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enzygo
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NPPF: Flood Risk Assessment & Outline Drainage Strategy

Halterworth Lane, Romsey

Gladman Developments Ltd

SHF.1132.258.HY.R.001.B

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Halterworth Lane, Romsey

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Executive Summary

This report presents a Flood Risk Assessment in accordance with the National Planning Policy Framework and National Planning Practice Guidance: Flood Risk and Coastal Change ID: 7 guidance, for a proposed residential development located on land east of Halterworth Lane, Romsey, Hampshire.

The report includes an assessment of the surface water and foul drainage requirements of the Site and details the flood risk and how this could be managed and mitigated to allow the Site to be developed in support of the outline planning application.

The FRA has demonstrated the following:

- The 12.8-hectare (ha) Site is comprised of two agricultural (grassed) land parcels.
- The Northern Parcel slopes in a west/north-west direction and the Southern Parcel falls in a west/south-west direction. The Site is underlain by freely draining soils and bedrock with mixed infiltration potential.
- The risk of flooding is assessed as follows:
  - The risk of fluvial flooding is assessed as negligible.
  - The risk of surface water flooding is assessed as negligible for most of the Site but low associated with areas of ponding.
  - The risk of flooding from sewers is assessed as negligible for most of the Site but low but low along any overland flow pathways.
  - The risk of groundwater flooding is assessed as negligible above ground and low below ground.
  - The risk of flooding from all other sources is assessed as negligible.
- Flood risk from identified sources can be mitigated to a negligible level through the following approach:
  - No below surface habitable buildings (i.e. basements).
  - Set finished floor levels a minimum height above external levels.
  - Adoption of a surface water management strategy.
  - Provide a development free easement along onsite public foul water sewer assets, or re-direct through the Site boundary.
- The proposed residential use is classified as more vulnerable. More vulnerable uses are considered acceptable in terms of flood risk in Flood Zone 1 (low risk). There is however a risk of flooding from other sources. Subject to the implementation of the above mitigation measures, the Sequential Test would be passed, and the Exception Test would not be required.
- The FRA has considered the potential impact of the development on surface water runoff rates, given the increase in impermeable areas post-development. These rates have been calculated, and it has been demonstrated that surface water can be managed, such that flood risk to and from the Site following development will not increase. This will be achieved through restricted discharge rates and appropriately sized attenuation, comprising infiltration basins.
- It is proposed that foul flows will discharge to Halterworth Lane via a pumped connection.

The FRA demonstrates the proposed development would be operated with minimal risk from flooding and would not increase flood risk elsewhere. The development should therefore not be precluded on the grounds of flood risk, as well as surface water and foul drainage.

1.0 Introduction

1.1 Background

1.1.1 Enzygo Ltd was commissioned by Gladman Developments Ltd to carry out a site-specific Flood Risk Assessment (FRA), including an outline surface water and foul drainage strategy, in support of an outline application for a proposed residential development. The Site is located on land east of Halterworth Lane, Romsey, Hampshire (the 'Site').

1.1.2 The proposal is for an outline planning application of up to 270 dwellings on the 12.8ha Site, including affordable housing, with land for the potential future expansion of Halterworth Primary School, public open space, structural planting and landscaping, sustainable drainage system (SuDS) and vehicular access points. All matters reserved except for means of vehicular access.

1.1.3 A site-specific FRA assesses the current and future flood risk to and from a development site. It demonstrates how flood risk will be managed now and over the development's lifetime, taking climate change, drainage, and the vulnerability of its intended users into account.

1.1.4 The objectives of a site-specific FRA are to:

- Assess whether a proposed development is likely to be affected by current or future flooding from a range of sources.
- Assess whether the development will increase flood risk elsewhere.
- Decide on measures to deal with these effects and risks and assess their appropriateness.
- Provide enough evidence for the local planning authority to apply (if necessary) the Sequential Test.
- Decide whether the development will be safe and will pass the Exception Test if applicable.

1.1.5 In England, planning applications for development need an FRA[1] for most developments including:

- In Flood Zones 2 and 3 including minor development and change of use.
- Sites of 1ha or larger in Flood Zone 1.
- Sites of less than 1ha in Flood Zone 1, including change of use to a more vulnerable class (for example from commercial to residential), and where they could be affected by sources of flooding other than rivers and the sea.
- Land in Flood Zone 1 in a Critical Drainage Area (CDA) as notified by the Environment Agency.
- Land in Flood Zone 1 identified in a strategic flood risk assessment as being at increased flood risk in future.

[1] Department for Environment, Food & Rural Affairs and Environment Agency (published March 2014 and update February 2017). Flood Risk Assessments if You're Applying for Planning Permission [https://www.gov.uk/guidance/flood-risk-assessment-for-planning-applications].

1.1.6 An FRA is required for this development, as initial screening using Environment Agency online indicative flood mapping shows the Site is in Flood Zone 1 (low risk) but is more than 1ha and is at risk of surface water flooding.

1.1.7 The purpose of this FRA is to assess the risk of flooding to the proposed development and where possible provide sufficient mitigation to demonstrate that future users of the development would remain safe throughout its lifetime, that the development would not increase flood risk on Site and elsewhere and, where practicable, would reduce flood risk overall.

1.2 Scope

1.2.1 Government policy on development and flood risk is set out in the National Planning Policy Framework (NPPF)[2] and is supported by National Planning Practice Guidance: Flood Risk and Coastal Change [NPPG ID7][3].

1.2.2 NPPF paragraphs 158-175 set out the need for an appropriate assessment of flood risk at all levels of the planning process and require the application of a sequential risk-based approach to assess the suitability of land for development in flood risk areas.

1.2.3 The FRA should also make allowances for climate change[4] to minimise vulnerability and provide resilience to flooding and coastal change in the future. The allowances are predictions of anticipated change in:

- Peak river flow by river basin district.
- Peak rainfall intensity.
- Sea level rise.
- Offshore wind speed and extreme wave height.

1.2.4 The allowances are based on climate change projections and different scenarios of carbon dioxide emissions to the atmosphere. There are different allowances for different periods of time over the next century.

1.2.5 Site-specific FRAs are categorised according to level. Simple Level 1 Screening studies give a general indication of the potential flood risk to a site and identify whether more detailed Level 2 assessment is required or not. A Level 2 assessment is a qualitative appraisal to develop understanding of flood risk to a site and the effects of the site on flooding elsewhere including recommended mitigation measures. Level 3 assessments are more detailed quantitative studies, for example modelling to establish flood levels at a site in the absence of Environment Agency or other data or providing detailed outline drainage designs.

1.2.6 This report is a Level 2 qualitative FRA, which includes a Level 3 assessment of the surface water and foul drainage requirements for the proposed development.

[2] Ministry of Housing, Communities & Local Government (published March 2012 and updated December 2023). National Planning Policy Framework [https://www.gov.uk/government/publications/national-planning-policy-framework--2].
[3] Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government (published March 2014 and updated August 2022). Planning Practice Guidance ID7-030-20140306; Flood Risk & Coastal Change [https://www.gov.uk/guidance/flood-risk-and-coastal-change].
[4] Environment Agency (published February 2016 and updated May 2022). Flood Risk Assessments: Climate Change Allowances [https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances].

1.3 Aims

1.3.1 This FRA aims to provide enough flood risk information to satisfy the requirements of the NPPF, PPG ID7 and regional/local government plans and policies. It describes the potential for the Site to be impacted by flooding, the impacts of the proposed development on flooding elsewhere near the Site, and the proposed measures that could be incorporated into the development to mitigate the identified risks.

1.4 Planning Context

National Policy

1.4.1 The FRA was prepared in accordance with the NPPF and NPPG ID7.

Regional/Local Policy

1.4.2 The FRA considers the following policies within the Test Valley Borough Council Local Plan (2011 to 2029)[5]:

- Policy E7: Water Management – *Development will be permitted provided that it complies with national policy and guidance in relation to flood risk, and it does not risk the quality of groundwater.*

1.4.3 This FRA also considers the following flood risk and drainage guidance documents:

- Test Valley Borough Council Local Development Scheme (2022)[6].
- Test Valley Borough Council Strategic Flood Risk Assessment (SFRA) and associated mapping[7].

1.5 Report Structure

1.5.1 This report is structured as follows:

- Section 2 identifies the sources of information that were consulted.
- Section 3 describes the existing Site.
- Section 4 outlines the flood risk to the existing site and proposed development.
- Section 5 details the proposed mitigation measures against identified flooding sources.
- Section 6 assesses the surface water drainage requirements of the proposed development.
- Section 7 presents a summary and conclusions.

[5] https://www.testvalley.gov.uk/planning-and-building/planningpolicy/local-development-framework/dpd
[6] https://www.testvalley.gov.uk/planning-and-building/planningpolicy/lds
[7] https://www.testvalley.gov.uk/assets/attach/2619/tvbc-sfra-main-report.pdf

2.0 Sources of Information

2.1 Sources of Information

2.1.1 The following information was consulted:

- Ordnance Survey mapping (Drawings 001 and 002).
- Detailed topographic survey (Appendix 1).
- Environment Agency online mapping (Flood Map for Planning[8], Long Term Flood Risk Assessment for Locations in England[9], Catchment Data Explorer[10] and Main River Map[11]).
- Environment Agency Reduction in Risk of Flooding from Rivers and Sea online mapping[12].
- Online mapping for Climate Change Allowances for Peak River Flow and Peak Rainfall in England online mapping[13].
- National Soils Resources Institute (NSRI): Soilscapes online mapping[14].
- British Geological Survey [BGS] Geology Viewer online mapping[15].
- British Geological Survey [BGS] Borehole Records online mapping[16].
- Landmark's Promap: Flood Data package (see Drawings).
- Geosmart 1 in 100-year groundwater flood risk map (see Drawings).
- DEFRA's Magic Map for identifying Designated Sites[17].
- River Levels UK for identifying Flood Alert and Flood Warning areas[18].

