August 46
RECEIVED
24/08/16
emailed to all 26/8
+ planning committee
1/9 mtg,
for information

A E Designs Ltd.
20, Short Road,
Stretham, Ely,
Cambridgeshire.
CB6 3LS
Tel: 01353 649002
Mob: 07708 185915
alan@aedesignsltd.co.uk

A E DESIGNS LTD
Flood Defence and
Drainage Engineers

ASSESSMENT OF FOUL WATER SEWERAGE FACILITIES IN LINTON VILLAGE, CAMBS.

LINTON PARISH COUNCIL

AUGUST 2016

Reference: 1400 Report

23 August 2016

FOUL WATER DRAINAGE REPORT

Site Address: Linton Village, Cambridge.

Brief: To consider foul water sewerage capacities for extant and proposed housing loads.

Appendices: A. Location Plan.
B. Anglian Water record drawings.
C. Capacity Calculations for the extant sewerage loads.
D. Capacity Calculations for the proposed sewerage loads.

Discussion: Linton Parish Council have expressed concerns with regard to the capacity of the foul water sewerage system serving the Village of Linton. Their concerns are expressed by their perception that foul water drainage issues are becoming more frequent. Their concerns are further heightened by proposals to develop lands bounded by Lonsdale to the west and Harefield Rise and Kenwood Gardens to the south. The development proposals are for 50 dwellings. Refer to **Appendix A** for Location Plan

Foul Water Sewerage loadings and capacities: The foul water sewerage system has been considered using the Sewers for Adoption 7th Edition standards and the 'discharge unit' methodology. All of the occupied buildings have been assessed with a standard 3.5 discharge units (DU's) per building. No allowances have been used to consider highway drainage or informal connections. The Colebrook-White formula has been used for determining the necessary pipe capacities. The sewerage data has been taken from Anglian Water record plans attached as **Appendix B**. The principal foul sewerage is shown upon the record plan highlighted red with the pipe numbers (Pn) shown for reference to the spreadsheets. The sewage loadings have been calculated within the spreadsheet to consider foul water flows and pipe capacities relative to the available gradients.

The potential flow rates have been calculated using the standard formula from BS EN 12056-2:2000 given as $Q = k_{DU}\sum n_{DU}$ with a frequency factor (k_{DU}) used to represent intermittent discharges from dwellings, quest houses and offices.

The Anglian Water data provision is not complete and where there are gaps in the data the nearest upstream and downstream invert levels have been used in the spreadsheets to give an average gradient for the sewer sections.

The flow capacity and flow velocity of the individual sewers has been calculated and is presented within the spreadsheets as FAIL or OK. The capacity check is between the calculated flow and the capacity of the sewer, whilst the velocity check is in comparison to the minimum requirement of 0.75 meters per second (m/s).

With reference to the spreadsheet for the extant situation (please refer to **Appendix C**) it can be seen that a number of sewer sections are in a parlous configuration. Sewer sections Pn1.07, Pn1.08, Pn1.09, Pn 1.10, and Pn1.11 all fail as not being able to generate sufficient self-cleansing velocities, whilst sewer sections Pn1.10, Pn1.11, Pn1.12, and Pn1.13 all fail as having insufficient capacity to convey the flows. The above calculated velocities at 0.613m/s are only 82% of the required standard. The above referenced sewers have capacities ranging between 101% and 119% over-subscription from the capacities available. Similarly, with reference to the spreadsheet for the proposed situation (please refer to **Appendix D**) it can be seen that the referred to sewer sections do not have any variation in the poor velocities for self-cleansing but have a notable increase in capacity failings with ranges between 105% and 134% over-subscription from the capacities available.

