

Lower Broadbridge Farm, Broadbridge Heath

PEREGA

Report Title: Drainage Strategy Report

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Suitability Code	Revision/Version	Date	Written by	Checked by	Description
S2	P1	11/03/2026	Robert Masson	Gregory Schmidt	Issued for information
S2	P2	24/03/2026	Robert Masson	Gregory Schmidt	Updated appendices only
S2	P3	30/03/2026	Robert Masson	Gregory Schmidt	Updated to comments provided

1 INTRODUCTION

- 1.1 This Drainage Strategy Report has been prepared by Perega Ltd on behalf of Taylor Wimpey South Thames to support the Reserved Matters planning application for the development at Lower Broadbridge Farm, Horsham. This follows the Section 73 application which includes Flood risk Assessment and Drainage Strategy Reports.
- 1.2 The application boundary covers an area of approximately 7 hectares (ha) and is a greenfield site.
- 1.3 This Drainage Strategy presented in accordance with the requirements set out in the National Planning Policy Framework (NPPF) 2024 and the associated Technical Guidance.
- 1.4 The key site details are presented in Table 1, below.

Table 1 - Site Summary

Item	Description
Site Name	Lower Broadbridge Farm
Location	Broadbridge Heath, Horsham, RH12 3TL
Grid Reference	TQ 14175 31175
Development Site Area	7 hectares (ha)
Development Type	Residential Development
Flood Zone	Flood Zone 1 (Low Probability Risk), some Flood Zone 2.
Surface Water Flood Risk	Very Low Probability Risk (Areas of zone 2/3 adjacent to site, aligned with existing watercourses and ponds)
Local Water Authority	Southern Water
Local Planning Authority	Horsham District Council
Lead Local Flood Authority	West Sussex County Council

- 1.5 The development area is located in Flood Zone 1, and based on available information, it is not at risk of flooding from surface water or other flood sources. There are areas of Flood zone 2 and 3 adjacent aligning with existing watercourses and ponds with some Flood Zone 2 shown within the site which does not affect the infrastructure or dwellings on the layout. The modelling has confirmed the flood risk level to remain above. Therefore, in line with standing advice, an independent FRA is not required under the guidance of the National Planning Policy Framework (NPPF). There are existing reports by Odessey published.
- 1.6 This report has been prepared solely as a Drainage Strategy Report. It therefore only addresses any environmental issues to the extent they are impacted by drainage strategy. The findings are based on information evaluated at the time of preparation.
- 1.7 The report is the property of Perega and is produced for the exclusive use of our client and is confidential to that client. The contents may not be made use of by any third party without the express written consent of Perega. Any liability to any third party is expressly excluded.
- 1.8 This report is made on behalf of Perega. By receiving this report and acting on it, the client, or any third party relying on it, accepts that no individual is personally liable in contract, tort, or breach of statutory duty (including negligence).

2 METHODOLOGY

- 2.1 This is a desk-based study that utilises existing, publicly held information in the form of mapping and previously undertaken work. Conclusions made about flooding have been made using our expert judgement and knowledge of similar events.
- 2.2 In preparing this report, information has been gathered and referenced from several sources. These are as follows:
- i. The Environment Agency's Flood Map for Planning.
 - ii. The Long-Term Flood Risk Map for England.
 - iii. The National Planning Policy Framework , and.
 - iv. The Planning Practice Guidance.
 - v. As-Built topographical survey information for the property

3 SITE DETAILS

3.1 Site Setting

- 3.1.1 The site is roughly triangular, irregular shape and includes a ditchcourse. The northern, eastern and western boundaries all connect to adjacent agricultural or undeveloped land. The southern and south-eastern boundary is adjacent to a carriageway and the site is to be accessed via a new arm on a new roundabout to the south.
- 3.1.2 A site location plan is included in **Appendix A** of this report.

3.2 Topography

- 3.2.1 The site displays a moderate difference in ground levels, generally falling from south to north. The levels range from approximately 30.75m AOD along parts of the southern boundary corner to around 29.50m AOD in the north-east and 27.5m AOD in the north-west.
- 3.2.2 The Topographic survey can be seen in **Appendix B**.

3.3 Surface Water Features

- 3.3.1 There is an unnamed surface water features on site running south to north through the western third of the site.

3.4 Geology & Hydrogeology

- 3.4.1 A ground investigation report has been undertaken by CDS Group in April 2022. The report body, without appendix, can be seen in **Appendix G**.
- 3.4.2 The borehole logs from the investigation indicated a layer of made ground is present over the site, ranging between 0.3-0.5m in depth. The logs suggest that clay underlays the site beneath the made ground, with occasional mudstone and stiff clay lenses. Overall the site is clay.
- 3.4.3 BGS Geology Viewer indicates that site is situated on the Weald Clay Formation of Mudstone, with superficial deposits of Grinstead Clay Member. These are layers of clay and mudstone.
- 3.4.4 Defra's Magic Maps show that the site is in an unproductive area for groundwater and records no vulnerability. This tallies with the site being located atop clay formations.
- 3.4.5 Although groundwater has been noted in the information provided by CDS Group within their monitoring wells they report this is likely seepage into the well from the surface and not representative of the groundwater on site.