2.2 Consultation and Discussion with Regulators

2.2.1 Consultation and discussions were undertaken with the relevant water regulators.

Environment Agency

2.2.2 The Environment Agency is a statutory consultee on flood risk and planning and is directly responsible for the prevention, mitigation, and remediation of flood damage for main rivers and coastal areas; and it has a strategic overview for all forms of flooding.

2.2.3 Environment Agency Standing Advice[19] and the NPPF/PPG ID: 7 was consulted and reviewed.

[8] https://flood-map-for-planning.service.gov.uk/
[9] https://flood-warning-information.service.gov.uk/long-term-flood-risk/
[10] http://environment.data.gov.uk/catchment-planning/
[11] https://environment.maps.arcgis.com/apps/webappviewer/index.html?id=17cd53dfc524433980cc333726a56386
[12] ArcGIS - My Map
[13] https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances
[14] https://www.landis.org.uk/soilscapes/
[15] https://www.bgs.ac.uk/map-viewers/bgs-geology-viewer/
[16] https://www.bgs.ac.uk/information-hub/borehole-records/
[17] https://magic.defra.gov.uk/magicmap.aspx
[18] https://riverlevels.uk/flood-map#.XclKwPn7RPZ
[19] Environment Agency and Department for Environment, Food & Rural Affairs (published April 2012 and updated February 2022). Preparing a Flood Risk Assessment: Standing Advice [https://www.gov.uk/guidance/flood-risk-assessment-standing-advice].

2.2.4 Correspondence with the Environment Agency is included in Appendix 3.

Lead Local Flood Authority

2.2.5 Hampshire County Council as the Lead Local Flood Authority (LLFA) is responsible for local flood risk management in their area and for maintaining a register of flood risk assets. They also have lead responsibility for managing the risk of flooding from surface water, groundwater, and ordinary watercourses.

2.2.6 Hampshire County Council online policies and guidance were consulted in order to inform this report. The surface water checklist and guidance were also checked.

Water Utility

2.2.7 Drainage and sewerage services in the UK are provided by a number of water and sewerage companies. Southern Water is responsible for sewerage within the area of the Site.

2.2.8 All sewerage undertakers maintain the 'DG5 register' of properties and external areas (such as gardens, highways, open spaces) which have suffered flooding from public foul/combined sewers. It does not include flooding caused by blockages.

2.2.9 Southern Water asset plans and pre-development enquiry response is included in Appendix 2.

2.3 Site Walkover

2.3.1 Enzygo staff carried out a walkover of the Site during March 2021. Observations made were used to inform the Site description.

3.0 Site Location and Description

3.1 Location

3.1.1 The Site is located on land east of Halterworth Lane, Romsey, Hampshire, SO51 9AE.

3.1.2 The Site is centred on National Grid Reference (NGR) 437481, 121399.

3.1.3 The 12.8ha Site location is shown in Drawing 001 and in more detail in Drawing 002.

3.2 Land Use

3.2.1 The land use is comprised of two agricultural (grassed) land parcels (Figures 3.1 and 3.2), hereafter referred to as the 'northern parcel' and the 'southern parcel'.

3.2.2 The Site is bounded by residential dwellings and Halterworth Lane to the west; residential dwellings and Halterworth Primary School to the south; and agricultural land to the north and east.

3.2.3 Vehicle access is currently via a gate off Halterworth Lane along the north-west and south-west of the Site. A footpath is also oriented west to east through the northern extents.

Figure 3.1: Photographs of the Site

Left: View looking north from the southern boundary. Right: View looking north-west from the north.

Figure 3.2: Aerial Photograph of the Site

Image © 2024 Digital Globe.

3.3 Topographic Information

3.3.1 A detailed topographic survey was carried out during June 2021 and a copy is included in Appendix 1.

3.3.2 The Northern Parcel generally falls in a west/north-west direction from 39.98 metres Above Ordnance Datum (m AOD) in the south-west corner, to 36.57m AOD in the north-west corner. The fall of 3.41m over 290m gives a gradient of 1:85.

3.3.3 The Southern Parcel generally falls west/south-west from 39.78m AOD along the eastern boundary, to 38.12m AOD along the south-west boundary. The fall of 1.66m over 313m gives a gradient of 1:189.

Figure 3.3: Summary of Site Topography

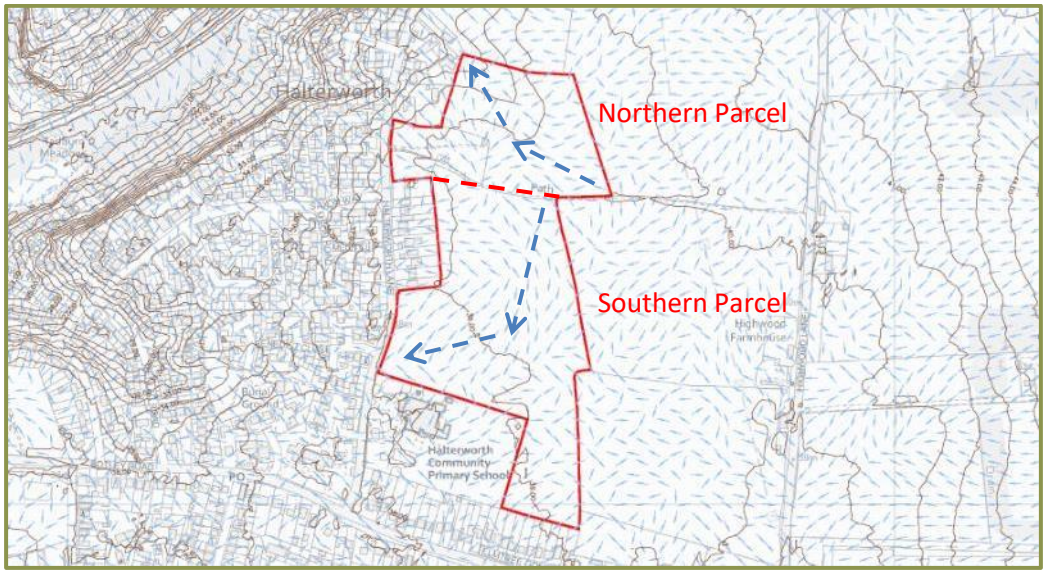


Table 3.1: Summary of Site Topography

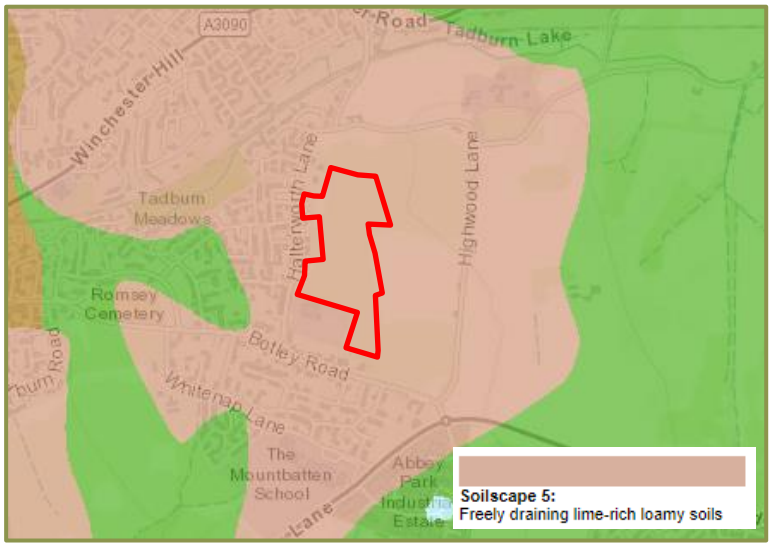
Land Parcel Reference	Direction of Fall	Maximum Elevation (m AOD)	Minimum Elevation (m AOD)	Distance (m)	Average Gradient Across Land Parcel
Northern	West/north-west	39.98	36.57	290	1:85
Southern	South/south-west	39.78	38.12	313	1:189

3.4 Soils and Geology

Soils Mapping

3.4.1 The online NSRI Soilscapes mapping (Figure 3.4) shows the Site is underlain by freely draining loamy soils.

Figure 3.4: Soils Mapping



Soils Data © Cranfield University (NSRI) and for the Controller of HMSO [2024].

