

BELLWAY HOMES LTD

PARCEL 4, MOWBRAY DEVELOPMENT

OLD HOLBROOK, HORSHAM, WEST SUSSEX

DRAINAGE TECHNICAL NOTE

**REPORT REF.
2500120_A-ACE-XX-XX-RP-C-0301**

May 2026

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Document Control Sheet

REV	ISSUE PURPOSE	AUTHOR	CHECKED	APPROVED	DATE
-	DRAFT ISSUE	DC	TR	JM	13/02/26
A	FINAL SUBMISSION	DC	TR	JM	20/02/26
B	SITE LAYOUT UPDATED	JTM	DC	JM	25/05/26

Distribution

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1. Introduction

Scope

- 1.1. Ardent Consulting Engineering (ACE) has been appointed by Bellway Homes to prepare a Drainage Technical Note and Drainage Strategy in respect of the development proposals for the land know as "Parcel 4, Mowbray Development" in Old Holbrook, Horsham, West Sussex (herein referred to as 'the Site').
- 1.2. The Site benefits from Outline planning and this report has been prepared to demonstrate a suitable drainage strategy can be implemented for the Site.

Development Proposal

- 1.3. The development is for "*Reserved matters application (internal access, appearance, landscaping, layout and scale) pursuant to Condition 5 of Outline Planning Permission reference DC/16/1667 for Phase 1 RM Area 4 comprising 82 (C3 Use) residential units, car and cycle parking, new landscaping, drainage, access and internal roads and associated infrastructure.*"

Planning Consent History

- 1.4. Prior planning approvals and associated conditions relevant to the site are contained withing the following Decision Notices, which together establish the planning context for the development:
- i) Outline Planning Permission DC/16/1677, granted on 1st March 2019
 - ii) Non-Material Amendment DC/19/0984, approved on 12th June 2019
 - iii) Discharge of Condition 17 (Site-Wide Surface Water Drainage Strategy), DISC/19/0214, approved on 20th September 2019
 - iv) Reserved Matter Approval DC/24/0446, approved 4th October 2024
- 1.5. These approvals collectively define the evolution of the site-wide and parcel-specific drainage requirements.
- 1.6. Where planning conditions have been varied, amended, or supersede through subsequent approvals, the most recent approved wording takes precedence.

Accordingly, this Drainage Strategy has been prepared to demonstrate compliance with the currently extant and relevant drainage-related conditions, namely

- 1.7. Outline Planning Permission DC/16/1677, as amended by DC/19/0984, including:
 - i) Condition 17 (as amended) – Site-Wide Surface Water Drainage Strategy
 - ii) Condition 54 – Detailed Surface Water Strategy for Reserved Matters
 - iii) Condition 55 – Foul Water Drainage
 - iv) Condition 56 – Restrictions of Infiltration Drainage
- 1.8. The proposals within this report are consistent with the principles established in the approved Site-Wide Surface Water Drainage Strategy (PBA Consulting, August 2019) and with the approved drainage arrangement forming part of Reserved Matter approval DC/24/0446, where relevant.
- 1.9. This submission therefore addresses the latest applicable condition requirements insofar as they relate to the Parcel 4 Reserved Matters Application.

2. Existing Site

Site Description

- 2.1. The Site is located directly North of Horsham, in the district of Horsham District Council (HDC). The Site is a parcel part of a wider development, named Mowbray Development.
- 2.2. The total area of the site is circa 3.44 hectares (ha) and is centres approximately at Ordnance Survey 518589mE, 125056mN
- 2.3. Refer to **Figure 2-1** for an extract of the site layout and to **Appendix A** for the full plan.



Figure 2-1: Extract of the Site Layout

- 2.4. The development site area is primarily consists of open grass land pasture. The boundaries consist of hedgerows with the following features: a ditch along the eastern boundary; an existing farm, "Rapelands Farm", adjacent to the north western boundary; Moat Road adjacent to the north eastern boundary.
- 2.5. The topography slopes from gently to steeply, from the northern to the southern boundary. The highest point on-site found within in the north-eastern corner at 67.35m AOD. The land falls south towards the lowest point of the field, 56.60m AOD with gradients of ranging from of 1:13 to 1:50. The topography can be found in **Appendix B**.
- 2.6. A ground investigation report has been produced by Endeavour Drilling, ref. END20-007, dated March 2020. This report can be found in **Appendix C**.

- 2.7. As per the reports, the boreholes and trial pits show the site is underlain by stiff silty clays (Weald Clay Formation). The topsoil is found to be at an average depth of 0.34m bgl.
- 2.8. Within the ground investigation report, trial pit ref. TP204 shows the groundwater level is approx. 2.2m bgl in the southern part of the site.

Existing Drainage

- 2.9. As part of Mowbray development, within the vicinity of the proposed site, foul and surface water sewers have been designed, approved and constructed under the S104 agreement. In the south east corner of the site, a surface water spur and a foul water spur has been provided for the Site. In the northern part of the site, a foul water spur is in Phase 1 Primary Road. As shown in Glanville's Moat Road Drainage Layout, ref. MOW-GLA-MRE-PH1-D-C-1201-P7; as part of Glanville's Drainage Statement, approved part of DC/24/0446, refer to **Appendix D**.

3. Surface Water Drainage

Technical Standards

3.1. The surface water drainage strategy for the proposed development is in accordance with the following technical standards and best practice guidance, which are referred to throughout this section:

- West Sussex Local Flood Risk Management Strategy: 2025 – 2030
- West Sussex Sustainable Drainage Guidance
- The CIRIA SuDS Manual (C753) 2015
- Non-statutory technical standards for sustainable drainage. A Best Practice Guidance was published by the Association of SuDS Authorities (ASA), formerly known as the Local Authority SuDS Officer Organisation (LASOO), in July 2015 to accompany this document
- BS8582 Code of practice for surface water management for development site; and
- The National Planning Policy Framework.

Sustainable Drainage Systems (SuDS)

3.2. The SuDS management train has been set in the sitewide strategy for outline planning, DC/16/1677. The Site's runoff discharges into a basin, prior to discharging to the wider Mowbray development watercourses.

Drainage Strategy at Reserved Matters (DC/24/0446)

3.3. The following section covers the Drainage Statement, outlined in Glanville Consulting's Drainage Statement, dated 6th March 2024, agreed as part of the Reserved Matters Application (DC/24/0446), shown in **Appendix D**.

3.4. The Drainage Statement proposed for the site to discharge the surface water to the southern spur, via an attenuation basin, restricted to flow matching rates.

3.5. The Drainage Statement outlines the following greenfield rates, which were approved at outline planning (DC/16/1677), shown in **Table 3-2**:

Table 3-2: Greenfield Rates Per Hectare agree at Outline Planning (DC/16/1677)

	1 in 1 YEAR	Q_{Bar}	1 in 30 YEAR	1 in 100 YEAR
GREENFIELD RATE PER HECTARE (l/s/ha)	4.40	5.20	11.80	16.5

- 3.6. On 26th May 2024, the LLFA provided no objection to the reserved matter application and confirmed the Drainage Statement follows the Reserved Matters application (DC/24/0446).
- 3.7. The attenuation volumes were based on a 20% Climate Change, with 40% for sensitivity analysis, for the 1-in-100 year return period and FEH 2022 data.
- 3.8. Glanville's Attenuation Basin & Newt Pond Section drawing, ref. MOW-GLA-MRE-PH1-D-C-1202, show the area's required for the attenuation basin.
- 3.9. Glanville's General Arrangement drawing, ref. MOW-GLA-MRE-PH1-D-C-1101, shows the volume provided from the basin and the maintenance strip allowed.
- 3.10. Stantec's Section 38 Construction details, ref. 25216/2001/PH1/MHR/570, shows the headwall details required at the attenuation basin.

Proposed Surface Water Drainage Strategy

- 3.11. The greenfield runoff rates have been approved at outline planning (DC/16/1677), as shown in **Table 3-2**.
- 3.12. As approved at Reserved Matters (DC/24/0446), it is proposed to discharge the surface water into the site-wide drainage network at flow matching greenfield rates. A spur has been provided as a point of connection, located south-west of the site.
- 3.13. Surface water design calculations have been carried out for the storm events for the following storm events; 1 in 2, 1 in 30 and 1 in 100 plus climate change allowance.
- 3.14. The model has been simulated using 20% climate change with a 40% sensitivity analysis, in line with the Site-Wide Drainage Strategy for the discharge of Condition 17 (DISC/19/0214). As shown in **Appendix F**.

3.15. The model has also been simulated using a 45% climate change, for a sensitivity analysis, in line with Arun and Western Streams Management Catchment's current peak rainfall allowance. As shown in **Appendix F**.

3.16. The sensitivity analysis model has also been simulated with a CV value of 1, in line with WSCC's drainage requirements. As shown in **Appendix F**.

3.17. The impermeable area of the proposed development has been based upon the site layout, shown in **Appendix A**. The proposed impermeable area has been measured as 1.827ha (70% of the developable area). This accounts for an allowance for 10% of urban creep, in line with West Sussex County Council preferences.

3.18. The size and volume of the attenuation basin has been approved with Glanville's Moat road Extension Attenuation Basin & Newt Pond Section, ref. MOW-GLA-MRE-PH1-D-C-1202, as shown in **Appendix D**. The total attenuation approved for the site is 1,321 m³.

3.19. The proposed strategy has been summarised in **Table 3-3** below.

Table 3-3: Drainage Design Summary

Application	Impermeable Area (ha) + Urban Creep	Discharge rate (l/s)			Attenuation Storage Required (m ³)		
		1 in 2 year	1 in 30 year	1 in 100 year	20% CC	40% CC	45% CC
DC/24/0446	1.827	3.4	20.0	28.0	1225	1,321	-
PROPOSED					931	1,103	1,404

3.20. The Surface Water Drainage Strategy is shown in **Appendix E** and indicated how the site will be drained, including the location of the attenuation features and the discharge locations.

3.21. Flow Network modelling has been undertaken to demonstrate that the proposed drainage strategy can be restricted the site to equivalent greenfield runoff rates and accommodate the surface water runoff on site. Copies of the surface water drainage calculations are included in **Appendix F**.

3.22. As part of WSCC's recommendations, Surface Water Drainage Proforma has been completed to support the application; refer to **Appendix G**.

3.23. As shown in the Ground Investigation report, groundwater is found at 2.2m bgl, in the proximity of the proposed basin.

Surface Water Runoff Quality

3.24. The runoff from RM4 will be attenuated within a basin, before discharging to the wider Mowbray Development watercourses, with multiple stages of treatment. This has been agreed as part of outline planning (DC/16/1677).

Exceedance Routes

3.25. As a result of heavy or extreme storm events it is sometimes unavoidable for the capacity of sewers and other drainage systems to be exceeded. Drainage exceedance will occur when the rate of surface water runoff exceeds the inlet capacity of the drainage system, when the receiving water or pipe system becomes overloaded, blocked or when the outfall is restricted due to flood levels in the receiving water.

3.26. As the proposed attenuation feature will be located to the lowest lying area of the site, it will be intention to ensure flows are directed away from the residential units. The routes will ultimately mimic the current flow routes associated with the existing site as a result of the topography.

3.27. The exceedance flows paths have been shown in the Proposed Drainage Strategy in **Appendix E** and Glanville's Moat Road Extension Exceedance Flow Plan, ref. MOW-GLA-MRE-PH1-D-C-1203, in **Appendix D**.

Maintenance During Construction

3.28. Once SuDS are constructed, they will not be subjected to construction traffic without appropriate protection. All buried storage will be fenced off. If construction access is required across areas where buried storage is installed, the full depth of cover over will be required, and additional temporary geogrid may be provided if necessary.

Future Maintenance

- 3.29. It is intended for the proposed drainage to be adopted by Southern Water under S104 agreement. This includes the attenuation basin, headwalls and associated piped network.
- 3.30. A maintenance plan for the proposed basin has been included with Glanville's Drainage Statement; in **Appendix D**. There has been informed by the guidance outlines with CIRIA C753 and would be supplemented by manufacturer's specifications.

4. Foul Water Drainage

Drainage Strategy at Reserved Matters (DC/24/0446)

4.1. The following section covers the Drainage Statement, outlined in Glanville Consulting's Drainage Statement, dated 6th March 2024, submitted as part of the Reserved Matters Application (DC/24/0446), shown in **Appendix D**.

4.2. As per Glanville's Foul Water Drainage Plan, ref. MOW-GLA-PH1-RM4-1105, the foul spur's have been restricted to number of dwellings, as shown in **Table 4-1**.

**Table 4-1: Approved Number of Dwellings Permitted to connect under
DC/24/0446**

POINT OF CONNECTION	SPUR LOCATION	MAXIMUM NUMBER OF DWELLINGS
A	SOUTHERN	80
B	NORTHERN	5

Proposed Foul Drainage Strategy

4.3. It is proposed for the foul drainage to be split into two catchments, with a foul water spur located to the Northern and Southern part of the site. **Table 2-2** shows the maximum number of dwellings allocated for each spur.

4.4. This falls in line with the approved Glanville's Foul Water Drainage Strategy, ref. MOW-GLA-PH1-RM4-1105, shown in **Appendix D**.

