
Development of land east of Lockwood Road Goldthorpe

Flood Risk Assessment

Client:

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REVISION HISTORY

Revision	Date	Details
00	30 th March 2021	First issue
01	16 th January 2023	Surface water discharge rate updated

APENDICES

- A: Figure 1: Location Plan
- B: Topographical survey plan
- C: Infiltration tests report and calculations
- D: Yorkshire Water pre-development advice
- E: Schematic site layout plan
- F: Flood Map for Planning
- G: Surface water flood map
- H: Reservoirs flood map
- I: ReFH2 estimates of runoff rates and volumes
- J: Yorkshire Water email dated 31st May 2021
- K: LLFA email dated 28th April 2021

ABBREVIATIONS

AEP:	Annual exceedance probability
AOD:	Above Ordnance Datum
BGS:	British Geological Survey
CCA:	Climate change allowance
CDA:	Critical drainage area
d/s:	Downstream
FDL:	Flood defence level
FEH:	Flood Estimation Handbook
FRA:	Flood risk assessment
IL:	Invert level
NE:	North-east
NGR:	National Grid Reference
OS:	Ordnance Survey
OWC:	Ordinary watercourse
PPG:	Planning Practice Guidance
ReFH2:	Revitalised flood hydrology model, version 2
SFRA:	Strategic Flood Risk Assessment
SW:	South-west
u/s:	Upstream

1.0 SITE	Land east of Lockwood Road, Goldthorpe.
2.0 PURPOSE OF THIS REPORT	This site-specific flood risk assessment is required in connection with a planning application to Barnsley Council for a residential development on the site. References in this report to “the site” are references to the site which is the subject of the planning application.
3.0 PLANNING APPLICATION NUMBER	2021/1171
4.0 SITE LOCATION AND DESCRIPTION	See Figure 1: Location Plan in Appendix A.
4.1 National Grid Reference	446520E, 404685N
4.2 Gross Site Area	Approximately 4.68ha
4.3 Ground surface	100% pervious surface with grass or vegetation covering.
4.4 Topography	<p>Ground levels generally fall towards the north-east but there is a secondary gradient falling towards the west towards a shallow valley parallel with the northern boundary.</p> <p>Ground levels are within the range 49.61m to 55.90m AOD.</p> <p>See topographical survey plan in Appendix B.</p>
4.5 Geology	<p><u>Superficial</u>: None recorded.</p> <p><u>Bedrock</u>: Ackworth Rock - Sandstone.</p> <p>Data source: BGS Geology of Great Britain database.</p>
4.6 Ground investigation	<p>Infiltration tests were carried out during the ground investigation by Eastwood and Partners. It was concluded from the test results that the soils are not suitable for infiltration drainage.</p> <p>The infiltration tests report and the calculated infiltration rates are provided in Appendix C.</p>

4.6 Watercourses	The site is not within 20 of a Main River. There is an open drain at the NW corner of the site between the site boundary and the A635 highway. The LLFA has advised that this is a part of the highway drainage system for the A635.
4.7 Reservoirs	None in the immediate vicinity of the site.
4.8 Existing site drainage	Natural land drainage following the topography.
4.9 Existing sewers	The Yorkshire Water sewer map shows: <ul style="list-style-type: none">• a 225mm diameter surface water sewer which enters the site at the SE corner from Hamilton Road and progresses NE to MH 4701 where it connects to;• a 525mm diameter surface water sewer which progresses to the NW corner where it leaves the site; See Appendix D.
5.0 THE DEVELOPMENT	A development of 137 houses is proposed as shown on the planning layout drawing in Appendix E. Access to the site will be from East Street.
5.1 Vulnerability classification	The development is classified as 'More Vulnerable' , in accordance with Table 2 of the Planning Practice Guidance for Flood Risk and Coastal Change, paragraph 066.
5.2 Flood zone	The Flood Map For Planning shows the site to be in Flood Zone 1. See Appendix F.
5.3 Requirement to consult the Environment Agency	Not required for more vulnerable development that is in Flood Zone 1 and more than 20m from a Main River. ¹
5.4 Requirement for the sequential test	Not required when the development is in flood zone 1 and is not within 20m of a Main River or in a Critical Drainage Area. ²
5.5 Requirement for the exception test	Not required for More Vulnerable developments in Flood Zone 1. ³

¹ Environment Agency Standing Advice to local planning authorities. Updated 28th February 2017.

² Environment Agency Standing Advice to local planning authorities. Updated 28th February 2017.

³ Planning Practice Guidance for Flood Risk and Coastal Change, paragraph 067 Table 3.

6.0 CONSULTATIONS

6.1 Environment Agency

In view of the low risk of fluvial flooding, the Environment Agency was not consulted.

6.2 Barnsley LLFA

Barnsley LLFA was consulted in the preparation of this FRA and we are grateful for its helpful advice.

6.3 Yorkshire Water

Pre development advice was requested from Yorkshire Water and its response is provided in Appendix D.

Yorkshire Water has advised that surface water from the development may, if alternative methods of disposal are not feasible, be discharged to the 525mm diameter surface water sewer at a rate not exceeding 5.0 l/s.

See Appendix J.

7.0 FLUVIAL FLOODING

7.1 Functional floodplain

The site is not in the functional floodplain.

7.2 History of flooding

There is no available evidence of historic or potential flooding of the site.

7.3 Annual probability of fluvial flooding

0.1% or less.

7.4 Flood defences

None

7.5 Fluvial flood hazard

None

7.6 Loss of floodplain storage

None

7.7 Flood warning area

The site is not in an Environment Agency flood warning area.

8.0 SURFACE WATER FLOODING

8.1 Risk of surface water flooding

The current Surface Water Flood Map shows the site generally to be at a very low risk of surface water flooding. Some flooding is indicated however in the NW field and in the former allotment gardens area. The risk in these areas ranges from Low to High. Flood depths are indicated to be mainly less than 300mm but exceed 300mm in the NW field.

The area of flooding is consistent with the shallow valley area towards the north of the site. This will act as a natural basin for surface water runoff.

See Appendix G.

A comparison of the medium risk surface water flood depth map, which indicates an annual probability in the range 1% to 3.3%, with the topographical survey suggests that the limit of the flooded area occurs approximately at around 50.30m AOD. At the lowest point of the site, against the northern boundary, the ground level is 49.61m AOD, so depths ranging from 0.00m to approximately 700mm could be expected.

The surface water flow path from the site continues across the northern boundary and then flows west, adjacent to the A635 highway, culminating in a flooded area just to the east of the B6098/A635 roundabout.

It is therefore important that the layout of the development makes provision for this flow path and does not obstruct it.

8.2 Critical Drainage Areas

The site is not in a critical drainage area.

9.0 GROUNDWATER FLOODING

Groundwater flooding is associated with highly permeable rock such as chalk. This type of geology is not present at the site. It is possible however, at times of high soil saturation, that there could be some emergence of groundwater at the lowest part of the site and this should be considered in the design of any attenuation storage basin that may be located in this area.

10.0 SEWER FLOODING

Sewer flooding can occur when the capacity of the sewerage system is exceeded by exceptional rainfall. Although there are 225mm and a 525mm diameter surface water sewers crossing the site, there is no evidence that the site has been affected by this type of flooding.

The risk of sewer flooding to the development is assessed to be low.

11.0 FLOODING FROM RESERVOIRS AND CANALS

The site is not in an area at risk of flooding resulting from an uncontrolled release of water from reservoirs. (See Appendix H).

The site is not at risk of flooding from canals.

12.0 EFFECT OF THE DEVELOPMENT ON FLOOD RISK

12.1 Fluvial and tidal flood risk

No effect

12.2 Surface water flood risk

It is assumed for the purposes of this FRA that the development will create impervious area on approximately 50% of the gross site area. This is a conservative estimate as the impervious area in Gleeson developments is typically less than this.

Runoff rates and volumes in the existing and post-development conditions have been estimated using FEH point data for the site and the ReFH2 model. The results are shown in Appendix I.

The 2 year rural peak flow rate (Q MED) is 16.65 l/s for the site. As the site is in Hydrological Area 3, the growth curve factor used to convert Q bar to Q(T) is 0.94.

Q bar is therefore $Q \text{ MED}/0.94$
 $= 16.65/0.94 = 17.72 \text{ l/s}$.

The ReFH2 model shows that the development will increase the peak runoff rate of a 1% AEP rainfall event by a factor of approximately 2.2.

Runoff volumes in the same event are estimated to increase by a factor of approximately 2.0.

12.3 Groundwater flood risk

The risk of groundwater emergence at the lowest part of the site may be reduced by the drainage system for the development.

12.4 Sewer flooding risk No effect

13.0 EFFECT OF CLIMATE CHANGE

13.1 Lifetime of the development Climate change must be considered over the expected lifetime of the development which, for residential development is defined to be 100 years in paragraph 026 of the Planning Practice Guidance. Climate change must therefore be considered up to 2119.

13.2 Current guidance Current guidance on the application of climate change allowances was issued in February 2016 and updated on 22nd July 2020. The guidance provides the anticipated changes to peak river flow and rainfall intensity for different scenarios of carbon dioxide emissions over future epochs up to 2115.

13.3 Effect on fluvial flood risk The effects of climate change on peak river flow are not relevant to this FRA as the site is not at risk from fluvial flooding.

13.4 Effect on surface water flood risk The current guidance requires the Central and Upper End allowances to be used when assessing the effects of increases to peak rainfall intensities. The allowances apply across the whole of England and in the period 2070 to 2115 are:

- Central allowance: 20%
- Upper end allowance: 40%

The detailed drainage design must therefore take into account the range of climate change effects on rainfall intensity.

The ReFH2 estimates of post-development runoff rates and volumes are provided in Appendix I and a summary is provided below:

13.5 Post development runoff rates

- 3.3% AEP: 103.64 l/s
- 1% AEP: 142.16 l/s
- 1% AEP with 20% CCA: 171.86 l/s
- 1% AEP with 40% CCA: 202.02 l/s

13.6 Post development runoff volumes

- 3.3% AEP: 1,291.25 m³
- 1% AEP: 1,783.86 m³
- 1% AEP with 20% CCA: 2,167.54 m³
- 1% AEP with 40% CCA: 2,560.20 m³

14.0 FLOOD RISK MANAGEMENT

14.1 Fluvial flood risk

As the development is in Flood Zone 1, no flood risk management measures are required in respect of fluvial flooding.

Flood warnings

Not required.

Evacuation

Not required.

14.2 Surface water flood risk

As noted in section 8.1 above, it is important that provision is made for the overland surface water flow path in the layout of the development.

The design of the drainage system should ensure that surface water runoff is managed in the lowest part of the site in order to avoid a flooding risk to the proposed dwellings. The public open space shown on the site layout plan should be re-located to the central valley area close to the northern boundary where it can function as a flood storage area when necessary.

The effect of the development on surface water flood risk can be mitigated by the application of sustainable drainage principles in the detailed drainage design.

Infiltration drainage

The ground investigation report concludes that infiltration will not be feasible owing to poor infiltration rates, but suggests that some limited infiltration from pervious paving could be considered. This method of disposal would however not be sufficient for the design rainfall event and a positive drainage outlet either to a watercourse or sewer would be required.

Disposal of surface water to a watercourse

Barnsley LLFA has advised that the Barnsley Highway Authority has a policy of resisting the connection of flows from development sites to highway drains. Yorkshire Water on the other hand has stated that it will not accept surface water into its surface water sewer if the option of disposal to a watercourse is available.

The Land Drainage Act 1991 defines the term “watercourse” to include: *all rivers and streams and all ditches, drains, cuts, culverts, dikes, sluices, sewers (other than public sewers within the meaning of the Water Industry Act 1991) and passages through which water flows.* The Act makes no exclusion for highway drains, so the Highway Authority may have difficulty in upholding its policy in this instance, especially as it is clear from the topography that greenfield surface water runoff from the site must already enter the watercourse at the NW corner of the site.

The LLFA stated in its email of 28th April 2021 that, as the watercourse to the north west of the site is maintained as a highway drain, the highway authority will not give consent for an easement across its land or for a surface water outfall. (See appendix K).

It will therefore be necessary for surface water to be discharged to the 525mm surface water sewer. Yorkshire Water has agreed to this.