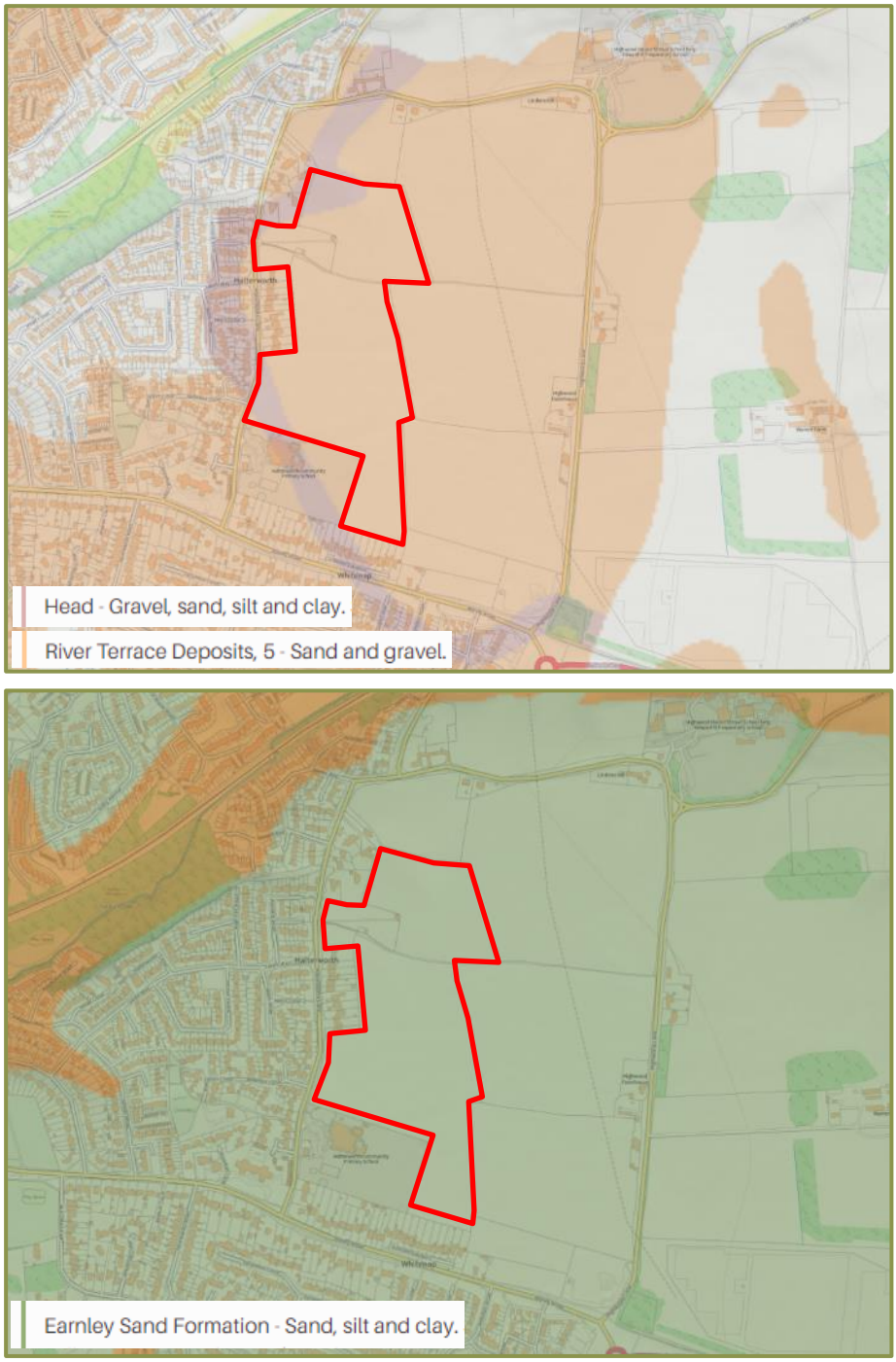
Geology Mapping

3.4.2 The online BGS Geology Viewer (Figure 3.5) shows most of the Site is underlain by River Terrace Deposits 5 - sand and gravel (superficial deposits). The south-west and north-west corners of the Site are underlain by a small band of Head - Gravel, sand, silt and clay.

3.4.3 The bedrock beneath the entire Site is Earnley Sand Formation - Sand, silt, and clay.

3.4.4 The geology mapping is indicative and there may be localised variation.

Figure 3.5: Geology Mapping

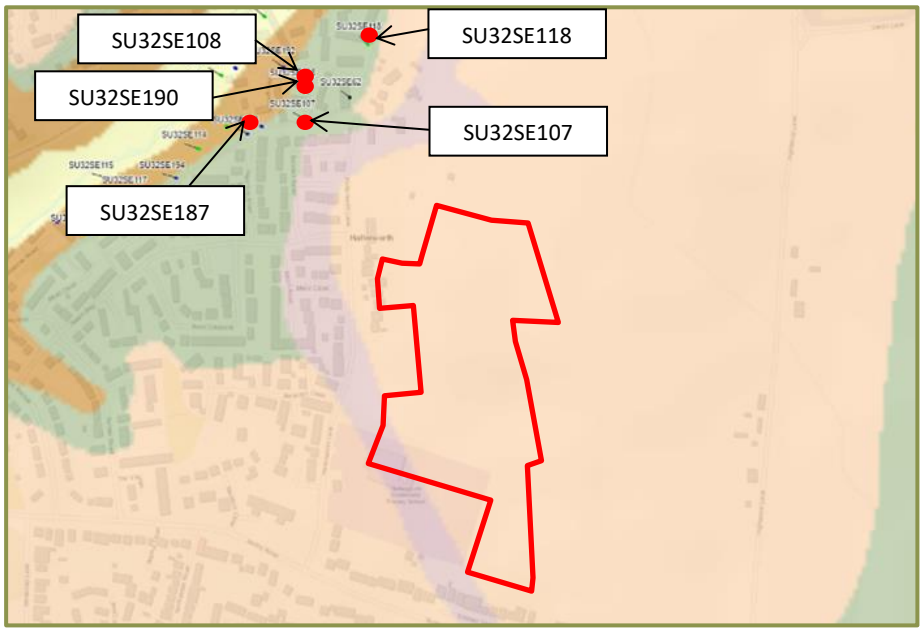


Top: Superficial deposits. Bottom: Bedrock geology. Contains British Geological Survey materials © NERC [2024].

BGS Borehole Records

3.4.5 The BGS Borehole Records online mapping (Figure 3.6) shows there are no historical boreholes located within the same mapped geology of the Site. There are however five borehole records within the same bedrock to the west of the Site, albeit in different superficial deposits. As such, only the groundwater depth has been noted (Table 3.2).

Figure 3.6: Borehole Mapping



Contains British Geological Survey materials © NERC [2024].

Table 3.2: BGS Borehole Data

Reference	Depth (m bgl)	Groundwater Depth (m bgl)
SU32SE107	10.95	16
SU32SE108	10	2.4
SU32SE118	10	1.3
SU32SE187	5.7	1.00 - 3.00
SU32SE190	2.5	Not Encountered

Contains British Geological Survey materials © NERC [2024].

Soakaway Testing

3.4.6 Soakaway testing was undertaken in accordance with DG365 'Soakaway Design' methodology guidance, during October 2023. A copy of the Soakaway Testing Results is included in Appendix 5.

3.4.7 A total of nine soakaway test pits and three boreholes were established across the Site, with focus on the topographic low point, where SuDS attenuation features would be positioned (Figure 3.7).