4.5. The foul drainage strategy can be found in **Appendix E**.

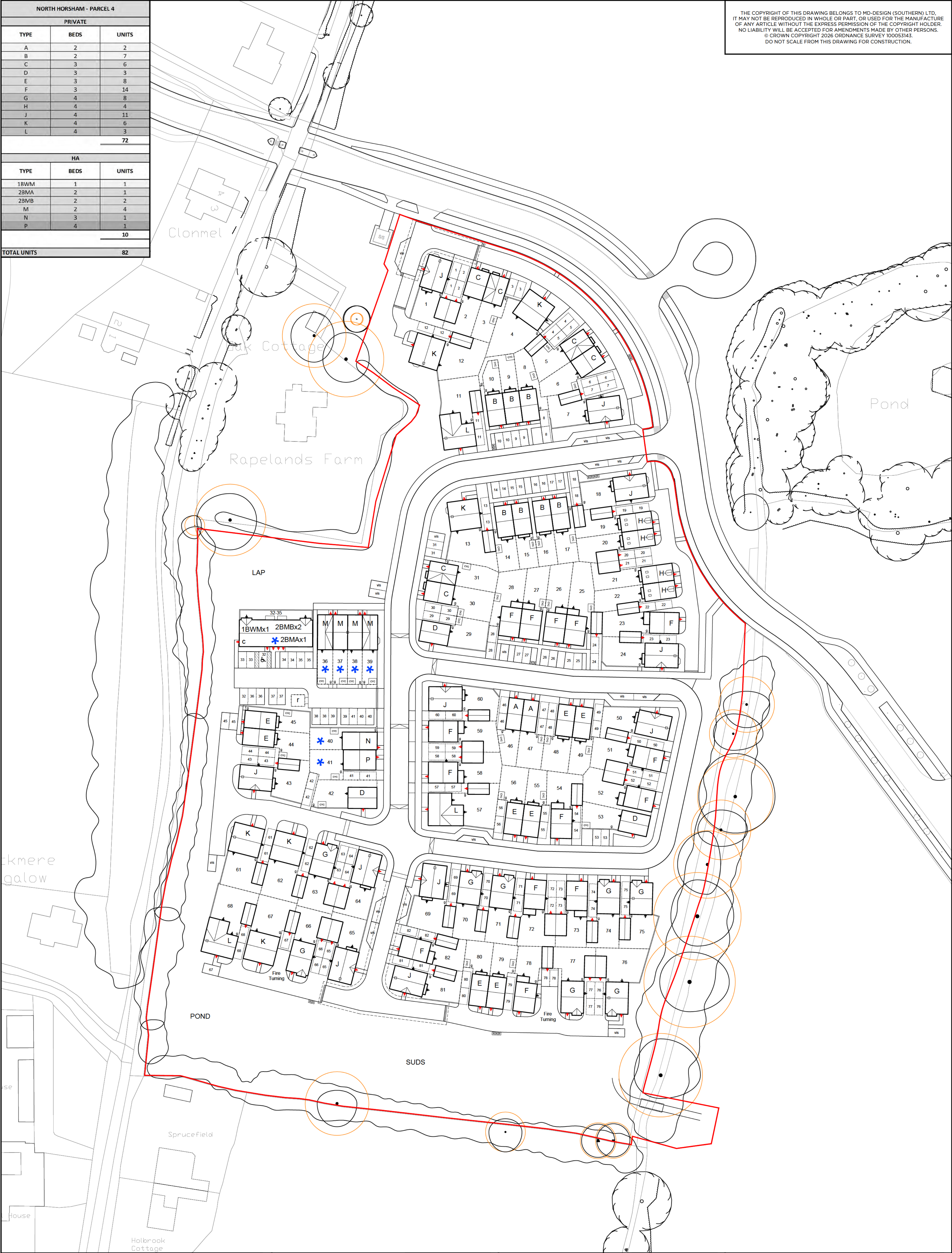
5. Conclusion

- 5.1. The development proposals are to construct a total of 82 residential dwellings and associated infrastructure.
- 5.2. The greenfield rates follow the principles outlined in the outline planning application (DC/24/0446).
- 5.3. The surface water drainage strategy comprises of a pipe surface water network within the roads. The pipe network discharges via an attenuation basin, into the sitewide drainage network, restricted to flow matching greenfield rates.
- 5.4. The SuDS management train has been set in the sitewide strategy for outline planning. The Site runoff discharges into a basin, prior to discharging to the wider Mowbray development watercourses.
- 5.5. Surface water design calculations have been carried out for the 1 in 2, 1 in 30 plus climate change and 1 in 100 plus change allowances storm events using FEH data.
- 5.6. A 20% climate change allowance was applied to the rainfall intensities, with a 40% and 45% climate change allowance for sensitivity allowance.
- 5.7. It is proposed to drainage the foul water sewers, via gravity, into the sitewide drainage network, with spurs located in Primary Road and in the south-east corner of the site.

Appendix A
Site Layout

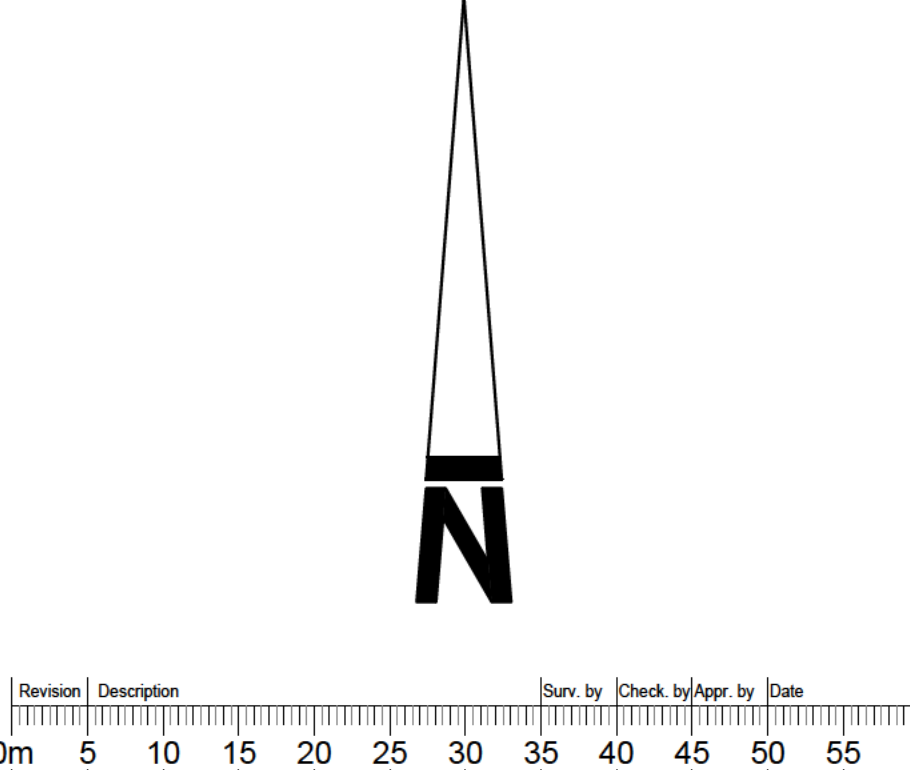
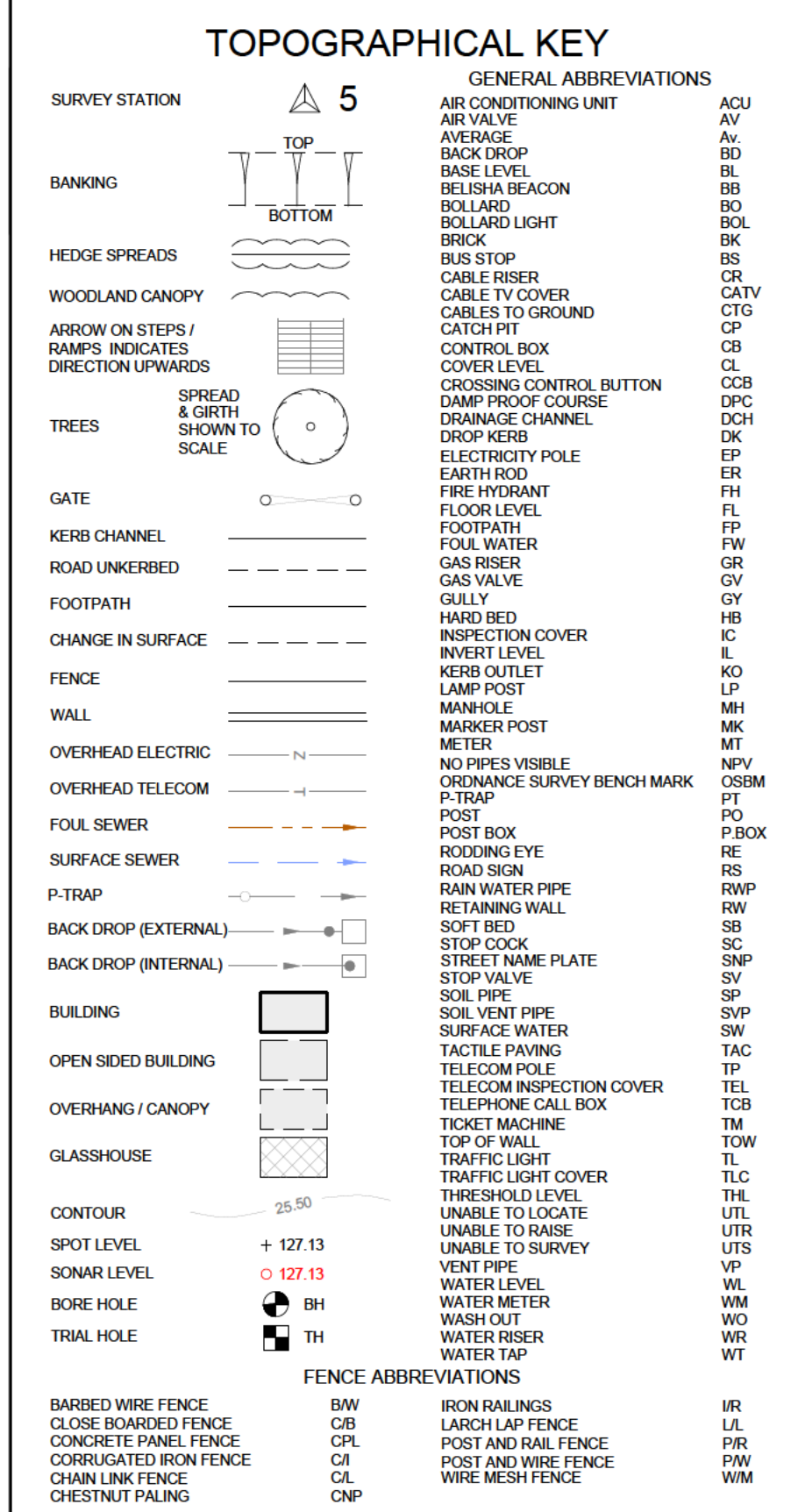
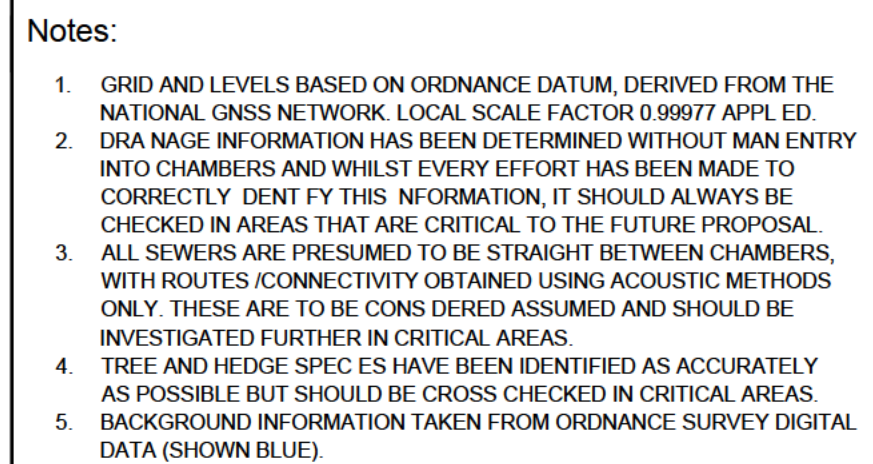
NORTH HORSHAM - PARCEL 4		
PRIVATE		
TYPE	BEDS	UNITS
A	2	2
B	2	7
C	3	6
D	3	3
E	3	8
F	3	14
G	4	8
H	4	4
J	4	11
K	4	6
L	4	3
		72
HA		
TYPE	BEDS	UNITS
1BWM	1	1
2BMA	2	1
2BMB	2	2
M	2	4
N	3	1
P	4	1
		10
TOTAL UNITS		82

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KEY Application Boundary Affordable Housing Proposed New Tree Existing Trees & Hedges Root Protection Zones Primary Entrance Gate Location Bin Collection Point Bike Storage	CLIENT: Bellway Homes Southern Counties	 0 10m 20m 30m 40m 50m	SITE: Area 4, North Horsham
MDD ARCHITECTURE + URBAN DESIGN	MDD Architecture & Urban Design 18 Mulberry Walk - Bordon Hampshire - GU35 0UL Email: info@md-design.co.uk	A Planning Issue REV: DESCRIPTION: BY: DATE: MD 12.05.26	TITLE: Site Layout
SCALE AT A1: 1:500	DATE: 12.05.26	DRAWN: MD	CHECKED: MD
PROJECT NO: BSC-010	DRAWING NO: SL-01	REVISION: A	