3.5 Existing Drainage

- 3.5.1 The incumbent sewage undertaker is Southern Water.
- 3.5.2 Asset records from Southern Water show that there are existing foul water (FW) and surface water (SW) sewers in or adjacent to the A281 along the south-east boundary of the site. The SW is noted at ø750 increasing to ø900 before discharging into a nearby watercourse located south west of the development site. The FW is noted as ø450 but the shape is unknown and may be irregular.
- 3.5.3 There is an existing SW culvert which discharges into the existing watercourse on site, at the location of the new roundabout arm into the site. This is proposed to be extended into the site as part of the separate highway works, to accommodate the new roundabout design. It is not envisaged that these works will affect the proposed development.
- 3.5.4 No drainage is shown for existing properties adjacent to the site boundary and in the vicinity, this includes Arun House and the development to the north. It is likely that they are served with private drainage not recorded on public utilities records.
- 3.5.5 Asset records are shown in **Appendix C** of this report.

3.6 Existing Discharge Rate

- 3.6.1 The development site is entirely greenfield.
- 3.6.2 The HR Wallingford tool has been used to calculate the following Greenfield discharge rate per hectare for the site which can be seen in **Appendix E**. This is summarised in Table 2.

Table 2 - Greenfield Runoff rate per ha

Storm Event	Greenfield Rate (l/s)
QBar	38.1
1-year	32.4
30-year	87.6
100-year	121.4

4 THE PROPOSED DEVELOPMENT

- 4.1 The proposed development consists of 133 new homes, each with associated car parking, external hardstanding and soft landscaping.
- 4.2 The proposed development layout can be seen in **Appendix A**.
- 4.3 The impermeable and permeable areas for the site are summarised in Table 3.

Table 3 - Impermeable and Permeable Areas

Description	Impermeable Area (m ²)	Permeable Area (m ²)
Total Area	23,080m²	46,920m²

4.1 Peak Rainfall Intensity

- 4.1.1 With climate change it is becoming more common to see rainfall events of higher intensity. Increased rainfall intensity affects river levels and drainage systems, with the result being an increase in surface water flooding and sewerage surcharge.
- 4.1.2 The NPPF states that for flood risk assessments for developments with a lifetime beyond 2100, the upper end allowances should be used. Table 4 and Table 5 summarises the data attributed the *Arun and Western Streams Management Catchment*.

Table 4: Catchment Peak Rainfall Flow Allowances - 3.3% annual exceedance rainfall event

Epoch	Central Allowance	Upper End Allowance
2050s	20%	35%
2070s	20%	35%

Table 5: Catchment Peak Rainfall Flow Allowances - 1% annual exceedance rainfall event

Epoch	Central Allowance	Upper End Allowance
2050s	20%	45%
2070s	25%	45%

- 4.1.3 The emerging surface water strategy for the proposed development has been designed to accommodate and discharge peak rainfall flows up to the 1 in 100-year event, including a 40% increase in rainfall for climate change, as identified by the Arun and Western Streams Management Catchment Peak Rainfall allowance for the 1% AEP. Similarly, the 3.3% AEP shall be designed using an increased rainfall uplift of 45%

4.2 Hierarchy of Surface Water Discharge

- 4.2.1 The Hierarchy for the discharge of surface water looks at the most sustainable ways to discharge surface water from most preferred to least preferred options.
- 4.2.2 The most preferred option is to discharge to ground, then discharge to surface water body, then discharge to surface water sewer, then discharge to combined sewers.
- 4.2.3 The ground investigation undertaken by CSD Group notes that the site is underlain by clay therefore soakaways and infiltration is not viable. There is a surface water body within the site boundary, therefore all surface water discharges should be made to this unnamed ditchcourse within the site.
- 4.2.4 It should be noted that asset records from Southern Water identified offsite and onsite surface water sewers along the southern boundary east of the site, which discharge to an existing watercourse on the western boundary of the site. However, this would not be supported by topography without pumping but may serve as an alternative for some parts of the site if necessary.

4.3 Proposed Discharge Rate

- 4.3.1 Based on the impermeable site area of 23,080m², the following discharge rates would be required to match greenfield runoff rate.

Table 6 - Greenfield Runoff rate per ha

Storm Event	Greenfield Rate (l/s)
QBar	12.5
1-year	10.6
30-year	28.8
100-year	39.9

5 PROPOSED DRAINAGE STRATEGY

5.1 Based on the above assumptions and constraints, a proposed drainage strategy has been developed which can be seen in **Appendix D**. Drainage calculations can be seen in **Appendix F**.