Peak flow control

In its email dated 31st May 2021, Yorkshire Water stated that it would accept a peak surface water discharge rate into the 525mm surface water sewer of 5 l/s.

Attenuation storage

Attenuation storage will be required, and the form that this will take will be a matter for the detailed design of the drainage system. The attenuation storage has been designed based on the agreed peak discharge rate of 5 l/s.

14.3 Groundwater flood risk

No recommendations.

14.4 Sewer flooding risk

No recommendations.

14.5 Reservoir flood risk

No recommendations.

14.6 Access and egress

As the site is in flood zone 1 and is generally at a very low risk of surface water flooding, access and egress will not be impeded. The small area of low risk flooding at the site entrance from Essex Road can be mitigated in the detailed design of the drainage system.

15.0 RESIDUAL RISKS

Residual risks are those that remain after the implementation of the flood risk management measures.

15.1 Risk of 40% CCA

If the drainage design assumes a 20% CCA, the residual risk of a 40% CCA should be considered.

The preliminary estimate of the attenuation storage capacity for a 1% AEP event with 40% CCA, based on a discharge rate of 17.72 l/s, is approximately 2,337 m³, an increase over the 20% CCA volume of approximately 393m³. This risk can be mitigated by:

- allowing the additional volume to be stored within a controlled area, such as within the freeboard of a storage basin; and/or
- increasing the attenuation storage capacity; and/or
- allowing limited surface water flooding in controlled areas that does not result in a flood risk to buildings.

15.2 Risk of the 1% AEP design event being exceeded

Should the design event be exceeded, the additional runoff volume would initially be stored in the attenuation pond up to the limit of its capacity. When this is exceeded, there will be overland flow which should be constrained within designed exceedance routes shown on the detailed design drawings.

16.0 CONCLUSIONS

1. The development classification is **More Vulnerable**.
2. The site is in flood zone 1 where the annual probability of fluvial flooding is less than 0.1%.
3. There is no requirement for the Environment Agency to be consulted on this development.
4. There is no requirement for the Sequential Test or Exception Test to be applied to the development.
5. There is no evidence of the site having been affected by flooding in the past but some surface water flooding in the lowest parts of the site is likely to have occurred.
6. The risk of surface water flooding at the site is generally very low, but there is a medium risk in the valley area towards the north of the site with depths up to approximately 700mm.

7. The risk of groundwater flooding is assessed generally to be negligible but some emergence of groundwater at the lowest part of the site could occur at times when soil saturation is high.
8. Sewer flooding is unlikely to occur more than once in 30 years, due to storage in the sewerage system. It is unlikely that this type of flooding would affect the site more frequently than this, based on the required design criteria.
9. The site is not at risk of flooding from canals and is not in an area at risk from the uncontrolled release of water from reservoirs.
10. The development will reduce the pervious area of the site by up to 50% which will increase surface water runoff rates and volumes. This will be mitigated by restricting the peak surface water discharge rate to the public sewer to 5 l/s, as agreed with Yorkshire Water.
11. Subject to the implementation of the flood risk management measures recommended in this report, the development will not increase flood risk elsewhere.

RECOMMENDATIONS

A detailed drainage design should be prepared and submitted to Barnsley Council and Yorkshire Water for approval, prior to construction of the development. The actual attenuation storage capacities should be determined in the detailed design of the drainage scheme.

The flood risk management measures recommended in this report should be implemented in the design and construction of the development.

USE OF REPORT

This report is prepared specifically for Gleeson Developments Ltd for the purpose of the aforementioned planning application and the report may not be used for any other purpose and it may not be assigned to any third party without our written permission.

DISCLAIMER

This flood risk assessment is based on data available at the time of its preparation and JOC Consultants Ltd accepts no liability for the consequences of any changes to or re-assessment of this data in the future.

APPENDIX A

Figure 1: Location Plan

Development site east of Lockwood Road, Goldthorpe

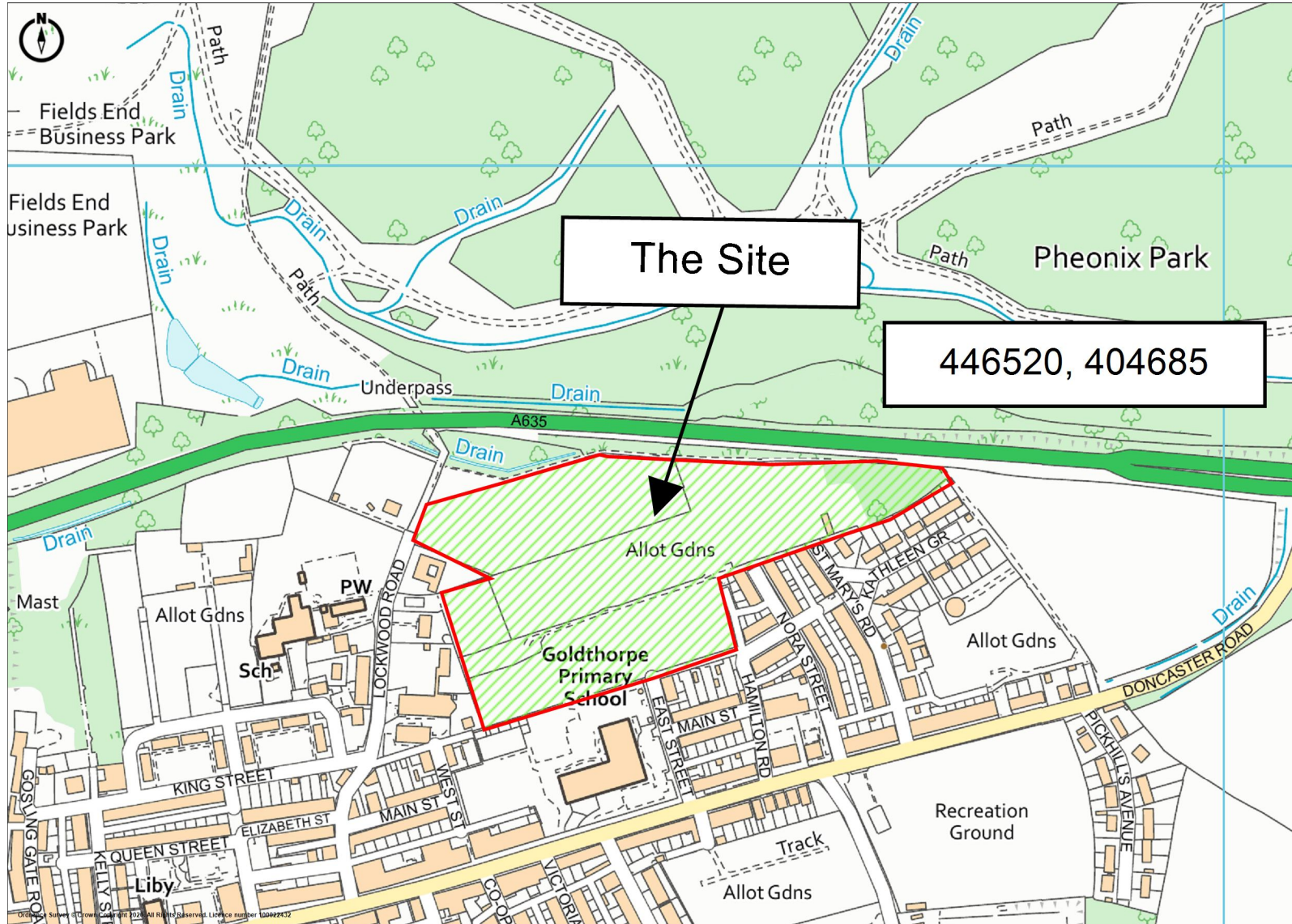
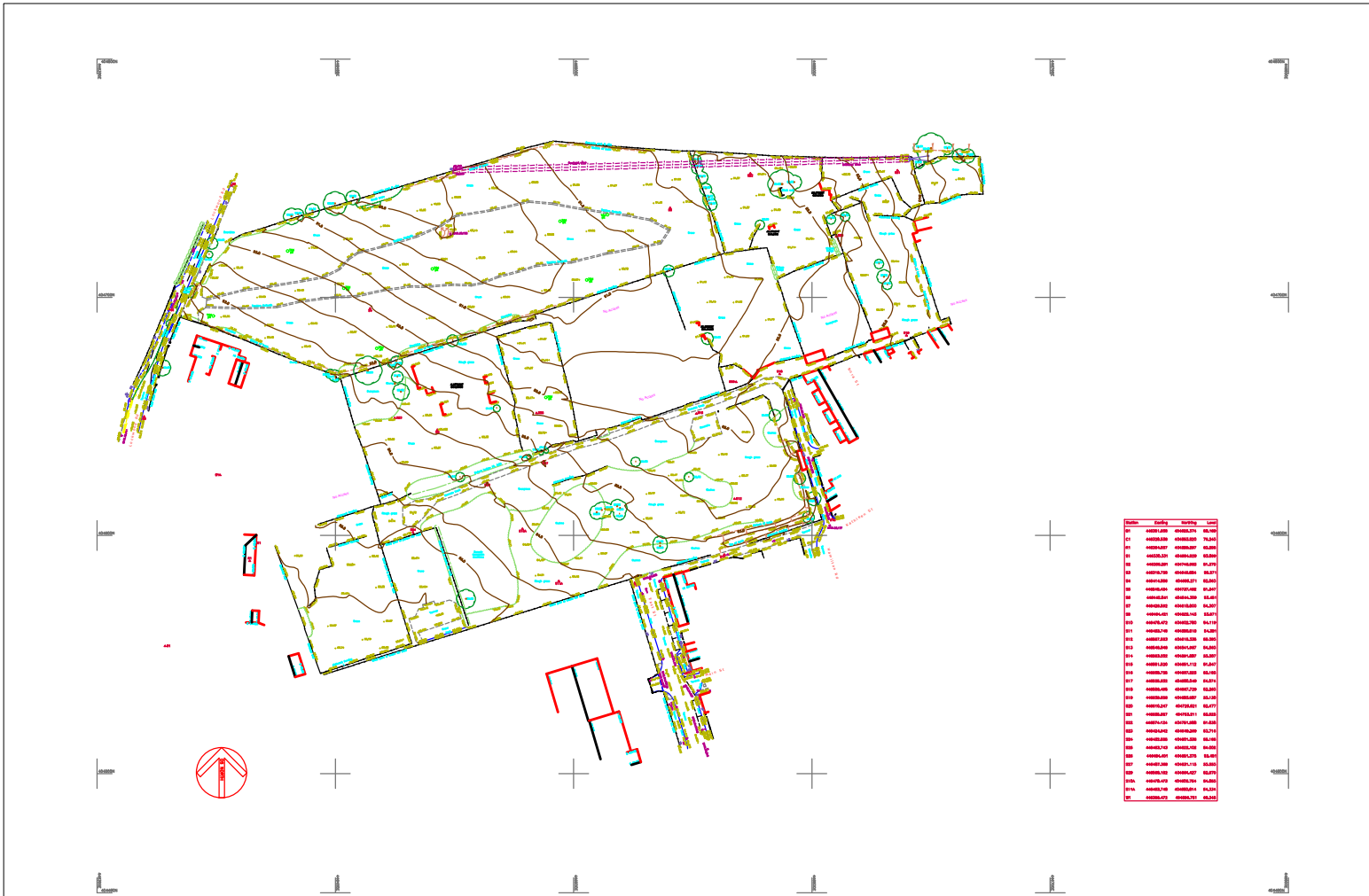