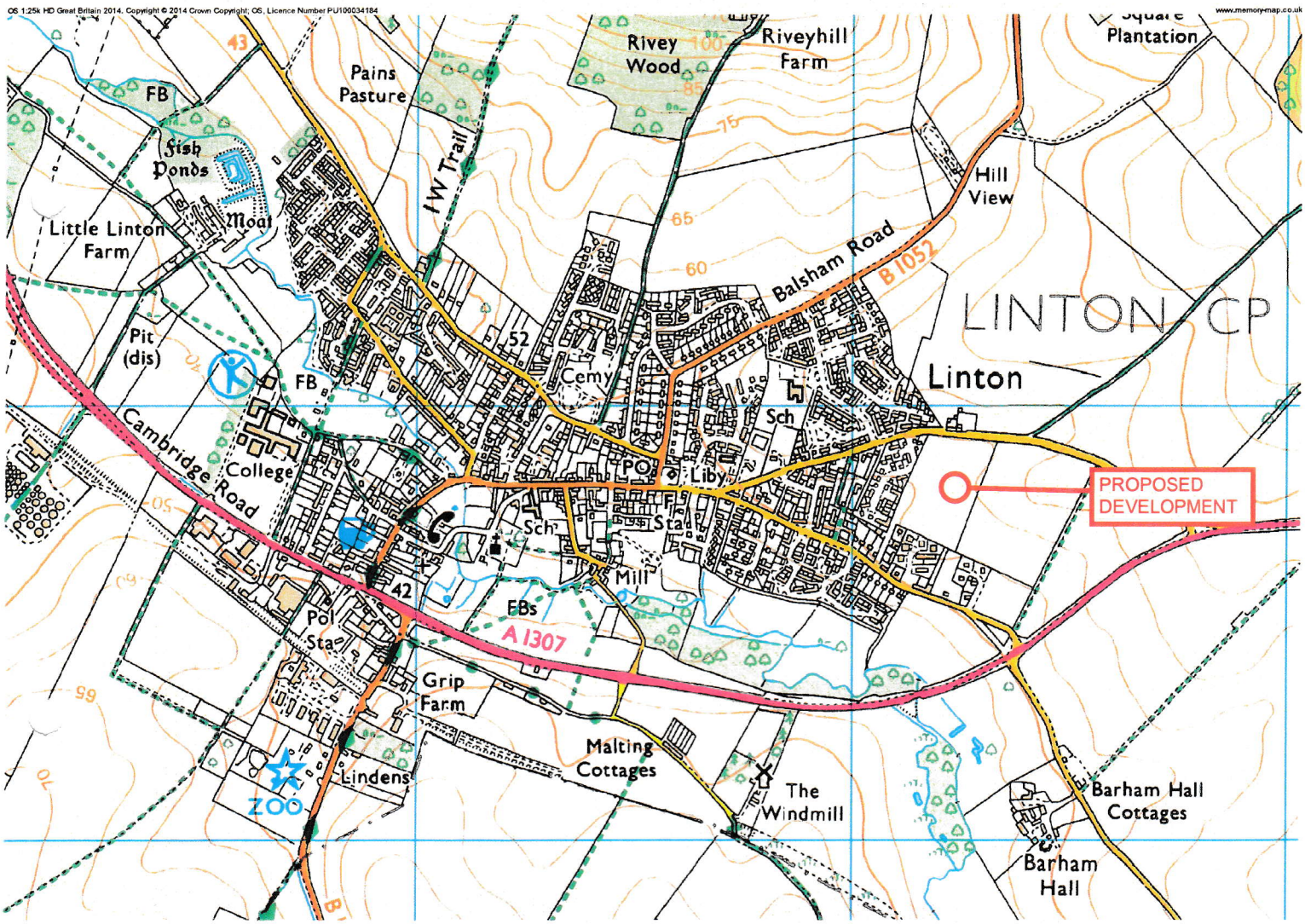
Conclusion: The extant foul sewerage that may serve the proposed development is currently (allowing for variations in the assessment data and Du calculations) is delicately balanced between sufficiency and failure. Any loading additions to the sewerage under review should demonstrate the suitability of the extant installation. In particular, flow