Lane

Landmark House

Littleworth Di

17

Worth's Farm

Green Lane Drain-157

Barr Farm

Worths Farm Dyke-232

Deeping Fen

St Nicholas House

Tolethorpe

Church Farm

Church Farm Dyke-126

16

Harrow Farm

Harrow Farm Dyke-164

Porters Farm

Porters Farm dyke-198

Gull House Farm-158

Picks Home Farm-196

South Drove Drain-212

Vine House Farm Dyke-223

Vine House Farm

Deeping St Nicholas

Station Farm Dyke No.1-213

Hedge Farm Dyke-166

Lonsdale Farm

MP

Sch

15

A1175

Chapel Road Dyke-124

Station Farm Dyke No.2-214

Sewage Works

Picks Deeping High Bank-195

N

NOTES

1. The potential flooding consequences shown on this map relate to flooding from the sea, main rivers and Internal Drainage Board systems taking into account the presence of current flood risk management measures such as flood defences.

2. In addition to the potential flood extents shown on this map, there may be shallow flooding in low-lying rural areas

3. The consequences designated as being an Actual Risk arise from direct overtopping of defences, where this would occur, together with assumed breach failure of some defences. Breach failure has been assumed to occur in places where the freeboard between peak sea or river water level and the defence crest level is less than the minimum desirable for structural security of the defence.

4. The consequences designated as being a Residual Risk arise from direct overtopping of defences, where this would occur, together with breach failure which is assumed could occur at any point along the defences.

5. The potential flooding consequences relate to flood probability bandings as follows:

Probability Band	Annual probability of Flooding	
	from a river (fluvial)	from the sea (tidal)
Low	<0.1%	<0.1%
Medium	1%-0.1%	0.5%-0.1%
High	>1%	>0.5%

6. Functional Floodplain encompasses areas where water is intended to flow or be stored in times of flood.

7. Land outside South Holland District is not considered.

8. This map shows the extents only of the flooding probability bands relevent to the map Title

Map Legend

Peak Depth

- 0m - 0.5m
- 0.5m - 1m
- 1m - 1.5m
- >1.5m
- Functional Floodplain
- South Holland District Boundary