5.1 Surface Water

5.1.1 Following from the drainage hierarchy, the preferred method of surface water discharge is via connection to the unnamed ditchcourse within the site. There will be four separate discharges to suit topography across the site and to keep storage efficient. The total rate of discharge of 11.8 l/s has been pro-rata'd between the 4No. discharge locations.

5.1.2 The rainfall runoff from the housing roof's are proposed to be collected via rainwater pipes and discharge into a below ground surface water system. Hardstanding areas such as driveways are proposed to be drained via linear drainage channels and gullies where necessary. Highway areas are proposed to be drained via highway gullies in the carriageway which discharge directly to the main drainage or to a highway drain. Drainage Kerbs are also an option in areas with adjacent ponds which can be assessed at detailed design.

5.1.3 The site will utilise above-ground storage in the form of detention basins, three are proposed. In addition, in one location to the south-west, porous paving will be used due to topography, to store surface water below ground.

5.1.4 The discharge rates will be achieved for the surface water discharges from site using a proprietary flow control vortex device. For the porous paving area, an orifice plate will likely be used within a PPIC to control the restricted discharge of surface water. All discharge rates are for the peak flow in all storm events up to and including the 1-in-100 year event range with a 45% allowance for climate change. This is subject to approval from Southern Water.

Table 7 - Summary of Storage Volumes and Discharge Rates

Network Name	Approximate Plot No.	Impermeable Area m ²	Storage Volume m ³	Discharge Rate l/s
Basin 1 SW	1-5, 16-21	3,070m ²	190m ³	2.8 l/s
Basin 2 SE	33-37, 99-108, 119-133	4,390m ²	415m ³	3.1 l/s
Basin 3	21-32, 38-98, 109-118	14,460m ²	1,585m ³	2.4 l/s
Porous Paving 1	6-15	1,160m ²	93m ³	3.5 l/s
Total	133	23,080m²	2,465m³	11.8 l/s

5.1.5 Different areas of hardstanding pose different risks of pollution. Table 8 is replicated from CIRIA's C753: The SuDS Manual, and details the various pollution risk indices for the different runoff surfaces.

Table 8: Pollution hazard indices for different land use classifications - reproduced from CIRIA C753: The SuDS Manual

Land use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydrocarbons
Residential roofs	Very Low	0.2	0.2	0.05
Other roofs (typically commercial/industrial roofs)	Low	0.3	0.2 (up to 0.8 where there is potential for metals to leach from the roof)	0.05
Individual property driveways, residential car parks, low traffic roads (e.g. cul-de-sacs, home zones and general access roads) and non-residential car parking with infrequent change (e.g. schools, offices) i.e. < 300 traffic movements/day	Low	0.5	0.4	0.4
Commercial yard and delivery areas, non-residential car parking with frequent change (e.g. hospitals, retail), all roads except low traffic roads and trunk roads/motorways ¹	Medium	0.7	0.6	0.7
Sites with heavy pollution (e.g. haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured; industrial sites; trunk roads and motorways ¹	High	0.8 ²	0.8 ²	0.9 ²

Notes

1 Motorways and trunk roads should follow the guidance and risk assessment process set out in Highways Agency (2009)

2 These should only be used if considered appropriate as part of a detailed risk assessment – required for all these land use types (Table 4.3). When dealing with high hazard sites, the environmental regulator should first be consulted for pre-permitting advice. This will help determine the most appropriate approach to the development of a design solution.

5.1.6 Based on Table 8, the site is classified as Low pollution hazard level due to the presence of only residential traffic and driveways – although the number of traffic movements from the 133 properties will need to be assessed against the Low pollution hazard index criteria.

5.1.7 Some roads are proposed as block paving and may utilise permeable paving as required to reduce the pollution index, if required, prior to discharge to the watercourse.

5.2 Foul Water

5.2.1 It is proposed that the foul drainage from the development will be directed to a pumping station in the north-east corner of the site. This adoptable pumping station will pump via a rising main to the public

foul water sewer, located to the south-east corner of the site and connect via the first efficient chamber.

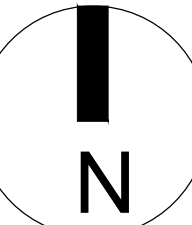
5.2.2 This is subject to connection and adoptable approval from Southern Water or other authority.