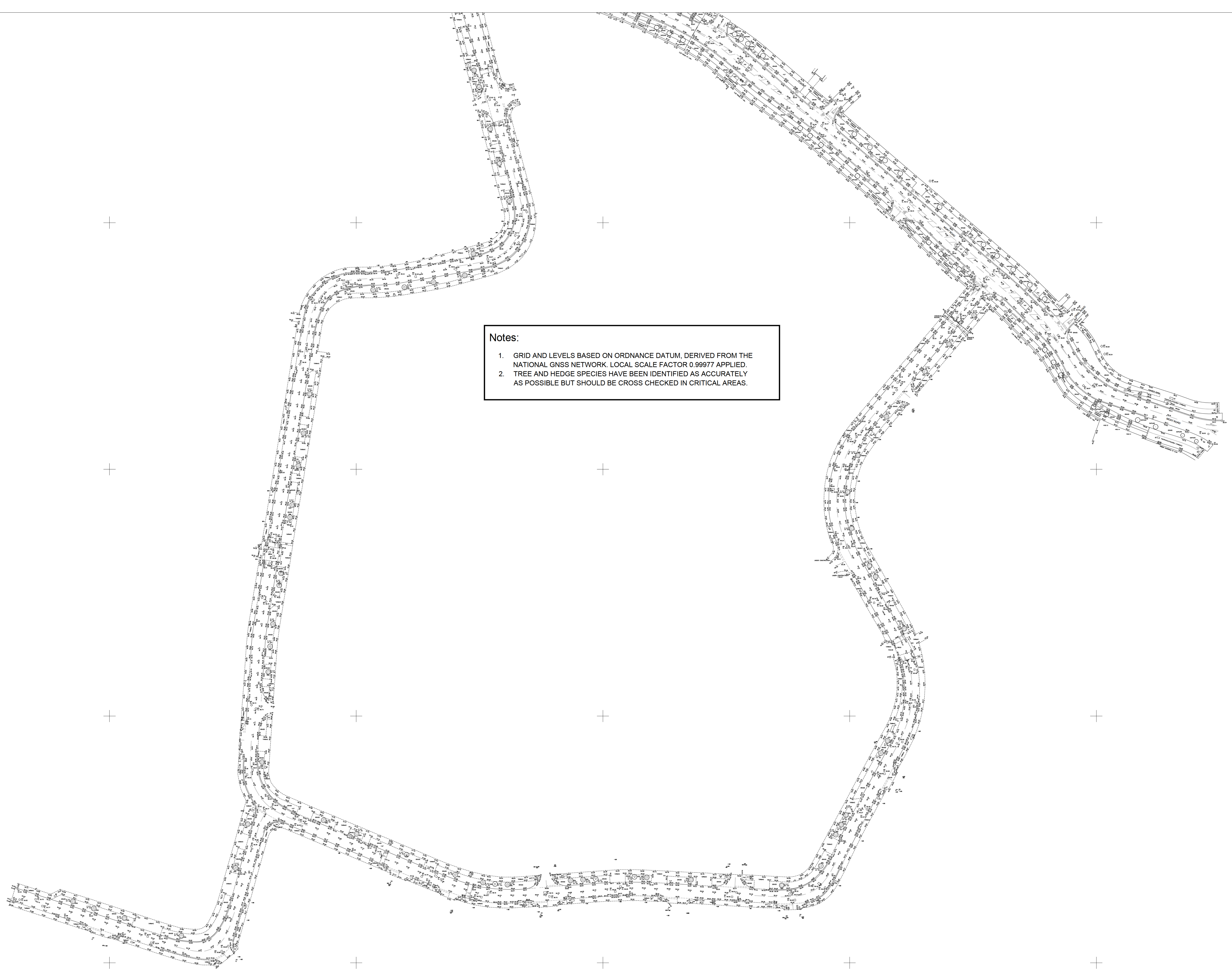
Appendix B
Topography Survey





Notes:

1. GRID AND LEVELS BASED ON ORDNANCE DATUM, DERIVED FROM THE NATIONAL GNSS NETWORK. LOCAL SCALE FACTOR 0.99977 APPLIED.
2. TREE AND HEDGE SPECIES HAVE BEEN IDENTIFIED AS ACCURATELY AS POSSIBLE BUT SHOULD BE CROSS CHECKED IN CRITICAL AREAS.



Notes:

1. GRID AND LEVELS BASED ON ORDNANCE DATUM, DERIVED FROM THE NATIONAL GNSS NETWORK. LOCAL SCALE FACTOR 0.99977 APPLIED.
2. TREE AND HEDGE SPECIES HAVE BEEN IDENTIFIED AS ACCURATELY AS POSSIBLE BUT SHOULD BE CROSS CHECKED IN CRITICAL AREAS.

Appendix C
Endeavour Drilling Ground Investigation



GROUND INVESTIGATION REPORT (FACTUAL)

Phase 1- Land North of Horsham, West Sussex
Moathouse Farm,
Rusper Road,
Horsham,
RH12 4QR,

Client: Legal & General (Strategic Land North of Horsham) Ltd

Consultant: Stantec UK Limited

March 2020

Report No: END20-007

Endeavour Drilling Ltd
Unit 7
Mapledean Industrial Estate
Maldon Road
Latchingdon
Essex
CM3 6LG

GROUND INVESTIGATION REPORT (FACTUAL)

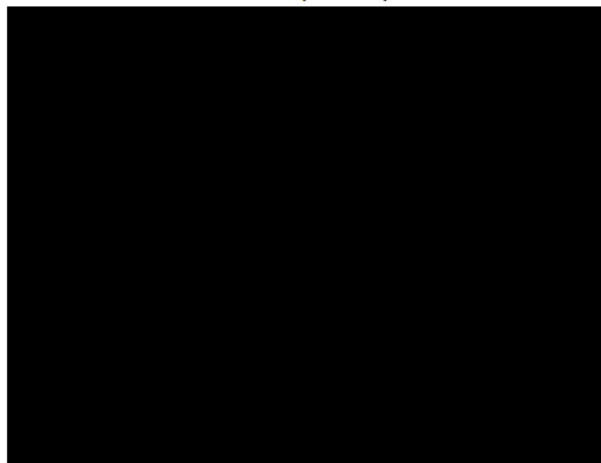
Phase 1 - Land North of Horsham, West Sussex

Author: Jake Wood BSc (Hons), FGS

Signed:

Checked By:

Signed:



Revision	Date	Description	Prepared	Checked
FINAL	19.03.20	Factual Report	JJW	OW

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APPENDIX D:	WINDOWLESS SAMPLE BOREHOLE RECORDS
APPENDIX E:	MACHINE EXCAVATED TRIAL PIT RECORDS
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APPENDIX G:	SOAKAWAY TEST RESULTS
APPENDIX H:	HAND EXCAVATED TRIAL PIT RECORDS
APPENDIX I:	MONITORING RESULTS
APPENDIX J:	GEOTECHNICAL LABORATORY RESULTS
APPENDIX K:	CHEMICAL ANALYSIS RESULTS

1. INTRODUCTION

Endeavour Drilling Limited received instruction to carry out Phase 1 ground investigations to aid in the design and construction of a proposed residential development located on Land North of Horsham, West Sussex. The nearest postcode to the site is RH12 4QR.

The ground investigation was instructed by Stantec UK Limited, on behalf of the client; Legal and General (Strategic Land North of Horsham) Ltd and comprised of eight (8) rotary core boreholes, six (6) windowless sample boreholes, fifty-six (56) machine excavated trial pits, with associated sampling and insitu testing, one (1) infiltration test, fifty-five (55) TRL-DCP insitu tests, surface water sampling from four (4) selected locations from existing water courses and finally, variable head tests were carried out at the location of two (2) rotary core boreholes. Laboratory testing, comprising of geotechnical and chemical testing was also undertaken.

It should be noted that one (1) windowless sample borehole (WS203) and one (1) machine excavated trial pit (TP209) along with its associated infiltration test was not carried out due to restricted access. Two additional (2) infiltration tests were not carried out at TP247 and TP252 due to groundwater accumulating in the trial pit. One (1) TRL-DCP was abandoned at TP233 due to services in close proximity.

Semi-permanent groundwater standpipes were installed within all of the rotary core boreholes and all of the window sample boreholes for future gas and groundwater monitoring.

This report presents the factual findings of the ground investigation, together with the results of the geotechnical and chemical laboratory testing.

Where applicable, investigation techniques, sampling, logging of soils and insitu testing complied with the requirements of British Standard BS5930: 2015 – ‘Code of Practice for Site Investigations’.

2. LIMITATIONS

This report is based upon the results of the ground investigation and on details of the scheme provided by the consultant; Stantec.

This report has been prepared for the benefit of Legal and General (Strategic Land North of Horsham) Ltd and its contents should not be relied upon by others without the written authority of Endeavour Drilling Limited (ED).

If any unauthorised third party makes use of this report they do so at their own risk and ED owes them no duty of care or skill.

All information provided by others is taken in good faith as being accurate, but ED cannot and does not accept any liability for the detailed accuracy, errors, or omissions within such information.

Subsoils are by their nature hidden from view and no investigation can be exhaustive to the extent that all ground conditions are revealed. Conditions may well be present beneath the site which were not evident from the investigations carried out.

3. FIELDWORK

The fieldwork was undertaken between the 28th November and 20th December 2019 and comprised the following:

- Eight (8) rotary core boreholes formed to final depths of between 8.0mbgl and 19.50mbgl.
- Six (6) windowless sample boreholes drilled to depths of between 1.75mbgl and 4.80mbgl.
- Fifty-six (56) machine excavated trial pits were formed to depths ranging from between 0.50m and 4.0mbgl.
- One (1) soakaway test carried out in accordance with BRE365, within one trial pit.
- Fifty-six (55) dynamic cone penetration tests (TRL-DCPs) were completed from surface.
- Six (6) falling head tests carried out at the location of two rotary core boreholes.
- Four (4) water samples selected locations from existing water courses.
- Groundwater and gas monitoring totalling six (6) visits.

The exploratory hole positions for the ground investigation were predetermined by a representative of Stantec prior to undertaking the fieldwork. An exploratory hole location plan is presented as Figure 1 in Appendix A.

All exploratory positions were service traced with Ground Penetrating Radar and subsequently scanned using a Cable Avoidance Tool (CAT), for the presence of underground buried services by suitably trained ED staff.

3.1. Rotary Cored Boreholes

In total, eight rotary boreholes utilising a Comacchio 205 track-mounted rotary drilling rig, employing a PWF triple tube core barrel utilising a water drilling flush method were completed. This rotary drilling method is designed to maximise core recovery and produces 93mm diameter core retrieved in rigid plastic liners. Dynamic sampling techniques commenced from between 1.20mbgl and 3.00mbgl in cohesive strata, whilst rotary rock coring commenced from between 2.0 and 3.0mbgl once mudstone was encountered and to target depth.

Disturbed and environmental samples were recovered from the cohesive strata for possible future geotechnical and chemical analysis.

Standard or Cone Penetration Tests (SPT / CPT) were undertaken using an automatic trip hammer at 1.00m intervals to 6.0mbgl and at 1.50m centres where possible to target depth. The number of blows required to advance a standard split spoon over the final 300mm of a 450mm total drive was recorded and is shown on the borehole records as the penetration resistance ('N' value).

The retrieved plastic core liners were split open to expose the core and to allow detailed logging and photography by an engineering geologist. In addition, selected sub samples were taken of appropriately sized intact core to allow for laboratory testing.

Upon completion a combination of 19mm and 50mm HDPE standpipes were installed and finished at surface with a raised cover. The design of the standpipes can be summarised in Table 1 below.

Table 1: Standpipe Design (Rotary Core)

BH No.	Standpipe Diameter (mm)	Slotted Section (mbgl)	Plain Section (mbgl)	Gravel Surround (mbgl)	Bentonite Seal (mbgl)
BH201	50	1.00 – 6.00	GL – 1.00	1.00 – 6.00	0.20 – 1.00
BH202	19	1.00 – 7.00	GL – 1.00	1.00 – 7.00	0.20 – 1.00
BH203	50	1.00 – 6.00	GL – 1.00	1.00 – 6.00	0.20 – 1.00
BH204	50	1.00 – 6.00	GL – 1.00	1.00 – 6.00	0.20 – 1.00
BH205	50	1.00 – 6.00	GL – 1.00	1.00 – 6.00	0.20 – 1.00
BH206	50	1.00 – 6.00	GL – 1.00	1.00 – 6.00	0.20 – 1.00
BH207	19	6.00 – 7.00	GL – 6.00	6.00 – 7.00	0.20 – 6.00
BH208	50	1.00 – 6.00	GL – 1.00	1.00 – 6.00	0.20 – 1.00

The rotary cored borehole logs are presented in Appendix B and give both descriptions and depths of strata encountered, together with details of samples taken, in-situ tests, photographs and any other relevant information.

3.2. Falling Head Test

In total, six falling head tests were carried out within rotary boreholes BH202 and BH207, during the drilling process at depths of 2mbgl, 4mbgl and 6mbgl and as specified by the consultant Stantec UK Ltd.

All permeability tests were carried out in accordance with BS 5930:1999. The results of the tests are given within Appendix C.

It should be noted that it was not possible to calculate the permeability due to a low rate of fall.

3.3. Windowless Sample boreholes

In total, six windowless sample boreholes were completed utilising a Dando Terrier rig operated by a two-man crew. These rigs use hydraulics to lift a percussive hammer to drive a series of small diameter tubes into the ground.

It should be noted that all window samples were terminated prior to reaching target depth, were further driving would have caused loss or damage of equipment. Further details are shown in the remarks section on the typed logs.