Figure 1: Location Plan

APPENDIX B

Topographical Survey Plan



Point	Easting	Northing
01	4521.180	4562.574
02	4521.200	4562.580
03	4521.220	4562.586
04	4521.240	4562.592
05	4521.260	4562.598
06	4521.280	4562.604
07	4521.300	4562.610
08	4521.320	4562.616
09	4521.340	4562.622
10	4521.360	4562.628
11	4521.380	4562.634
12	4521.400	4562.640
13	4521.420	4562.646
14	4521.440	4562.652
15	4521.460	4562.658
16	4521.480	4562.664
17	4521.500	4562.670
18	4521.520	4562.676
19	4521.540	4562.682
20	4521.560	4562.688
21	4521.580	4562.694
22	4521.600	4562.700
23	4521.620	4562.706
24	4521.640	4562.712
25	4521.660	4562.718
26	4521.680	4562.724
27	4521.700	4562.730
28	4521.720	4562.736
29	4521.740	4562.742
30	4521.760	4562.748
31	4521.780	4562.754
32	4521.800	4562.760
33	4521.820	4562.766
34	4521.840	4562.772
35	4521.860	4562.778
36	4521.880	4562.784
37	4521.900	4562.790
38	4521.920	4562.796
39	4521.940	4562.802
40	4521.960	4562.808
41	4521.980	4562.814
42	4522.000	4562.820
43	4522.020	4562.826
44	4522.040	4562.832
45	4522.060	4562.838
46	4522.080	4562.844
47	4522.100	4562.850
48	4522.120	4562.856
49	4522.140	4562.862
50	4522.160	4562.868
51	4522.180	4562.874
52	4522.200	4562.880
53	4522.220	4562.886
54	4522.240	4562.892
55	4522.260	4562.898
56	4522.280	4562.904
57	4522.300	4562.910
58	4522.320	4562.916
59	4522.340	4562.922
60	4522.360	4562.928
61	4522.380	4562.934
62	4522.400	4562.940
63	4522.420	4562.946
64	4522.440	4562.952
65	4522.460	4562.958
66	4522.480	4562.964
67	4522.500	4562.970
68	4522.520	4562.976
69	4522.540	4562.982
70	4522.560	4562.988
71	4522.580	4562.994
72	4522.600	4563.000
73	4522.620	4563.006
74	4522.640	4563.012
75	4522.660	4563.018
76	4522.680	4563.024
77	4522.700	4563.030
78	4522.720	4563.036
79	4522.740	4563.042
80	4522.760	4563.048
81	4522.780	4563.054
82	4522.800	4563.060
83	4522.820	4563.066
84	4522.840	4563.072
85	4522.860	4563.078
86	4522.880	4563.084
87	4522.900	4563.090
88	4522.920	4563.096
89	4522.940	4563.102
90	4522.960	4563.108
91	4522.980	4563.114
92	4523.000	4563.120
93	4523.020	4563.126
94	4523.040	4563.132
95	4523.060	4563.138
96	4523.080	4563.144
97	4523.100	4563.150
98	4523.120	4563.156
99	4523.140	4563.162
100	4523.160	4563.168
101	4523.180	4563.174
102	4523.200	4563.180
103	4523.220	4563.186
104	4523.240	4563.192
105	4523.260	4563.198
106	4523.280	4563.204
107	4523.300	4563.210
108	4523.320	4563.216
109	4523.340	4563.222
110	4523.360	4563.228
111	4523.380	4563.234
112	4523.400	4563.240
113	4523.420	4563.246
114	4523.440	4563.252
115	4523.460	4563.258
116	4523.480	4563.264
117	4523.500	4563.270
118	4523.520	4563.276
119	4523.540	4563.282
120	4523.560	4563.288
121	4523.580	4563.294
122	4523.600	4563.300
123	4523.620	4563.306
124	4523.640	4563.312
125	4523.660	4563.318
126	4523.680	4563.324
127	4523.700	4563.330
128	4523.720	4563.336
129	4523.740	4563.342
130	4523.760	4563.348
131	4523.780	4563.354
132	4523.800	4563.360
133	4523.820	4563.366
134	4523.840	4563.372
135	4523.860	4563.378
136	4523.880	4563.384
137	4523.900	4563.390
138	4523.920	4563.396
139	4523.940	4563.402
140	4523.960	4563.408
141	4523.980	4563.414
142	4524.000	4563.420
143	4524.020	4563.426
144	4524.040	4563.432
145	4524.060	4563.438
146	4524.080	4563.444
147	4524.100	4563.450
148	4524.120	4563.456
149	4524.140	4563.462
150	4524.160	4563.468
151	4524.180	4563.474
152	4524.200	4563.480
153	4524.220	4563.486
154	4524.240	4563.492
155	4524.260	4563.498
156	4524.280	4563.504
157	4524.300	4563.510
158	4524.320	4563.516
159	4524.340	4563.522
160	4524.360	4563.528
161	4524.380	4563.534
162	4524.400	4563.540
163	4524.420	4563.546
164	4524.440	4563.552
165	4524.460	4563.558
166	4524.480	4563.564
167	4524.500	4563.570
168	4524.520	4563.576
169	4524.540	4563.582
170	4524.560	4563.588
171	4524.580	4563.594
172	4524.600	4563.600
173	4524.620	4563.606
174	4524.640	4563.612
175	4524.660	4563.618
176	4524.680	4563.624
177	4524.700	4563.630
178	4524.720	4563.636
179	4524.740	4563.642
180	4524.760	4563.648
181	4524.780	4563.654
182	4524.800	4563.660
183	4524.820	4563.666
184	4524.840	4563.672
185	4524.860	4563.678
186	4524.880	4563.684
187	4524.900	4563.690
188	4524.920	4563.696
189	4524.940	4563.702
190	4524.960	4563.708
191	4524.980	4563.714
192	4525.000	4563.720
193	4525.020	4563.726
194	4525.040	4563.732
195	4525.060	4563.738
196	4525.080	4563.744
197	4525.100	4563.750
198	4525.120	4563.756
199	4525.140	4563.762
200	4525.160	4563.768
201	4525.180	4563.774
202	4525.200	4563.780
203	4525.220	4563.786
204	4525.240	4563.792
205	4525.260	4563.798
206	4525.280	4563.804
207	4525.300	4563.810
208	4525.320	4563.816
209	4525.340	4563.822
210	4525.360	4563.828
211	4525.380	4563.834
212	4525.400	4563.840
213	4525.420	4563.846
214	4525.440	4563.852
215	4525.460	4563.858
216	4525.480	4563.864
217	4525.500	4563.870
218	4525.520	4563.876
219	4525.540	4563.882
220	4525.560	4563.888
221	4525.580	4563.894
222	4525.600	4563.900
223	4525.620	4563.906
224	4525.640	4563.912
225	4525.660	4563.918
226	4525.680	4563.924
227	4525.700	4563.930
228	4525.720	4563.936
229	4525.740	4563.942
230	4525.760	4563.948
231	4525.780	4563.954
232	4525.800	4563.960
233	4525.820	4563.966
234	4525.840	4563.972
235	4525.860	4563.978
236	4525.880	4563.984
237	4525.900	4563.990
238	4525.920	4563.996
239	4525.940	4564.002
240	4525.960	4564.008
241	4525.980	4564.014
242	4526.000	4564.020
243	4526.020	4564.026
244	4526.040	4564.032
245	4526.060	4564.038
246	4526.080	4564.044
247	4526.100	4564.050
248	4526.120	4564.056
249	4526.140	4564.062
250	4526.160	4564.068
251	4526.180	4564.074
252	4526.200	4564.080
253	4526.220	4564.086
254	4526.240	4564.092
255	4526.260	4564.098
256	4526.280	4564.104
257	4526.300	4564.110
258	4526.320	4564.116
259	4526.340	4564.122
260	4526.360	4564.128
261	4526.380	4564.134
262	4526.400	4564.140
263	4526.420	4564.146
264	4526.440	4564.152
265	4526.460	4564.158
266	4526.480	4564.164
267	4526.500	4564.170
268	4526.520	4564.176
269	4526.540	4564.182
270	4526.560	4564.188
271	4526.580	4564.194
272	4526.600	4564.200
273	4526.620	4564.206
274	4526.640	4564.212
275	4526.660	4564.218
276	4526.680	4564.224
277	4526.700	4564.230
278	4526.720	4564.236
279	4526.740	4564.242
280	4526.760	4564.248
281	4526.780	4564.254
282	4526.800	4564.260
283	4526.820	4564.266
284	4526.840	4564.272
285	4526.860	4564.278
286	4526.880	4564.284
287	4526.900	4564.290
288	4526.920	4564.296
289	4526.940	4564.302
290	4526.960	4564.308
291	4526.980	4564.314
292	4527.000	4564.320
293	4527.020	4564.326
294	4527.040	4564.332
295	4527.060	4564.338
296	4527.080	4564.344
297	4527.100	4564.350
298	4527.120	4564.356
299	4527.140	4564.362
300	4527.160	4564.368
301	4527.180	4564.374
302	4527.200	4564.380
303	4527.220	4564.386
304	4527.240	4564.392
305	4527.260	4564.398
306	4527.280	4564.404
307	4527.300	4564.410
308	4527.320	4564.416
309	4527.340	4564.422
310	4527.360	4564.428
311	4527.380	4564.434
312	4527.400	4564.440
313	4527.420	4564.446
314	4527.440	4564.452
315	4527.460	4564.458
316	45	

APPENDIX C

Infiltration tests report and calculations

John O'Connor

From: Luke Wilson [luke.wilson@eastwoodandpartners.com]
Sent: 29 March 2021 11:53
To: Ben Parkins
Cc: Glen Burgin; Catherine Topliss
Subject: 44271 - Lockwood Road, Goldthorpe - Soakaway Summary
Attachments: 44271 - Soakaway Tests - Calculation of Infiltration Rates.pdf

CAUTION: This email originated outside of Gleeson. You should NOT open attachments or click links unless you are certain of its origin. If in doubt, please contact Gleeson IT.

Good morning Ben,

We write to provide a brief summary of the soakaway works undertaken on the above site. Eastwood & Partners conducted the tests on the 9 December 2020. The tests were carried out at depths of between 0.6 m and 1.6 m below ground level (bgl).

The results of the testing are summarised in the following table:

Trial Pit	Test	Base of Trial Pit (m BGL)	BRE365 Infiltration Rate ($\times 10^{-6}$) m/s	Average Infiltration Rate ($\times 10^{-6}$) m/s
SA1	1	1.6	18	21
	2		N/A	8
SA2	1	1.2	15	17
SA3	1	1.6	N/A	1.3
SA4	1	1.4	N/A	1.2

An infiltration rate was unable to be calculated in accordance with BRE365 for the majority of tests. The subsequent test in SA1 showed a reduction in the average infiltration rate, suggesting that the sides and base of the test pit had become saturated and/or silted up during the previous test.

Groundwater was not typically encountered during the investigation works. The exception to this was in trial pits TP101 to TP104 in the central northern part of the site where slow ingress was noted between 1.8 m and 2.2 m bgl. Subsequent monitoring has recorded groundwater to be standing between around 1 and 2 m bgl.

Given the above, the natural residual soils are not considered suitable for soakaway drainage. Therefore, consideration should be given to a piped connection. An existing surface water sewer is noted to cross the site from south east to north west.

Notwithstanding the above, a limited volume of infiltration into the residual soils is still possible. The use of shallow create soakaways in conjunction with small scale permeable paving, or semi-permeable attenuation, could be considered.

Should you have any queries, please do not hesitate to contact us.