REV	DATE	REMARKS

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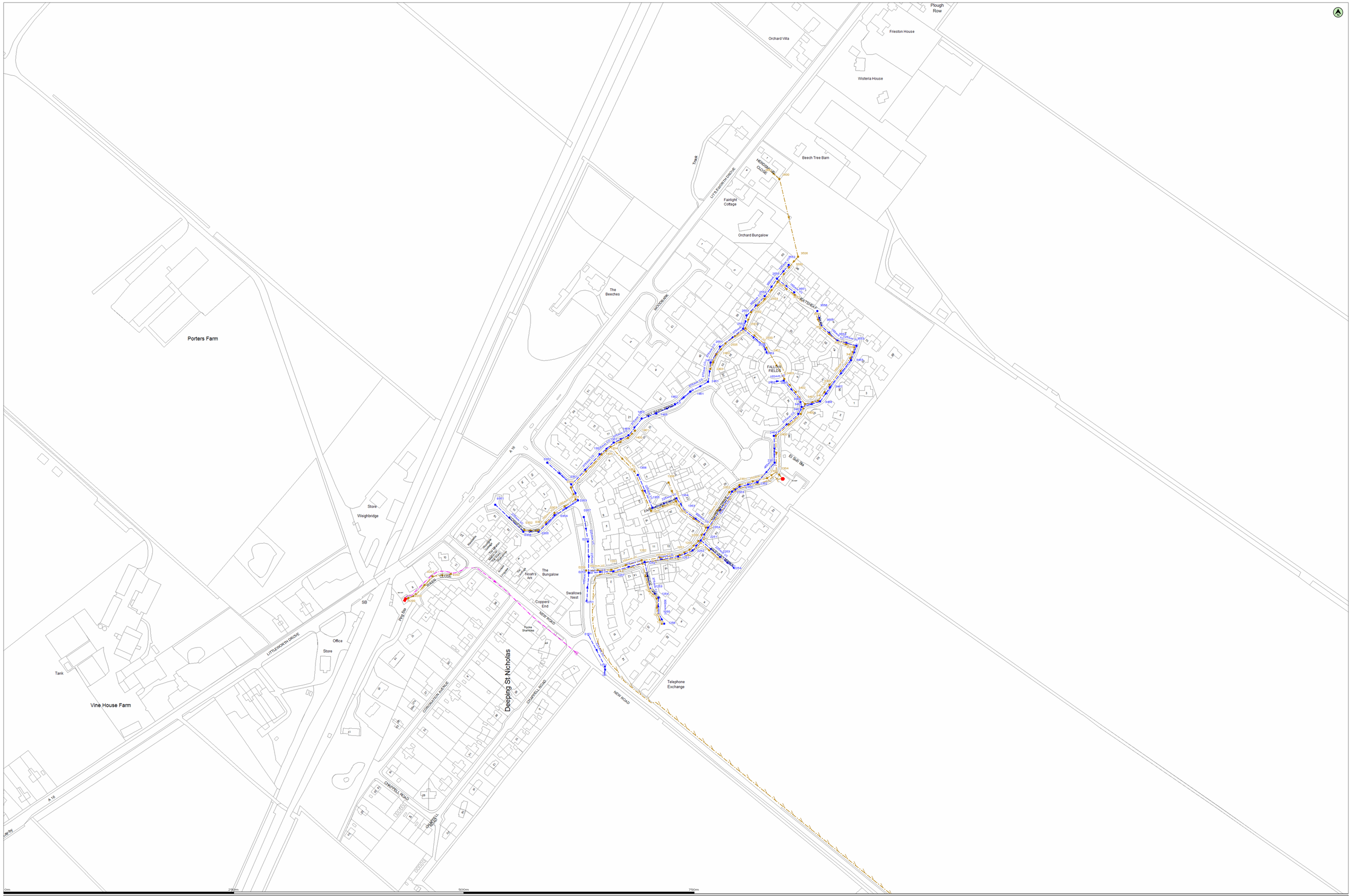
UPDATE OF STRATEGIC FLOOD RISK ASSESSMENT

Residual Peak Depth
District - Year 2115
1% Fluvial / 0.5% Tidal Event Probability

DATE OF ISSUE: January 2010 **REV NO:**

SCALE: 1 : 60,000 @ A1

MAP NO:



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This plan is provided by Anglian Water pursuant its obligations under the Water Industry Act 1991 sections 198 or 199. It must be used in conjunction with any search results attached. The information on this plan is based on data currently recorded but position must be regarded as approximate. Service pipes, private sewers and drains are generally not shown. Users of this map are strongly advised to commission their own survey of the area shown on the plan before carrying out any works. The actual position of all apparatus MUST be established by trial holes. No liability whatsoever, including liability for negligence, is accepted by Anglian Water for any error or inaccuracy or omission, including the failure to accurately record, or record at all, the location of any water main, discharge pipe, sewer or disposal main or any item of apparatus. This information is valid for the date printed. This plan is produced by Anglian Water Services Ltd from its digital database. Crown copyright rights 2016 Ordnance Survey 100022432. This map is to be used for the purposes of viewing the location of Anglian Water plant only. Any other uses of the map data or further copies is not permitted. This notice is not intended to exclude or restrict liability for death or personal injury resulting from negligence.

- Foul Sewer
- Surface Sewer
- Combined Sewer
- Final Effluent
- Rising Main (Colour denotes effluent type)
- Proposed Sewer (Colour denotes effluent type)
- Decommissioned Sewer (Colour denotes effluent type)
- Outfall (Colour denotes effluent type)
- Inlet (Colour denotes effluent type)
- Manhole (Colour denotes effluent type)
- Sewage Treatment Works
- Pumping Station