Three window samples (WS202, WS204, WS205) were terminated due to encountering services whilst hand pitting prior to drilling. These inspection pits were backfilled with arisings and reinstated.

Small disturbed and larger bulk samples were recovered from throughout the window samples for possible future chemical and geotechnical testing. Samples required for chemical analysis were recovered in plastic containers and then stored in refrigerated cool boxes for transport to the analytical laboratory.

Standard Penetration Tests (SPT / CPT), were undertaken at 1.20mbgl at the bottom of each inspection pit and 1.00m intervals to the base of the borehole.

Upon completion 50mm diameter HDPE groundwater standpipes were installed within all window samples and finished at surface with either a flush or raised cover. The design of the standpipes can be summarised in Table 2 overleaf.

Table 2: Standpipe Design (Windowless Samples)

BH No.	Diameter (mm)	Slotted Section (mbgl)	Plain Section (mbgl)	Gravel Surround (mbgl)	Bentonite Seal (mbgl)
WS201	50	1.00 – 2.00	GL – 1.00	1.00 – 2.00	0.20 – 1.00
WS202A	50	0.80 – 1.80	GL – 0.80	0.80 – 1.80	0.20 – 0.80
WS204A	50	1.00 – 2.00	GL – 1.00	1.00 – 2.00	0.20 – 1.00
WS205A	50	0.60 – 1.60	GL – 0.60	0.60 – 1.60	0.20 – 0.60
WS206	50	1.00 – 2.00	GL – 1.00	1.00 – 2.00	0.20 – 1.00
WS207A	50	1.00 – 4.50	GL – 1.00	1.00 – 4.50	0.20 – 1.00

The windowless sample borehole records are presented in Appendix D and give both descriptions and depths of strata encountered, together with details of samples taken.

3.4. **Machine Excavated Trial Pits**

In total, fifty-six trial pits were mechanically excavated utilising both an eight tonne and thirteen tonne tracked excavator. Each trial pit was formed to a depth ranging from 0.50mbgl (TP233) to 4.00mbgl (various).

It should be noted that TP233 was terminated at 0.50mbgl prior to reaching target depth due to encountering a suspected water pipe.

Small disturbed and larger bulk samples were recovered from throughout the window samples for possible future chemical and geotechnical testing. Samples required for chemical analysis were recovered in plastic containers and then stored in refrigerated cool boxes for transport to the analytical laboratory.

A note was made of any groundwater encountered, and of the stability of the trial pit sides during excavation.

The trial pit logs are presented in Appendix E and give both descriptions and depths of the strata encountered, together with details of samples taken, insitu tests, and any other relevant information.

3.5. TRL-DCP Insitu Tests

In total, fifty-five TRL-DCP tests were completed from surface.

The TRL-DCP uses an 8kg hammer dropping over a height of 575mm and a 60° cone that has a maximum diameter of 20mm. The instrument is held vertically. A hammer is lifted to the handle before the operator lets it fall freely to achieve penetration of the ground surface.

Penetration readings are taken in increments of 100mm and the number of blows between each reading is recorded and is proportional to the insitu density of the material encountered.

The results are presented in Appendix F.

3.6. Soakaway Testing

One soakaway test was carried out within one trial pit (TP202) utilising a thirteen tonne tracked excavator. This test was carried out at a targeted depth specified by the Consultant and were undertaken in general accordance with BRE Digest 365 “Soakaway Design” 2007.

The dimensions of the pit were measured and then filled with water, the fall in water level was measured at regular intervals in order that infiltration rates may be calculated.

The results are presented in Appendix G.

3.7. Hand Excavated Trial Pits

In total, three trial pits were hand excavated utilising insulated hand tools to gather additional environmental samples for possible future chemical analysis. Each hand pit was formed to a target depth of 1.20mbgl.

A note was made of any groundwater encountered, and of the stability of the trial pit sides during excavation.

The hand pits logs are presented in Appendix H and give both descriptions and depths of the strata encountered, together with details of samples taken, insitu tests, and any other relevant information.

3.8. Gas & Groundwater Monitoring

The standpipes as detailed in Table 1 and 2 above, have been monitored by a ED technician every two weeks for a period of twelve weeks, totalling six visits for methane, carbon dioxide and oxygen using a GA2000 Infra-Red Gas Analyser. Atmospheric pressure, gas flow rate and water levels were also recorded during each visit. The groundwater monitoring results are presented in appendix I.

3.9. Geology

The British Geological Survey 1:50,000 scale, Solid and Drift Edition, indicates that majority of the site is underlain by the Weald Clay Formation. At Moathouse Farm an ironstone band can be found that runs in an East-West trend and Alluvium is present to the South East of the site near Channels Brook.

4. LABORATORY TESTING

The laboratory testing programme comprised of both geotechnical and chemical testing for use in classifying and assessing the ground conditions encountered.

Laboratory testing was undertaken by UKAS / MCERTS accredited laboratories; the geotechnical testing by I2 Analytical and chemical analysis by ALS Environmental. The results are included in Appendices J and K respectively.

4.1. Geotechnical Testing

The geotechnical laboratory testing was undertaken to provide classification and strength data on selected samples.

Twenty-seven samples were tested for moisture content to enable the material to be classified and its engineering behaviour assessed in accordance with BS1377, Part 2:1990; clause 3.2, 4.4, 5.3 and 5.4.

Atterberg limits were determined for Twenty-seven samples of cohesive material to enable the material to be classified and its engineering behaviour assessed in accordance with BS1377, Part 2:1990; clause 3.2, 4.4, 5.3 and 5.4.

Twenty-five particle size distribution tests were carried out, using the wet sieve method. These tests were undertaken in accordance with BS1377, Part 2:1990; clause 9.

The quantitative determination of the particle size distribution for fine soils, from coarse silt to clay was undertaken on eighteen samples, assessed in accordance with BS1377, Part 2: 1990, clause 9.4, using the sedimentation by pipette method.

Fifty-six samples were tested for shear strength using a calibrated laboratory hand shear vane.

Twelve samples were tested for dry density and moisture content relationship in accordance with BS1377, Part 4:1990; clause 3.5 for heavy compaction using a 2.50kg rammer with a freefall height of 450mm.

Fourteen uniaxial compressive strength tests were performed on suitable samples of rock, with the deformation in uniaxial compression also being recorded together with seventeen point load tests. All tests were undertaken in general accordance with ISRM suggested methods 1981-1985.

4.2. Chemical Testing

Thirty-seven samples of soil were analysed for a comprehensive range of determinants summarised in Tables 3 to 5 presented below:

Table 3: Stantec basic soil suite

<i>Arsenic</i>	<i>Zinc</i>
<i>Cadmium</i>	<i>Water Soluble Sulphate</i>
<i>Chromium</i>	<i>TPH – CWG (C5 - 35)</i>
<i>Copper</i>	<i>Speciated PAH</i>
<i>Lead</i>	<i>Phenols</i>
<i>Mercury</i>	<i>Asbestos Screen</i>
<i>Nickel</i>	<i>Soil Organic Matter</i>
<i>Selenium</i> <i>Polychlorinated Biphenyls (PCB)</i>	<i>pH</i>

Table 4: Stantec herbicides soil suite

<i>Organophosphorus</i>	<i>Triazine Herbicides</i>
<i>Organochlorine</i>	<i>Acid Herbicides</i>

Table 5: Stantec geochemical test suite

<i>Asbestos Quantification by Gravimetric Analysis</i>	<i>Asbestos Quantification by Phase Contrast Optical Microscopy</i>
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In order to evaluate any aggressive tendency of the sub soil to buried concrete, thirteen soil samples were analysed in accordance with the BRE SD1 Suite, comprising pH, total sulphate, total sulphide, water soluble sulphate, chloride, nitrate and magnesium.

A total of eleven water samples were recovered during the second round of monitoring and were analysed for a comprehensive range of determinants summarised in Table 6 and Table 7 below:

Table 6: Stantec basic water suite

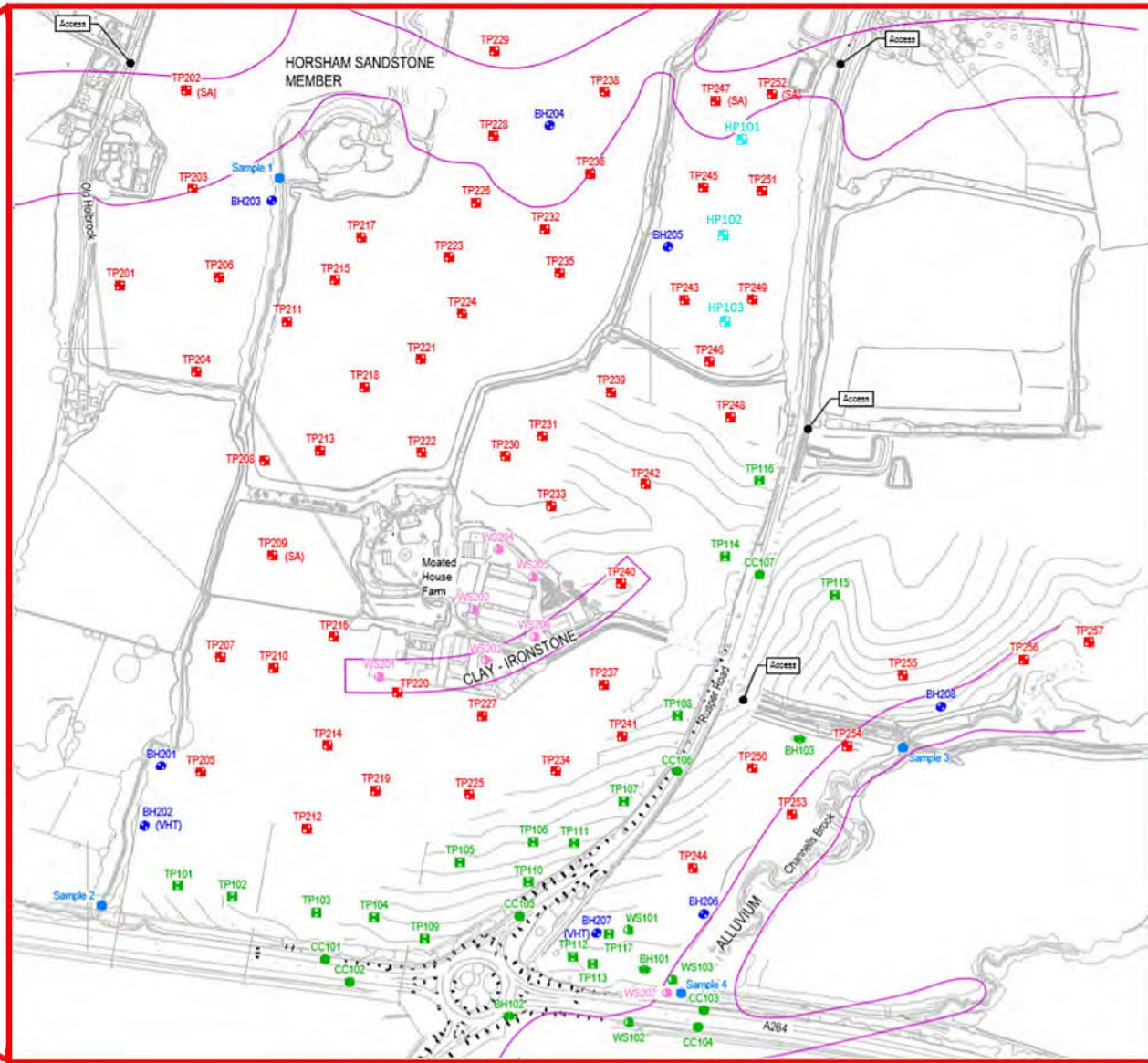
<i>Arsenic</i>	<i>Chloride</i>
<i>Cadmium</i>	<i>Water Soluble Sulphate</i>
<i>Chromium</i>	<i>TPH – CWG (C5 - 35)</i>
<i>Copper</i>	<i>Speciated PAH</i>
<i>Lead</i>	<i>Phenols</i>
<i>Mercury</i>	<i>pH</i>
<i>Nickel</i>	<i>Calcium</i>
<i>Selenium</i> <i>Polychlorinated Biphenyls (PCB)</i>	<i>Dissolved Organic Carbon</i>
<i>Zinc</i>	<i>Total Alkalinity</i>
<i>Ammoniacal Nitrogen</i>	<i>Electrical Conductivity</i>

Table 7: Stantec herbicides water suite

<i>Pesticides Suite I</i>	<i>Pesticides Suite III</i>
<i>Pesticides Suite II</i>	

APPENDIX A

Site Location Plan



PROJECT:
PHASE 1 LAND NORTH OF HORSHAM, WEST SUSSEX

CLIENT:
LEGAL AND GENERAL LTD



SCALE:	JOB No.
NTS	J4175
DRAWN:	DATE:
JJW	29/01/20
CHECKED:	
MJS	

TITLE:
EXPLORATORY HOLE LOCATION PLAN

KEY:

- Deep Boreholes
- Trial Pit
- Windowless Sample Borehole
- Surface Water Sample Location
- Hand Pit
- (SA) Soakaway Location
- (VHT) Variable Head Test Location
- Existing Exploratory Hole Locations (Hydrock, 2019)

REV:	DATE:	DETAILS:	DRW:	GHK:
DWG No:	FIGURE 1		REV:	