6 CONCLUSION

- 6.1 This Drainage Strategy Report has been prepared by Perega Ltd on behalf of Taylor Wimpey South Thames to support the Reserved Matters planning application for development at Broadbridge Heath, Horsham, RH12 3TL. The site comprises a new development of 133 new homes with associated parking, hardstanding areas and soft landscaping.
- 6.2 The existing site is greenfield and the northern, eastern and western boundaries all connect to adjacent agricultural or undeveloped land. The southern and south-eastern boundary is adjacent to a carriageway and the site is to be accessed via a new arm on a roundabout to the south.
- 6.3 The development area is located in Flood Zone 1, and based on available information, it is not at risk of flooding from surface water or other flood sources. There are areas of Flood zone 2 and 3 adjacent aligning with existing watercourses and ponds with some Flood Zone 2 shown within the site which does not affect the infrastructure or dwellings on the layout.
- 6.4 Ground investigations carried out at the site confirm the site has a layer of made ground underlain by clay rendering soakaways and infiltration SUDs infeasible.
- 6.5 The surface water is proposed to be attenuated and stored on site within ponds and permeable paving. The runoff from the roofs, car parks/driveways, and other hardstanding areas is proposed to be collected via a combination of rainwater pipes, permeable paving, gullies and linear drainage channels.
- 6.6 The surface water is to be discharged at controlled rate via a proprietary vortex flow control devices, to the existing unnamed watercourse within the site for all storms up to and including a 1-in-100 year event range with a 45% allowance for climate change.
- 6.7 The total discharge rate is 11.8 l/s total from four separate locations to suit topography.
- 6.8 An existing foul sewer located at the edge of the site, to the south, is at a level that cannot be reached by gravity. An adoptable pumping station is required to discharge foul water to this public sewer.
- 6.9 This drainage strategy is in-line with Condition 12 of the Section 73 for the development.