Kind Regards

Luke Wilson
Geotechnical & Geo-environmental Engineer

PROJECT:	Lockwood Road, Golthorpe	Job No. 44271	Date 09.12.20
SUBJECT:	Infiltration Test Results and Calculation of Infiltration Rates	Prepared LW	Checked

Test No. SA1

Soil Infiltration Rate in Accordance with BR365

$$f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$$

Where:

- V_{p75-25} is the effective storage volume of water in the trial pit between 75% and 25% effective depth;
- a_{p50} is the internal surface area of the trial pit up to 50% effective depth and including the base area
- t_{p75-25} is the time for the water level to fall from 75% to 25% effective depth

Initial parameters

Depth to water = **1010** mm Average water depth: **345** mm
 Start time = **0** min

Change in water depth: **490** mm

Final parameters

Depth to water = **1500** mm Time interval: **167** min
 End time = **167** min

Effective Storage Volume of Water in the Trial Pit = **0.6608** m³
 75% Effective Depth = **1158** mm from ground level
 25% Effective Depth = **1453** mm from ground level
 Time at 75% Effective Depth = **17** minutes
 Time at 25% Effective Depth = **143** minutes

V_{p75-25} = **0.33** m³

a_{p50} = **2.42** m²

t_{p75-25} = **7560** sec

f = **1.8E-05** m/sec

Average Soakaway Rate = **5.5E-05** m³/sec
 Average soakaway area = **2.64** m² (sides + base)

BR365 Soil Infiltration Rate = 1.8E-05 m/sec
Average Infiltration Rate = 2.1E-05 m/sec

PROJECT:	Lockwood Road, Golthorpe	Job No. 44271	Date 09.12.20
SUBJECT:	Infiltration Test Results and Calculation of Infiltration Rates	Prepared LW	Checked

Test No. SA1 (Test 2)

Soil Infiltration Rate in Accordance with BR365

$$f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$$

Where:

- V_{p75-25} is the effective storage volume of water in the trial pit between 75% and 25% effective depth;
- a_{p50} is the internal surface area of the trial pit up to 50% effective depth and including the base area
- t_{p75-25} is the time for the water level to fall from 75% to 25% effective depth

Initial parameters

Depth to water = **990 mm** Average water depth: **485 mm**
 Start time = **0 min**

Change in water depth: **250 mm**

Final parameters

Depth to water = **1240 mm** Time interval: **180 min**
 End time = **180 min**

Effective Storage Volume of Water in the Trial Pit = **0.6832 m³**
 75% Effective Depth = **1143 mm** from ground level
 25% Effective Depth = **1448 mm** from ground level
 Time at 75% Effective Depth = **88 minutes**
 Time at 25% Effective Depth = **N/A minutes**

V_{p75-25} = **0.34 m³**

a_{p50} = **2.46 m²**

t_{p75-25} = **-5280 sec**

f = **-2.6E-05 m/sec**

Average Soakaway Rate = **2.6E-05 m³/sec**
 Average soakaway area = **3.25 m² (sides + base)**

BR365 Soil Infiltration Rate = N/A m/sec
Average Infiltration Rate = 8.0E-06 m/sec

PROJECT:	Lockwood Road, Golthorpe	Job No. 44271	Date 09.12.20
SUBJECT:	Infiltration Test Results and Calculation of Infiltration Rates	Prepared LW	Checked

Test No. SA2

Soil Infiltration Rate in Accordance with BR365

$$f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$$

Where:

- V_{p75-25} is the effective storage volume of water in the trial pit between 75% and 25% effective depth;
- a_{p50} is the internal surface area of the trial pit up to 50% effective depth and including the base area
- t_{p75-25} is the time for the water level to fall from 75% to 25% effective depth

Initial parameters

Depth to water = **590 mm** Average water depth: **330 mm**
 Start time = **0 min**

Change in water depth: **560 mm**

Final parameters

Depth to water = **1150 mm** Time interval: **240 min**
 End time = **240 min**

Effective Storage Volume of Water in the Trial Pit = **0.6832 m³**
 75% Effective Depth = **743 mm** from ground level
 25% Effective Depth = **1048 mm** from ground level
 Time at 75% Effective Depth = **45 minutes**
 Time at 25% Effective Depth = **200 minutes**

V_{p75-25} = **0.34 m³**

a_{p50} = **2.46 m²**

t_{p75-25} = **9300 sec**

f = **1.5E-05 m/sec**

Average Soakaway Rate = **4.4E-05 m³/sec**
 Average soakaway area = **2.57 m²** (sides + base)

BR365 Soil Infiltration Rate = 1.5E-05 m/sec
Average Infiltration Rate = 1.7E-05 m/sec

PROJECT:	Lockwood Road, Golthorpe	Job No. 44271	Date 09.12.20
SUBJECT:	Infiltration Test Results and Calculation of Infiltration Rates	Prepared LW	Checked

Test No. SA3

Soil Infiltration Rate in Accordance with BR365

$$f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$$

Where:

- V_{p75-25} is the effective storage volume of water in the trial pit between 75% and 25% effective depth;
- a_{p50} is the internal surface area of the trial pit up to 50% effective depth and including the base area
- t_{p75-25} is the time for the water level to fall from 75% to 25% effective depth

Initial parameters

Depth to water = **1000** mm Average water depth: **390** mm
 Start time = **0** min

Change in water depth: **420** mm

Final parameters

Depth to water = **1420** mm Time interval: **212** min
 End time = **212** min

Effective Storage Volume of Water in the Trial Pit = **0.624** m³
 75% Effective Depth = **1150** mm from ground level
 25% Effective Depth = **1450** mm from ground level
 Time at 75% Effective Depth = **9** minutes
 Time at 25% Effective Depth = **N/A** minutes

V_{p75-25} = **0.31** m³

a_{p50} = **2.30** m²

t_{p75-25} = **-540** sec

f = **-2.5E-04** m/sec

Average Soakaway Rate = **3.4E-05** m³/sec
 Average soakaway area = **2.68** m² (sides + base)

BR365 Soil Infiltration Rate = N/A m/sec
Average Infiltration Rate = 1.3E-05 m/sec

PROJECT:	Lockwood Road, Golthorpe	Job No. 44271	Date 09.12.20
SUBJECT:	Infiltration Test Results and Calculation of Infiltration Rates	Prepared LW	Checked

Test No. SA4

Soil Infiltration Rate in Accordance with BR365

$$f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$$

Where:

- V_{p75-25} is the effective storage volume of water in the trial pit between 75% and 25% effective depth;
- a_{p50} is the internal surface area of the trial pit up to 50% effective depth and including the base area
- t_{p75-25} is the time for the water level to fall from 75% to 25% effective depth

Initial parameters

Depth to water = **700** mm Average water depth: **510** mm
 Start time = **0** min

Change in water depth: **380** mm

Final parameters

Depth to water = **1080** mm Time interval: **180** min
 End time = **180** min

Effective Storage Volume of Water in the Trial Pit = **0.784** m³
 75% Effective Depth = **875** mm from ground level
 25% Effective Depth = **1225** mm from ground level
 Time at 75% Effective Depth = **38** minutes
 Time at 25% Effective Depth = **N/A** minutes

V_{p75-25} = **0.39** m³

a_{p50} = **2.66** m²

t_{p75-25} = **-2280** sec

f = **-6.5E-05** m/sec

Average Soakaway Rate = **3.9E-05** m³/sec
 Average soakaway area = **3.36** m² (sides + base)

BR365 Soil Infiltration Rate = **N/A** m/sec
Average Infiltration Rate = **1.2E-05** m/sec

APPENDIX D

Yorkshire Water pre-development advice



YorkshireWater

**Mr J O'Connor
JOC Consultants Ltd
Park Farm House
Leatheley Lane
Leathley
LS21 2JU
john@jocconsultants.co.uk**

**Yorkshire Water Services
Developer Services
Pre-Development Team
PO BOX 52
Bradford
BD3 7AY**

Tel: 0345 120 8482

Fax:

**Your Ref:
Our Ref: W017931**

**Email:
technical.sewerage@yorkshirewater.co.uk**

**For telephone enquiries ring:
Chris Roberts on 0345 120 8482**

11th January 2021

Dear Mr O'Connor,

**Land East Of Lockwood Road, Goldthorpe, S63 9FL - Pre Planning
Sewerage Enquiry U078790**

Thank you for your recent enquiry and remittance. Our official VAT receipt has been sent to you under separate cover. Please find enclosed a complimentary extract from the Statutory Sewer Map which indicates the recorded position of the public sewers. Please note that as of October 2011 and the private to public sewer transfer, there are many uncharted Yorkshire Water assets currently not shown on our records.

The following comments reflect our view, with regard to the public sewer network only, based on a 'desk top' study of the site and are valid for a maximum period of twelve months:





Existing Infrastructure

There is a 225 mm diameter public surface water sewer recorded crossing the site. No buildings, or other obstructions, are to be erected within 3 (three) metres, nor trees planted within 5 (five) metres of this public sewer.

There is a 525 mm diameter public surface water sewer recorded crossing the site. No buildings, or other obstructions, are to be erected within 3.5 (three point five) metres, nor trees planted within 5 (five) metres of this public sewer.

It may not be acceptable to raise or lower ground levels over the sewer, nor to restrict access to the manholes on the sewer. If you wish to have this sewer diverted under Section 185 of the Water Industry Act 1991 an application should be made in writing. To discuss this matter, please telephone 0345 120 84 82.

Foul Water

Development of the site should take place with separate systems for foul and surface water drainage. The separate systems should extend to the points of discharge to be agreed.

Foul water domestic waste can discharge to the 375 mm diameter public combined sewer recorded in Hamilton Road, at a point to the south of the site.

From the information supplied, it is not possible to determine if the whole site will drain by gravity to the public sewer network. If the site, or part of it, will not drain by gravity, then it is likely that a sewage pumping station will be required to facilitate connection to the public sewer network. If sewage pumping is required foul water discharge must not exceed 4.7 (four point seven) litres per second. This permission is not an acceptance in respect to any planning conditions imposed under the Grant of Planning Permission.



Surface Water

The developer's attention is drawn to Requirement H3 of the Building Regulations 2000. This establishes a preferred hierarchy for surface water disposal. Consideration should firstly be given to discharge to soakaway, infiltration system and watercourse in that priority order.

Sustainable Drainage Systems (SuDS), for example the use of soakaways and/or permeable hardstanding etc, may be a suitable solution for surface water disposal appropriate in this situation. You are advised to seek comments on the suitability of SuDS in this instance from the appropriate authorities.

As the proposed site is currently undeveloped no surface water is known to have previously discharged to the public sewer network

As such, the local public sewer network does not have capacity to accept any surface water from the proposed site. If SuDS are not viable, the developer is advised to contact the Environment Agency/local Land Drainage Authority/Internal Drainage Board* with a view to establishing a suitable watercourse (if any nearby*) for discharge.

It is understood that a watercourse is located to the north west of the site. This appears to be the obvious place for surface water disposal (if SuDS are not viable). Please note Yorkshire Water cannot provide plans of culverted watercourses or highway drains. To obtain plans please contact the Lead Local Flood Authority for more details.

As a last resort and subject to providing satisfactory evidence as to why the other methods of surface water disposal have been discounted, curtilage surface water may discharge to the 525 mm diameter public surface water sewer recorded crossing the site.

The surface water discharge from the site to be restricted to not greater than 3.5 (three point five) litres/second. This permission is not an acceptance in respect to any planning conditions imposed under the Grant of Planning Permission.



Please note further restrictions on surface water disposal from the site may be imposed by other parties. You are strongly advised to seek advice/comments from the Environment Agency/Land Drainage Authority/Internal Drainage Board, with regard to surface water disposal from the site.

Other Observations

Any new connection to an existing public sewer will require the prior approval of Yorkshire Water. You may apply on line or obtain an application form from our website (www.yorkshirewater.com) or by telephoning 0345 120 84 82.

An off-site foul and surface water sewer may be required which may be provided by the developer and considered for adoption under Section 104 of the Water Industry Act 1991. Please telephone 0345 120 84 82 for advice on sewer adoptions. Alternatively, the developer may in certain circumstances be able to requisition off-site sewers under Section 98 of the Water Industry Act 1991 for which an application must be made in writing. For further information, please telephone 0345 120 84 82.

Prospectively adoptable sewers and pumping stations must be designed and constructed in accordance with the WRc publication "Sewers for Adoption - a design and construction guide for developers" 6th Edition as supplemented by Yorkshire Water's requirements, pursuant to an agreement under Section 104 of the Water Industry Act 1991. An application to enter into a Section 104 agreement must be made in writing prior to any works commencing on site. Please contact our Developer Services Team (telephone 0345 120 84 82) for further information.

All the above comments are based upon the information and records available at the present time and is subject to formal planning approval agreement. The information contained in this letter together with that shown on any extract from the Statutory Sewer Map that may be enclosed is believed to be correct and is supplied in good faith.