APPENDIX B

Rotary Core Borehole Records

	Contract Name: P1, Land North of Horsham, West Sussex			Client: Legal and General (Strategic Land North of Horsham) Ltd			Borehole ID: BH203																												
	Contract Number: J4175	Date Started: 06/12/2019	Logged By: OW	Checked By: MJS	Status: FINAL	Sheet 1 of 2																													
	Geobore 'S' Rotary Drilling Log	Easting: 518663.6	Northing: 134139.8	Ground Level: 62.05mOD	Plant Used: Comacchio205	Print Date: 21/02/2020	Scale: 1:50																												
Weather: Frequent showers			Termination: Reached target depth			SPT Hammer: SPT5 Energy Ratio: 65%																													
Samples & In Situ Testing						Strata Details			Groundwater																										
Depth	TCR	SCR	RQD	FI	Sample	SPT	Level (mAOD)	Legend	Depth (m) (Thickness)	Strata Description	Water Strike	Backfill Installation																							
1.20 - 2.00	100	0	0		0.50 ES1	SPT(C) 1.20m, N=29 (2,2/6,7,9,7)	61.85		0.20	TOP SOIL - Dark brown sandy CLAY with frequent rootlets <2mm (living). Firm light brown mottled orangish brown and light grey sandy CLAY. (RESIDUAL WEALD CLAY FORMATION)																									
					60.85		1.20																												
2.00 - 3.00	100	23	0	10	1.10 ES2	SPT(C) 2.00m, N=34 (4,6/8,8,8,10)	60.65		1.40	Firm to stiff light brown mottled orangish brown and slight grey slightly silty CLAY. (RESIDUAL WEALD CLAY FORMATION)																									
					59.65		2.40																												
3.00 - 4.00	100	45	0	18	1.80 - 2.00 D1	SPT(C) 3.00m, 100 (8,11/100 for 200mm)	58.75		3.30	Very stiff dark brownish orange sandy CLAY thinly laminated with extremely weak dark brown bluish grey mudstone recovered as fine to coarse angular to sub-angular gravel. (DESTRUCTURED WEALD CLAY FORMATION)																									
					(0.90)				3.30																										
4.00 - 5.00	100	30	0	24	2.84 - 2.92 C1	SPT(C) 4.00m, N=74 (10,12/12,12,20,30)	58.05		4.00	Very weak thin laminated to thinly bedded MUDSTONE. Fractures are horizontal very closely to closely spaced (4-10-31) planar with rough and smooth surfaces. Apertures are open to moderately wide and clean. Weathering is dark orange penetrating up to 20mm along fractured surfaces and with frequent bands recovered as stiff silty clay. (PARTIALLY WEATHERED WEALD CLAY FORMATION)																									
					(0.70)				4.00																										
5.00 - 6.00	75	0	0	15	3.48 - 3.57 C2	SPT(C) 5.00m, 100 (10,13/100 for 285mm)	56.05		6.00	Very stiff dark grey and dark orangish brown slightly sandy CLAY thickly interbedded with extremely weak partially weathered to very weak dark grey weathered dark orangish brown thickly laminated mudstone. Fractures are horizontal extremely close to very closely spaced (2-21-60mm) planar with rough and smooth surfaces. Apertures are open to tight wide and clean. Weathering penetrating up to 15mm and distinctly to partially weathered. (DISTINCTLY TO PARTIALLY WEATHERED WEALD CLAY FORMATION)																									
					6.80 - 6.98 C5				6.00																										
6.00 - 7.50	95	69	33	13	4.20 - 4.76 C3	SPT(C) 6.00m, 100 (20,5/100 for 145mm)			6.00	Very weak to weak dark grey thin to thickly laminated MUDSTONE with rare bands recovered as very stiff silty clay. Fractures are horizontal to sub-horizontal extremely closely to very closely spaced (3-180-61mm) planar with rough to smooth surfaces. Apertures are tight to open with clay infilling and clean. (UNWEATHERED WEALD CLAY FORMATION)																									
					6.80 - 6.98 C5				6.00																										
7.50 - 9.00	79	77	45	13	5.82 - 6.00 C4	SPT(C) 7.50m, 100 (25 for 75mm/100 for 45mm)			6.00	Very weak to weak dark grey thin to thickly laminated MUDSTONE with rare bands recovered as very stiff silty clay. Fractures are horizontal to sub-horizontal extremely closely to very closely spaced (3-180-61mm) planar with rough to smooth surfaces. Apertures are tight to open with clay infilling and clean. (UNWEATHERED WEALD CLAY FORMATION)																									
					6.80 - 6.98 C5				6.00																										
9.00 - 10.50	98	65	11	14	6.80 - 6.98 C5	SPT(C) 9.00m, 100 (21,4/100 for 135mm)			6.00	Very weak to weak dark grey thin to thickly laminated MUDSTONE with rare bands recovered as very stiff silty clay. Fractures are horizontal to sub-horizontal extremely closely to very closely spaced (3-180-61mm) planar with rough to smooth surfaces. Apertures are tight to open with clay infilling and clean. (UNWEATHERED WEALD CLAY FORMATION)																									
					6.80 - 6.98 C5				6.00																										
Start & End of Shift Observations <table border="1"> <tr> <th>Date</th> <th>Time</th> <th>Depth (m)</th> <th>Casing (m)</th> <th>Water (m)</th> </tr> <tr> <td>06-12-2019</td> <td>16:30</td> <td>4.00</td> <td></td> <td></td> </tr> <tr> <td>09-12-2019</td> <td>16:30</td> <td>12.00</td> <td></td> <td></td> </tr> </table> Borehole Diameter <table border="1"> <tr> <th>Depth (m)</th> <th>Dia (mm)</th> </tr> <tr> <td>1.20</td> <td>300</td> </tr> </table> Casing Diameter <table border="1"> <tr> <th>Depth (m)</th> <th>Dia (mm)</th> </tr> <tr> <td></td> <td></td> </tr> </table>													Date	Time	Depth (m)	Casing (m)	Water (m)	06-12-2019	16:30	4.00			09-12-2019	16:30	12.00			Depth (m)	Dia (mm)	1.20	300	Depth (m)	Dia (mm)		
Date	Time	Depth (m)	Casing (m)	Water (m)																															
06-12-2019	16:30	4.00																																	
09-12-2019	16:30	12.00																																	
Depth (m)	Dia (mm)																																		
1.20	300																																		
Depth (m)	Dia (mm)																																		

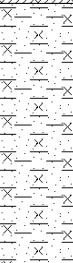
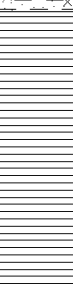
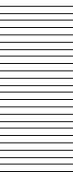
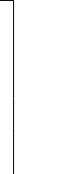
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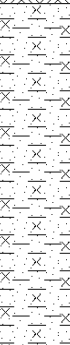
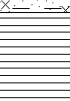
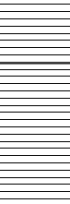
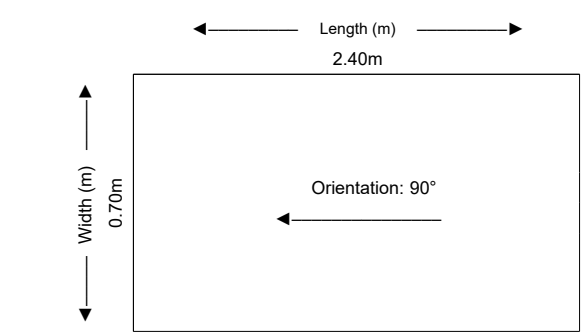
1. Inspection pit hand excavated to 1.20mbgl.

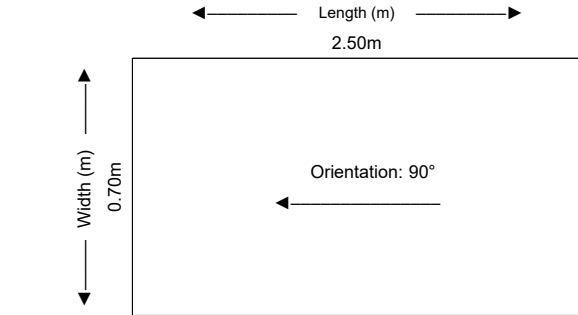
	Contract Name: P1, Land North of Horsham, West Sussex				Client: Legal and General (Strategic Land North of Horsham) Ltd			Borehole ID: BH203						
	Contract Number: J4175		Date Started: 06/12/2019		Logged By: OW		Checked By: MJS		Status: FINAL					
	Easting: 518663.6		Northing: 134139.8		Ground Level: 62.05mOD		Plant Used: Comacchio205		Print Date: 21/02/2020					
Geobore 'S' Rotary Drilling Log								Sheet 2 of 2 Scale: 1:50						
Weather: Frequent showers				Termination: Reached target depth				SPT Hammer: SPT5 Energy Ratio: 65%						
Samples & In Situ Testing						Strata Details				Groundwater				
Depth	TCR	SCR	RQD	FI	Sample	SPT	Level (mAOD)	Legend	Depth (m) (Thickness)	Strata Description	Water Strike	Backfill/ Installation		
10.50 - 12.00	100	83	37	8	10.90 - 11.20 C8	SPT(C) 10.50m, 100 (25 for 0mm/100 for 10mm)				...between 10.50 to 12.0m fractures are horizontal to sub-horizontal (20-260-93mm extremely closely to medium spaced planar with rough to smooth surfaces. Apertures are tight to open with frequent clay infilling.	11			
						SPT(C) 12.00m, 100 (25 for 0mm/100 for 10mm)	50.05		12.00	End of Borehole at 12.00m	12			
											13			
											14			
											15			
											16			
											17			
											18			
											19			
											20			
Start & End of Shift Observations						Borehole Diameter		Casing Diameter		Remarks:				
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)	1. Inspection pit hand excavated to 1.20mbgl.					
06-12-2019	16:30	4.00			1.20	300								
09-12-2019	16:30	12.00												
Flush Information						Installation				Water Strikes				
Top (m)	Base (m)	Flush Type	Return	Flush Colour	Top (m)	Base (m)	Type	Dia (mm)	Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
					0.00	1.00	PLAIN	50						
					1.00	6.00	SLOTTED	50						
Fracture spacing reported as Index average over 1m. TCR, SCR and RQD reported in %														
HBSI RC Issue Number: 1 Issue Date: 21/04/2017 Author: CG														

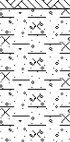
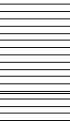
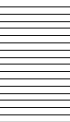
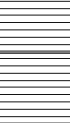
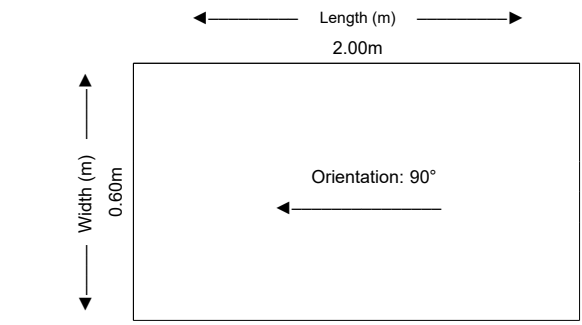
APPENDIX E

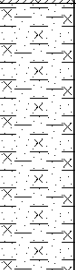
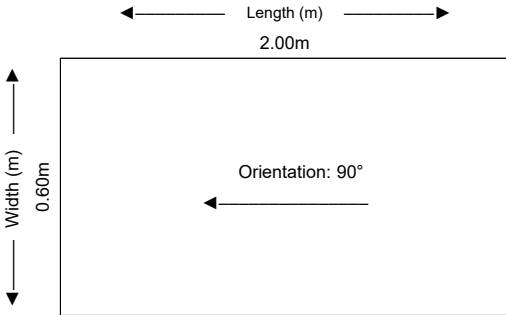
Machine Excavated Trial Pit Records

	Contract Name: P1, Land North of Horsham, West Sussex		Client: Legal and General (Strategic Land North of Horsham) Ltd			Trial Pit ID: TP201					
	Contract Number: J4175	Date Started: 03/12/2019	Logged By: RAF	Checked By: MJS	Status: FINAL	Sheet 1 of 1					
Trial Pit Log		Easting: 518531.9	Northing: 134064.6	Ground Level: 60.24mOD	Plant Used: 13T Excavator	Date Printed: 21/02/2020	Scale: 1:30				
Weather: Dry/Sunny			Termination: Reached target depth			Stability: Good					
Samples & In Situ Testing				Strata Details			Water	Backfill			
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description					
0.10 0.10	D1 ES1	HV 0.50m, 73kPa	59.94	(0.30)		TOP SOIL - Brown silty sandy CLAY.	1				
0.50	ES2			0.30		Firm to stiff light grey and orange silty sandy CLAY. [RESIDUAL WEALD CLAY FORMATION]					
		HV 1.00m, 95kPa	58.84	(1.10)		Light bluish grey and light brown mottled black extremely weak to weak MUDSTONE with occasional thinly laminated clay (<6mm) recovered as sandy fine to coarse angular gravel. [DESTRUCTURED WEALD CLAY FORMATION]	2				
1.50	B1			1.40		Light brown mottled blue grey and black very weak to moderately weak MUDSTONE. Recovered as sandy fine to coarse angular gravel and occasional cobbles. (DISTINCTLY WEATHERED WEALD CLAY FORMATION)					
2.40 2.50	B2 B3		57.74	2.50		Grey brown mottled black and reddish orange weak to moderately weak MUDSTONE with light blueish grey thinly laminated (<6mm) silty clay. Recovered as sandy fine to coarse angular gravel and occasional cobbles. (DISTINCTLY WEATHERED WEALD CLAY FORMATION)	3				
				(0.80)							
3.30	B4		56.94	3.30			4				
				(0.70)							
			56.24	4.00		End of Trial Pit at 4.00m					
Dimensions:						General Remarks:					
Final Depth: 4.00m						1. Trial pit machine excavated to 4.0mbgl. 2. No groundwater encountered 3. Backfilled with arisings on completion.					
← Length (m) → 2.00m ↑ Width (m) ↓ 0.60m Orientation: 90° ←											
Inclination: °						Water Strikes					
						Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
						HBSI TP Template Issue Number: 1 Issue Date: 09/06/2015					