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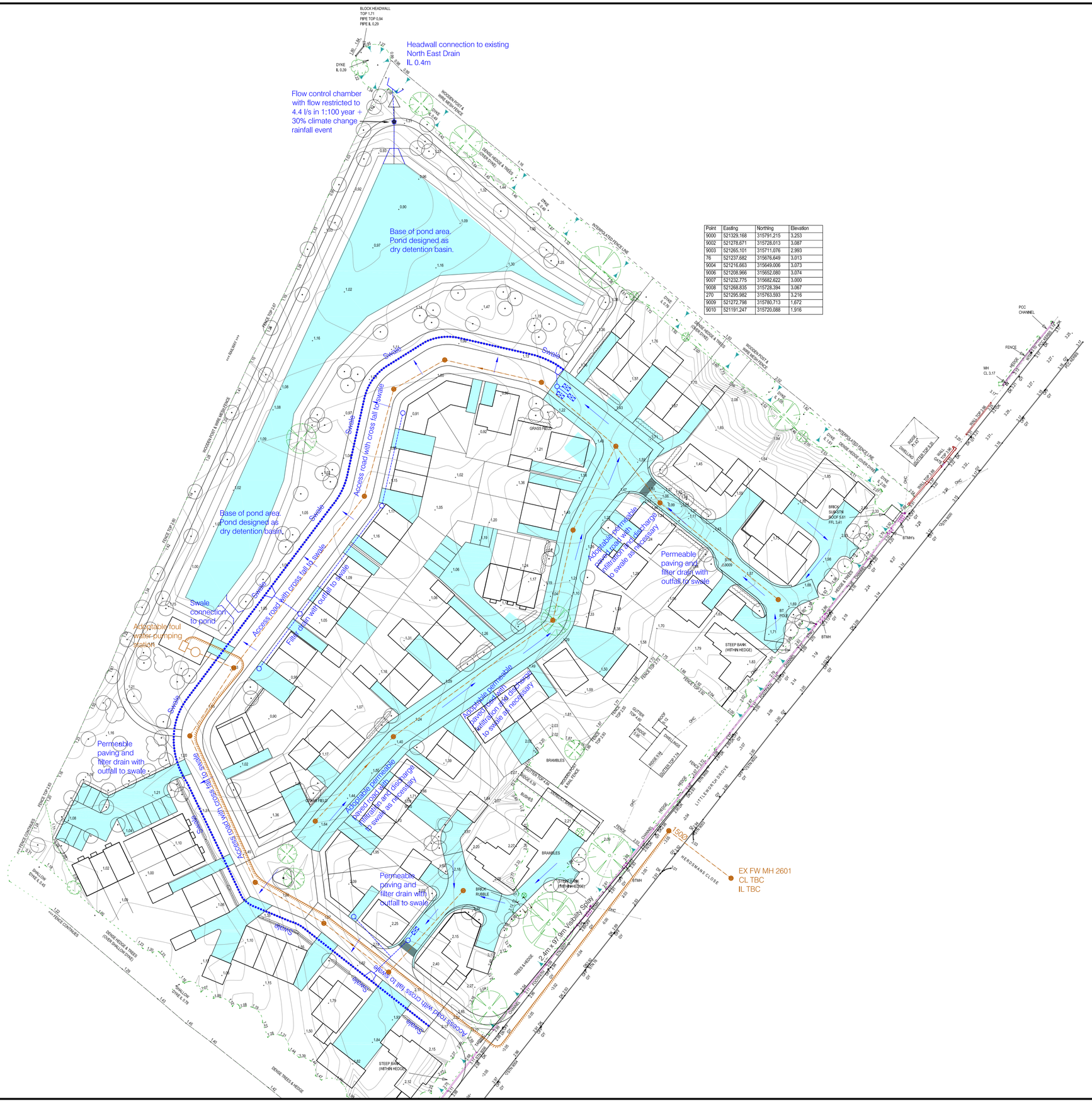
Deeping St Nicholas