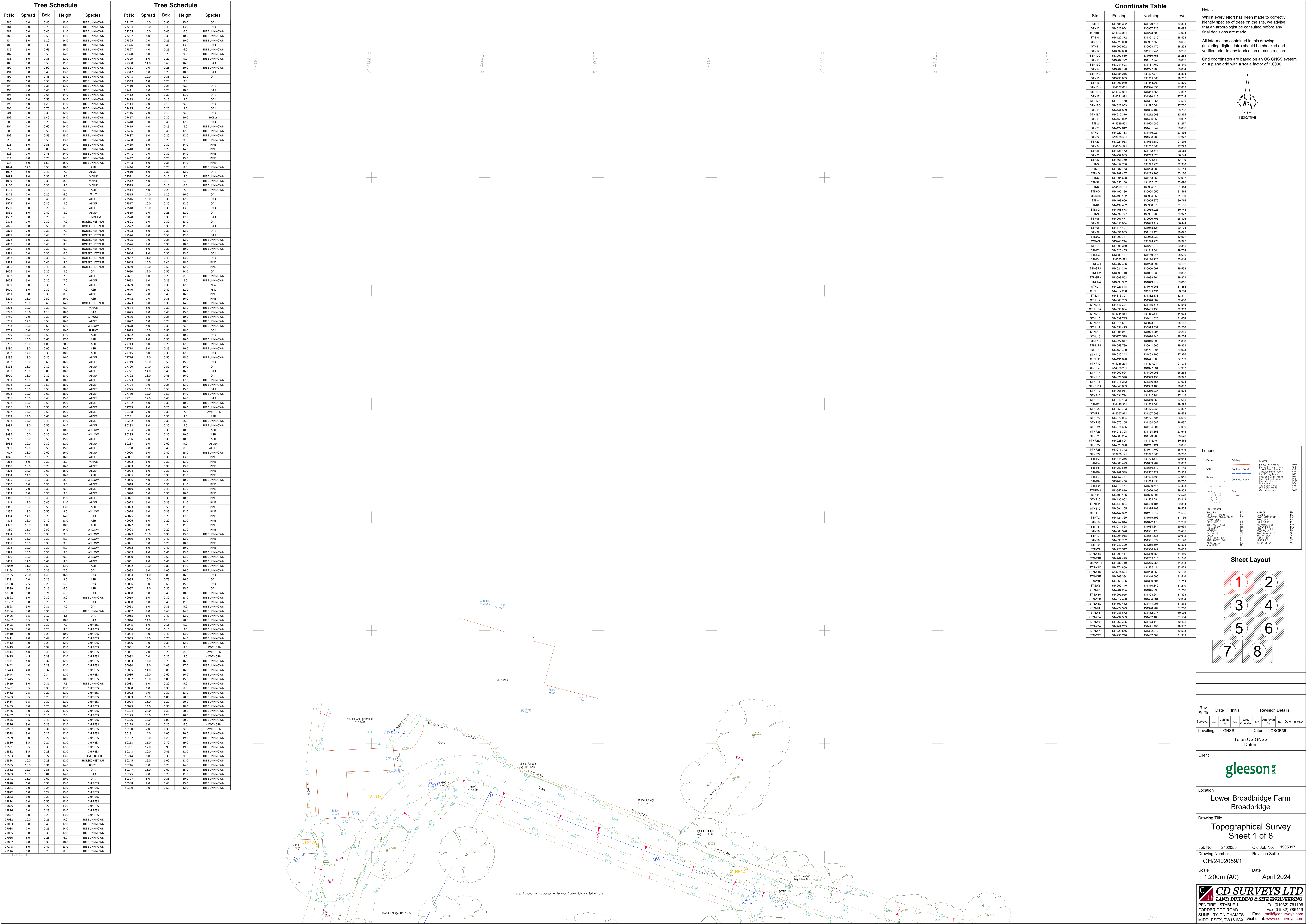
Appendix A

Proposed Site Plan

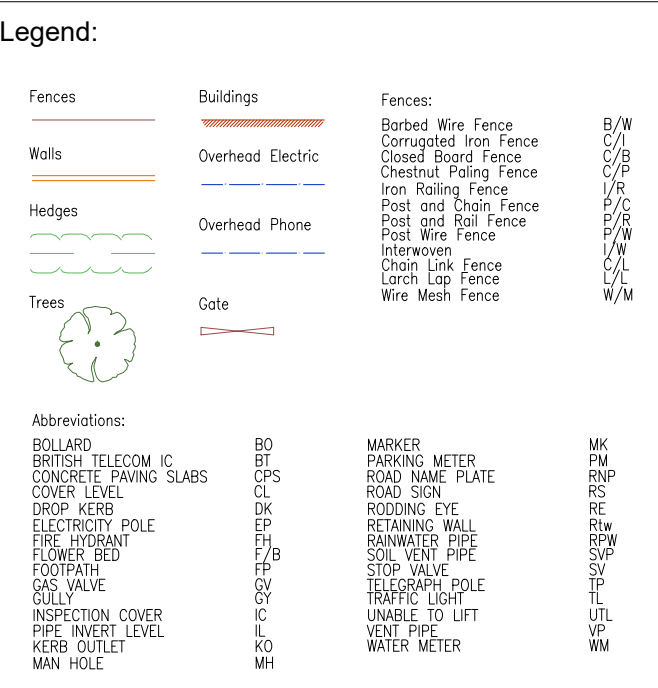


Appendix B

Topographical Survey



All information contained in this drawing
(including digital data) should be checked and
verified prior to any fabrication or construction.



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Datum

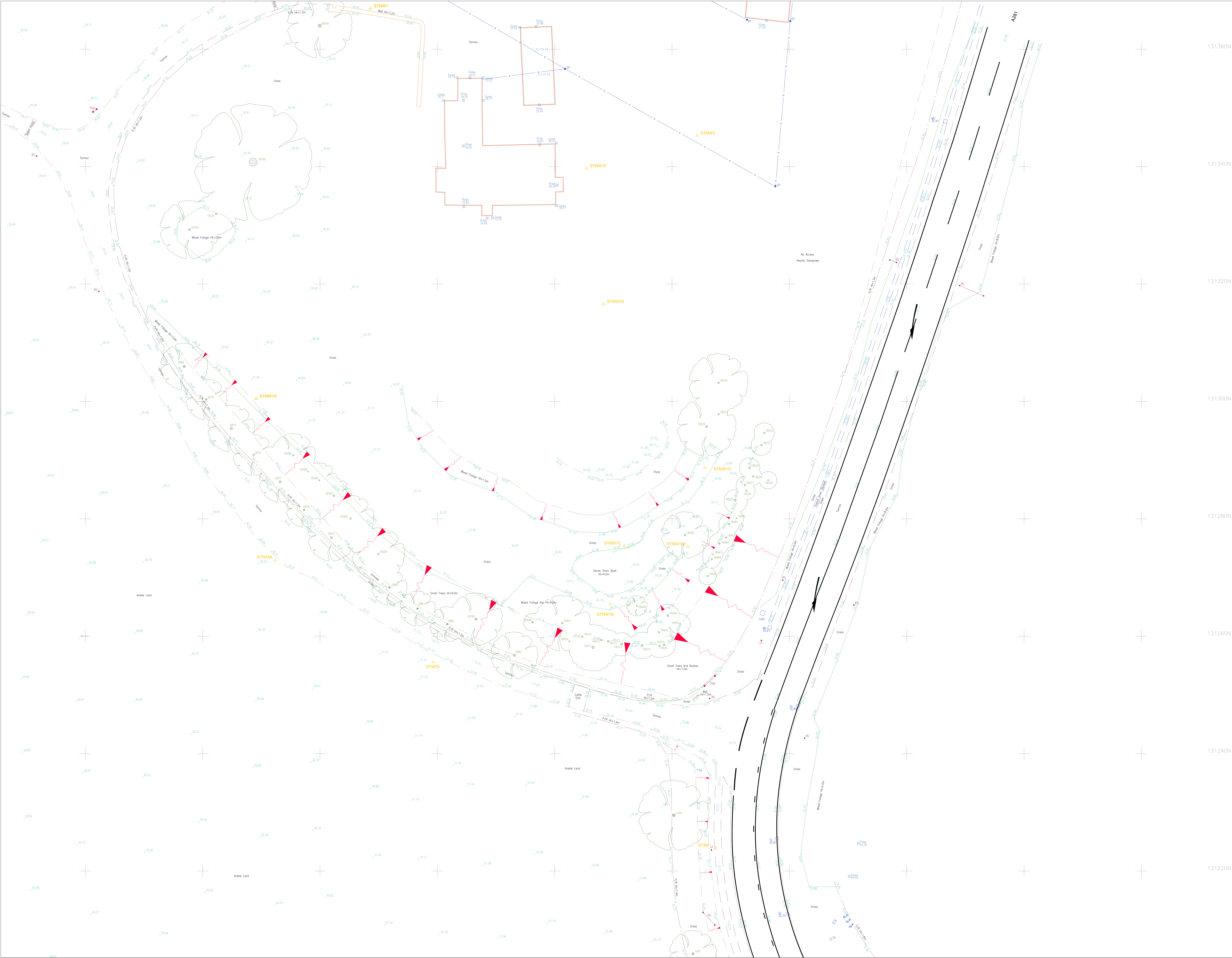
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Lower Broadbridge Farm
Broadbridge