3.4.8 The borehole records confirm the soils and geology as depicted by the soils and geology mapping.

Figure 3.7: Trial Pit Location Plan

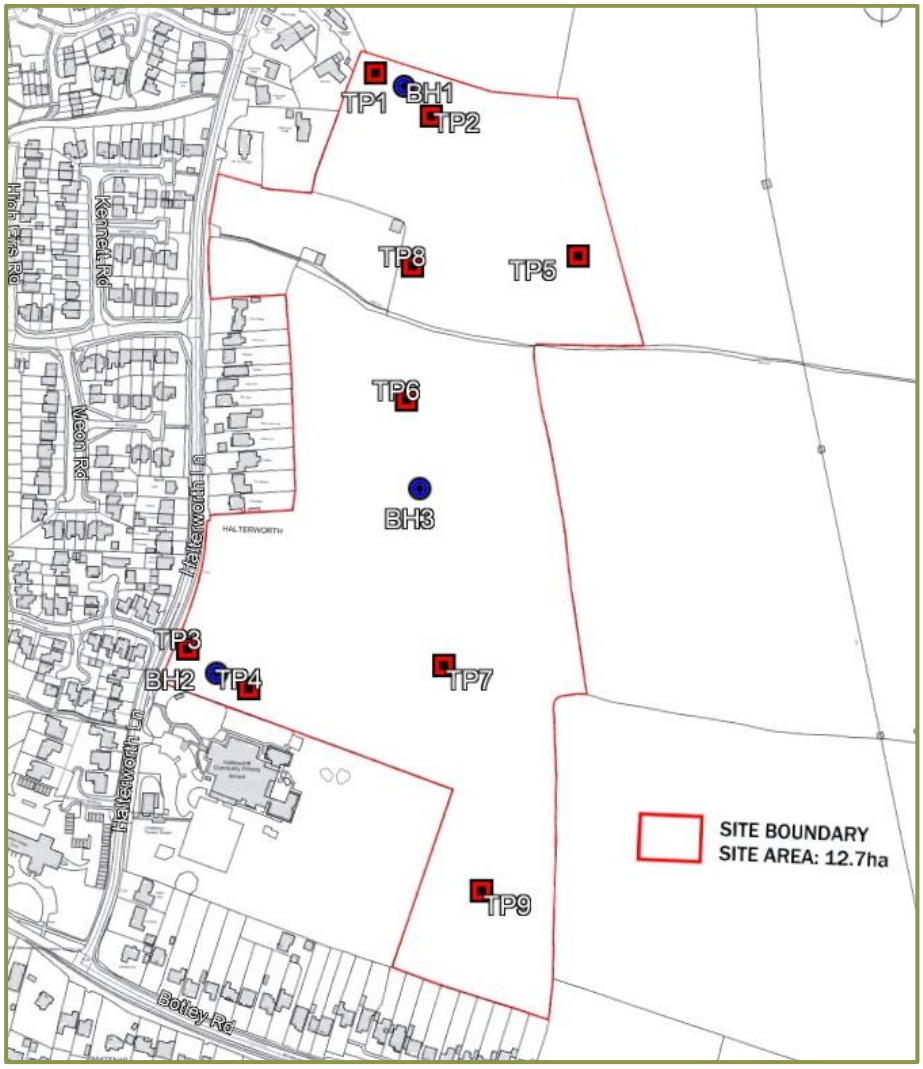


Table 3.3: Soakaway Data

Trial Pit	Depth (m bgl)	Soil Infiltration Rate (m/s)			Comments
		Test 1	Test 2	Test 3	
TP1	1.6	1.37E-04	1.43E-04	1.37E-04	Perched Groundwater at 1.5m bgl. Sand and sandstone deposits. Pit stable. Soil Horizon 0.3m.
TP2	1.5	n/a	n/a	n/a	Perched groundwater 1.2m - Pit unstable. Sandstone gravel and sand deposits. Water strike and pit collapse led to no infiltration calculations.
TP3	1.7	9.64E-04	6.46E-04	5.79E-04	Groundwater N/A. Sandstone gravel, clay and sand deposits with mudstone, siltstone and sandstone. Pit stable. Soil Horizon 0.25m.
TP4	1.6	4.09E-04	3.58E-04	2.63E-04	Groundwater N/A. Sandstone gravel, clay and sand deposits with mudstone, siltstone

					and sandstone. Pit stable. Soil Horizon 0.3m.
TP5	1.7	n/a	n/a	n/a	Groundwater N/A. Sandstone gravel, clay and sand deposits with mudstone, siltstone and sandstone. Pit stable. Soil Horizon 0.3m.
TP6	1.8	2.70E-05	2.23E-05	1.80E-05	Groundwater N/A. Sandstone gravel, clay and sand deposits with mudstone, siltstone and sandstone. Pit stable. Soil Horizon 0.2m.
TP7	1.6	1.52E-04	1.13E-04	1.00E-04	Groundwater N/A. Sandstone gravel, clay and sand deposits with mudstone, siltstone and sandstone. Pit stable. Soil Horizon 0.25m.
TP8	1.8	n/a	n/a	n/a	Groundwater N/A. Sandstone gravel, clay and sand deposits with mudstone, siltstone and sandstone. Pit stable. Soil Horizon 0.3m.
TP9	1.6	1.78E-04	1.43E-04	1.37E-04	Groundwater N/A. sandstone gravel, sand and silty sand. Pit stable. Soil Horizon 0.2m.
BH1	12	Test not run	n/a	n/a	Perched groundwater at 3m bgl, groundwater table at 12m bgl. Silty sand, gravel, clay, sand. Soil Horizon 0.4m.
BH2	7	2.82E-07	n/a	n/a	Perched groundwater at 4m bgl, groundwater table struck at 9m bgl. Sands and clays, mudstone, siltstone, sandstone. Pit stable. Tests 2 and 3 had insufficient uptake to calculate infiltration.
BH3	9	3.88e-07	n/a	n/a	Perched groundwater 4m bgl. Groundwater at 9.2m bgl. Sands, clays, and limestone gravel. Pit stable. Tests 2 and 3 had insufficient uptake to calculate infiltration.

3.5 Hydrogeology

Infiltration Potential

3.5.1 The SuDS Infiltration Potential Mapping (Drawing 005) shows most of the Site is in the mapped extent indicative of high potential. The north-west and south-west corners of the Site are in the mapped extent of moderate infiltration. The south-east corner is in the mapped extent of low infiltration potential.

3.5.2 The freely draining soils are indicative of high infiltration potential, but the infiltration potential of the bedrock is dependent on the composition of the sandstone and groundwater levels.

3.5.3 The north-west corner and south-east corners of the Site are within the mapped extent of moderate potential. The south-east corner is within the mapped extent of low potential.

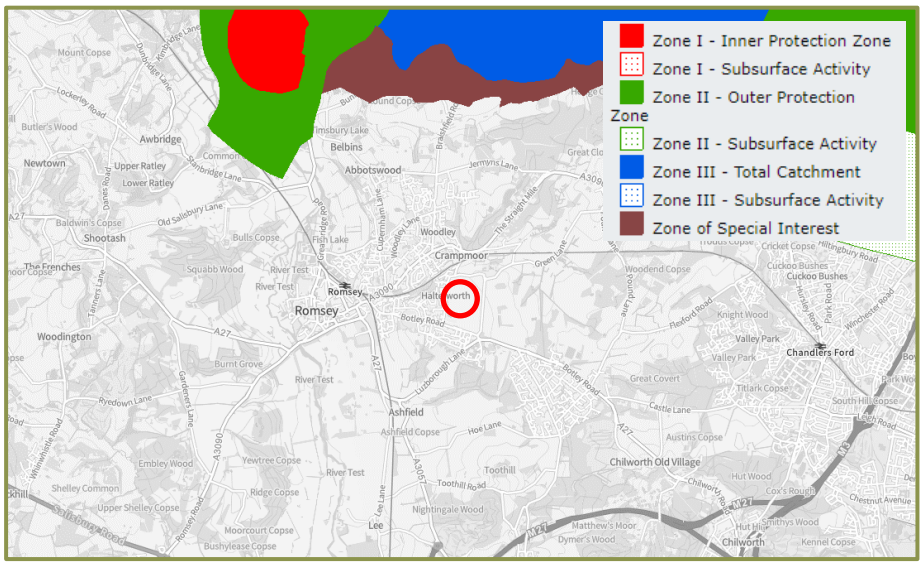
3.5.4 Shallow soakaway testing demonstrated infiltration to be viable across most of the Site, with three successful runs undertaken in accordance with DG: 365 in TP1, TP3, TP4, TP6, TP7 and TP9.

3.5.5 Groundwater was encountered in BH1, BH2, BH3 and TP2. The initial groundwater was struck at depths of between 1.2-4m bgl, but it is noted that this is perched groundwater within the superficial deposits. The groundwater table was encountered between 9-12m bgl.

Defra Magic Map

3.5.6 The online Defra Magic Map mapping (Figure 3.8) shows the Site is not located in a groundwater Source Protection Zone (SPZ).

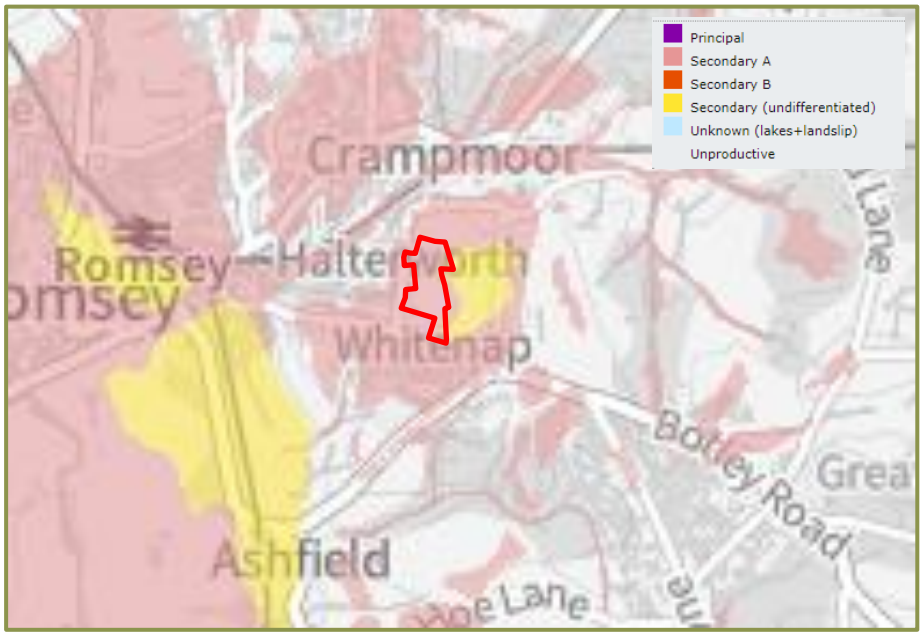
Figure 3.8: Source Protection Zone Map

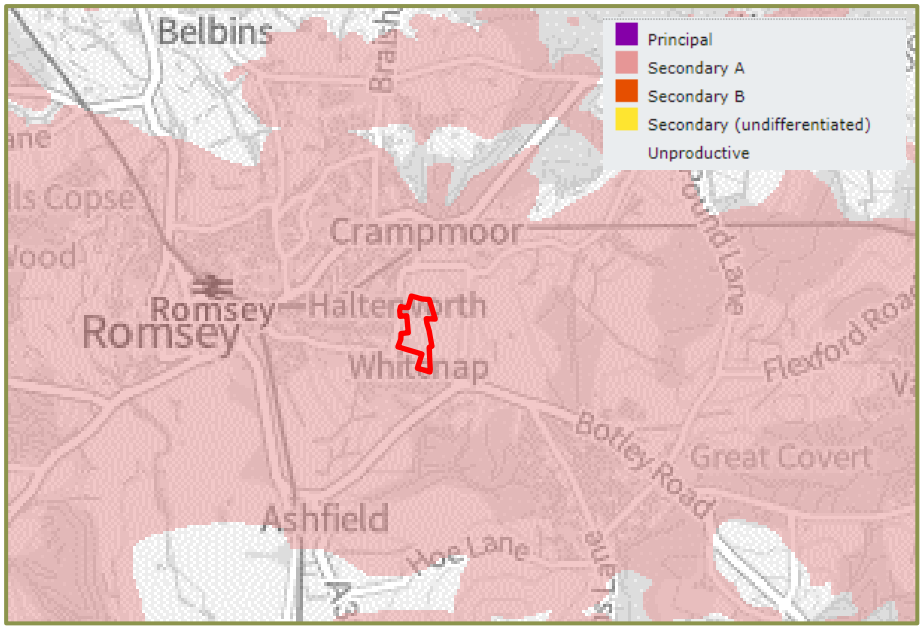


From Magic Map. Contains Environment Agency information © Environment Agency and database right [2024].