love every drop anglianwater

Manhole Reference	Easting	Northing	Liquid Type	Cover Level	Invert Level	Depth to Invert
0200	521087	315258	F	-	-	-
0300	521070	315348	F	-	-	-
0301	521034	315301	F	-	-	-
0302	521020	315302	F	-	-	-
0303	521053	315320	F	-	-	-
0304	521075	315335	F	-	-	-
1200	521199	315280	F	-	-	-
1201	521188	315275	F	-	-	-
1202	521147	315269	F	-	-	-
1203	521155	315236	F	-	-	-
1204	521163	315227	F	-	-	-
1205	521164	315210	F	-	-	-
1206	521169	315200	F	-	-	-
1207	521114	315258	F	-	-	-
1300	521191	315323	F	-	-	-
1301	521184	315333	F	-	-	-
1302	521157	315322	F	-	-	-
1303	521139	315366	F	-	-	-
1304	521114	315392	F	-	-	-
1305	521104	315384	F	-	-	-
1306	521176	315353	F	-	-	-
1400	521132	315402	F	-	-	-
1401	521140	315410	F	-	-	-
2200	521209	315290	F	-	-	-
2201	521231	315271	F	-	-	-
2300	521283	315358	F	-	-	-
2301	521253	315351	F	-	-	-
2302	521242	315343	F	-	-	-
2303	521217	315304	F	-	-	-
2304	521293	315365	F	-	-	-
2400	521293	315404	F	-	-	-
2401	521286	315494	F	-	-	-
2402	521228	315493	F	-	-	-
2403	521222	315477	F	-	-	-
2500	521280	315505	F	-	-	-
2501	521260	315521	F	-	-	-
2502	521266	315538	F	-	-	-
2503	521281	315553	F	-	-	-
2504	521295	315572	F	-	-	-
2505	521238	315504	F	-	-	-
2600	521297	315683	F	-	-	-
2601	521285	315694	F	-	-	-
3400	521320	315428	F	-	-	-
3401	521325	315439	F	-	-	-
3402	521314	315452	F	-	-	-
3403	521302	315466	F	-	-	-
3404	521339	315442	F	-	-	-
3405	521351	315460	F	-	-	-
3406	521374	315489	F	-	-	-
3500	521307	315587	F	-	-	-
3501	521314	315557	F	-	-	-
3502	521378	315500	F	-	-	-
3503	521361	315506	F	-	-	-
3504	521341	315522	F	-	-	-
3505	521336	315537	F	-	-	-
3506	521317	315599	F	-	-	-
8200	520894	315228	F	2.37	0.52	1.85
9200	520902	315232	F	2.52	0.68	1.84
9201	520920	315251	F	2.7	1.1	1.6
9202	520940	315254	F	2.82	1.43	1.39
0151	521089	315188	S	-	-	-
0251	521087	315224	S	-	-	-
0252	521089	315289	S	-	-	-
0253	521089	315255	S	-	-	-
0351	521071	315351	S	-	-	-
0352	521045	315375	S	-	-	-
0353	521078	315334	S	-	-	-
0354	521053	315318	S	-	-	-
0355	521035	315300	S	-	-	-
0356	521018	315300	S	-	-	-
0357	521084	315316	S	-	-	-
1151	521107	315153	S	-	-	-
1251	521187	315273	S	-	-	-
1252	521150	315267	S	-	-	-
1253	521157	315238	S	-	-	-
1254	521165	315228	S	-	-	-
1255	521166	315211	S	-	-	-
1256	521172	315200	S	-	-	-
1257	521116	315257	S	-	-	-
1351	521117	315397	S	-	-	-
1352	521101	315384	S	-	-	-
1353	521194	315323	S	-	-	-
1354	521185	315336	S	-	-	-
1355	521159	315326	S	-	-	-
1356	521143	315362	S	-	-	-
1451	521200	315452	S	-	-	-
1452	521183	315438	S	-	-	-
1453	521147	315423	S	-	-	-
1454	521133	315405	S	-	-	-
1455	521163	315429	S	-	-	-
2251	521211	315291	S	-	-	-
2252	521202	315280	S	-	-	-
2253	521232	315273	S	-	-	-
2254	521247	315261	S	-	-	-
2351	521291	315375	S	-	-	-
2352	521273	315354	S	-	-	-
2353	521245	315344	S	-	-	-
2354	521219	315304	S	-	-	-
2355	521253	315349	S	-	-	-
2451	521219	315463	S	-	-	-
2452	521222	315484	S	-	-	-
2453	521283	315495	S	-	-	-
2454	521291	315404	S	-	-	-
2455	521288	315463	S	-	-	-
2551	521232	315501	S	-	-	-
2552	521257	315521	S	-	-	-
2553	521261	315535	S	-	-	-
2554	521281	315556	S	-	-	-
2555	521294	315575	S	-	-	-
2556	521279	315503	S	-	-	-
3451	521317	315428	S	-	-	-
3452	521321	315435	S	-	-	-
3453	521374	315487	S	-	-	-
3454	521318	315444	S	-	-	-
3455	521302	315464	S	-	-	-
3456	521341	315442	S	-	-	-
3457	521352	315457	S	-	-	-
3551	521313	315560	S	-	-	-
3552	521307	315590	S	-	-	-
3553	521381	315502	S	-	-	-
3554	521360	315508	S	-	-	-
3555	521342	315523	S	-	-	-
3556	521338	315540	S	-	-	-
9351	520988	315329	S	-	-	-