Job No. 2402059	Old Job No. 19050
Drawing Number	Revision Suffix

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Notes:

Whilst every effort has been made to correctly identify species of trees on the site, we advise that an arborologist be consulted before any final decisions are made.

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Grid coordinates are based on an OS GNSS system on a plane grid with a scale factor of 1.0000.

Legend:

Fences	Buildings	Fences
Walls	Overhead Cable	Overhead Cable
Height	Overhead Pole	Overhead Pole
Tree	Tree	Tree

Abbreviations:

BRICK	BRICK	BRICK
CONCRETE	CONCRETE	CONCRETE
WOOD	WOOD	WOOD
IRON	IRON	IRON
STEEL	STEEL	STEEL
GLASS	GLASS	GLASS
PLASTER	PLASTER	PLASTER
ROOF	ROOF	ROOF
WALL	WALL	WALL
DOOR	DOOR	DOOR
WINDOW	WINDOW	WINDOW
CEILING	CEILING	CEILING
FLOOR	FLOOR	FLOOR
ROOF	ROOF	ROOF
WALL	WALL	WALL
DOOR	DOOR	DOOR
WINDOW	WINDOW	WINDOW
CEILING	CEILING	CEILING
FLOOR	FLOOR	FLOOR

Sheet Layout

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3	4
5	6
7	8

Rev. Suffix	Date	Initial	Revision Details
1	18.04.24	GH	Initial Survey

Surveyor	GH	Verified By	GH	CAD Operator	TJH	Approved By	GH	Date	18.04.24
Levelling	GNSS	Datum	OSGB36						

To an OS GNSS Datum

Client

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Location

Lower Broadbridge Farm
Broadbridge

Drawing Title

Topographical Survey
Sheet 4 of 8

Job No.	2402059	Old Job No.	1905017
Drawing Number	GH/2402059/4	Revision Suffix	
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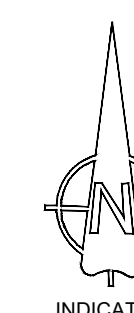
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Sheet Layout

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5	6	

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Rev. Suffix	Date		Initial		Revision Details				
Surveyor	GG	Verified By	GG	CAD Operator	TJH	Approved By	EG	Date	18
Levelling		GNSS			Datum		OSGB36		

To an OS GNSS Datum

Client

gleesonland

Location	
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Lower Broadbridge Farm
Broadbridge

Drawing Title

Topographical Survey
Sheet 5 of 8

Job No. 2402059	Old Job No. 1905017
Drawing Number	Revision Suffix

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Scale	Date

Scale	Date
1:200m (A0)	April 2024

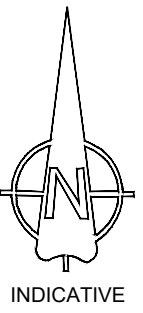


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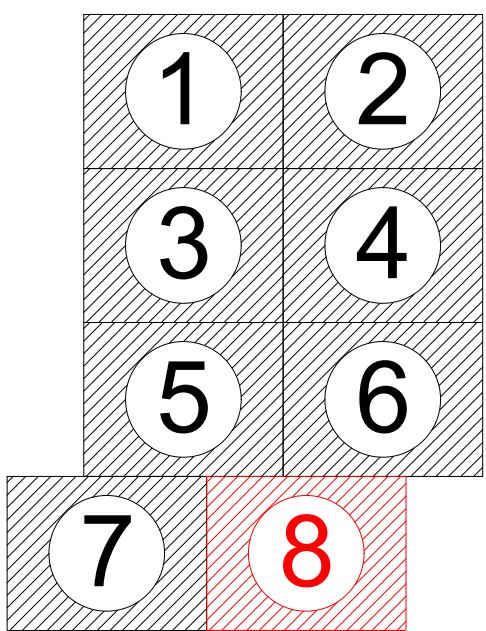
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Sheet Layout



Rev. Suffix		Date		Initial		Revision Details				
Surveyor	GG	Verified By	GG	CAD Operator	TJH	Approved By	EG	Date	18.04.24	
Levelling		GNSS			Datum		OSGB36			