additions from surface water highway drainage and informal connections, should be fully investigated before any drainage infrastructure proposals are offered.

From the desktop assessment carried out using Anglian Water sewerage data it is considered that the extant sewerage should not be further stressed by additional connections.

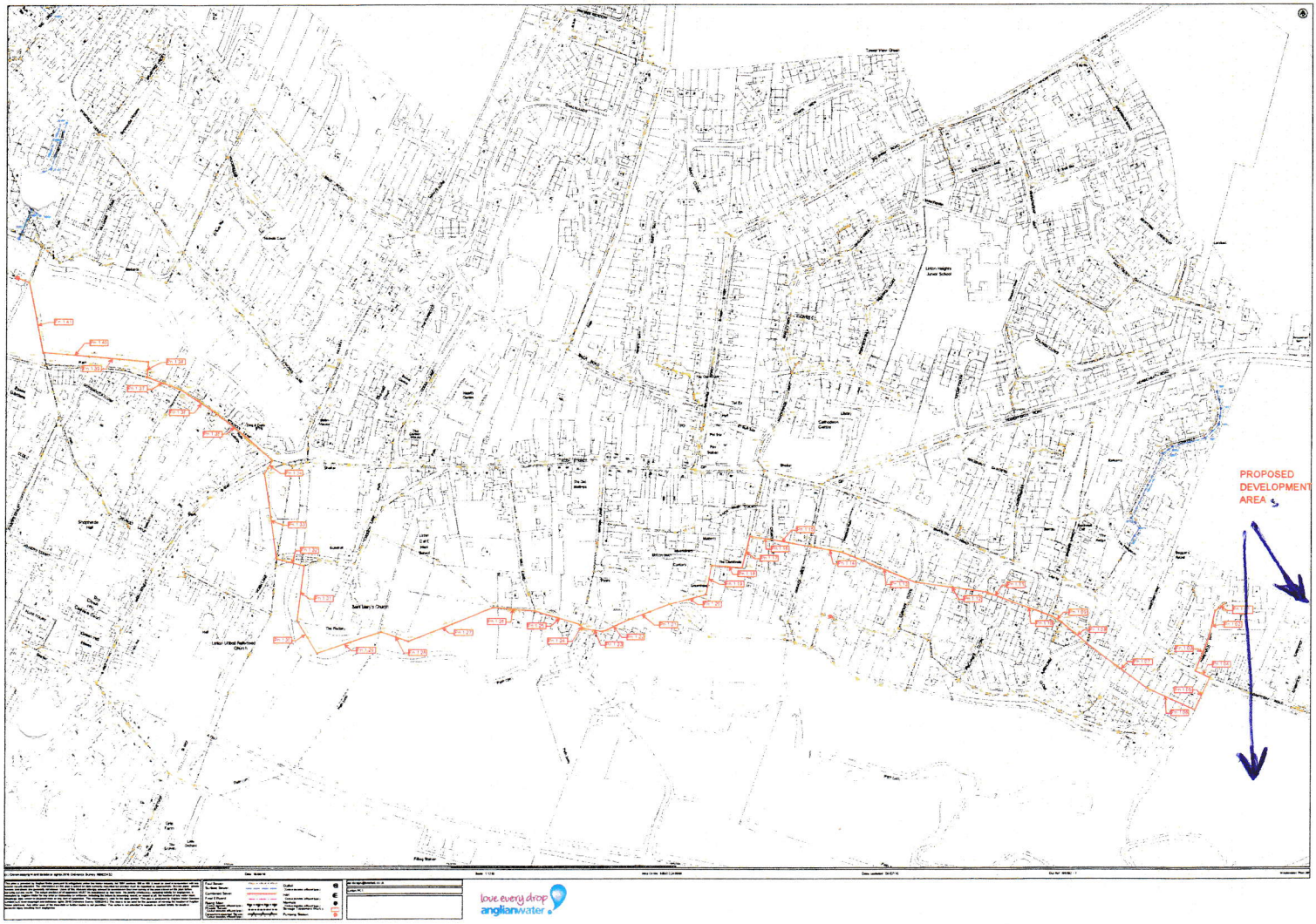
.....A D Rich.