3.5.7 The Site is not located above a Principal Aquifer (bedrock designation) (Figure 3.9). The Site is however located above a Secondary A Aquifer (bedrock designation) and a Secondary A Aquifer (superficial drift). The eastern boundary is above a Secondary Undifferentiated Aquifer (superficial drift).

Figure 3.9: Aquifer Designation Map





Top: Aquifer Designation (superficial deposits). Bottom: Aquifer Designation (bedrock). From Magic Map. Contains Environment Agency information © Environment Agency and database right [2024].

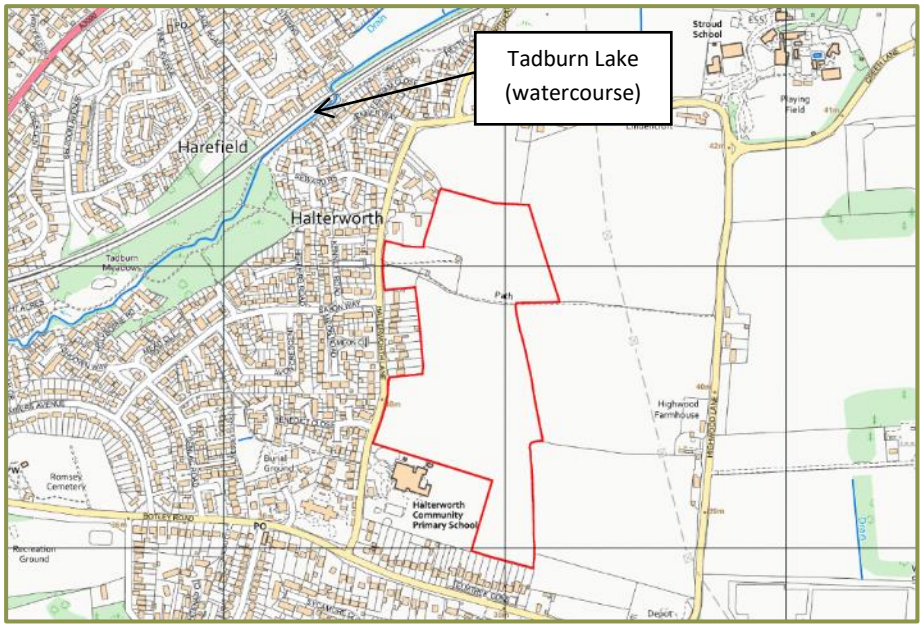
3.6 Catchment Hydrology

OS Mapping and Site Walkover Observations

3.6.1 OS mapping (Figure 3.10) shows Tadburn Lake (watercourse) conveying flows south-west, approximately 250m north-west of the Site at its closest point.

3.6.2 The Site walkover did not observe any onsite or bounding watercourses.

Figure 3.10: Map of Watercourses

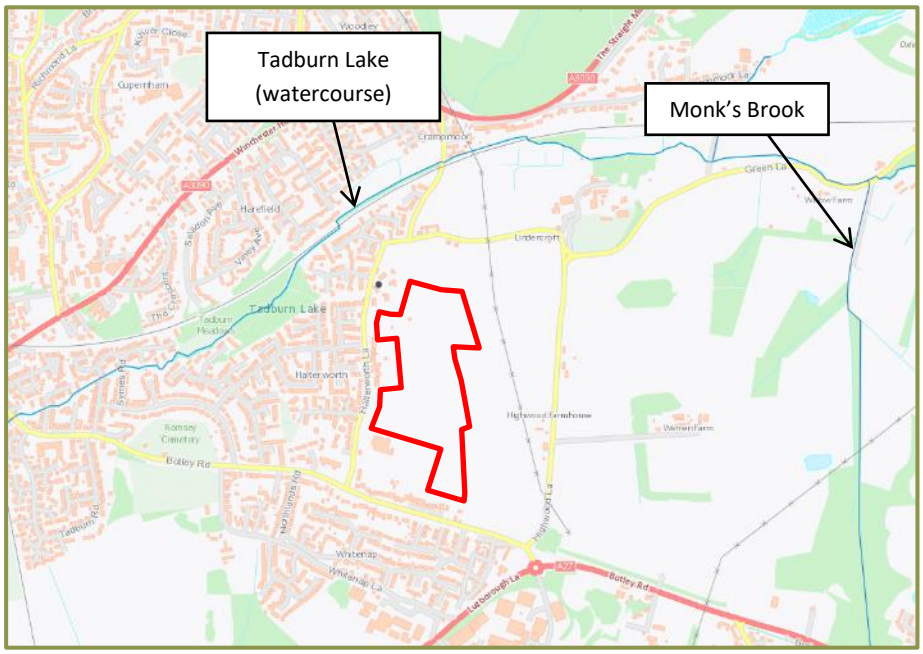


Main River Map

3.6.3 The Environment Agency online main river map (Figure 3.11) identifies the Tadburn Lake 'main river' approximately 250m north-west of the Site. Monk's Brook 'a main river' is located approximately 1.2km east of the Site. Monks Brook is a tributary of Tadburn Lake.

3.6.4 A main river is a watercourse where flood risk work is carried out by the Environment Agency.

Figure 3.11: Main River Map

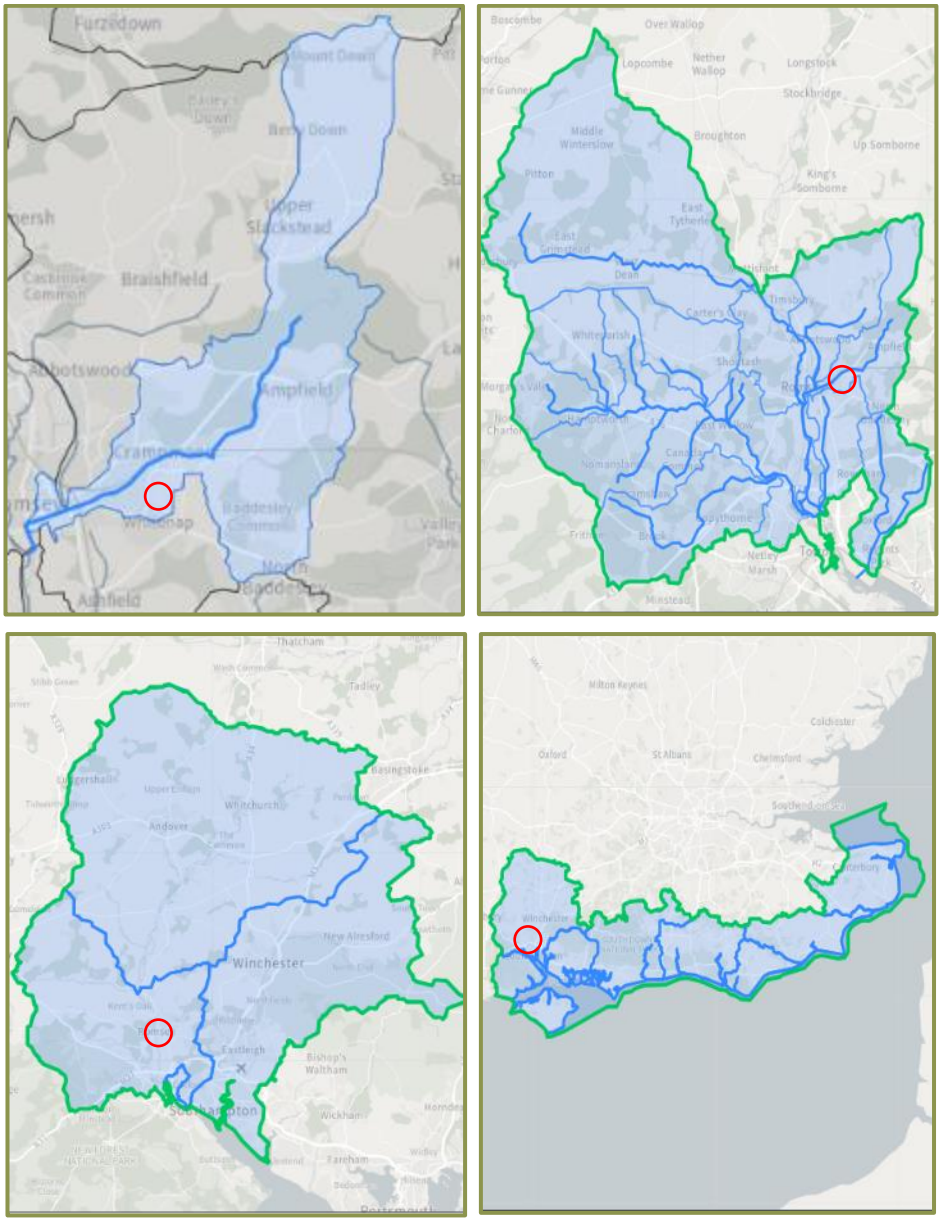


Contains Environment Agency information © Environment Agency and database right [2024].