Manhole Reference	Easting	Northing	Liquid Type	Cover Level	Invert Level	Depth to Invert
Manhole Reference	Easting	Northing	Liquid Type	Cover Level	Invert Level	Depth to Invert
Manhole Reference	Easting	Northing	Liquid Type	Cover Level	Invert Level	Depth to Invert
Manhole Reference	Easting	Northing	Liquid Type	Cover Level	Invert Level	Depth to Invert
Manhole Reference	Easting	Northing	Liquid Type	Cover Level	Invert Level	Depth to Invert
Manhole Reference	Easting	Northing	Liquid Type	Cover Level	Invert Level	Depth to Invert

Appendix E
Preliminary Drainage Strategy



Point	Easting	Northing	Elevation
9000	521329,168	315791,215	3,253
9002	521278,671	315728,013	3,087
9003	521265,101	315711,076	2,993
76	521237,882	315676,649	3,013
9004	521216,663	315649,006	3,073
9006	521208,966	315652,080	3,074
9007	521232,775	315682,622	3,000
9008	521268,835	315728,394	3,067
270	521295,982	315763,593	3,216
9009	521272,798	315780,713	1,672
9010	521191,247	315720,088	1,916

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A1

0 10 20 30 40 50
Millimetres At Original Drawing Size

General Notes

1. DO NOT SCALE.

2. This drawing is to be read in conjunction with all other relevant drawings and details.

3. Should there be any conflict between the details indicated on this drawing and those indicated on other drawings the Engineer should be informed PRIOR to construction on site.

4. Until technical approval has been obtained from the relevant Authority, it should be understood that all drawings issued are Preliminary and NOT for construction. Should the contractor commence site work prior to such approval being given, it is entirely at his own risk.

5. All dimensions are in millimetres unless otherwise stated.

6. The BSP Hazard Identification and Risk Assessment information for this project must be reviewed and understood by the contractor PRIOR to the commencement of any works on site.

Rev.	Description	Date.	Drawn	Appr.

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Also offices in Derby, Leicester and Sheffield

Drawing Status
PRELIMINARY

Client
Trustees of DW Dennis Settlement

Project Title
Residential Development
Caultons Field, Littleworth Drove
Deeping Saint Nicholas

Drawing Title
Preliminary Drainage Strategy

Drawn By:	TE	Checked By:	AG	Scale:	1:500
Project Engineer :	AG	Approved By:	AG	Date:	09/03/16