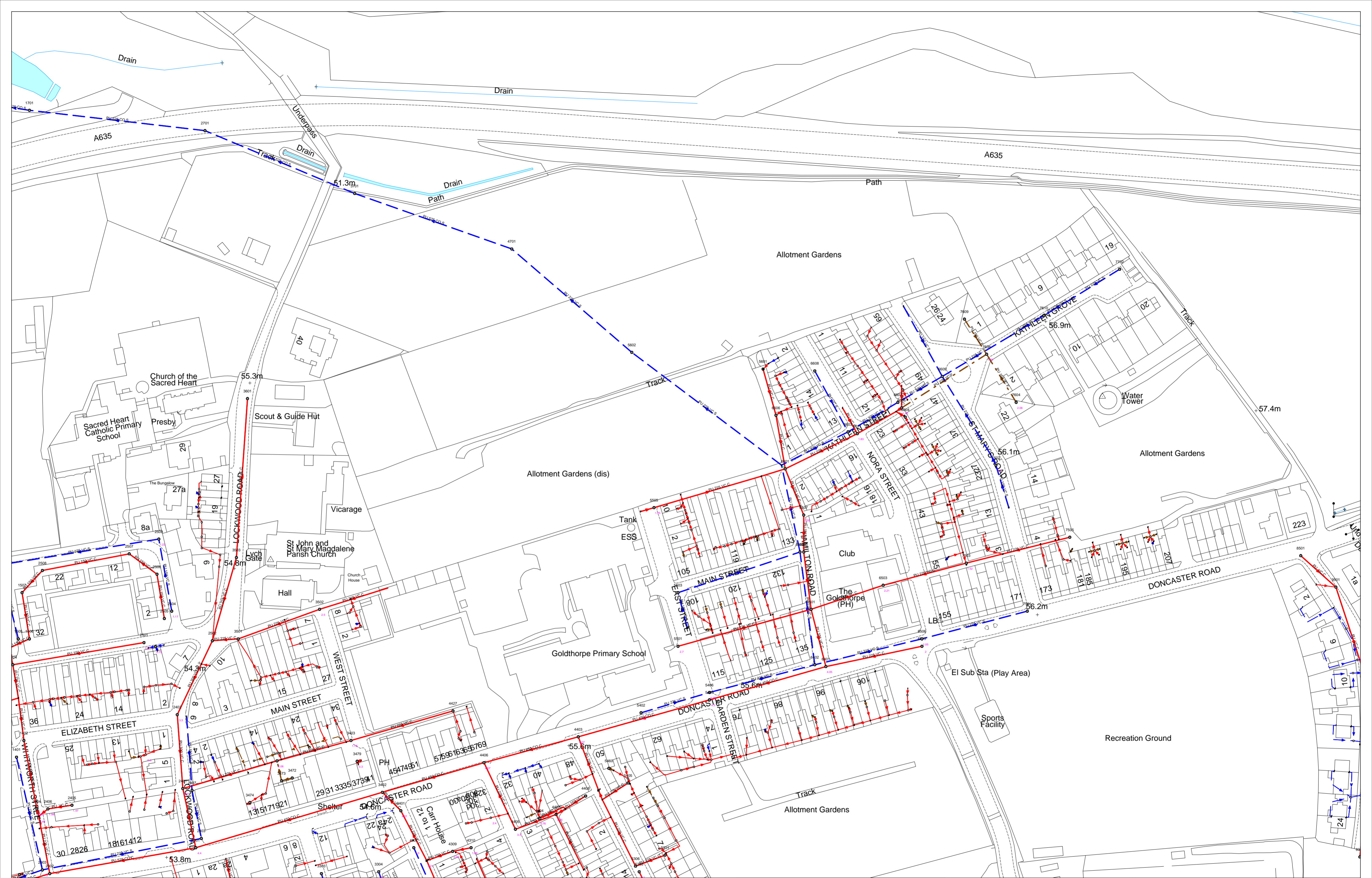


YorkshireWater


Please note that capacity in the public sewer network is not reserved for specific future development. It is used up on a 'first come, first served' basis. You should visit the site and establish the line and level of any public sewers affecting your proposals before the commencement of any design work.

Yours sincerely

Chris Roberts
Development Services Technician



446454 : 404553



Yorkshire Water

Map Name : SE4604SW

Yorkshire Water,
PO Box 500,
Halifax Road,
Bradford BD6 2LZ

Contact Name :
YorMap Advisor C ROBERTS
Contact Tel : 87 2582

Title

Notes

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Partial Key

Foul Sewer = F
Combined Sewer = C
Surface Water Sewer = SW
Trade Sewer = TD
Partially Separate = PS

Date Req : 11/01/2021, 14:10:25
Source : Sewer Network Enquiry

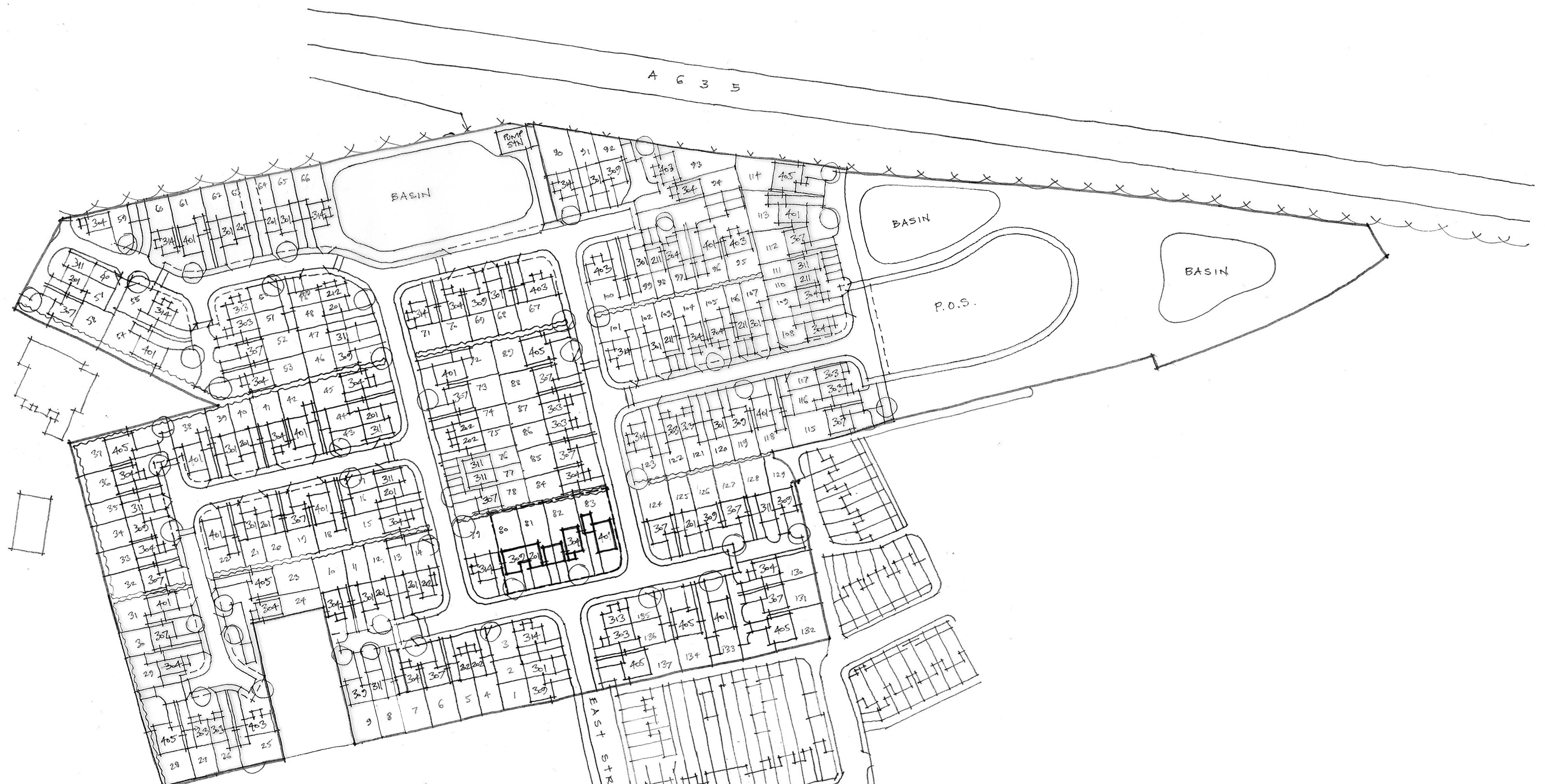
Date Gen : 11/01/2021, 14:19:08

This plan is furnished as a general guide only and no warranty as to its correctness is given or implied. This plan must not be relied upon in the event of excavations or other works made in the vicinity of public sewers. No house or property connections are shown.

APPENDIX E

Schematic Site Layout Plan

NI
15

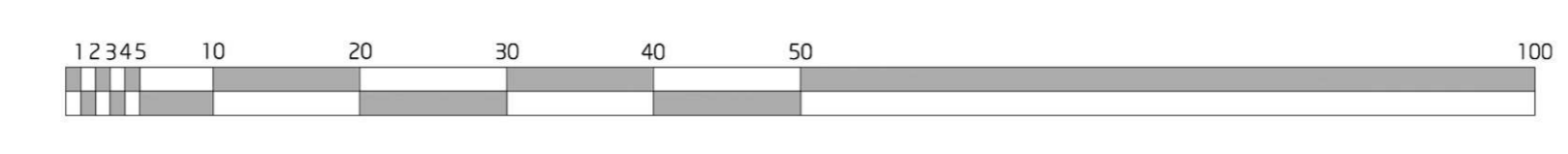


Schedule of Accommodation
To be read in conjunction with drawing no. 3228-0-001-B

Ref.	No. of Beds	Type	No. of Units	Percentage	Sq. Ft.	Total Sq. Ft.
201	2 Bedrooms	Semi-detached	13	9.49	651.00	8463.00
202	2 Bedrooms	Semi-detached	4	2.92	671.00	2684.00
211	2 Bedrooms	Semi-detached	4	2.92	651.00	2604.00
212	2 Bedrooms	Semi-detached	3	2.19	671.00	2013.00
301	3 Bedrooms	Semi-detached	12	8.76	759.00	9108.00
303	3 Bedrooms	Semi-detached	9	6.57	772.00	6948.00
304	3 Bedrooms	Detached	20	14.60	772.00	15440.00
307	3 Bedrooms	Detached	16	11.68	807.00	12912.00
309/310s	3 Bedrooms	Semi-detached	10	7.30	788.00	7880.00
311	3 Bedrooms	Semi-detached	10	7.30	759.00	7590.00
313	3 Bedrooms	Semi-detached	1	0.73	811.00	811.00
314	3 Bedrooms	Detached	9	6.57	811.00	7299.00
401	4 Bedrooms	Detached	13	9.49	1066.00	13858.00
403	4 Bedrooms	Detached	5	3.65	1048.00	5240.00
405	4 Bedrooms	Detached	8	5.84	1172.00	9376.00
Totals			137	100.00		112226.00



Lockwood Road, GOLDTHORPE
DO NOT SCALE - ALL DIMENSIONS & LEVELS TO BE CHECKED ON SITE - THIS DRAWING IS COPYRIGHT



SKETCH
 subject to structural review
 subject to accurate measured survey

revision	date	content	initials
project	PROPOSED RESIDENTIAL LOCKWOOD ROAD GOLDTHORPE		
client	SCHEMATIC SITE LAYOUT		
title	GLEESON DEVELOPMENTS		
date	27.10.20	scale	1:500@A0
drawing number	3228-0-001-B	drawn	SN
		checked	SN

niemen
architects
Niemen Architects
Deck 2 The Waterscape
42 Leeds & Bradford Road
Kirkstall Leeds LS5 3EG
Tel: 0113 239 5400
Fax: 0113 239 5401
office@niemen.co.uk
www.niemen.co.uk

APPENDIX F

Flood Map for Planning



Flood map for planning

Your reference
20/032

Location (easting/northing)
446520/404685

Created
22 Mar 2021 9:24

Your selected location is in flood zone 1, an area with a low probability of flooding.