Datum _____

Client

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Location

Lower Broadbridge Farm
Broadbridge

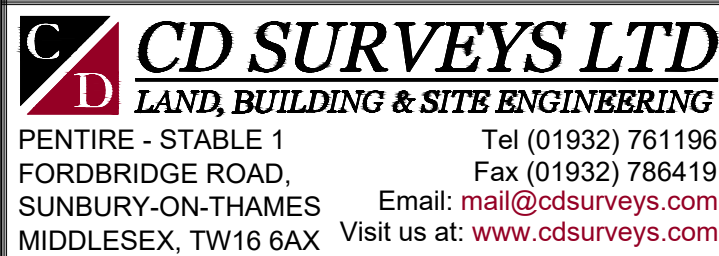
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Topographical Survey
Sheet 8 of 8

Job No. 2402059	Old Job No. 1905017
Drawing Number	Revision Suffix

GH/2402059/8

Scale 1:200m (A0)	Date April 2024
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Appendix C
Asset Records

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
0901	F	29.56	26.85	
1901	F	30.15	26.85	
1902	F	29.30	0.00	
2001	F	0.00	0.00	
2002	F	0.00	0.00	
2101	F	0.00	0.00	
2102	F	0.00	0.00	
2901	F	0.00	0.00	
2902	F	30.87	28.81	
2903	F	30.53	28.60	
2904	F	30.50	28.46	
2905	F	31.06	28.33	
2906	F	31.20	29.89	
2907	F	30.94	27.84	
2908	F	31.26	28.00	
2909	F	31.41	30.11	
3101	F	34.13	29.87	
3102	F	33.72	29.69	
3103	F	33.54	31.30	
3104	F	33.16	29.90	
3201	F	33.97	31.59	
3202	F	33.52	31.16	
3203	F	33.33	31.45	
3204	F	33.56	32.01	
3301	F	33.33	31.55	
3302	F	33.05	31.41	
3903	F	33.23	31.13	
3304	F	33.14	30.99	
3400	F	32.13	30.68	
3803	F	31.88	30.01	
3901	F	32.67	31.32	
3902	F	32.48	30.96	
3903	F	32.34	30.87	
3904	F	32.92	30.78	
3905	F	32.27	30.68	
3906	F	31.85	29.92	
3907	F	32.22	30.12	
3908	F	32.82	30.30	
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4502	F	32.56	29.00	
4503	F	32.78	29.43	
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5111	F	0.00	0.00	
5201	F	36.40	34.11	
5202	F	38.45	0.00	
5203	F	0.00	0.00	
5204	F	0.00	0.00	
5205	F	0.00	0.00	
5206	F	0.00	0.00	
5207	F	0.00	0.00	
5208	F	0.00	0.00	
5209	F	0.00	0.00	
5210	F	0.00	0.00	
5401	F	36.38	33.24	
5402	F	35.58	0.00	
5403	F	35.11	0.00	
5404	F	35.70	32.76	
5405	F	0.00	0.00	
5408	F	0.00	0.00	
5409	F	0.00	0.00	
5411	F	0.00	0.00	
5701	F	0.00	0.00	
5702	F	32.22	31.06	
5703	F	0.00	0.00	
5704	F	31.92	30.03	
5705	F	30.99	29.81	
5706	F	31.89	30.55	
5707	F	31.89	30.58	
5708	F	31.80	30.77	
6001	F	37.65	35.69	
6002	F	0.00	0.00	
6101	F	37.83	35.21	
6102	F	38.15	35.38	
6103	F	39.01	36.43	
6104	F	38.81	36.76	
6105	F	39.23	37.09	
6106	F	0.00	0.00	
6201	F	0.00	0.00	
6202	F	0.00	0.00	
6203	F	0.00	0.00	
6204	F	0.00	0.00	
6301	F	39.45	0.00	
6302	F	0.00	0.00	
6303	F	0.00	0.00	
6401	F	39.51	35.01	
6402	F	0.00	0.00	
6403	F	37.17	33.54	
6404	F	37.70	33.97	
6405	F	36.60	0.00	
6406	F	38.52	34.24	
6501	F	37.03	35.03	
6502	F	36.09	33.12	
6601	F	34.27	33.71	
6602	F	34.39	32.71	
6603	F	32.48	31.33	
6604	F	33.04	32.04	
6605	F	35.32	0.00	
7101	F	40.59	38.44	
7102	F	41.05	38.21	
7103	F	41.10	38.09	
7104	F	40.14	37.64	
7105	F	41.07	38.19	
7201	F	0.00	0.00	
7202	F	0.00	0.00	
7203	F	0.00	0.00	
7204	F	0.00	0.00	

