min Summer	94.555	0.305	0.0	2.0	0.0	2.0	1.7	O K
2160 min Summer	94.400	0.150	0.0	1.6	0.0	1.6	0.4	O K
2880 min Summer	94.343	0.093	0.0	1.3	0.0	1.3	0.2	O K
4320 min Summer	94.297	0.047	0.0	0.9	0.0	0.9	0.0	O K
5760 min Summer	94.279	0.029	0.0	0.7	0.0	0.7	0.0	O K
7200 min Summer	94.271	0.021	0.0	0.6	0.0	0.6	0.0	O K
8640 min Summer	94.266	0.016	0.0	0.5	0.0	0.5	0.0	O K
10080 min Summer	94.264	0.014	0.0	0.5	0.0	0.5	0.0	O K
15 min Winter	95.995	1.745	0.0	2.1	32.5	34.6	11.8	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Summer	153.586	0.0	16.1	3.4	12
30 min Summer	100.544	0.0	21.1	6.8	19
60 min Summer	62.881	0.0	26.4	9.0	34
120 min Summer	37.049	0.0	31.1	8.1	66
180 min Summer	27.223	0.0	34.3	7.2	98
240 min Summer	21.864	0.0	36.8	6.3	130
360 min Summer	16.006	0.0	40.4	4.5	194
480 min Summer	12.773	0.0	42.9	2.7	264
600 min Summer	10.685	0.0	44.9	1.0	342
720 min Summer	9.213	0.0	46.4	0.0	426
960 min Summer	7.255	0.0	48.7	0.0	558
1440 min Summer	5.134	0.0	51.7	0.0	752
2160 min Summer	3.605	0.0	54.5	0.0	1100
2880 min Summer	2.808	0.0	56.5	0.0	1464
4320 min Summer	1.987	0.0	59.8	0.0	2140
5760 min Summer	1.569	0.0	62.7	0.0	2912
7200 min Summer	1.326	0.0	66.4	0.0	3600
8640 min Summer	1.166	0.0	70.0	0.0	5968
10080 min Summer	1.054	0.0	74.0	0.0	2728
15 min Winter	153.586	0.0	18.1	5.4	12

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Overflow (l/s)	Max Outflow Σ (l/s)	Max Volume (m³)	Status
30 min Winter	95.981	1.731	0.0	2.1	29.7	31.9	11.8	Flood Risk
60 min Winter	95.940	1.690	0.0	2.1	21.6	23.7	11.6	Flood Risk
120 min Winter	95.874	1.624	0.0	2.1	11.1	13.2	11.4	Flood Risk
180 min Winter	95.851	1.601	0.0	2.1	6.9	9.0	11.3	Flood Risk
240 min Winter	95.834	1.584	0.0	2.0	5.0	7.1	11.2	O K
360 min Winter	95.814	1.564	0.0	2.0	2.9	5.0	11.0	O K
480 min Winter	95.798	1.548	0.0	2.0	1.7	3.7	10.9	O K
600 min Winter	95.778	1.528	0.0	2.0	0.6	2.6	10.8	O K
720 min Winter	95.608	1.358	0.0	2.0	0.0	2.0	9.5	O K
960 min Winter	95.092	0.842	0.0	2.0	0.0	2.0	5.7	O K
1440 min Winter	94.410	0.160	0.0	1.7	0.0	1.7	0.5	O K
2160 min Winter	94.330	0.080	0.0	1.2	0.0	1.2	0.1	O K
2880 min Winter	94.299	0.049	0.0	0.9	0.0	0.9	0.0	O K
4320 min Winter	94.275	0.025	0.0	0.7	0.0	0.7	0.0	O K
5760 min Winter	94.266	0.016	0.0	0.5	0.0	0.5	0.0	O K
7200 min Winter	94.262	0.012	0.0	0.5	0.0	0.5	0.0	O K
8640 min Winter	94.260	0.010	0.0	0.4	0.0	0.4	0.0	O K
10080 min Winter	94.257	0.007	0.0	0.3	0.0	0.3	0.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
30 min Winter	100.544	0.0	23.7	9.4	19
60 min Winter	62.881	0.0	29.6	12.2	34
120 min Winter	37.049	0.0	34.9	11.6	64
180 min Winter	27.223	0.0	38.4	10.3	94
240 min Winter	21.864	0.0	41.1	9.0	126
360 min Winter	16.006	0.0	45.2	6.2	196
480 min Winter	12.773	0.0	48.1	3.5	270
600 min Winter	10.685	0.0	50.3	0.9	360
720 min Winter	9.213	0.0	52.0	0.0	454
960 min Winter	7.255	0.0	54.6	0.0	604
1440 min Winter	5.134	0.0	58.0	0.0	736
2160 min Winter	3.605	0.0	61.0	0.0	1100
2880 min Winter	2.808	0.0	63.2	0.0	1464
4320 min Winter	1.987	0.0	67.2	0.0	2160
5760 min Winter	1.569	0.0	69.9	0.0	4728
7200 min Winter	1.326	0.0	74.1	0.0	6560
8640 min Winter	1.166	0.0	78.3	0.0	7424
10080 min Winter	1.054	0.0	82.8	0.0	2328

Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 445153 241444 SP 45153 41444
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.056

Time (mins) From:	To:	Area (ha)
0	4	0.056

Model Details

Storage is Online Cover Level (m) 96.150

Filter Drain Structure

Infiltration Coefficient Base (m/hr)	0.00000	Pipe Diameter (m)	0.150
Infiltration Coefficient Side (m/hr)	0.00000	Pipe Depth above Invert (m)	0.000
Safety Factor	2.0	Slope (1:X)	150.0
Porosity	0.30	Cap Volume Depth (m)	1.500
Invert Level (m)	94.250	Cap Infiltration Depth (m)	0.000
Trench Width (m)	0.6	Number of Pipes	1
Trench Length (m)	40.9		

ACO Q-Brake Outflow Control

Design Head (m)	1.500	Diameter (mm)	62
Design Flow (l/s)	2.0	Invert Level (m)	94.250

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.3	1.200	1.8	3.000	2.8	7.000	4.3
0.200	1.9	1.400	1.9	3.500	3.0	7.500	4.4
0.300	2.0	1.600	2.1	4.000	3.2	8.000	4.6
0.400	1.8	1.800	2.2	4.500	3.4	8.500	4.7
0.500	1.1	2.000	2.3	5.000	3.6	9.000	4.9
0.600	1.3	2.200	2.4	5.500	3.8	9.500	5.0
0.800	1.5	2.400	2.5	6.000	4.0		
1.000	1.6	2.600	2.6	6.500	4.1		

Orifice Overflow Control

Diameter (m) 0.225 Discharge Coefficient 0.600 Invert Level (m) 95.750