Environment Agency Catchment Data Explorer Mapping

3.6.5 The Site resides within the Tadburn Lake Water Body (Figure 3.12), which is in the Test Lower and Southampton Streams Operational Catchment, Test and Itchen Management Catchment, and South East River Basin District.

Figure 3.12: Catchment Data Explorer



Top Left: Tadburn Lake Water Body. Top Right: Test Lower and Southampton Streams Operational Catchment. Bottom Left: Test and Itchen Management Catchment. Bottom Right: South East River Basin District. Contains Environment Agency information © Environment Agency and database right [2024].

3.7 Sewerage Assets

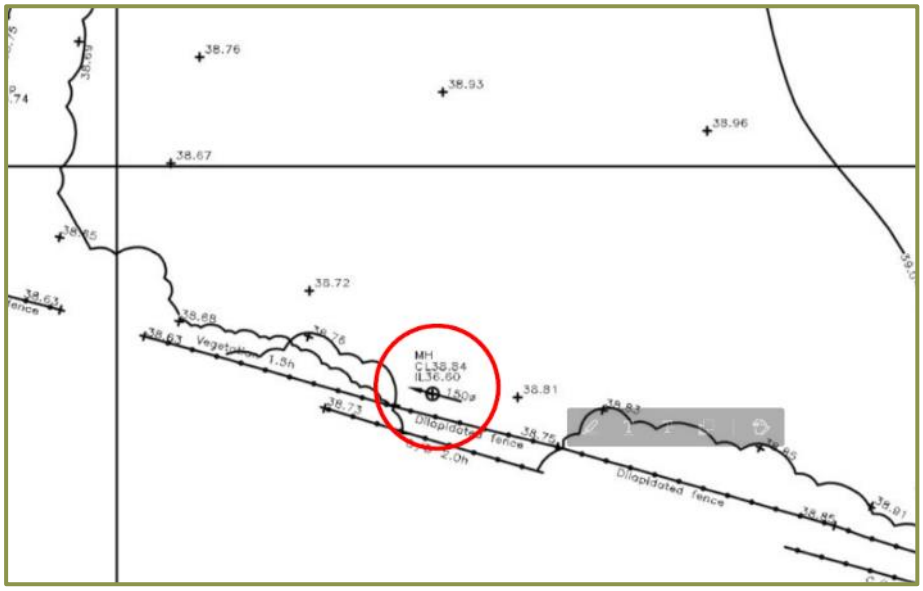
Public Assets

3.7.1 Southern Water assets plans show there is a Ø150mm public foul sewer network serving the residential dwellings to the west of the Site. The foul sewer is oriented north to south beneath Halterworth Lane.

3.7.2 The residential development west of Halterworth Lane is served by another Ø150mm public foul sewer network and a Ø150mm and Ø225mm public surface water network orientated east to west.

3.7.3 The residential dwellings to the south of the Site are served by a Ø150mm foul sewer. The topographic survey shows a manhole associated with this sewer (Figure 3.13), oriented north-west, just within the southern boundary of the Site.

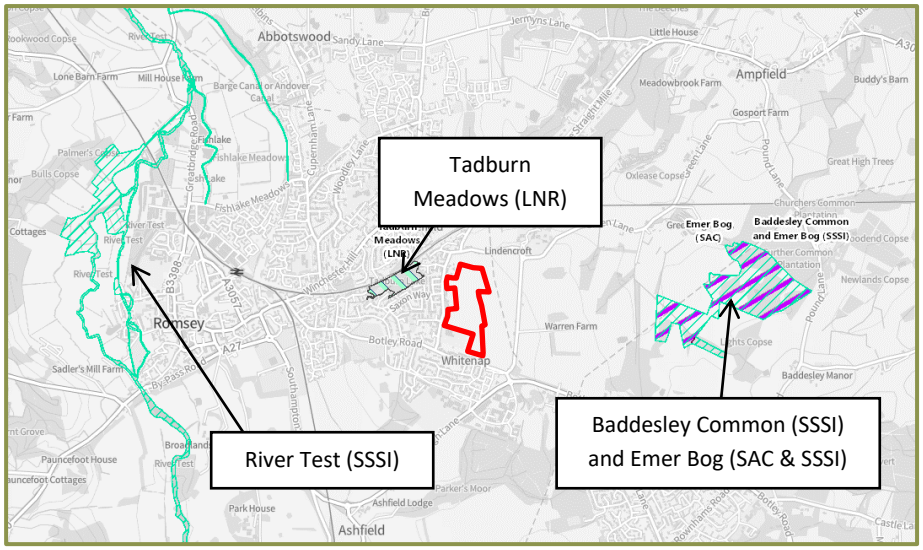
Figure 3.13: Topographic Survey Manhole



3.8 Designated Sites

3.8.1 The online Defra Magic Map mapping (Figure 3.14) shows the nearest designated sites include Tadburn Meadows (Local Nature Reserve [LNR]) located, located approximately 165m west of the Site, Baddesley Common and Emer Bog (Special Area of Conservation [SAC] & Site of Special Scientific Interest [SSSI]) located approximately 1.3km to the east of the Site, and the River Test (SSSI), located approximately 2.4km to the west of the Site. The Site is not hydrologically connected to either of these sites including downstream (from a flood risk and drainage perspective).

Figure 3.14: Designated Sites



From Magic Map. Contains Environment Agency information © Environment Agency and database right [2024].

4.0 Flood Risk Assessment

4.1 Potential Sources of Flooding

4.1.1 A summary of the potential sources of flooding and the potential risk posed by each source at the Site is presented in Table 4.1. Each source of flooding and level of risk is then assessed in further detail.

Table 4.1: Potential Risk Posed by Flooding Sources

Flooding Source	Potential Flood Risk at Application Site (Yes/No)	Potential Source	Data Sources
Fluvial	No	Tadburn Lake	Environment Agency consultation response (Appendix 3) and Environment Agency Flood Zone mapping (Drawing 003).
Tidal	No	None identified	Environment Agency consultation response (Appendix 3) and Environment Agency Flood Zone mapping (Drawing 003).
Groundwater	Yes	Secondary A Aquifer	Geosmart Groundwater (Drawing 004) and BGS Borehole Records (Appendix 4).
Surface Water	Yes	Site topography	Environment Agency Complex Surface Water Flood Mapping (Drawings 006.1 to 006.4).
Sewers and Mains	Yes	Public sewers	Southern Water asset plans (Appendix 2), and topographic survey (Appendix 1).
Infrastructure Failure	No	None identified	OS mapping (Drawings 001 to 002) and Environment Agency online mapping: Long Term Flood Risk Assessment for Locations in England.

4.2 Fluvial Flooding

Environment Agency Flood Zone Mapping

4.2.1 The Environment Agency Flood Zones are the current best information on the extent of the extremes of flooding from rivers or the sea that would occur without the presence of flood defences, since these can be breached, overtopped and may not be in existence for the lifetime of a development.

4.2.2 The Environment Agency Flood Zone mapping (Drawing 003) shows the Site is in Flood Zone 1, which is land outside the 1 in 1000-year 0.1% Annual Exceedance Probability [AEP]) extent of fluvial (river) flooding, at 'low' risk.

Modelled Flood Levels and Flood Outline Mapping

4.2.3 The Environment Agency provided modelled flood levels for Tadburn Lake sourced from the Romsey Model (2011). A range of return periods were provided, including the 1 in 100-year and 1000-year event, for nodes adjacent to the Site.

4.2.4 The model shows the Site is not inundated and sits at a minimum level of 36.57m AOD, which is 11.94m above the worse-case (1 in 100-year) modelled flood level.

Flood History

4.2.5 Correspondence with the Environment Agency (Appendix 3) reported no historical fluvial flooding incidents within the Site boundary or immediate vicinity.

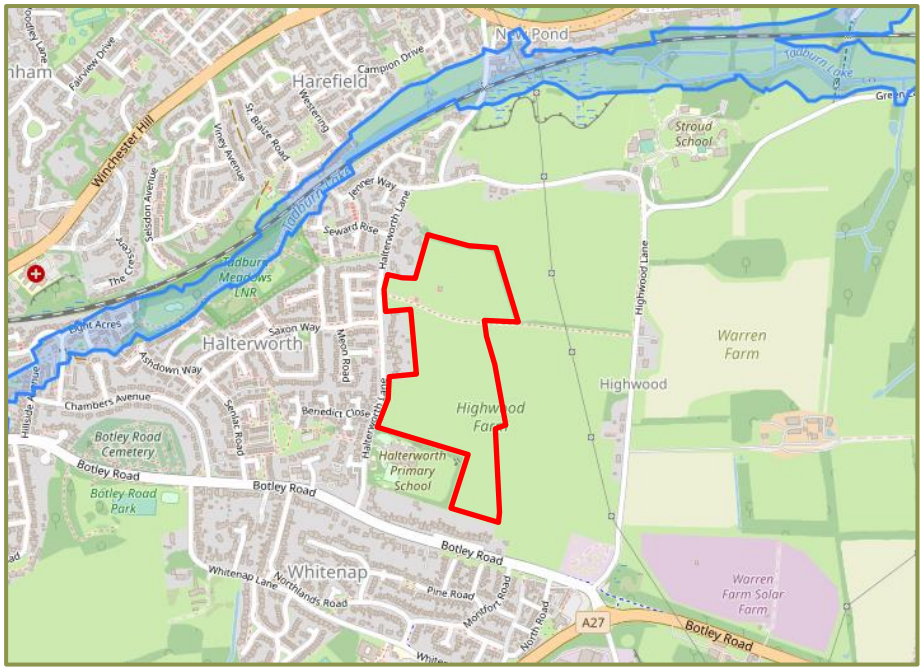
Flood Defences

4.2.6 The Environment Agency Reduction in Risk of Flooding from Rivers and Sea online mapping shows the Site does benefit from flood defences.