		Contract Name: P1, Land North of Horsham, West Sussex		Client: Legal and General (Strategic Land North of Horsham) Ltd			Trial Pit ID: TP202																				
		Contract Number: J4175	Date Started: 02/12/2019	Logged By: RAF	Checked By: MJS	Status: FINAL	Sheet 1 of 1																				
Trial Pit Log		Easting: 518586.7	Northing: 134237.1	Ground Level: 67.15mOD	Plant Used: 13T Excavator	Date Printed: 21/02/2020	Scale: 1:30																				
Weather: Dry/Sunny			Termination: Refusal at 3.0mbgl			Stability: Unstable																					
Samples & In Situ Testing				Strata Details				Water	Backfill																		
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description																					
0.10 0.10	D1 ES1	HV 0.50m, 70kPa HV 1.00m, 60kPa	66.75	0.40		TOP SOIL - Brown slightly gravelly silty sandy CLAY with occasional rootlets <2mm (living).		1																			
0.50 0.50	B1 ES2			0.40		Firm light bluish grey mottled dark orangish brown slightly sandy silty CLAY with occasional rootlets <2mm (dead). [RESIDUAL WEALD CLAY FORMATION]																					
1.50	D2	HV 1.50m, 62kPa	65.35	1.80		Light bluish grey and light brown extremely weak MUDSTONE. Recovered as sandy clayey fine to coarse sub-angular gravel. [DESTRUCTURED WEALD CLAY FORMATION]		2																			
2.40	B2		64.75	2.40		Light brown mottled blue grey and orange extremely weak to very weak MUDSTONE. Recovered as sandy clayey fine to coarse sub-angular gravel. [DESTRUCTURED WEALD CLAY FORMATION]		3																			
			64.15	3.00		End of Trial Pit at 3.00m		4																			
Dimensions:					General Remarks:																						
Final Depth: 3.00m					1. Trial pit machine excavated to 3.0mbgl. 2. Ground water encountered at 0.80mbgl (moderate inflow) 3. Soak away test carried out from 1.65mbgl 4. Trial pit unstable, 20mm gravel infill to 0.60mbgl 5. Gravel removed and backfilled with arisings on completion.																						
					<table><tr><th colspan="6">Water Strikes</th></tr><tr><th>Strike (m)</th><th>Casing (m)</th><th>Sealed (m)</th><th>Time (mins)</th><th>Rose to (m)</th><th>Remarks</th></tr><tr><td>0.80</td><td></td><td></td><td>0</td><td></td><td>Moderate inflow</td></tr></table>					Water Strikes						Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks	0.80			0		Moderate inflow
Water Strikes																											
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks																						
0.80			0		Moderate inflow																						
Inclination: °					HBSI TP Template Issue Number: 1 Issue Date: 09/06/2015																						

		Contract Name:		Client:		Trial Pit ID:					
		P1, Land North of Horsham, West Sussex		Legal and General (Strategic Land North of Horsham) Ltd		TP203					
Trial Pit Log		Contract Number:	Date Started:	Logged By:	Checked By:	Status:	Sheet 1 of 1				
		J4175	02/12/2019	RAF	MJS	FINAL					
		Easting:	Northing:	Ground Level:	Plant Used:	Date Printed:	Scale:				
		518610.8	134148.8	64.12mOD	13T Excavator	21/02/2020	1:30				
Weather: Dry/Sunny			Termination: Refusal at 3.60mbgl			Stability: Good					
Samples & In Situ Testing				Strata Details			Water	Backfill			
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description					
0.10 0.10	D1 ES1	HV 0.50m, 70kPa HV 1.00m, 70kPa	63.77	(0.35)		TOP SOIL - Dark brown slightly sandy slightly gravelly silty CLAY with occasional rootlets <2mm (living).	1				
0.50 0.50	B1 ES2			0.35		Firm light blueish grey mottled orange and grey slightly sandy slightly gravelly silty CLAY. Gravel is fine to medium sub-angular weak mudstone. [RESIDUAL WEALD CLAY FORMATION]					
				(1.75)							
1.50	D2	HV 1.50m, 68kPa	62.02	2.10		Light bluish grey mottled light brown and black extremely weak to weak MUDSTONE. Recovered as clayey sandy fine to coarse sub-angular gravel. [DESTRUCTURED WEALD CLAY FORMATION]	2				
2.10	B2	HV 2.00m, 67kPa		(1.20)							
3.10	D3	HV 3.00m, 67kPa	60.82	3.30		Dark reddish brown and brownish orange very weak to moderately weak MUDSTONE. Recovered as sandy fine to coarse sub-angular gravel and occasional cobbles. [DESTRUCTURED WEALD CLAY FORMATION]	3				
3.40	B3			(0.30)							
				60.52	3.60	End of Trial Pit at 3.60m					
							4				
Dimensions:					General Remarks:						
Final Depth: 3.60m					1. Trial pit machine excavated to 3.60mbgl. 2. No groundwater encountered 3. Backfilled with arisings on completion.						
											
Inclination: °											
						Water Strikes					
Strike (m)		Casing (m)		Sealed (m)		Time (mins)		Rose to (m)		Remarks	
HBSI TP Template Issue Number: 1 Issue Date: 09/06/2015											

		Contract Name:		Client:		Trial Pit ID:				
		P1, Land North of Horsham, West Sussex		Legal and General (Strategic Land North of Horsham) Ltd		TP204				
Trial Pit Log		Contract Number:	Date Started:	Logged By:	Checked By:	Status:	Sheet 1 of 1			
		J4175	02/12/2019	RAF	MJS	FINAL				
		Easting:	Northing:	Ground Level:	Plant Used:	Date Printed:	Scale:			
		518607.6	133981.7	58.15mOD	13T Excavator	21/02/2020	1:30			
Weather: Dry/Sunny			Termination: Refusal at 3.50mbgl			Stability: Good				
Samples & In Situ Testing				Strata Details						
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description	Water			
0.10 0.10	D1 ES1	HV 0.50m, 80kPa	57.65	(0.50)		TOP SOIL - Brown slightly gravelly silty sandy CLAY with occasional rootlets <2mm (living). Gravel is fine to medium sub-angular to sub-rounded brick.	1			
0.60 0.60	B1 ES2			0.50		Firm to stiff light grey and orange mottled black slightly sandy slightly gravelly silty CLAY. Gravel is fine to coarse sub-angular extremely weak to very weak mudstone. [RESIDUAL WEALD CLAY FORMATION]				
1.40	B2			1.40		Light grey and brownish orange extremely weak MUDSTONE with thinly laminated silty clay (<6mm). Recovered as fine to coarse sub-angular clayey sandy gravel. [DESTRUCTURED WEALD CLAY FORMATION]				
1.80	B3			1.80		Light brown mottled bluish brown extremely weak to very weak MUDSTONE. Recovered as fine to coarse sub-angular sandy gravel and occasional cobbles. [DISTINCTLY WEATHERED WEALD CLAY FORMATION]				
2.70	B4		55.55	2.60		Light brown mottled bluish grey and orange weak to moderately weak MUDSTONE. Recovered as sub-angular fine to coarse sub-angular sandy gravel and occasional cobbles. (PARTIALLY WEATHERED WEALD CLAY FORMATION]	2			
				(0.80)						
			54.65	3.50		End of Trial Pit at 3.50m	3			
							4			
Dimensions:					General Remarks:					
Final Depth: 3.50m					1. Trial pit machine excavated to 3.0mbgl. 2. Ground water encountered at 2.20mbgl (slow inflow) 3. Backfilled with arisings on completion.					
										
Inclination: °										
					Water Strikes					
					Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
					2.20			0		Slow inflow
					HBSI TP Template Issue Number: 1 Issue Date: 09/06/2015					

	Contract Name: P1, Land North of Horsham, West Sussex			Client: Legal and General (Strategic Land North of Horsham) Ltd			Trial Pit ID: TP206														
	Contract Number: J4175	Date Started: 03/12/2019	Logged By: JJW	Checked By: MJS	Status: FINAL	Sheet 1 of 1															
Trial Pit Log		Easting: 518614.6	Northing: 134068.1	Ground Level: 60.34mOD	Plant Used: 13T Excavator	Date Printed: 21/02/2020	Scale: 1:30														
Weather: Dry/Sunny			Termination: Refusal at 3.30mbgl			Stability: Good															
Samples & In Situ Testing				Strata Details				Water	Backfill												
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description															
0.10 0.10	D1 ES1	HV 0.50m, 81kPa	60.04	(0.30)		TOP SOIL - Dark brown slightly sandy slightly gravelly silty CLAY with occasional rootlets <2mm (living).		1													
0.50 0.50	B1 ES2			0.30		Light brown mottled orange and grey silty sandy CLAY with occasional rootlets <2mm (living). [RESIDUAL WEALD CLAY FORMATION]															
				(1.10)																	
				58.94	1.40		Brown mottled orange and black extremely weak to very weak MUDSTONE. Recovered as fine to coarse sub-angular gravel. [DESTRUCTURED WEALD CLAY FORMATION]														
1.70	B2			(0.90)				2													
2.40	B3		58.04	2.30		Brown mottled orange very weak MUDSTONE with occasional thinly laminated grey clay (<6mm) recovered as fine to coarse sub-angular to angular gravel and occasional cobbles. [DISTINCTLY WEATHERED WEALD CLAY FORMATION]		3													
				(0.70)																	
3.00 3.00	B4 D2		57.34	3.00		Reddish Brown and grey mottled black very weak MUDSTONE recovered as fine to coarse sub-angular to angular gravel and occasional cobbles. (DISTINCTLY WEATHERED WEALD CLAY FORMATION)															
			57.04	3.30	End of Trial Pit at 3.30m		4														
Dimensions:					General Remarks:																
Final Depth: 3.30m					1. Trial pit machine excavated to 3.30mbgl. 2. No groundwater encountered 3. Backfilled with arisings on completion.																
																					
Inclination: °																					
					Water Strikes																
					<table><tr><th>Strike (m)</th><th>Casing (m)</th><th>Sealed (m)</th><th>Time (mins)</th><th>Rose to (m)</th><th>Remarks</th></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>					Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks						
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks																
					HBSI TP Template Issue Number: 1 Issue Date: 09/06/2015																

Appendix D

Glanville's Drainage Statement (Approved as part of DC/24/0446)

DRAINAGE STATEMENT

Mowbray, North Horsham, West Sussex (Phase 1) – Moat Road Extension



Prepared for: Legal & General (Strategic Land North Horsham) Limited
Ref: 119_8220585_JD_Drainage_Statement_MRE

Document History

Issue	Date	Description	Prepared By	Checked By
1	14 Feb 24	First draft	J Dunesby	C Salt
2	29 Feb 24	Amended following client comments	J Dunesby	C Salt
3	6 Mar 24	Amended following client comments	J Dunesby	C Salt

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Appendices

Appendix A:	Site Location Plan
Appendix B:	Development Proposals
Appendix C:	Approved Site-Wide Surface Water Strategy
Appendix D:	Moat Road Detailed Pond Design
Appendix E:	Drainage Layout and Basin Sections
Appendix F:	InfoDrainage Catchment Plans
Appendix G:	InfoDrainage Calculations – 1 in 100 year +20% Climate Change Design Event
Appendix H:	InfoDrainage Calculations – Surcharged Outfall
Appendix I:	SuDS Management and Maintenance Plan
Appendix J:	Exceedance Flow Route Plan
Appendix K:	Approved Site-Wide Foul Water Strategy

1.0 Introduction

1.1 This Drainage Statement has been prepared by Glanville Consultants on behalf of Legal & General (Strategic Land North Horsham) Limited to support an application for the approval of reserved matters for the extension of the Phase 1 Primary Road (herein referred to as Moat Road) at the Mowbray development, North Horsham, West Sussex.

1.2 Outline planning permission was granted in March 2018 for the following development on Land North of Horsham (planning application reference: DC/16/1677):

"Outline planning application with all matters reserved except access for a mixed use strategic development to include housing (up to 2,750 dwellings), business park (up to 46,450m²), retail, community centre, leisure facilities, education facilities, public open space, landscaping and related infrastructure."

1.3 The first section of Moat Road (previously referred to as the Phase 1 Primary Road in the outline planning permission) was consented under Reserved Matters application DC/20/2345, dated 27 November 2020, and was constructed as part of the initial infrastructure works undertaken for Phase 1 of the Mowbray development. The approval of reserved matters is now sought for the extension of Moat Road westwards (including land to the south for ecology and sustainable drainage purposes) up to, but not including Old Holbrook. The Old Holbrook crossroads located to the west of the Moat Road extension has been consented under the outline planning permission (consented drawing reference 25216/5506/007B).

1.4 The description of development is as follows:

"Application for approval of Reserved Matters pursuant to Condition 5 of Outline Planning Permission DC/16/1677 for the extension of the Phase 1 Primary Road to Old Holbrook, landscaping, SUDS, ecological enhancements, substation, footbridge and the Sub Phase 1D Strategic Landscape Buffer."