Drawing Number: 15736-241
Revision: /

Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
720 min Summer	1.131	0.681	4.0	0.0	4.0	1136.0	O K
960 min Summer	1.144	0.694	4.0	0.0	4.0	1163.4	O K
1440 min Summer	1.152	0.702	4.0	0.0	4.0	1179.5	O K
2160 min Summer	1.142	0.692	4.0	0.0	4.0	1157.6	O K
2880 min Summer	1.125	0.675	4.0	0.0	4.0	1122.6	O K
4320 min Summer	1.094	0.644	3.9	0.0	3.9	1057.1	O K
5760 min Summer	1.065	0.615	3.8	0.0	3.8	997.1	O K
7200 min Summer	1.037	0.587	3.7	0.0	3.7	941.1	O K
8640 min Summer	1.010	0.560	3.7	0.0	3.7	888.2	O K
10080 min Summer	0.984	0.534	3.7	0.0	3.7	838.2	O K
720 min Winter	1.202	0.752	4.2	0.0	4.2	1289.0	O K
960 min Winter	1.218	0.768	4.2	0.0	4.2	1325.2	O K
1440 min Winter	1.231	0.781	4.2	0.0	4.2	1354.2	O K
2160 min Winter	1.227	0.777	4.2	0.0	4.2	1346.3	O K
2880 min Winter	1.212	0.762	4.2	0.0	4.2	1310.8	O K
4320 min Winter	1.174	0.724	4.1	0.0	4.1	1227.8	O K
5760 min Winter	1.138	0.688	4.0	0.0	4.0	1150.0	O K
7200 min Winter	1.101	0.651	3.9	0.0	3.9	1072.2	O K
8640 min Winter	1.064	0.614	3.8	0.0	3.8	996.6	O K
10080 min Winter	1.028	0.578	3.7	0.0	3.7	923.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
720 min Summer	7.443	0.0	622.9	0.0	726
960 min Summer	5.915	0.0	625.7	0.0	966
1440 min Summer	4.273	0.0	622.2	0.0	1444
2160 min Summer	3.082	0.0	1209.0	0.0	2144
2880 min Summer	2.442	0.0	1192.6	0.0	2452
4320 min Summer	1.756	0.0	1138.9	0.0	3200
5760 min Summer	1.389	0.0	1912.9	0.0	3984
7200 min Summer	1.157	0.0	1992.5	0.0	4832
8640 min Summer	0.996	0.0	2036.8	0.0	5624
10080 min Summer	0.878	0.0	1963.2	0.0	6456
720 min Winter	7.443	0.0	646.6	0.0	716
960 min Winter	5.915	0.0	649.7	0.0	948
1440 min Winter	4.273	0.0	645.5	0.0	1406
2160 min Winter	3.082	0.0	1253.0	0.0	2076
2880 min Winter	2.442	0.0	1242.2	0.0	2712
4320 min Winter	1.756	0.0	1193.2	0.0	3376
5760 min Winter	1.389	0.0	2142.7	0.0	4320
7200 min Winter	1.157	0.0	2214.2	0.0	5200
8640 min Winter	0.996	0.0	2162.8	0.0	6136
10080 min Winter	0.878	0.0	2058.9	0.0	7056

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Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.000	Shortest Storm (mins)	720
Ratio R	0.405	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+30

Time Area Diagram

Total Area (ha) 1.914

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.638	4	8	0.638	8	12	0.638

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Model Details

Storage is Online Cover Level (m) 1.750

Tank or Pond Structure

Invert Level (m) 0.450

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	1235.0	0.500	1880.0	1.000	2588.0	1.300	3027.0

Hydro-Brake® Outflow Control

Design Head (m) 0.800 Hydro-Brake® Type Md6 SW Only Invert Level (m) 0.400
Design Flow (l/s) 4.2 Diameter (mm) 90

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.6	0.800	4.1	2.000	6.5	4.000	9.2	7.000	12.2
0.200	3.7	1.000	4.6	2.200	6.9	4.500	9.8	7.500	12.7
0.300	3.5	1.200	5.1	2.400	7.2	5.000	10.3	8.000	13.1
0.400	3.4	1.400	5.5	2.600	7.5	5.500	10.8	8.500	13.5
0.500	3.5	1.600	5.8	3.000	8.0	6.000	11.3	9.000	13.9
0.600	3.7	1.800	6.2	3.500	8.6	6.500	11.8	9.500	14.2

Weir Overflow Control

Discharge Coef 0.544 Width (m) 10.000 Invert Level (m) 1.650

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