A E Designs Ltd. Ref: 1400 Rpt

Appendix A


OS 1:25k HD Great Britain 2014. Copyright © 2014 Crown Copyright; OS, Licence Number PU100034184
www.memorymap.co.uk
Rivey Wood
Riveyhill Farm
Plantation
Pains Pasture
FB
Fish Ponds
Moat
Little Linton Farm
IW Trail
Hill View
Balsham Road
B 1052
LINTON CP
Linton
Pit (dis)
FB
52
Cemy
Sch
Cambridge Road
College
PO
Liby
PROPOSED DEVELOPMENT
Sch
Sta
Mill
42
FBs
A 1307
Pol Sta
Grip Farm
Malting Cottages
Lindens
ZOO
The Windmill
Barham Hall Cottages
Barham Hall

Appendix B


PROPOSED
DEVELOPMENT
AREA

Manhole Reference	Easting	Northing	Liquid Type	Cover Level	Invert Level	Depth to Invert
0000	556072	247095	F	-	-	-
0001	557043	247025	F	83.391	81.291	2.1
0002	557013	247057	F	83.157	81.917	1.24
0003	557089	247006	F	83.925	82.145	1.78
0004	557097	247004	F	83.707	82.167	1.54
0101	556014	247144	F	43.64	41.8	1.84
0102	556026	247163	F	-	-	
0103	556036	247134	F	-	-	
0104	556030	247164	F	-	-	-
0201	556057	247218	F	46.87	45.06	1.81
0201	557019	247218	F	59.742	56.942	2.8
0202	557020	247216	F	60.019	57.389	2.63
0501	556030	248563	F	39.294	37.524	1.76
0601	557056	248616	F	43.18	42.07	1.11
0602	557027	248618	F	43.1	41.64	1.46
0603	557060	248566	F	46.4	44.96	1.44
0604	557000	248652	F	-	-	-
0605	557006	248556	F		-	
0606	557037	248640	F		-	-
0601	556077	248651	F	38.637	36.307	2.33
0601	557000	248676	F	49.12	47.71	1.41
0602	557084	248609	F	50.27	48.33	1.94
0700	557040	248784	F	-	51.3	-
0701	556008	248782	F	38.365	36.315	2.04
0702	556064	248714	F	37.728	36.428	2.3
0703	556083	248706	F	-	-	-
0800	557075	248834	F	-	54.5	-
0801	556078	248824	F	38.4	34.83	3.57
0801	557086	248842	F		55	-
0802	556014	248879	F	37.923	34.633	3.29
0803	556070	248809	F		-	-
0901	556098	248822	F	40.354	38.534	1.82
0901	557030	248947	F	60.49	59.16	1.33
0902	556044	248987	F	40.156	37.696	2.46
0902	557043	248944	F	60.47	59.36	1.11
0903	557010	248990	F	61.66	59.85	1.81
1001	557101	247041	F	65.997	63.967	2.03
1101	556103	247167	F	47.75	46.12	1.63
1102	556165	247118	F	50.41	48.01	2.4
1501	557130	248679	F	49.61	47.72	1.89
1502	557112	248643	F	46.31	45.52	0.79
1503	557114	248597	F	-		
1600	556130	248607	F	-	-	-
1601	556106	248544	F	-	-	-
1601	557112	248672	F	53.98	52.67	1.31
1602	557110	248679	F	-	-	-
1603	557130	248626	F	-	-	-
1604	557136	248655	F			
1605	557148	248663	F	-	-	-
1701	556132	248713	F	37.454	35.854	1.6
1702	556172	248708	F	38.213	36.613	1.6
1703	556186	248745	F	38.671	36.941	1.73
1704	556115	248706	F	-		-
1800	557127	248851	F		55.8	
1801	556101	248818	F	37.885	34.905	2.98
1801	557137	248895	F	-	56.1	
1802	556118	248827	F	38.886	35.616	3.27
1802	557138	248882	F	-	56.7	-
1803	556131	248863	F	39.718	37.788	1.93
1804	556119	248851	F	38.193	36.543	1.65
1901	557130	248989	F	63.96	62.69	1.27
1902	556155	248934	F	43.076	41.516	1.56
1902	557132	248905	F		57.6	-
1903	556145	248929	F		-	
2001	556234	247081	F	52.305	49.775	2.53
2501	557222	248545	F	50.34	48.79	1.55
2502	557236	248546	F	-	-	
2600	556232	248620	F	-		
2601	556202	248631	F			
2701	556203	248771	F	39.803	37.963	1.84
2702	556245	248799	F	41.916	40.076	1.84
2704	556264	248712	F	41.497	37.497	4
2801	556211	248818	F	40.796	39.106	1.69
2802	556214	248844	F	41.994	39.954	2.04
2803	556248	248818	F	42.195	40.275	1.92
2804	556228	248865	F	42.79	40.88	1.91
2901	556251	248906	F	44.412	42.712	1.7
2902	556261	248920	F	-	-	-
3300	556391	247307	F			
3601	556327	248650	F	40.683	37.633	3.05
3602	556373	248656	F	39.99	37.75	2.24
3603	556361	248689	F	41.21	39.61	1.6
3701	556346	248800	F	45.383	43.873	1.51
3801	556330	248816	F	44.666	42.886	1.78
4000	556463	247085	F	-		-
4001	556453	247058	F	-		
4002	556434	247012	F		-	
4100	556499	247174	F			
4200	556497	247204	F		-	-
4201	556490	247272	F	59.562	56.772	2.79
4202	556441	247286	F		-	
4203	556491	247277	F	58.36	55.8	2.56
4303	556427	247327	F		-	
4304	556405	247328	F	-		-
4306	556475	247330	F	60.82	58.67	2.15
4307	556471	247312	F	60.25	58.2	2.05
4308	556494	247303	F	60	57.43	2.57
4601	556423	248539	F	39.443	37.913	1.53
4602	556438	248608	F	42.433	39.393	3.04
4603	556449	248631	F	39.761	38.051	1.71
4604	556427	248636	F	39.353	37.953	1.4