This means:

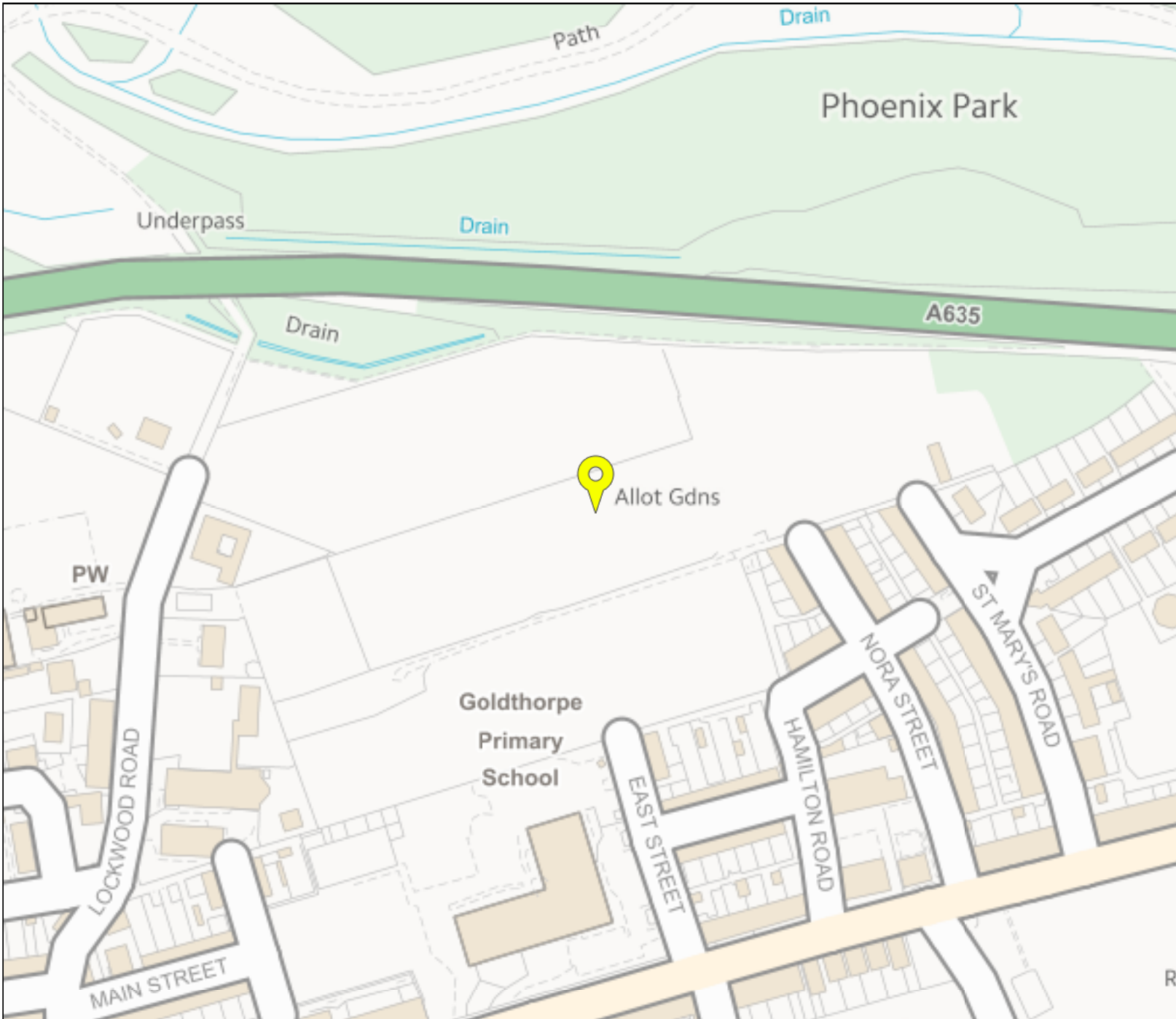
- you don't need to do a flood risk assessment if your development is smaller than 1 hectare and not affected by other sources of flooding
- you may need to do a flood risk assessment if your development is larger than 1 hectare or affected by other sources of flooding or in an area with critical drainage problems

Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

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<https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/>











Flood map for planning

Your reference
20/032

Location (easting/northing)
446520/404685

Scale
1:2500

Created
22 Mar 2021 9:24

-  Selected point
-  Flood zone 3
-  Flood zone 3: areas benefitting from flood defences
-  Flood zone 2
-  Flood zone 1
-  Flood defence
-  Main river
-  Flood storage area



APPENDIX G

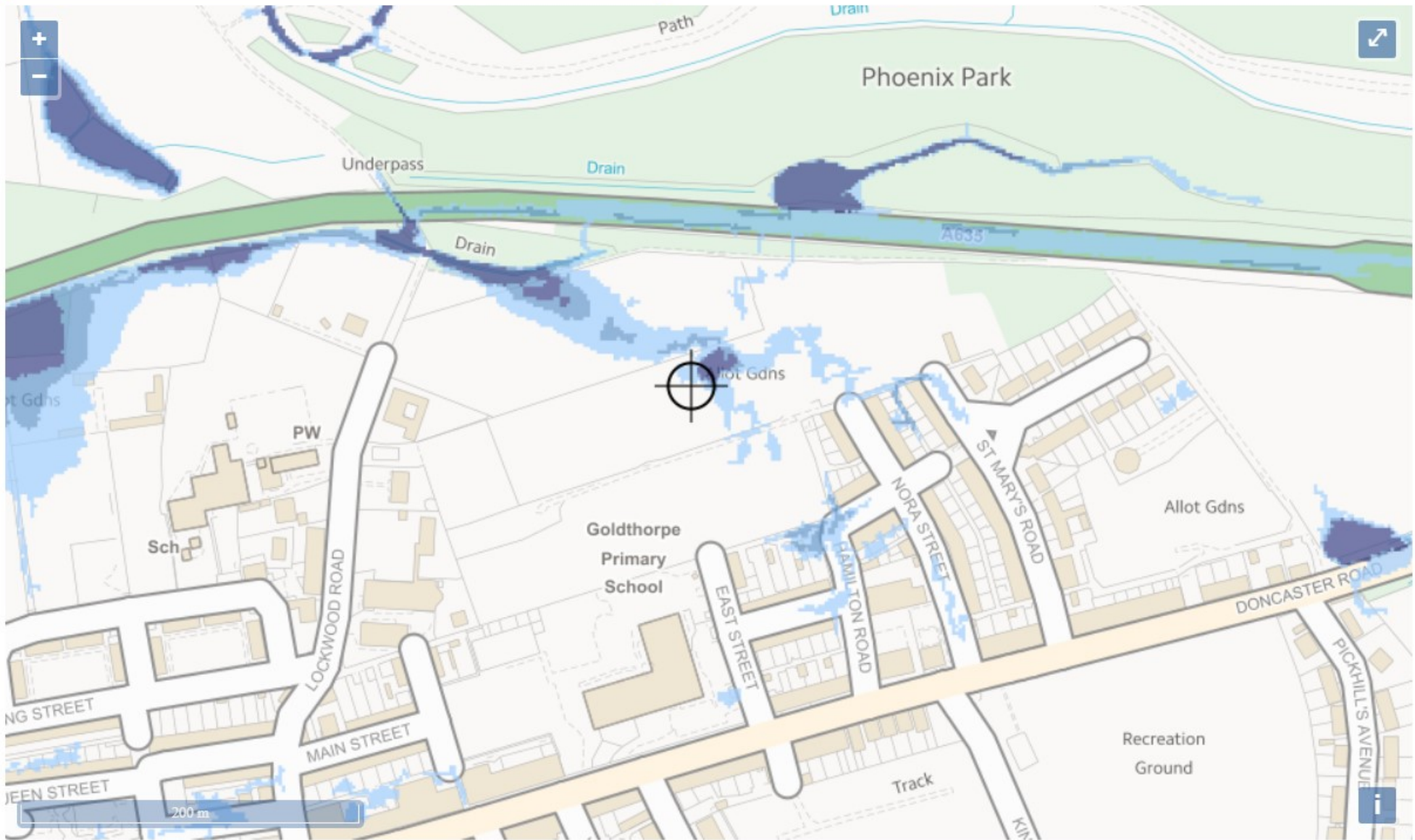
Surface water flood map

Flood risk

Location

Extent of flooding

Lockwood Road, Goldthorpe



Extent of flooding from surface water

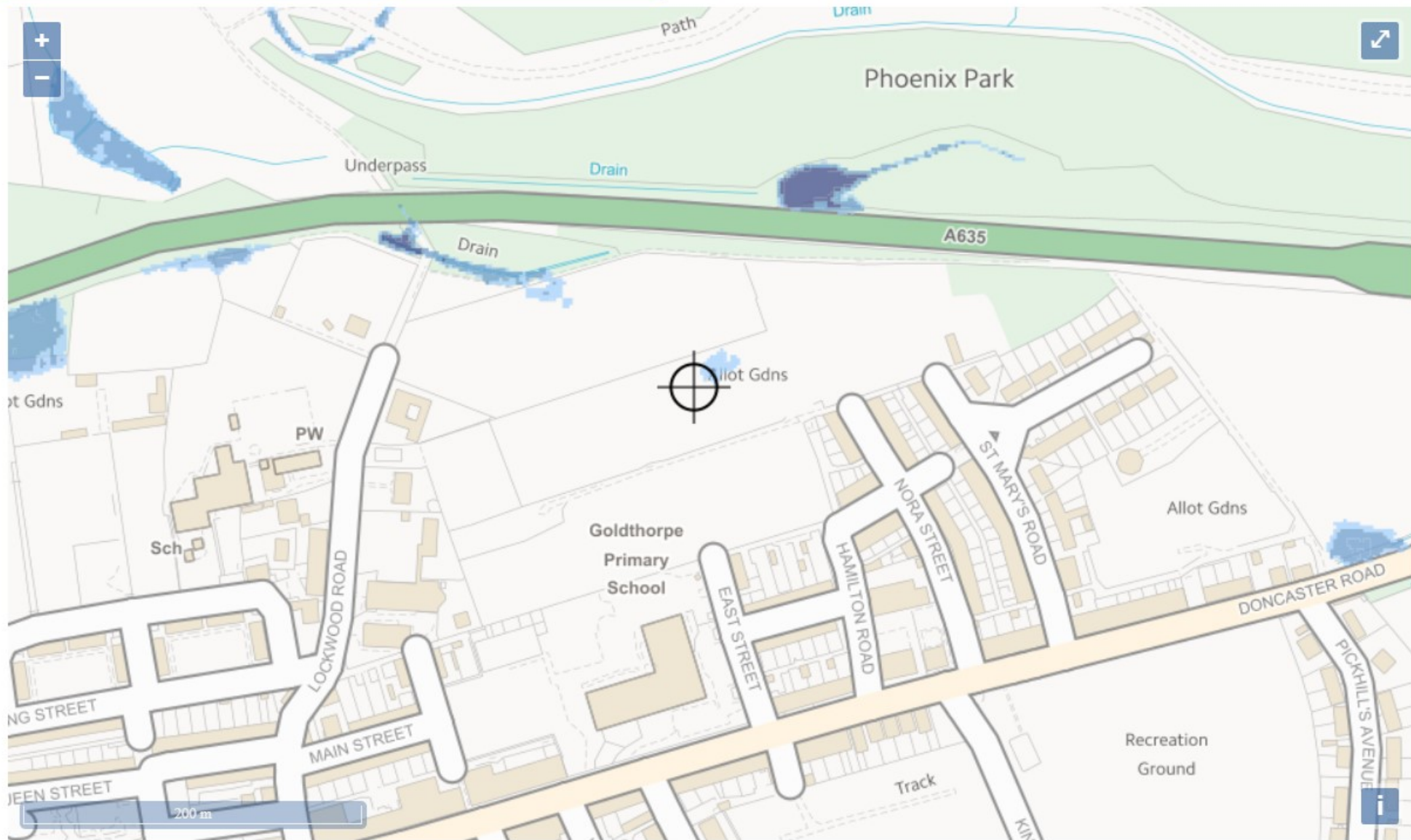
● High ● Medium ● Low ○ Very low ⊕ Location you selected

Flood risk

Location

High risk: depth

Lockwood Road, Goldthorpe



Surface water flood risk: water depth in a high risk scenario

Flood depth (millimetres)