1.5 This report provides describes the disposal of surface water run-off generated by the Moat Road extension and adjacent residential parcels and the provision of suitable foul drainage infrastructure to accommodate the disposal of foul effluent generated by the upstream catchments in accordance with Conditions 54 and 55 of the outline planning permission.

1.6 Condition 17 of the outline planning permission (with wording as subsequently amended via a Section 96a application reference DC/19/0984) related to the site-wide surface water strategy principles and was discharged in 2019 (application reference DISC/19/0214).

1.7 Condition 54 of the outline planning permission states:

"Each Reserved Matters application shall be accompanied by a Detailed Surface Water Strategy demonstrating how the principles established in the approved Site Wide-Surface Water Strategy will be achieved within the area covered by that Reserved Matters Application and shall include details of all Sustainable Drainage Systems (SuDS) and their catchment areas and the location, size and appearance of all features such as ponds, basins and swales, details of critical stormwater storage, details of any surface water sewers, the timing of delivery of the infrastructure necessary to deliver the Detailed Surface Water Strategy and details of long-term management and maintenance of the surface water drainage systems, as well as any temporary measures necessary to facilitate development until the approved surface water drainage strategy is provided in full. The development shall be implemented in accordance with the approved Detailed Surface Water Strategy and thereafter managed and maintained in accordance with the approved details."

1.8 Condition 55 of the outline planning permission states:

"Each Reserved Matters application shall be accompanied by a foul water drainage scheme (including implementation timetable) for that Reserved Matters Area. The approved foul water drainage scheme shall be implemented for each Reserved Matters Area as approved and no development in that Reserved Matters Area shall be occupied until the foul water drainage system has been completed in accordance with the approved details."

2.0 Existing Situation and Proposed Development

Site Context

- 2.1 The wider Mowbray development at North Horsham is currently under construction with various applications for the approval of reserved matters for individual infrastructure elements and sub-phases, both under consideration and determined. Prior to development, the wider Mowbray site had a mix of uses, including agricultural land and associated buildings, and dwellings.
- 2.2 The application site is wholly within Phase 1 of the Mowbray development. It is located to the west of the existing section of Moat Road and extends westwards as far as the road known as Old Holbrook, including land to the south for ecology and sustainable drainage purposes. The first section of Moat Road (previously referred to as the Phase 1 Primary Road in the outline planning permission) was consented under Reserved Matters application DC/20/2345, dated 27 November 2020, and was constructed as part of the initial infrastructure works undertaken for Phase 1 of the Mowbray development. A location plan showing the extent of the application site edged in red is provided in Appendix A.
- 2.3 The application site currently comprises previously undeveloped land used in the past for agricultural purposes.

Existing Drainage Infrastructure

- 2.4 No formal drainage infrastructure exists within the application site boundary, apart from that which serves the already constructed section of Moat Road. Foul and surface water sewers in the south-east corner of the application site have also been designed, approved, and constructed under the S104 agreement for the Southern Loop Road. There is an unnamed watercourse that runs through the application site. The topographical survey (submitted as part of the outline planning application) confirms that surface water run-off from the undeveloped agricultural land within the application site drains overland to this watercourse and others around the site.

Proposed Development

- 2.5 The proposals for which reserved matters approval is sought comprise the extension of Moat Road westwards to Old Holbrook, together with associated infrastructure. None of the drainage works proposed affect land that is subject to the Section 38 and Section 104 Agreements for the adoption of the first section of Moat Road and its associated infrastructure.
- 2.6 Drawings relevant to drainage that illustrate the proposals are provided in Appendix B, as follows:

Mowbray-GLA-RMA1-PH2-D-C-1001 - Adoption Plan

Mowbray-GLA-RMA1-PH2-D-C-1101 - General Arrangement Layout

Mowbray-GLA-RMA1-PH2-D-C-1102 - Road Levels Layout

Mowbray-GLA-RMA1-PH2-D-C-1103 - Road Longitudinal Sections

3.0 Surface Water Drainage

- 3.1 This section provides details of the proposed disposal arrangements for surface water run-off generated by the proposed development within the application site in accordance with Condition 54 of the outline planning permission. This condition requires each reserved matters application to demonstrate the principles set out in the site-wide surface water drainage strategy, approved through the discharge of Condition 17 of the outline consent (application reference DISC/19/0214). As such, this strategy has been prepared with reference to the approved Site-Wide Surface Water Strategy Report (Rev. A, dated August 2019). The approved strategy drawings are included in Appendix C.
- 3.2 The application site is split into two main catchment areas, the extension to Moat Road (Catchment MRE), and the future development parcel (RM4) to the south of the road (Catchment RM4), which are discussed further in this section.

Moat Road Extension (Catchment MRE)

- 3.3 A section of Moat Road that has already been constructed, along with the extension to Moat Road subject of this reserved matters application, have been designed to discharge to a watercourse, with an offline pond (Pond MREa) providing storage and a flow control restricting discharge to the watercourse. This pond and outfall were approved under application reference DC/22/0369 and has since been constructed.
- 3.4 The proposed drainage strategy serving the Moat Road extension has therefore been prepared based on the existing drainage infrastructure approved and constructed as part of Moat Road, specifically the pond and associated surface water drainage which will provide conveyance and attenuation of surface water run-off generated by the Moat Road extension. The approved detailed design drawings of the pond are included in Appendix D. The proposed surface water drainage strategy is illustrated on drawing Mowbray-GLA-MRE-PH1-D-C-1201, included in Appendix E.
- 3.5 The surface water drainage system within the proposed Moat Road extension will solely serve highway infrastructure for which the approval reserved matters is sought under this application, together with surface water run-off from the proposed Old Holbrook crossroads located just outside of the application site boundary to the west. Works to form the Old Holbrook Crossroads, in accordance with the details shown on drawing number 25216/5506/007B, were approved under the outline planning permission (DC/16/1677) and are therefore outside the scope of this application for the approval of reserved matters.
- 3.6 The impermeable area for this catchment has been taken from the general arrangement drawing included at Appendix B, with the areas detailed in Table 1.
- 3.7 Since the pond and flow control were approved at planning, designed, and built, the impermeable area of the catchment (comprising the existing section of Moat Road, Moat Road extension and Old Holbrook crossroads) has increased by 45%.
- 3.8 Given the flow control serving the Moat Road pond has already been constructed, the approved discharge rate utilised within this structure of 5.0 l/s for all storm events has been adopted within the proposed drainage design for Catchment MRE.

- 3.9 InfoDrainage calculations included in Appendix G demonstrate that the Moat Road pond provides attenuation storage for all storm events up to and including the 1 in 100 year storm event, with a 20% allowance for climate change. This demonstrates that the surface water drainage networks and pond can accommodate the increase in catchment area without flooding from surface water or encroaching on the freeboard of the pond.
- 3.10 Whilst Pond MREa has sufficient capacity to accommodate run-off generated by the Moat Road extension, the calculated discharge rates for the respective storm events (which have been reproduced in Table 1 below) highlight that the calculated discharge rate for the 1 in 100 year +CC event exceeds the proposed rate of 5.0l/s.

Table 1: Proposed and Calculated Discharge Rates

	Total Catchment Area (ha)	Discharge Rate (l/s)		
		1:2 Year	1:30 Year	1:100 Year +20% CC
Approved 2022	0.253	5.0		
Revised 2024	0.367	5.0	5.0	5.2

- 3.11 The increase in impermeable area has been the result of various design revisions for the Moat Road extension, which ultimately increases the surface water run-off volume entering the existing pond and subsequently increases the discharge rate due to an increase in head at the flow control.
- 3.12 However, whilst the discharge rate of the 1 in 100 year +CC event slightly exceeds 5.0l/s, the rate increases by only 4% relative to the additional 45% of impermeable area being accommodated by the pond without increasing its associated risk of flooding. Therefore, the slight increase in discharge rate to what was previously approved is considered to be within acceptable limits.

Development Parcel (Catchment RM4)

- 3.13 Catchment RM4 comprises the future residential development parcel RM4 located within the application site.
- 3.14 Catchment RM4 will discharge run-off to the existing watercourse with on-site attenuation provided by a basin (Pond ref. RM4a). The route between the basin and the watercourse utilises a surface water sewer located outside of the application boundary, that has already been designed, approved, and constructed under a S104 agreement.
- 3.15 The proposed surface water drainage strategy is illustrated on drawing Mowbray-GLA-MRE-PH1-D-C-1201, included in Appendix E. This strategy has been prepared with reference to the approved Site-Wide Surface Water Strategy Report (Rev. A, August 2019), including the following principles.

Surface Water Outfall

- 3.16 The site-wide surface water drainage strategy established in accordance with the drainage hierarchy that all discharges from the development will be to the local network of watercourses running through and around the site.
- 3.17 Given the above, it is proposed to discharge surface water run-off generated by the application site to the watercourse running through the site, as per the existing situation.

Discharge Rate Approach

- 3.18 The site-wide surface water strategy employed a staged discharge approach to restrict discharge from the development to the greenfield run-off rates – Q1 for the 1 in 1 year event and Q100 for the 1 in 100 year plus climate change event. This strategy has been approved and Condition 17 discharged accordingly. As such, a staged discharge approach has been adopted for the drainage infrastructure serving the future residential parcel within the application site.
- 3.19 The approved site-wide surface water strategy calculated greenfield run-off rates as set out in Table 2 and these rates have been adopted for the future residential parcel within the application site.

Table 2: Greenfield Rates

Return Period	Greenfield Rate
QBAR	5.2 l/s/ha
Q1	4.4 l/s/ha
Q30	11.8 l/s/ha
Q100	16.5 l/s/ha

- 3.20 Utilising the impermeable area for RM4 (refer to Table 4), the greenfield run-off rates for the 1 in 1 year, 1 in 30 year, and 1 in 100 year plus climate change events have been determined as detailed in Table 3 and applied within the hydraulic model for catchment RM4 as a staged discharge.

Table 3: Greenfield Run-Off Rates

Catchment	Pond Ref.	Greenfield Run-Off Rate (l/s)		
		1:2 Year	1:30 Year	1:100 Year +20% CC
RM4	RM4a	3.4	20.0	28.0

Rainfall Data and Climate Change

- 3.21 The latest FEH 2022 dataset has been adopted.
- 3.22 Condition 17 of the outline application states that a 20% allowance for the effects of climate change should be assessed for surface water drainage systems. As such, a 20% climate change allowance has also been included.
- 3.23 Condition 17 of the outline application also states that an exceedance event equivalent to the 1 in 100 year plus 40% climate change event should also be assessed for surface water drainage systems. As such, this event has been modelled for the drainage system serving the future residential parcel and its outputs discussed later in this report.

Impermeable Areas

- 3.24 The site-wide surface water drainage strategy calculated impermeable areas based on housing density within each drainage catchment, with an additional allowance for highway infrastructure, where appropriate.
- 3.25 Given the above, and that detailed proposals for the future housing catchment are not available at the time of writing this report, a similar approach is proposed to be adopted for the drainage design for the development parcel within the application site.

- 3.26 A further allowance for urban creep has also been included for residential areas, based on the housing density in the catchment as outlined in West Sussex County Council's (WSCC) Local Standards.
- 3.27 By adopting this design approach and including an allowance for urban creep, the impermeable area detailed within Table 4 has been calculated for RM4.

Table 4: Parcel Impermeable Areas

Catchment	Contributing Parcels	Pond Ref.	Impermeable Area incl. Urban Creep (ha)
RM4	4	RM4a	1.827

Long-Term Storage

- 3.28 Given the staged discharge approach has been applied within the surface water drainage design for catchment RM4, an assessment of the run-off volumes pre- and post-development has been completed to determine if long term storage is required.
- 3.29 Table 5 below details both the greenfield run-off volume and post-development discharge volume which confirms the discharge volume from RM4 does not increase from pre- to post-development. Therefore, provision of long-term storage is not required.

Table 5: Greenfield Run-Off Volume and Post-Development Discharge Volume

Catchment	Pond Ref.	Greenfield Run-off Volume (100 Year 6 Hour Event) (m ³)	Post-Development Discharge Volume (100 Year 6 Hour Event) (m ³)
RM4	RM4a	441.1	414.4

Hydraulic Calculations

- 3.30 InfoDrainage calculations for the proposed basin included in Appendix G demonstrate that the basin has been sized to provide attenuation storage for all storm events up to and including the 1 in 100 year storm event, with a 20% allowance for climate change. This demonstrates that the surface water drainage network and basin can accommodate the 1 in 100 year plus 20% climate change storm without flooding from surface water.
- 3.31 The InfoDrainage model has been run with a surcharged outfall in order to represent the condition that the watercourse would be in when in flood as detailed in the attached calculations at Appendix H. The following results were found:
- no flooding of the network upstream of the basin(s) occurs;
 - freeboard in the basins reduces, however no flooding occurs;
 - no flooding occurs around the outfall location; and
 - there is no increase in flow rates off-site.
- 3.32 As such, there is no risk to the proposed residential development in this scenario, and no increase in flood flows off-site.