4605	556479	248645	F	-	-	-
4701	556445	248754	F	43.98	41.87	2.11
4702	556475	248701	F		-	-
4801	556449	248818	F	46.351	43.681	2.67
4803	556437	248823	F	46.384	44.834	1.55
4901	556442	248927	F	48.848	47.398	1.45
4902	556479	248912	F	48.713	47.123	1.59
4903	556417	248969	F	-	-	-
4904	556409	248948	F	-		-
5001	556561	247076	F	50.32	48.42	1.9
5002	556585	247079	F	50.37	48.91	1.46
5200	556517	247262	F		-	-
5601	556565	248672	F	41.576	39.909	1.67
5602	556527	248682	F	40.944	38.164	2.78
5603	556569	248625	F	40.221	38.321	1.9
5701	556530	248742	F	43.416	42.136	1.28
5702	556560	248748	F	43.981	42.221	1.76
5703	556571	248706	F	42.333	40.763	1.57
5801	556548	248814	F	45.653	44.153	1.5
5802	556553	248813	F	45.564	-	-
5803	556563	248884	F	46.941	45.441	1.5
5804	556581	248894	F	46.385	45.136	1.25
5805	556556	248859	F	46.3	44.96	1.34
5806	556551	248820	F	45.895	44.875	1.02
5807	556550	248893	F		-	-
5808	556560	248896	F	-	-	-
5901	556579	248941	F	49.267	47.617	1.65
5902	556545	248918	F	-		
5903	556531	248923	F	-	-	-
5904	556526	248925	F	-	-	-
5905	556516	248927	F	-	-	-
5906	556508	248930	F	-	-	
6001	556649	247101	F	50.66	49.13	1.53
6002	556656	247011	F	50.115	47.883	2.235
6003	556665	247034	F	50.234	48.054	2.18
6004	556693	247043	F	51.374	49.399	1.975
6601	556663	248614	F	40.201	38.601	1.6
6602	556694	248651	F	41.902	39.892	2.05
6603	556653	248622	F	40.271	38.491	1.78
6604	556604	248619	F	-	-	-
6605	556656	248642	F	-	-	-
6701	556693	248797	F	47.717	45.917	1.8
6702	556605	248703	F	42.764	41.594	1.17
6703	556614	248738	F	44.152	42.542	1.61
6704	556637	248735	F	-	-	
6705	556685	248726	F		-	
6706	556682	248729	F	-	-	
6801	556629	248817	F	46.415	43.655	2.76
6802	556622	248823	F	47.01	44.475	2.535
6803	556627	248844	F	47.95	45.745	2.205
6804	556650	248875	F	49.31	46.56	2.75
6900	556695	248926	F	51.933	49.143	2.89
6901	556659	248921	F	50.08	47.205	2.875
6902	556651	248948	F	50.206	47.476	2.73
6903	556695	248961	F	51.547	49.512	2.035
6904	556656	248986	F	50.347	47.707	2.64
6905	556664	248931	F		-	-
6906	556669	248933	F		-	-
7000	556760	247004	F	55.537	53.402	2.135
7001	555799	247077	F	37.063	34.543	2.52
7001	556772	247022	F	56.17	54.205	1.965
7002	556713	247057	F	52.224	50.049	2.175
7003	556725	247060	F	52.507	50.302	2.205
7004	556756	247091	F	53.04	50.91	2.13
7005	556784	247102	F	54.004	51.794	2.21
7006	556710	247078	F			-
7007	556715	247083	F		-	
7008	556720	247086	F	-	-	-
7009	556724	247087	F		-	-
7101	556702	247131	F	51.38	49.74	1.64
7102	556754	247151	F	52.317	50.617	1.7
7201	555784	247226	F	39.56	36.11	3.45
7205	555784	247273	F	39.01	37.09	1.92
7206	555793	247295	F	39.14	37.42	1.72
7207	555796	247275	F	39.4	37.48	1.92
7501	556786	248505	F	40.56	38.88	1.68
7502	556733	248579	F	40.326	38.706	1.62
7601	556791	248563	F	44.601	42.761	1.84
7603	556780	248636	F	43.009	38.909	4.1
7604	556771	248626	F	42.527	38.902	3.62
7605	556709	248645	F	41.758	38.228	3.53
7701	556776	248768	F	49.254	47.234	2.02
7702	556717	248721	F	45.612	43.192	2.42
7801	556707	248805	F	48.071	46.201	1.87
7802	556745	248815	F	49.107	47.087	2.02
7803	556770	248824	F	50.185	48.565	1.62
7804	556779	248866	F	55.835	53.64	2.195
7900	556729	248919	F	53.628	51.248	2.38
7901	556745	248965	F	54.957	52.357	2.6
7902	556742	248946	F	54.944	52.979	1.965
7903	556761	248901	F	56.314	53.3	3.014
8001	555807	247023	F	36.99	33.61	3.38
8002	555821	247065	F	37.341	34.491	2.85
8003	555894	247045	F	38.18	36.05	2.13
8004	555811	247106	F	38.315	36.235	2.08
8005	555831	247054	F	-	-	-
8006	555840	247046	F	-		-
8008	555863	247054	F	-		-
8009	555891	247043	F	-		-
8101	555862	247190	F	40.83	38.75	2.08
8101	556806	247187	F	53.23	51.62	1.61
8102	555869	247188	F	-	-	
8102	556825	247195	F	53.577	51.937	1.64
8103	555801	247114	F	38.17	34.78	3.39
8103	556827	247183	F	53.725	52.345	1.38
8104	555801	247117	F	38.083	36.513	1.57
8104	556836	247161	F	54.896	53.129	1.77
8105	555810	247142	F	38.844	36.994	1.85
8105	556840	247144	F	56.354	53.784	2.57
8201	555812	247296	F	39.75	38.35	1.4
8201	556849	247202	F	53.964	52.314	1.65
8202	556884	247210	F	54.601	53.191	1.41
8302	555825	247332	F	40.04	38.69	1.35