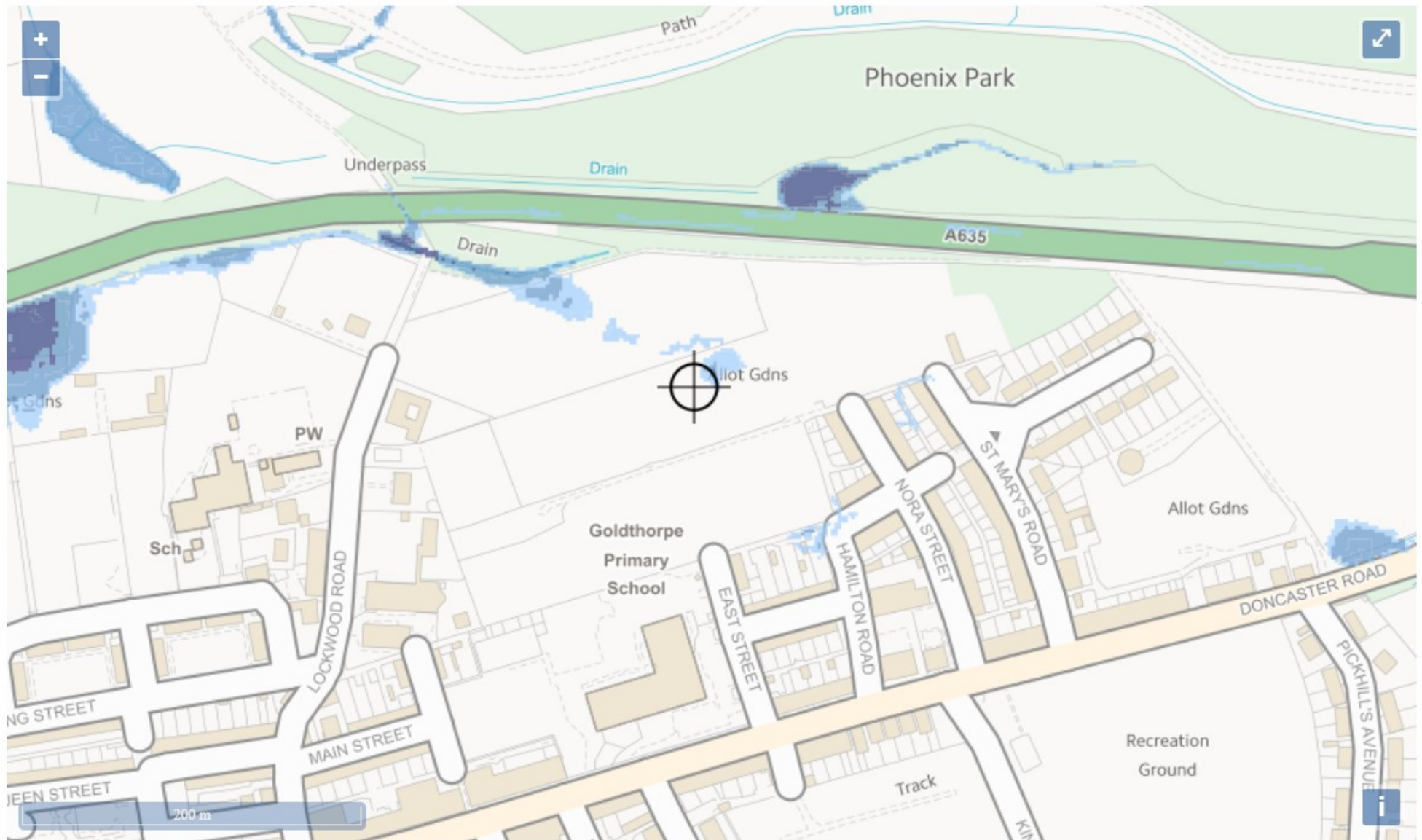
- Over 900mm
- 300 to 900mm
- Below 300mm
- Location you selected

Flood risk

Location

Medium risk: depth

Lockwood Road, Goldthorpe



Surface water flood risk: water depth in a medium risk scenario

Flood depth (millimetres)

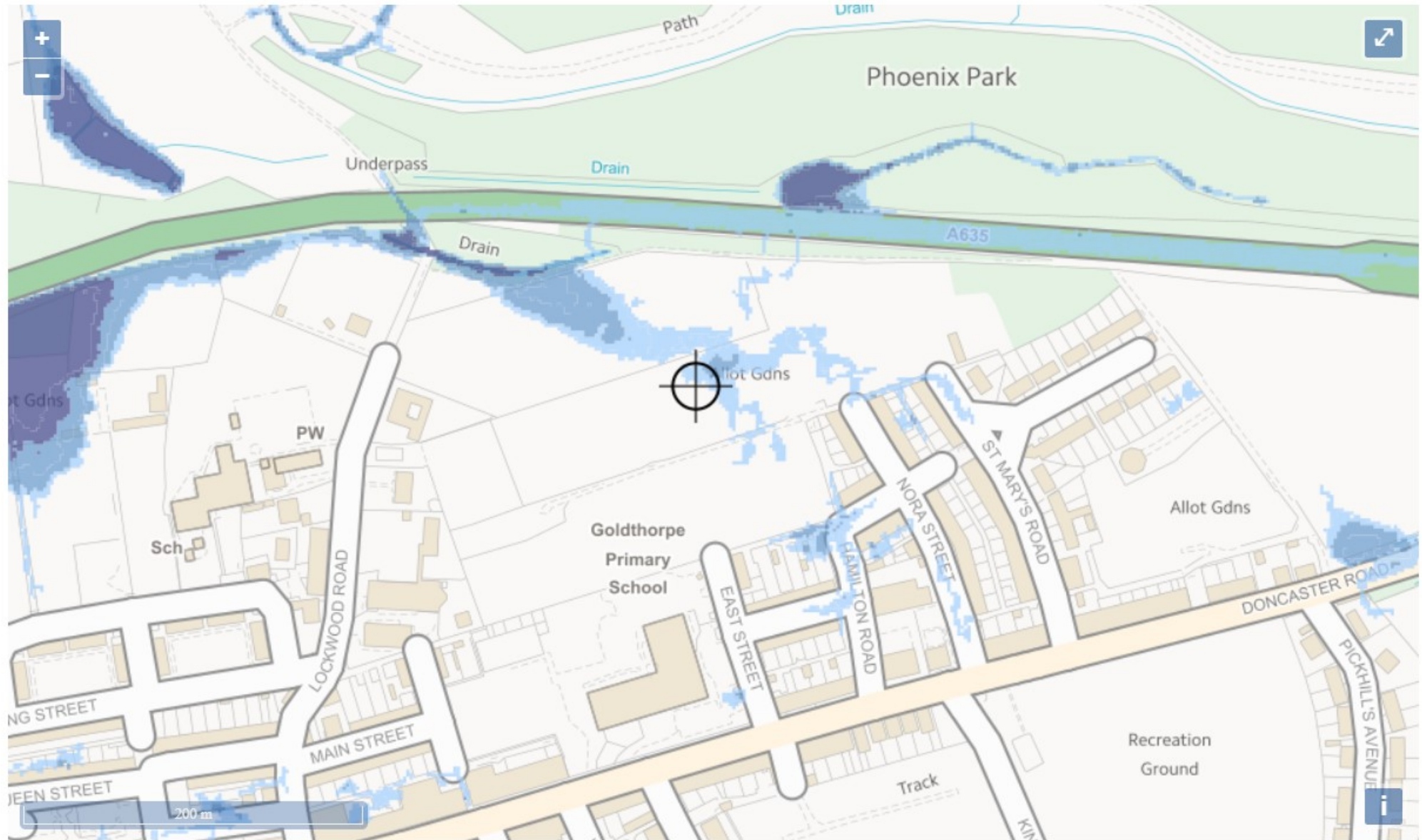
Over 900mm 300 to 900mm Below 300mm Location you selected

Flood risk

Location

Low risk: depth

Lockwood Road, Goldthorpe



Surface water flood risk: water depth in a low risk scenario

Flood depth (millimetres)

Over 900mm 300 to 900mm Below 300mm Location you selected

APPENDIX H

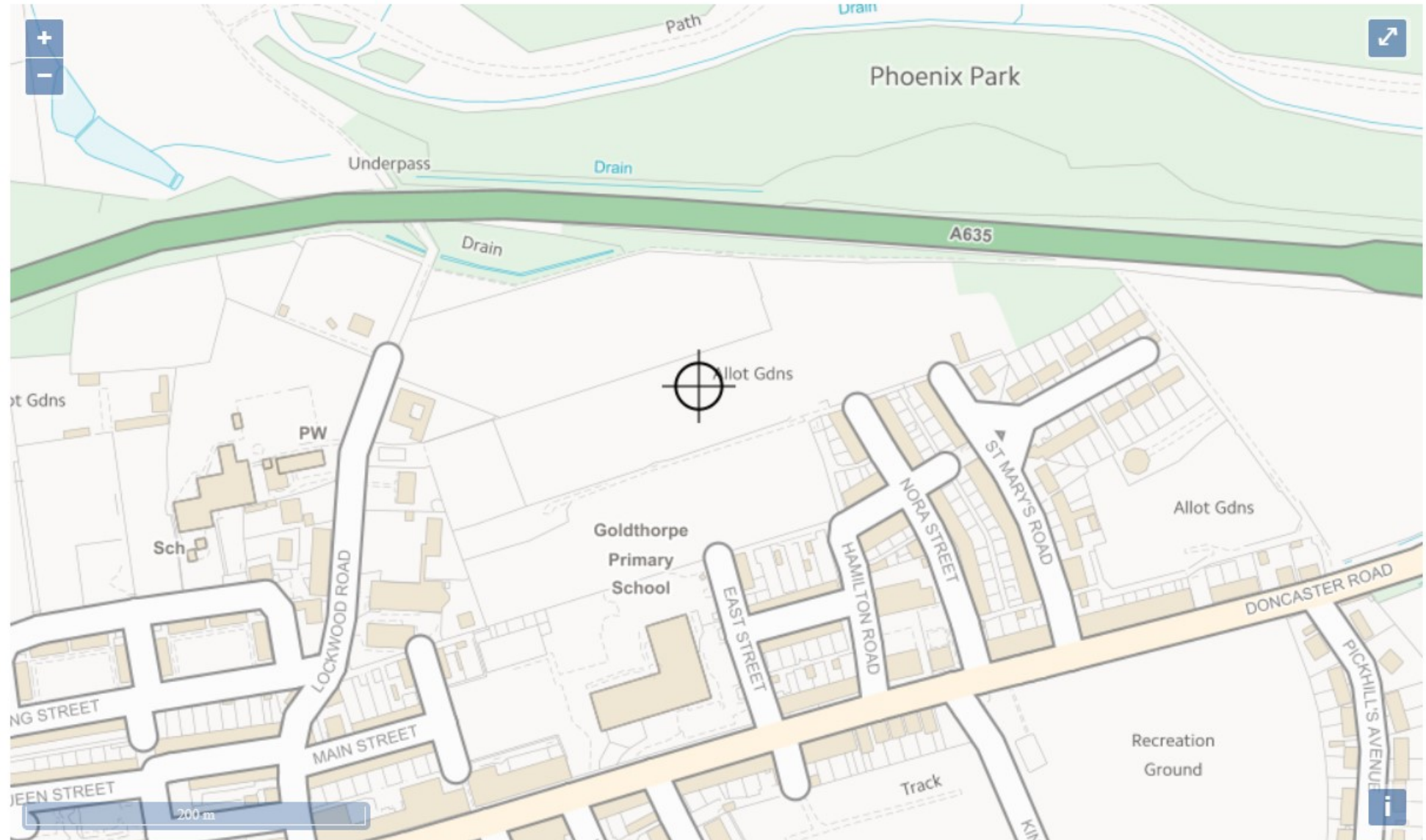
Reservoirs flood map

Flood risk

Location

Extent of flooding

Lockwood Road, Goldthorpe



Extent of flooding from reservoirs

● Maximum extent of flooding ⊕ Location you selected

APPENDIX I

ReFH2 estimates of runoff rates and volumes

20/032: Lockwood Road, Goldthorpe

APPENDIX I: REFH estimates of runoff rates and volumes

Description	Return period (yrs)	Urbanised peak flow (l/s)	Urbanised direct runoff (m ³)	As-rural peak flow (l/s)	As-rural direct runoff (m ³)	Increase factor in peak flow rate	Increase factor in volume
1 year	1	39.31	481.62	14.54	180.37	2.29	2.21
2 year	2	44.82	550.19	16.65	208.37	2.31	2.20
5 year	5	63.69	786.38	24.20	308.96	2.33	2.16
10 year	10	77.89	965.12	30.17	389.22	2.32	2.12
30 year	30	103.64	1291.25	41.61	544.41	2.30	2.07
50 year	50	118.18	1476.49	48.40	637.34	2.28	2.04
75 year	75	131.54	1647.50	54.86	726.09	2.26	2.02
100 year	100	142.16	1783.86	60.13	798.81	2.24	2.00
100 year 1.2 CC	100	171.86	2167.54	75.53	1012.40	2.19	1.95
100 year 1.4 CC	100	202.02	2560.20	92.10	1243.93	2.14	1.90
200 year	200	171.96	2168.85	75.58	1013.15	2.19	1.95
1000 year	1000	258.12	3298.53	125.33	1711.81	2.06	1.82
					Average:	2.24	2.04
Hydrological Region		3					
QMED/Qbar factor		0.94					
Qbar		17.72 l/s					
Area		4.68 ha					
Rate/ha		3.79 l/s per ha					

APPENDIX J

Yorkshire Water email dated 31st May 2021

John O'Connor

From: Chris.Roberts@yorkshirewater.co.uk on behalf of technical.sewerage@yorkshirewater.co.uk
Sent: 31 May 2021 11:20
To: John O'Connor
Subject: RE: Land East Of Lockwood Road, Goldthorpe, S63 9FL - Pre Planning Sewerage Enquiry U078790
Attachments: pic15574.gif

Hi John,

Apologies for the delay in responding.