Flood Warning Service

4.2.7 The River Levels UK website (Figure 4.1) shows the Site is not within an area which receives flood warnings. The area along the reach of Tadburn Lake does receive flood warnings.

Figure 4.1: Flood Warning Areas



River Levels UK [2024].

Flood Risk Summary

4.2.8 The risk of fluvial flooding is assessed as negligible.

4.3 Tidal Flooding

Environment Agency Flood Zone Mapping

4.3.1 The Environment Agency Flood Zone mapping (Drawing 003) shows the Site is in Flood Zone 1, which is land outside the 1 in 1000-year 0.1% Annual Exceedance Probability [AEP]) extent of tidal (sea) flooding, at 'low' risk.

Flood Risk Summary

4.3.2 The risk of tidal flooding is assessed as negligible.

4.4 Groundwater Flooding

Introduction

4.4.1 Groundwater flooding occurs when subsurface water emerges either at surface or in made ground or in subsurface structures such as basements and services ducts. It occurs as diffuse seepage, emergence from new point source springs or an increase in flow from existing springs. It results from aquifer recharge from infiltrating rainfall, from sinking streams entering aquifers from adjacent non-aquifers, or from high river levels or tides driving water through near surface deposits. It tends to occur with a delay following rainfall and can last for several weeks or months. Groundwater flooding or shallow water tables also prevent or reduce infiltration and so can worsen surface water flooding.

Geosmart Groundwater Flood Risk Map

4.4.2 The Geosmart 1 in 100-year groundwater flood risk map (Drawing 004) shows the Site is at negligible risk of groundwater flooding and falls within Risk Class 4 (Table 4.2).

4.4.3 Mapped classes combine understanding of likelihood, model and data uncertainty, and possible severity. Likelihood is ranked according to whether we expect groundwater flooding at a site due to extreme elevated groundwater levels with an annual probability of occurrence greater than 1%, considering model and data uncertainty. Severity relates to expectations of the amount of property damage or other harm that groundwater flooding at that location might cause (Table 4.2).

Table 4.2: Groundwater Flood Risk Classification

Risk Class	Probability of Groundwater Flooding	Effect
4: Negligible	Annual probability less than 1%.	Negligible unless unusually sensitive use.
3: Low	Annual probability greater than 1%.	Remote possibility of damage to property or harm to sensitive receptors Flooding likely to be limited to seepages and waterlogged ground, damage to basements and subsurface infrastructure, and should pose no significant risk to life. Surface water flooding may be worsened.
2: Moderate	Annual probability greater than 1%.	Significant possibility of damage to property or harm to other sensitive receptors at or near this location. flooding is likely to be in the form of shallow pools or streams. Surface water flooding and failure of drainage systems may be worsened when groundwater levels are high.
1: High	Annual probability greater than 1%.	Groundwater flooding will occur which could lead to damage to property or harm to other sensitive receptors at or near this location. Flooding may result in damage to property, road, or rail closures and, in exceptional cases, may pose a risk to life.

Risk Class	Probability of Groundwater Flooding	Effect
		Surface water flooding and failure of drainage systems may be worsened when groundwater levels are high.

Borehole Records and Soakaway Testing Results

4.4.1 BGS online borehole mapping recorded groundwater ingress at depths between 1.3m bgl to 10.05m bgl in the bedrock deposits.

4.4.2 Soakaway testing encountered perched groundwater ingress in one pit at 1.2m bgl.

4.4.3 Borehole monitoring encountered perched groundwater between 3 and 4m bgl but the groundwater table sat between 9m and 12m bgl.

Flood Risk Summary

4.4.4 The risk of groundwater flooding is assessed as low below ground but negligible above ground.

4.5 Surface Water Flooding

Introduction

4.5.1 Surface water flooding occurs following rainfall on ground where infiltration rates are less than the rainfall precipitation rate. This can occur when either:

- Soils or ground materials are naturally of low permeability or have been compacted (infiltration excess runoff).
- Soils or ground materials are saturated from previous rainfall either directly or from upslope (saturation excess runoff and return flow) or from high groundwater levels.

Environment Agency Complex Surface Water Flood Mapping

4.5.2 The Environment Agency Complex Surface Water Flood Mapping (Drawings 006.1 to 006.4) shows most of the Site is located outside the mapped extent of surface water flooding.

4.5.3 There is an area of surface water ponding in the south-west extent of the Site associated with the 1 in 1000-year event. Flood depths are up to 0.30m, velocities are up to 0.25m/s and the hazard is assessed as 'low' (0.50-0.75). Surface water ponding is associated with a topographic low spot.

Flood Risk

4.5.4 The risk of surface water flooding is assessed as negligible for most of the Site, with an area of low risk associated with surface water ponding.

4.5.5 Mitigation measures against surface water flooding are discussed in Section 5.

4.6 Sewer Flooding

Introduction

4.6.1 Sewer flooding occurs when urban drainage networks become overwhelmed after heavy or prolonged rainfall due to restrictions or blockage in the sewer network or if the volume of water draining into the system exceeds the sewer design capacity.

4.6.2 New adoptable sewers are built to have a minimum design standard up to and including the 1 in 30-year rainfall event. Older sewers were not designed to any standard. Modern sewer systems will only surcharge during rainstorm events with a return period greater than 1 in 30-years (e.g. 1 in 100-years).

Asset Plans

4.6.3 Southern Water asset plans (Appendix 2) show there is a Ø150mm public foul sewer orientated north-west just within the southern boundary of the Site. Any surcharged flows would be shallow (<150mm) and would shed overland, following the localised topography (Drawing 007).

Flood Risk

4.6.4 The risk of flooding from sewers is assessed as negligible for most of the Site but low along any overland flow pathways.

4.7 Flooding from Infrastructure Failure

Reservoir Failure

4.7.1 The Environment Agency online flood mapping shows the Site is outside the extent of flooding sourced from reservoirs. The risk of flooding from reservoirs is assessed as negligible.

5.0 Flood Risk Mitigation Measures

5.1 Introduction

5.1.1 The following sources of flooding were identified:

- Groundwater flooding (below ground).
- Surface water flooding (ponding).
- Sewer flooding (surcharged flows from public assets).

5.2 Mitigation Measures

Groundwater Flooding

- No below surface habitable buildings (i.e. basements).
- Set finished floor levels as per above.
- Set finished floor levels a minimum of +150mm above external levels.

Surface Water Flooding

- Adoption of a surface water management strategy.
- Set finished floor levels as per above.

Sewer Flooding

- Provide a development free easement (3m either side) of onsite public foul water sewer assets, or re-direct through the Site boundary.

5.3 Summary of Flood Risk

5.3.1 Table 5.1 summarises the probability and level of risk, both with and without mitigation measures.

Table 5.1: Probability and Consequences of All Sources of Flooding

Flooding Source	Potential Source	Probability	Consequence & Impact Without Mitigation	Consequence & Impact with Mitigation
Fluvial	Tadburn Lake	Negligible	Negligible	Negligible
Tidal	None identified	Negligible	Negligible	Negligible
Groundwater	Secondary A Aquifer	Low below ground but Negligible above ground	Low below ground but Negligible above ground	Negligible
Surface Water	Site Topography	Negligible for most of the Site but Low where there is surface water ponding	Negligible for most of the Site but Low where there is surface water ponding	Negligible

Sewers and Mains	Public Sewers	Negligible for most of the Site but Low along overland flow pathways	Negligible for most of the Site but Low along overland flow pathways	Negligible
Infrastructure Failure	None identified	Negligible	Negligible	Negligible

Key: Green - Negligible, Yellow - Low, Orange - Medium and Red - High; based on consequence and impact with mitigation from each flooding source.

5.4 Flood Guidance and Sequential Test

5.4.1 The proposal is for a residential development. The PPG ID: 7 (not included in this report) classifies the proposed use as 'more vulnerable'.

5.4.2 The Environment Agency Flood Zones and acceptable development types are listed in Table 5.2. All development types (including residential uses) are acceptable in Flood Zone 1 (low risk). There is however a risk of flooding from other sources. Subject to the above mitigation measures, the Sequential Test would be passed and the Exception Test would not be required as indicated in Table 5.3.