8303	555833	247333	F	40.37	38.74	1.63
8501	555863	248574	F	45.61	42.92	2.69
8501	556860	248591	F	42.922	41.342	1.58
8502	556808	248561	F	44.89	42.65	2.24
8502	555849	248577	F	42.518	40.318	2.2
8503	556879	248562	F	42.358	40.518	1.84
8601	555801	248620	F	45.82	43.98	1.84
8601	556790	248697	F	45.998	43.678	2.32
8602	555823	248616	F	-		-
8602	556879	248675	F	47.529	44.149	3.38
8603	556815	248621	F	43.274	39.674	3.6
8604	556818	248607	F	42.702	39.952	2.75
8605	556875	248617	F	44.231	42.221	2.01
8606	556809	248624	F	43.302	39.472	3.83
8701	555804	248782	F	41.41	39.27	2.14
8701	556857	248730	F	49.931	48.351	1.58
8702	555895	248787	F	41.57	38.84	2.73
8702	556846	248739	F	-		-
8703	555896	248765	F	41.81	39.12	2.69
8801	555840	248873	F	39.97	37.86	2.11
8801	556806	248839	F	51.686	50.106	1.58
8802	555858	248821	F	41.06	38.35	2.71
8802	556845	248851	F	53.072	51.462	1.61
8901	555828	248931	F	38.08	33.98	4.1
8902	555873	248941	F	37.3	-	-
8903	555823	248945	F	37.08	33.87	3.21
9001	555958	247023	F	38.18	36.46	1.72
9001	556979	247007	F	61.816	60.126	1.69
9002	555978	247057	F	40.12	36.67	3.45
9002	556942	247031	F	61.866	60.506	1.36
9003	555945	247101	F	40.45	37.64	2.81
9101	555917	247145	F	40.88	38.2	2.68
9101	556907	247192	F	55.766	53.496	2.27
9102	556918	247157	F	57.785	55.155	2.63
9103	556927	247126	F	58.884	57.674	1.59
9104	556967	247154	F	62.234	60.404	1.83
9201	555930	247264	F	42.27	40.31	1.96
9201	556927	247241	F	55.343	53.563	1.78
9202	555940	247253	F	42.46	40.91	1.55
9202	556986	247276	F	56.3	54.68	1.62
9203	556985	247273	F	56.24	54.89	1.35
9203	555954	247273	F	43.74	41.33	2.41
9204	555963	247301	F	45.2	42.69	2.51
9205	555938	247299	F	-	-	-
9206	555945	247281	F	-	-	-
9301	555922	248392	F	40.54	39.31	1.23
9302	555919	248383	F	-	-	-
9303	555914	248367	F	-		-
9401	555992	248456	F	40.75	38.29	2.46
9402	555964	248472	F	41.49	38.53	2.96
9501	555938	248506	F	41.31	39.65	1.66
9501	556980	248536	F	43.347	41.447	1.9
9502	556923	248550	F	42.846	40.666	2.18
9503	556943	248550	F	43.236	40.946	2.29
9504	556994	248544	F	-		-
9601	555944	248702	F	41.37	39.26	2.11
9601	556991	248618	F	46.62	44.63	1.99
9602	555910	248634	F	42.74	40.7	2.04
9602	556953	248648	F	46.792	44.522	2.27
9603	555980	248696	F	41.09	39.21	1.88
9603	556963	248642	F	46.692	44.492	2.2
9604	555982	248693	F	-	-	-
9604	556908	248665	F	46.563	44.273	2.29
9605	556994	248627	F	47.154	45.654	1.5
9606	556965	248692	F	49.161	46.861	2.3
9607	556954	248620	F	-	-	-
9608	556955	248626	F	-	-	-
9609	556959	248635	F	-	-	-
9701	555916	248753	F	41.56	39.49	2.07
9701	556971	248725	F	50.05	48.44	1.61
9702	555918	248749	F	-	-	
9702	556960	248758	F	52.224	51.114	1.11
9703	555977	248750	F	39.19	37.23	1.96
9703	556996	248784	F	52.97	51.34	1.63
9704	556906	248711	F	-		-
9705	556910	248750	F	-		-
9706	556914	248790	F		-	
9801	555941	248850	F	38.83	37.47	1.36
9801	556910	248870	F	55.746	53.666	2.08
9802	555921	248809	F	39.97	38.93	1.04
9802	556007	248846	F	58.072	54.882	3.19
9804	556996	248861	F	58.281	56.881	1.4
9805	556944	248811	F	-	-	-
9806	556932	248834	F	-	-	-
9807	556920	248803	F	-		-
9808	556945	248836	F			
9809	556952	248832	F	-	-	-
9810	556964	248829	F			-
9811	556967	248840	F	-	-	-
9812	556990	248842	F	-	-	-
9901	555911	248926	F	37.69	34.18	3.51
9901	556904	248901	F	58.436	57.255	1.18
9902	555875	248904	F	37.67	34.46	3.21
9902	556914	248915	F	58.895	57.595	1.26
9903	555937	248917	F	37.78	34.3	3.48
9903	556902	248982	F	59.8	58.16	1.64
9904	555934	248934	F	37.44	-	-
9904	556990	248975	F	60.065	58.295	1.79
9905	556969	248929	F	59.96	58.39	1.57
0751	557050	248747	S	-	50.8	-
0752	557041	248739	S	-	51.3	-
0851	557076	248831	S	-	54.5	-
0852	557086	248836	S	-	55	-
1851	557123	248849	S	-	55.8	
1852	557130	248864	S	-	56.1	-
1853	557142	248882	S	-	56.7	-
1951	557137	248900	S	-	57.6	
7051	555780	247061	S	37.279	35.694	1.58
8051	555809	247106	S	38.296	36.586	1.71
8052	555819	247099	S	38.519	37.199	1.32
8151	555830	247151	S	39.467	38.077	1.39
8152	555840	247181	S	39.928	38.528	1.4
8153	555847	247202	S	40.449	38.889	1.56
8154	555862	247115	S	38.11	36.67	1.44
8155	555812	247143	S	38.751	37.351	1.4
8353	555829	247323	S			-