Adoption and Maintenance Measures

- 3.33 All new surface water infrastructure will be designed and constructed in accordance with the Building Regulations, adoptable standards, and best practice, as appropriate.
- 3.34 The proposed surface water pipe network and associated drainage infrastructure serving the Moat Road extension (Catchment MRE) will be offered for adoption to WSCC as highway authority.
- 3.35 Surface water drainage infrastructure serving RM4 will be offered for adoption by the sewerage undertaker, with the exception of basin RM4a which will remain private and be the responsibility of a management company. This follows the approach taken throughout Phase 1 of the development.
- 3.36 The SuDS Management and Maintenance Plan included in Appendix I outlines typical maintenance tasks for drainage infrastructure. This plan will be implemented by the management company upon completion of the related drainage works associated with Moat Road Extension.

Exceedance Flow Routes

- 3.37 Any surface flooding caused by system failure or during extreme events above the design event which may overload the system will be routed away from the proposed residential parcels. Levels on-site have been designed such that any exceedance flows from drainage infrastructure within the proposed highway will be contained within the highway, with exceedance flows from the proposed basin overtopping at the lowest top of bank level in the south-west corner of the basin and flowing overland toward ditches along Old Hollbrook road. Exceedance flows from the surface water drainage system are shown on the drawing provided in Appendix J.
- 3.38 In addition, an exceedance event of the 1 in 100 year + 40% climate change event has been run within the InfoDrainage model for Catchment RM4 to determine how the proposed drainage infrastructure operates during exceedance and to validate this assessment. The following results were found:
- no flooding of the network upstream of the basin occurs;
 - freeboard in the basins reduce, however no flooding occurs; and
 - no flooding occurs around the outfall location.

4.0 Foul Water Drainage

Site-Wide Principles

- 4.1 The site wide foul water drainage strategy, dated August 2016, submitted within the consented outline planning application (application ref. DC/16/1677) generally follows the topography of the site, draining within various natural catchments. This results in five main proposed pump stations (FWPS1 – FWPS5) indicated within the strategy being required due to an inability to gravitate to the existing Southern Water foul network. Further smaller (and some private) pump stations are located within the development, where required, pumping to these five main pump stations. The approved strategy drawing is included in Appendix K.

Foul Water Drainage Strategy for Moat Road Extension

- 4.2 The foul water drainage strategy proposed as part of the Moat Road extension has been designed such that the foul water sewers have sufficient capacity to accommodate foul flows generated by the adjacent future residential parcels.
- 4.3 The foul water sewer within the Moat Road extension itself has already been designed, approved and partially built. It will convey some flows generated by the future development parcel (RM4) and discharge into the downstream foul network serving Phase 1. Foul flows will then drain to the adoptable pump station FWPS1 and be pumped off-site.
- 4.4 The majority of flows from the future development parcel (RM4) located within the application site will however convey flows to the foul water sewer located to the south-east which has already been constructed under the Southern Loop Road S104 Agreement. Foul flows will then drain to the adoptable pump station FWPS2 and be pumped off-site.
- 4.5 Both foul water networks discharging flows to pump stations FWPS1 and FWPS2 have been technically approved by Southern Water under a S104 and have been constructed to adoptable standards. Foul water pump stations FWPS1 and FWPS2 have been designed by TT Pumps and Willow Pumps respectively, have subsequently been technically approved by Southern Water and have been constructed to adoptable standards.
- 4.6 It should also be noted that the residential units associated with the future residential parcel (RM4) were always envisaged and the downstream foul water network and foul water pump stations FWPS1 and FWPS2 were subsequently designed to accommodate these units.

Sewer Adoption

- 4.7 All new foul water infrastructure will be designed in accordance with the Building Regulation Part H, adoptable standards, and best practice, as appropriate.
- 4.8 Where not already subject to a S104 agreement, the proposed foul water network constructed as part of the Moat Road Extension application and serving the adjacent future residential parcels will be offered for adoption by the sewerage undertaker.

5.0 Summary and Conclusion

Summary

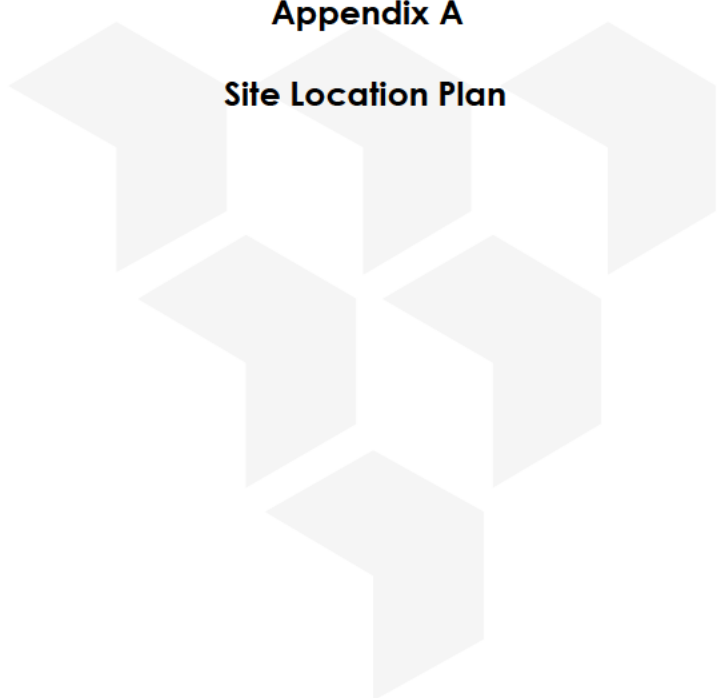
- 5.1 This Drainage Statement has been prepared to support an application for the approval of reserved matters for the extension of the Phase 1 Primary Road (Moat Road) at the Mowbray development, North Horsham.
- 5.2 This report demonstrates how suitable measures will be implemented to deal with surface and foul water drainage from the application site and surrounding catchments, in compliance with Conditions 54 and 55 of the outline planning consent DC/16/1677.
- 5.3 The surface water drainage strategy demonstrates that there will be no flooding for all storm events up to and including the 1 in 100 year storm event, with a 20% allowance for the effects of climate change. Flood risk on-site will therefore not increase either on-site or elsewhere as a result of the development.
- 5.4 Foul flows generated by the upstream catchments from the Moat Road extension will be conveyed via adoptable systems, which will discharge flows into the foul drainage networks serving Phase 1 and drain to the adoptable pump stations FWPS1 and FWPS2, which have been built.

Conclusion

- 5.5 In conclusion, this report has demonstrated that the proposed Moat Road extension:
- will not increase flood risk elsewhere;
 - will employ a surface water drainage strategy based on the principles of sustainable drainage and the approved site wide drainage strategy; and
 - suitable provision for the disposal of foul effluent generated by the upstream catchments has also been demonstrated to be feasible.
- 5.6 On this basis, the proposals are considered to fully comply with National, Regional and Local planning policy such that the requirements of Conditions 54 and 55 of the outline planning consent are met.

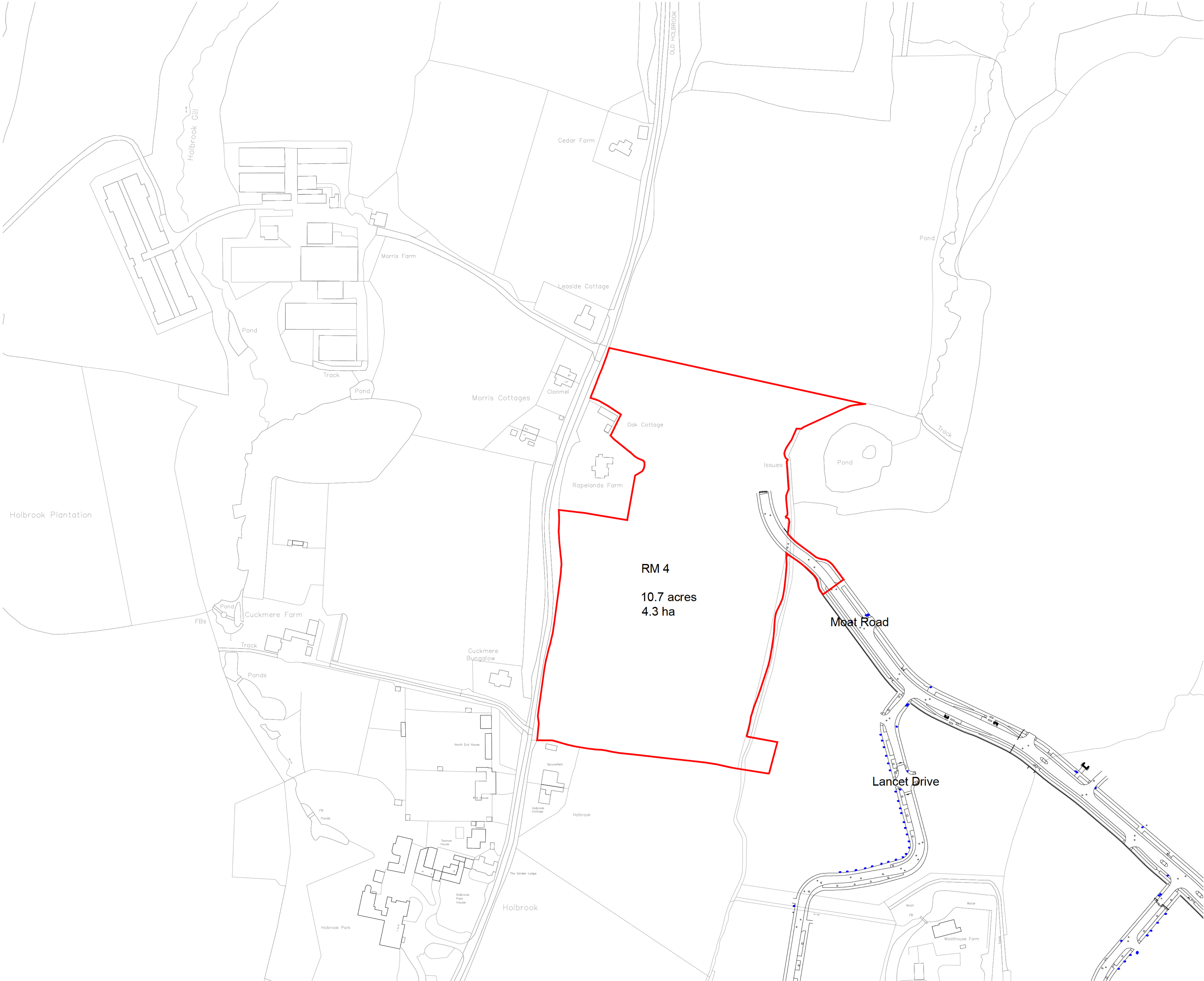
Appendices





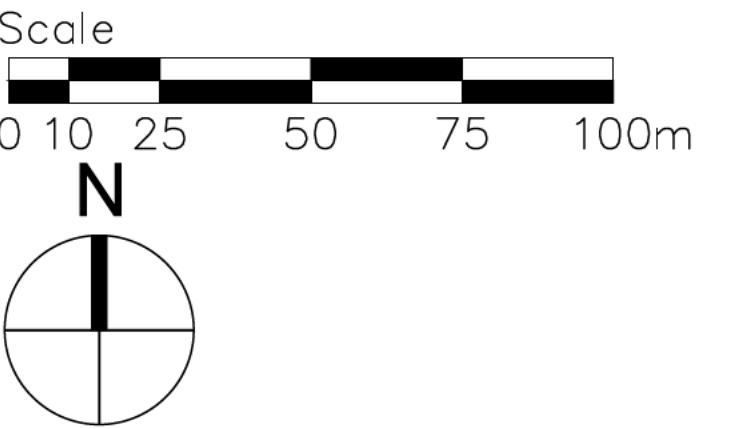
Appendix A

Site Location Plan



Contractors and consultants are not to scale dimensions from this drawing

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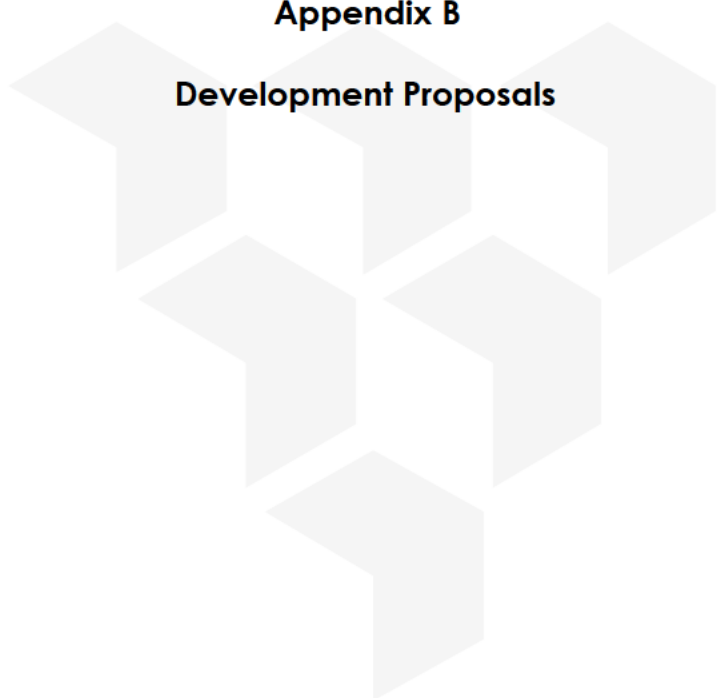
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Client
Legal and General

Project
Mowbray

Description
Moat Road Extension
Reserved Matters Application Red Line

Status	Planning	
Scale	1:1250@A1	Drawn By MK
Job Number	34854	Drawing Number 700
Date	Feb 2024	Revision C



Appendix B

Development Proposals