Unfortunately I cannot find any information on where the surface water outfalls. It is assumed it was diverted so as not to run under the buildings and rejoins the 525 mm surface water sewer adjacent Colliery Lane. At present I'm unable to get our Operational Team out to prove this as they are only attending essential works and as this has no operation issues will not get looked into.

In regards to the surface water rate I will increase the rate offered to the maximum we offer greenfield site of 5 l/s as long as the connection is made into the 525 mm section.

Kind Regards

(Embedded image moved to file: pic15574.gif)

*** Please note, all correspondence must be sent to technical.sewerage@yorkshirewater.co.uk and will be responded to within 10 working days ***

|----->
| From: |
|----->
>-----|
| "John O'Connor" <john@jocconsultants.co.uk> |
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|----->
| To: |
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>-----|
| Technical Sewerage@NotesMail |
>-----|
|----->
| Date: |
|----->
>-----|
| 18/05/2021 14:55 |
>-----|
|----->
| Subject: |
|----->
>-----|

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>-----|

VR 513800131010000 DATED 18/5/2021

Hi Chris,

Have you had any response as yet regarding the destination of the 525mm surface water sewer?

Also, with reference to your letter of 11th January 2021, the watercourse to the north west of the site is in fact a highway drain for the A635. We have proposed a surface water discharge from the development into this watercourse but Barnsley MBC will not grant an easement for a sewer from the site across its land and will not accept surface water into its highway drain. Disposal of surface water into the 525mm diameter sewer is therefore the only option for the development.

The maximum discharge rate of 3.5 l/s stated in your letter would require excessive storage capacity for the design event. In view of the size of the surface water sewer, would Yorkshire Water be able to allow a higher discharge rate than 3.5 l/s? The greenfield mean annual runoff rate (Qbar) is estimated to be 17.72 l/s. I shall be grateful if you will give this further consideration.

Kind regards,

John O'Connor
Director

joc consultants ltd
Park Farm House
Leathley Lane
Leathley
Otley
LS21 2JU

Tel: 0113 284 2838

www.jocconsultants.co.uk

-----Original Message-----

From: Chris.Roberts@yorkshirewater.co.uk [mailto:Chris.Roberts@yorkshirewater.co.uk] On Behalf Of technical.sewerage@yorkshirewater.co.uk

Sent: 12 May 2021 19:32

To: John O'Connor

Subject: RE: Land East Of Lockwood Road, Goldthorpe, S63 9FL - Pre Planning Sewerage Enquiry U078790

Hi John,

Ive asked people to look into what happened here and where these sw sewer now outfall and as soon as I get something back Ill come back to you. In future if after submitting a pre plan you need more zoomed out plans please come back to me and ill provide them.

Leathley Lane

Leathley

Otley

LS21 2JU

Tel: 0113 284 2838

www.jocconsultants.co.uk

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(See attached file: YW letter 17-12-20.pdf)

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(See attached file: Waste.pdf)

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<https://www.avast.com/antivirus>

APPENDIX K

LLFA email dated 28th April 2021

John O'Connor

From: Atkins , Wayne (ASSET MANAGER) [WayneAtkins@barnsley.gov.uk]
Sent: 28 April 2021 09:26
To: John O'Connor
Subject: RE: Land east of Lockwood Road, Goldthorpe

John,

As you are aware Section 100 States that:

(1)The highway authority for a highway may, for the purpose of draining it or of otherwise preventing surface water from flowing on to it, do all or any of the following:—

(a)construct or lay, in the highway or in land adjoining or lying near to the highway, such drains as they consider necessary;

(b)erect barriers in the highway or in such land as aforesaid to divert surface water into or through any existing drain;

(c)scour, cleanse and keep open all drains situated in the highway or in such land as aforesaid.

This drain was constructed for the purpose of draining the Highway therefore is a “Highway Drain”

Section 100 also states:

(4)If a person, without the consent of the highway authority, alters, obstructs or interferes with a drain or barrier which has been constructed, laid or erected by the authority in exercise of their powers under subsection (1) above, or which is under their control, then—

(a)the authority may carry out any work of repair or reinstatement necessitated by his action and may recover from him the expenses reasonably incurred by them in so doing, and

(b)without prejudice to their right to exercise that power, he is guilty of an offence and liable to a fine not exceeding three times the amount of those expenses.

i.e. Consent is required to connect to the Highway Drainage system, consent that BMBC has chosen to deny.

You are quite correct as to the definition of a “watercourse” under the Land Drainage Act, however this is a Highway Drain and thus is owned and maintained by the Highway Authority who would give consent for connection.

There is no as of right connection to a watercourse it is at the discretion of the Lead Local Flood Authority, although should not be unreasonably withheld. However consent to discharge / carry out works within a watercourse does not give the person gaining consent a right to work on a watercourse in third party land, permission of the land owner would be required. As Highway Authority and owner of the Highway Drain consent would not be given.

Regards

Wayne Atkins F.I.H.E.
Principal Engineer – Highways Asset Management
Environment & Transport
Place Directorate

Barnsley Metropolitan Borough Council

E-mail: wayneatkins@barnsley.gov.uk

From: John O'Connor <john@jocconsultants.co.uk>
Sent: 28 April 2021 08:49
To: Atkins , Wayne (ASSET MANAGER) <WayneAtkins@barnsley.gov.uk>
Subject: RE: Land east of Lockwood Road, Goldthorpe

Morning Wayne,

Thank you for your prompt response to my email yesterday, which is appreciated.

This matter appears to revolve around a point of law. Section 100(9) of the Highways Act 1980 states, as you will be aware: *“drain” includes a ditch, gutter, watercourse, soak-away, bridge, culvert, tunnel and pipe’.*

Section 72(1) of the Land Drainage Act 1991 states: *“watercourse” includes all rivers and streams and all ditches, drains, cuts, culverts, dikes, sluices, sewers (other than public sewers within the meaning of the Water Industry Act 1991) and passage, through which water flows.’*

The Land Drainage Act provides a very wide definition of watercourse and makes no exception for highway drains, so it is possible for the channel conveying water at the north west boundary of the site to be both a highway drain within the meaning of the 1980 Act, and a watercourse within the meaning of the 1991 Act.

I trust you will understand that I am not “trying” to describe the drain as a watercourse; I am simply following what is stated in law and the fact that the drain did not exist prior to the construction of the highway is irrelevant. The 1991 Act clearly states all... ditches, drains, cuts... etc, so if a new channel is dug tomorrow for the purpose of conveying water it would be a ‘watercourse’ unless it is a public sewer.

It remains the position that the SuDS hierarchy requires surface water to be discharged to a watercourse in preference to a sewer.

I look forward to hearing from you further on this matter.

Kind regards,

John O'Connor
Director

joc consultants ltd

Park Farm House
Leathley Lane
Leathley
Otley
LS21 2JU

Tel: 0113 284 2838

www.jocconsultants.co.uk

From: Atkins , Wayne (ASSET MANAGER) [<mailto:WayneAtkins@barnsley.gov.uk>]
Sent: 28 April 2021 07:31
To: John O'Connor
Subject: RE: Land east of Lockwood Road, Goldthorpe

John,

I work in the Highways Department and as well as being Flood Risk Manager for the Authority I am also Asset Manager for the Highway Network so am therefore well aware of the definition of a watercourse and the definition of a Highway Drain. This Drain was constructed for the purpose of carrying away surface water from a road, therefore under Section 100 of the Highways Act 1980, is defined as a Highway Drain NOT a Watercourse. There is no right of connection to Highway Drainage and therefore my previous comments stand, BMBC as Highway Authority, has a policy of resisting the connection of flows from development sites into the Highway Drainage system.

If you check historic maps of the area the Highway Drain you are trying to describe as a watercourse did not exist prior to the construction of the Highway.

Regards

Wayne Atkins F.I.H.E.
Principal Engineer – Highways Asset Management
Environment & Transport
Place Directorate
Barnsley Metropolitan Borough Council

E-mail: wayneatkins@barnsley.gov.uk

From: John O'Connor <john@jocconsultants.co.uk>
Sent: 27 April 2021 17:18
To: Atkins , Wayne (ASSET MANAGER) <WayneAtkins@barnsley.gov.uk>
Subject: RE: Land east of Lockwood Road, Goldthorpe

Hi Wayne,

Further to your email of 24th March 2021, I note your preference for surface water to be discharged into the surface water sewer. The SuDS hierarchy however requires surface water to be discharged to a watercourse in preference to a discharge to a sewer and Yorkshire Water has indicated that, as there is a watercourse to the north west of the site, this is the obvious location for surface water disposal. It has also stated that any discharge to the surface water sewer would have to be restricted to 3.5 l/s. This would result in the requirement for excessive storage capacity.

Although the watercourse is considered to be part of the highway drainage system, it is, by definition in the Land Drainage Act 1991, a “watercourse” and so it should be considered for surface water disposal from the development in preference to the sewer. It is also worth noting that the topography of the site indicates that greenfield runoff must already enter the watercourse, following the flow path shown on the attached surface water flood map. As it is proposed to limit the discharge rate to Qbar, I cannot see any reasonable grounds for the highway authority to object. Furthermore, a policy of not accepting surface water into that watercourse must run counter to the Adopted Local Plan policies CS1; CC3; CC4; and CC5.

I shall be grateful if you will consult with colleagues in the highways department and reconsider this matter.

Kind regards,

John O'Connor
Director

joc consultants ltd

Park Farm House
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From: Atkins , Wayne (ASSET MANAGER) [<mailto:WayneAtkins@barnsley.gov.uk>]
Sent: 24 March 2021 08:29
To: John O'Connor
Subject: RE: Land east of Lockwood Road, Goldthorpe

Hi John,

The "Watercourse" you describe is in fact part of the Highway Drainage system for the A635 Goldthorpe bypass, unfortunately BMBC as Highway Authority, has a policy of resisting the connection of flows from development sites into the Highway Drainage system.

My preferred option would be for the site to be connected to the Surface Water Sewer network. In this case a rate not exceeding 18.71 l/s will be acceptable to the LLFA.

Hope this helps.

Regards

Wayne Atkins F.I.H.E.
Principal Engineer – Highways Asset Management
Environment & Transport
Place Directorate
Barnsley Metropolitan Borough Council

E-mail: wayneatkins@barnsley.gov.uk

From: John O'Connor <john@jocconsultants.co.uk>
Sent: 23 March 2021 11:07
To: Atkins , Wayne (ASSET MANAGER) <WayneAtkins@barnsley.gov.uk>
Cc: James Eaton <james@jameseatondesign.co.uk>
Subject: Land east of Lockwood Road, Goldthorpe

Good Morning Wayne,

We are instructed to prepare a flood risk assessment for a proposed housing development on land east of Lockwood Road, Goldthorpe, shown outlined in red on the attached location plan.

I shall be grateful if you will let me know of any flooding or drainage problems known to the Council at or in the vicinity of the site.

Ground investigations, including infiltration tests are currently in progress and the results of infiltration tests are awaited. Should infiltration prove not to be feasible however, surface water may need to be discharged to the watercourse immediately to the north of the site, or to the 525mm diameter surface water sewer as a last resort, at a rate not exceeding the greenfield mean annual flow rate (Q-bar). I attach the REFH2 estimate of Q-MED (1 in 2 years) which is 16.65 l/s. As the site is in Hydrological Area 3, $Q\text{-bar} = Q\text{-MED}/0.89$. Q-bar is therefore estimated to be 18.71 l/s.

Can you please confirm that a controlled discharge rate to the watercourse the north of the site or, as a last resort, the surface water sewer, at a rate not exceeding 18.71 l/s will be acceptable to the LLFA?

Your earliest response will be appreciated.

Kind regards,

John O'Connor
Director

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