Appendix C

FOULWATER SEWERAGE ASSESSMENT OF PRINCIPAL SEWERS (EXTANT)

Client: **Linton Parish Council**
Job No: *1400
Address: Linton Village

'kv' = 1.500
'ks' = 0.650
K_{DU} = 0.50

Discharge rate taken at 3.5 Discharge Units per dwelling
Flow calculation used Q=Kdu SQRT(ΣNdu)

A E Designs Ltd
Flood Defence and Drainage Engineers
20, Sh ort Road,
Stretham
Cambs
CB6 3LS
01353 649002
07708 185915

Sewer No	U/s to D/s Manholes	Upstream Easting	Coordinates Northing	Downstream Easting	Coordinates Northing	Houses Connected	Cumalative No of DU's	Kdu	Design flow rate Q l/s	Pipe Diam	Gradient m/m	Gradient 1:?	Sewer Length	Pipe Q capacity	Capacity Chek	V m/s	V Check	Sewer capacity % used	U/s Invert Level	D/s Level
Pn 1.01	1605-1604	557148	246663	557136	246655	4	14	0.50	1.87	150	0.0194	52	14.422	24.53	OK	1.386	OK	8	55.520	55.241
Pn 1.02	1604-1603	557136	246655	557130	246626	4	28	0.50	2.65	150	0.0194	52	29.614	24.53	OK	1.386	OK	11		
Pn 1.03	1603-1503	557130	246626	557114	246587	1	31.5	0.50	2.81	150	0.0194	52	42.154	24.53	OK	1.386	OK	11		
Pn 1.04	1503-1501	557114	246587	557130	246579	0	31.5	0.50	2.81	150	0.0194	52	17.889	24.53	OK	1.386	OK	11		47.720
Pn 1.05	1501-1502	557130	246579	557112	246543	45	189	0.50	6.87	150	0.2931	3	40.249	96.12	OK	5.431	OK	7	47.720	45.520
Pn 1.06	1502-0503	557112	246543	557060	246568	22	266	0.50	8.15	150	0.0097	103	57.697	17.29	OK	0.977	OK	47	45.520	44.960
Pn 1.07	0503-9601	557060	246568	556991	246618	22	343	0.50	9.26	150	0.0039	258	85.212	10.84	OK	0.613	FAIL	85	44.960	44.630
Pn 1.08	9601-9609	556991	246618	556959	246635	5	360.5	0.50	9.49	150	0.0039	258	36.235	10.84	OK	0.613	FAIL	88	44.630	
Pn 1.09	9609-9502	556959	246635	556923	246559	5	378	0.50	9.72	150	0.0039	258	84.095	10.84	OK	0.613	FAIL	90		
Pn 1.10	9502-9604	556923	246559	556908	246665	75	640.5	0.50	12.65	150	0.0039	258	107.056	10.84	FAIL	0.613	FAIL	117		44.275
Pn 1.11	9604-8602	556908	246665	556879	246675	7	665	0.50	12.89	150	0.0039	258	30.676	10.84	FAIL	0.613	FAIL	119		44.149
Pn 1.12	8602-8601	556879	246675	556799	246687	12	707	0.50	13.29	150	0.0058	172	80.895	13.34	FAIL	0.754	OK	101	44.149	43.678
Pn 1.13	8601-7702	556679	246675	556717	246721	12	749	0.50	13.68	150	0.0058	172	59.666	13.34	FAIL	0.754	OK	103	43.768	43.192
Pn 1.14	7702-6705	556717	246721	556682	246729	3	759.5	0.50	13.78	150	0.0174	58	35.903	23.22	OK	1.312	OK	59	43.192	
Pn 1.15	6705-6704	556682	246729	556637	246735	1	763	0.50	13.81	150	0.0174	58	45.398	23.22	OK	1.312	OK	59		
Pn 1.16	6704-6703	556637	246735	556614	246738	328	1911	0.50	21.86	150	0.0174	58	23.195	23.22	OK	1.312	OK	94		
Pn 1.17	6703-6702	556614	246738	556605	246703	4	1925	0.50	21.94	150	0.0174	58	36.139	23.22	OK	1.312	OK	94		41.594
Pn 1.18	6702-5703	556605	246703	556571	246706	3	1935.5	0.50	22.00	150	0.0243	41	34.132	27.53	OK	1.556	OK	80	41.594	40.763
Pn 1.19	5703-5601	556571	246706	556565	246673	2	1942.5	0.50	22.04	150	0.0666	15	33.541	45.68	OK	2.581	OK	48	40.763	38.530
Pn 1.20	5601-5602	556565	246673	556524	246662	1	1946	0.50	22.06	150	0.0411	24	42.450	35.83	OK	2.025	OK	62	39.908	38.164
Pn 1.21	5602-4605	556524	246662	556478	246645	1	1949.5	0.50	22.08	375	0.0411	24	49.041	403.35	OK	3.647	OK	5	38.164	
Pn 1.22	4605-4603	556478	246645	556449	246631	7	1974	0.50	22.21	375	0.0125	80	32.202	221.81	OK	2.005	OK	10		38.031
Pn 1.23	4603-4604	556449	246631	556427	246635	7	1998.5	0.50	22.35	375	0.0035	287	22.361	116.48	OK	1.053	OK	19	38.031	37.953
Pn 1.24	4604-4601	556427	246635	556423	246639	0	1998.5	0.50	22.35	375	0.0071	141	5.657	166.46	OK	1.505	OK	13	37.953	37.913
Pn 1.25	4601-3602	556423	246639	556373	246655	4	2012.5	0.50	22.43	375	0.0031	322	52.498	109.82	OK	0.993	OK	20	37.913	37.75
Pn 1.26	3602-3601	556373	246655	556327	246659	3	2023	0.50	22.49	375	0.0025	395	46.174	99.07	OK	0.896	OK	23	37.750	37.633
Pn 1.27	3601-2800	556327	246659			0	2023	0.50	22.49	375	0.0025	395	103.270	99.07	OK	0.896	OK	23		
Pn 1.28	2800-2601					0	2023	0.50	22.49	375	0.0025	395	0.000	99.07	OK	0.896	OK	23		

Appendix D

FOULWATER SEWERAGE ASSESSMENT OF PRINCIPAL SEWERS (PROPOSED)

Client: **Linton Parish Council**
Job No: *1400
Address: Linton Village

'kv' = 1.150
'ks' = 0.650
K_{DU} = 0.50

Discharge rate taken at 3.5 Discharge Units per dwelling

Flow calculation used Q=Kdu SQRT(ånDu)

A E Designs Ltd
Flood Defence and Drainage Engineers
20, Short Road,
Stretham
Cambs
CB6 3LS
01353 649002
07708 185915