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
7205	F	0.00	0.00	
7501	F	38.21	36.31	
7502	F	38.39	37.27	
7503	F	39.12	0.00	
7504	F	36.92	35.44	
7506	F	36.50	34.99	
7507	F	0.00	0.00	
7508	F	0.00	0.00	
7509	F	0.00	0.00	
7510	F	0.00	0.00	
7512	F	0.00	0.00	
7513	F	0.00	0.00	
7514	F	0.00	0.00	
7515	F	0.00	0.00	
7601	F	36.27	0.00	
7603	F	36.30	34.74	
7604	F	35.90	34.39	
7606	F	35.42	0.00	
8101	F	0.00	0.00	
8102	F	0.00	0.00	
8401	F	39.94	38.02	
8501	F	39.44	0.00	
8601	F	37.54	35.55	
9202	F	0.00	0.00	
0951	S	0.00	0.00	
1951	S	29.85	27.09	
2051	S	31.73	29.87	
2052	S	31.96	30.53	
2053	S	32.07	30.46	
2151	S	32.42	30.66	
2850	S	0.00	0.00	
2950	S	30.86	29.19	
2951	S	30.48	29.11	
2952	S	30.60	29.08	
2953	S	31.23	29.01	
2954	S	31.34	0.00	
2955	S	0.00	0.00	
3050	S	33.61	31.92	
3151	S	34.08	32.31	
3152	S	33.83	32.27	
3153	S	33.13	31.90	
3154	S	33.71	31.85	
3155	S	34.22	32.65	
3156	S	32.86	31.34	
3251	S	33.43	31.97	
3252	S	33.40	32.14	
3253	S	34.17	32.55	
3254	S	33.56	32.50	
3255	S	34.05	33.09	
3256	S	33.93	32.83	
3351	S	33.28	32.01	
3352	S	33.27	31.88	
3353	S	33.01	31.73	
3354	S	33.23	31.52	
3355	S	33.16	31.48	
3451	S	31.77	30.26	
3551	S	31.25	29.70	
3852	S	31.90	30.31	
3950	S	32.27	30.33	
3951	S	32.61	30.02	
3952	S	33.08	31.60	
3953	S	33.50	32.00	
3954	S	32.81	31.13	
3955	S	32.19	30.54	
3956	S	32.49	29.82	
3957	S	32.28	29.73	
3958	S	32.28	29.71	
3959	S	32.04	29.68	
4051	S	35.46	34.02	
4151	S	36.25	33.07	
4152	S	36.15	32.63	
4153	S	35.47	32.52	
4154	S	36.19	32.89	
4155	S	35.09	32.48	
4156	S	34.34	32.45	
4157	S	34.34	32.79	
4158	S	0.00	0.00	
4251	S	35.81	34.04	
4252	S	36.09	33.87	
4253	S	34.64	32.74	
4254	S	34.85	32.81	
4255	S	35.16	33.30	
4256	S	35.43	33.59	
4351	S	34.16	32.69	
4352	S	34.77	33.75	
4353	S	34.87	34.07	
4451	S	32.79	31.24	
4452	S	32.68	30.73	
4453	S	33.29	30.90	
4454	S	32.21	30.47	
4455	S	33.65	30.98	
4456	S	34.24	32.90	
4551	S	32.65	31.32	
4651	S	30.75	28.98	
4652	S	30.34	28.78	
4751	S	30.43	28.45	
4752	S	30.35	28.29	
4753	S	30.11	27.89	
4754	S	30.78	28.85	
4950	S	33.61	32.07	
4951	S	33.62	32.19	
4952	S	33.75	32.30	
4953	S	33.63	32.28	
4954	S	33.35	31.90	
5051	S	36.20	34.65	
5052	S	36.48	35.01	
5151	S	36.24	33.55	
5152	S	36.39	33.31	
5153	S	36.15	33.80	
5154	S	36.41	34.12	
5155	S	37.22	35.15	
5156	S	36.29	34.65	
5157	S	37.30	35.22	
5158	S	37.64	36.21	
5159	S	37.94	36.42	
5160	S	38.08	35.97	
5251	S	36.47	34.68	
5452	S	35.90	34.44	
5453	S	35.42	34.36	
5454	S	35.66	34.36	
5455	S	35.66	34.29	
5751	S	31.78	29.78	
5752	S	30.75	29.00	
6051	S	37.70	35.90	
6052	S	36.56	35.05	
6151	S	37.76	35.62	
6152	S	38.21	35.76	
6153	S	39.16	37.11	
6154	S	38.77	37.22	
6155	S	39.24	37.89	
6451	S	37.24	36.11	
6651	S	32.73	31.20	
6751	S	32.82	30.98	
7051	S	38.63	37.15	
7551	S	36.92	35.72	
7552	S	36.50	35.24	
7651	S	36.38	34.99	
7652	S	35.88	33.55	
7653	S	35.50	33.15	
8051	S	39.71	38.25	
9160	S	40.53	39.63	

Manhole Reference	Liquid Type	Cover Level	Invert Level	
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