Sewer No	U/s to D/s Manholes	Upstream Coordinates Easting	Upstream Coordinates Northing	Downstream Coordinates Easting	Downstream Coordinates Northing	Houses Connected	Cumulative No of DU's	K_{DU}	Design flow rate Q l/s	Pipe Diam	Gradient m/m	Gradient 1:?	Sewer Length	Pipe Q capacity	Capacity Chek	V m/s	V Check	Sewer capacity % used	U/s Invert Level	D/s Level
Pn 1.01	1605-1604	557148	246663	557136	246655	54	189	0.50	6.87	150	0.0194	52	14.422	24.53	OK	1.386	OK	28	55.520	55.241
Pn 1.02	1604-1603	557136	246655	557130	246626	4	203	0.50	7.12	150	0.0194	52	29.614	24.53	OK	1.386	OK	29		
Pn 1.03	1603-1503	557130	246626	557114	246587	1	206.5	0.50	7.19	150	0.0194	52	42.154	24.53	OK	1.386	OK	29		
Pn 1.04	1503-1501	557114	246587	557130	246579	0	206.5	0.50	7.19	150	0.0194	52	17.889	24.53	OK	1.386	OK	29		47.720
Pn 1.05	1501-1502	557130	246579	557112	246543	45	364	0.50	9.54	150	0.2931	3	40.249	96.12	OK	5.431	OK	10	47.720	45.520
Pn 1.06	1502-0503	557112	246543	557060	246568	22	441	0.50	10.50	150	0.0097	103	57.697	17.29	OK	0.977	OK	61	45.520	44.960
Pn 1.07	0503-9601	557060	246568	556991	246618	22	518	0.50	11.38	150	0.0039	258	85.212	10.84	FAIL	0.613	FAIL	105	44.960	44.630
Pn 1.08	9601-9609	556991	246618	556959	246635	5	535.5	0.50	11.57	150	0.0039	258	36.235	10.84	FAIL	0.613	FAIL	107	44.630	
Pn 1.09	9609-9502	556959	246635	556923	246559	5	553	0.50	11.76	150	0.0039	258	84.095	10.84	FAIL	0.613	FAIL	108		
Pn 1.10	9502-9604	556923	246559	556908	246665	75	815.5	0.50	14.28	150	0.0039	258	107.056	10.84	FAIL	0.613	FAIL	132		44.275
Pn 1.11	9604-8602	556908	246665	556879	246675	7	840	0.50	14.49	150	0.0039	258	30.676	10.84	FAIL	0.613	FAIL	134		44.149
Pn 1.12	8602-8601	556879	246675	556799	246687	12	882	0.50	14.85	150	0.0058	172	80.895	13.34	FAIL	0.754	OK	111	44.149	43.678
Pn 1.13	8601-7702	556679	246675	556717	246721	12	924	0.50	15.20	150	0.0058	172	59.666	13.34	FAIL	0.754	OK	114	43.768	43.192
Pn 1.14	7702-6705	556717	246721	556682	246729	3	934.5	0.50	15.28	150	0.0174	58	35.903	23.22	OK	1.312	OK	66	43.192	
Pn 1.15	6705-6704	556682	246729	556637	246735	1	938	0.50	15.31	150	0.0174	58	45.398	23.22	OK	1.312	OK	66		
Pn 1.16	6704-6703	556637	246735	556614	246738	328	2086	0.50	22.84	150	0.0174	58	23.195	23.22	OK	1.312	OK	98		
Pn 1.17	6703-6702	556614	246738	556605	246703	4	2100	0.50	22.91	150	0.0174	58	36.139	23.22	OK	1.312	OK	99		41.594
Pn 1.18	6702-5703	556605	246703	556571	246706	3	2110.5	0.50	22.97	150	0.0243	41	34.132	27.53	OK	1.556	OK	83	41.594	40.763
Pn 1.19	5703-5601	556571	246706	556565	246673	2	2117.5	0.50	23.01	150	0.0666	15	33.541	45.68	OK	2.581	OK	50	40.763	38.530
Pn 1.20	5601-5602	556565	246673	556524	246662	1	2121	0.50	23.03	150	0.0411	24	42.450	35.83	OK	2.025	OK	64	39.908	38.164
Pn 1.21	5602-4605	556524	246662	556478	246645	1	2124.5	0.50	23.05	375	0.0411	24	49.041	403.35	OK	3.647	OK	6	38.164	
Pn 1.22	4605-4603	556478	246645	556449	246631	7	2149	0.50	23.18	375	0.0125	80	32.202	221.81	OK	2.005	OK	10		38.031
Pn 1.23	4603-4604	556449	246631	556427	246635	7	2173.5	0.50	23.31	375	0.0035	287	22.361	116.48	OK	1.053	OK	20	38.031	37.953
Pn 1.24	4604-4601	556427	246635	556423	246639	0	2173.5	0.50	23.31	375	0.0071	141	5.657	166.46	OK	1.505	OK	14	37.953	37.913
Pn 1.25	4601-3602	556423	246639	556373	246655	4	2187.5	0.50	23.39	375	0.0031	322	52.498	109.82	OK	0.993	OK	21	37.913	37.75
Pn 1.26	3602-3601	556373	246655	556327	246659	3	2198	0.50	23.44	375	0.0025	395	46.174	99.07	OK	0.896	OK	24	37.750	37.633
Pn 1.27	3601-2800	556327	246659			0	2198	0.50	23.44	375	0.0025	395	103.270	99.07	OK	0.896	OK	24		
Pn 1.28	2800-2601					0	2198	0.50	23.44	375	0.0025	395	0.000	99.07	OK	0.896	OK	24		