Table 5.2: Environment Agency Flood Zones and Appropriate Land Use

Flood Zone	Probability	Explanation	Appropriate Land use
Zone 1	Low	Less than 1 in 1000 annual probability of river or sea flooding in any year (<0.1%).	All development types generally acceptable.
Zone 2	Medium	Between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% - 0.1%) or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5% 0.1%) in any year.	Most development type are generally acceptable.
Zone 3a	High	A 1 in 100 or greater annual probability of river flooding (>1%) or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.	Some development types not acceptable.
Zone 3b	'Functional Floodplain'	Land where water must flow or be stored in times of flood. SFRAs should identify this zone (land which would flood with an annual probability of 1 in 30 (3.33%) or greater in any year or is designed to flood in an extreme (0.1% flood, or at another probability to be agreed between the LPA and the Environment Agency, including water conveyance routes).	Some development types not acceptable.

Note: The Flood Zones are the current best information on the extent of the extreme flood from rivers or the sea that would occur without the presence of flood defences, because these can be breached, overtopped and may not be in existence for the lifetime of the development. The identified risk of fluvial flooding is highlighted green.

Table 5.3: Vulnerability and Flood Zone 'Compatibility' as Identified in Table 2 of PPG ID: 7

Flood Risk Vulnerability classification (see Table 1 of PPG ID: 7)	Essential Infrastructure	Water Compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Zone 1	Yes	Yes	Yes	Yes	Yes
Zone 2	Yes	Yes	Exception test required	Yes	Yes
Zone 3a	Exception test required	Yes	No	Exception test required	Yes
Zone 3b 'Functional Floodplain'	Exception test required	Yes	No	No	No

Key: Yes: Development is appropriate, No: Development should not be permitted. The identified risk of fluvial flooding is highlighted green.

6.0 Site Drainage

6.1 Surface Water Drainage

6.1.1 Consideration of flood issues is not confined to the floodplain. This is recognised in the NPPF and associated guidance where all proposed development of 1ha or more in Flood Zone 1 and so outside the floodplain nevertheless requires an FRA. The alteration of natural surface water flow patterns through development can lead to problems elsewhere in a catchment, particularly flooding downstream, and the replacement of permeable vegetated areas by low-permeability roofs, roads and other paved surfaces will increase the speed, volume, and peak flow of surface water runoff. So, the NPPF and associated guidance require an FRA for all proposed development of 1ha or more outside the floodplain in Flood Zone 1.

6.1.2 A surface water management strategy for the development is proposed to manage and reduce the flood risk posed by surface water runoff from the Site. The developer will be required to ensure that any scheme for surface water management should build in enough capacity for the entire Site.

6.1.3 The surface water drainage arrangements for any development Site should be such that the volume and peak flow rates of surface water leaving a developed Site are no greater than the rates prior to the proposed development unless specific off-Site arrangements are made and result in the same net effect.

6.1.4 An assessment of the surface water runoff rates was undertaken to determine the surface water options and attenuation requirements for the Site.

6.2 Existing Drainage System

6.2.1 The 12.8ha Site is comprised of two agricultural (grassed) land parcels.

6.2.2 The Site is underlain by freely draining loamy soils above River Terrace Deposits 5 - Sand and gravel. Drainage will initially be infiltration until the soil infiltration capacity is exceeded or perched groundwater is raised in the superficial deposits, and overland flow is generated. Overland flows would follow the topography of the Site towards the topographic low points.

6.3 Developable and Impermeable Areas

6.3.1 The proposal is for residential development, with land for the potential future expansion of Halterworth Primary School, public open space, structural planting and landscaping, sustainable drainage system (SuDS) and vehicular access points.

6.3.2 The proposal is for an outline planning application of up to 270 dwellings on the 12.8ha Site, including affordable housing, with land for the potential future expansion of Halterworth Primary School, public open space, structural planting and landscaping, sustainable drainage system (SuDS) and vehicular access points.

6.3.3 An allowance of 55% impermeable area (inclusive of 10% urban creep) was applied to the 7.26ha residential developable area. The existing and proposed impermeable areas are shown in table 6.1.

6.3.4 The proposed development will increase the impermeable surfaces and so increase the amount of runoff.

Table 6.1: Impermeable Area

Area	Existing Buildings and Hardstanding	Proposed Buildings and Hardstanding	Difference
Area (ha)	0	3.99	+3.99
Percentage of Total Site Area (%)	0	31.2	+31.2

6.4 Greenfield Runoff Rates

6.4.1 An assessment of greenfield runoff rates was undertaken to determine the attenuation requirements for the proposed development.

6.4.2 The runoff rates were calculated using the HRWallingford UKSuDS online tool, with FEH method inputs (descriptors obtained from the FEH webservice[20]). This is a recommended methodology for Sites up to 50ha in area and the ap/proach is in line with the current 'industry best practice' guidelines as outlined in the Interim Code of Practice for SuDS[21], and Environment Agency Report SC030219 - Rainfall runoff management for developments.

6.4.3 It is anticipated that the area for expansion of the school development will be left as open space for the time being, any future development / expansions would be served by a specific drainage system installed as part of the future works. Therefore, it has been classified as greenfield land for the purposes of this assessment.

6.4.4 The following parameters were used in the runoff calculations:

- Developable Area: 7.26ha (includes parking and access roads).
- Average Annual Rainfall (SAAR): 788mm/year
- Region No.: 7
- BFIHOST19: 0.573

6.4.5 BFIHOST was updated to BFIHOST19 (November 2019) since a number of issues were identified with BFIHOST, which including a tendency to underestimate BFI in clay-dominated catchments.

6.4.6 BFIHOST19 is the baseflow index developed using the Hydrology of Soil Types (HOST) classification and is the baseflow proportion of the flow on average. It is estimated based on the daily mean flow data. Baseflow comprises water entering the watercourse through shallow subsurface flow and groundwater flow (mechanisms other than direct surface runoff); hence permeable soils and geology tend to yield a higher baseflow.

6.4.7 The Soilscapes online soils map viewer and Geology of Britain online map viewer identified the following, which were confirmed by soakaway testing trial pit logs (Appendix 5):

- Soils: freely draining loamy soils
- Superficial Deposits: River Terrace Deposits 5 - Sand and gravel
- Bedrock: Earnley Sand Formation - Sand, silt, and clay

6.4.8 BFIHOST19 value assigned by the FEH webservice is considered to replicate on-site conditions.

[20] Centre for Ecology and Hydrology, Flood Estimation Handbook Web Service [https://fehweb.ceh.ac.uk/].
[21] Office of the Deputy Prime Minister, National SuDS Working Group (July 2004) Interim Code of Practice for Sustainable Drainage Systems [https://www.susdrain.org/files/resources/other-guidance/nswg_icop_for_suds_0704.pdf].

6.4.9 Table 6.2 shows the calculated greenfield runoff rates. Runoff calculations are included in Appendix 6.

Table 6.2: Greenfield Runoff Rates

Annual Probability (Return Period, Years)	Greenfield Runoff (l/s)
QBAR	25.7
100% (1)	21.8
3.33% (30)	59.0
1% (100)	81.8
1% Plus Climate Change	114.5

Note: 45% climate change added. The 1 in 1-year, 30-year and 100-year annual probability events are of importance to the Water Companies and the Environment Agency when looking at sewage discharge and flood risk.

6.5 Sustainable Drainage Options (SuDS)

Feasibility of SuDS

6.5.1 Shallow and borehole soakaway testing was undertaken during October 2023. A copy of the soakaway testing is included in Appendix 6. Findings demonstrate good infiltration potential in the shallow soakaways and a groundwater table between 9-12m bgl.

6.5.2 Perched groundwater was encountered between 1.2m bgl and 3m bgl. Perched groundwater would be considered a construction risk rather than a design consideration. Due to the nature perched water is anticipated to be encountered locally in pockets rather than extend throughout the Site. Any excess water would need to be pumped during construction. The actual soakage testing shows acceptable levels of infiltration for the design proposals. The actual groundwater table was encountered at between 9 and 12m bgl, therefore there is no anticipated recharge of shallow perched groundwater. It may be prudent to undertake full scale infiltration testing prior to construction.

Choice of SuDS Options

6.5.3 Sustainable water management measures should be used to control the surface water runoff from the proposed development Site, thereby managing the flood risk to the Site and surrounding areas from surface water runoff. These measures will also improve the quality of water discharged from the Site.

6.5.4 Current guidance promotes sustainable water management using SuDS. Options applicable to this Site are identified in Table 6.3.

Table 6.3: SuDS Options

Green roofs	Infiltration basins
Water butts	Detention basins
Permeable paving	Oversized pipes
Rainwater harvesting	Brown roofs
Filter strips	Swales
Wetland Areas	Cellular Storage

Note: SuDS appropriate to the development are highlighted green.

6.5.5 A hierarchy of SuDS techniques is identified[22]:

1. **Prevention** - the use of good Site design and housekeeping measures on individual Sites to prevent runoff and pollution (e.g. minimise areas of hard standing).
2. **Source Control** - control of runoff at or very near its source (such as the use of rainwater harvesting).
3. **Site Control** - management of water from several sub-catchments (including routing water from roofs and car parks to one/several large soakaways for the whole Site).
4. **Regional Control** - management of runoff from several Sites, typically in a detention pond or wetland.

6.5.6 Using SuDS as opposed to conventional drainage systems provides several benefits by:

- Reducing peak flows to watercourses or sewers and potentially reducing the risk of flooding downstream.
- Reducing the volumes and frequency of water flowing directly to watercourses or sewers from developed Sites.
- Improving water quality over conventional surface water sewers by removing pollutants from diffuse pollutant sources.
- Reducing potable water demand through rainwater harvesting.
- Improving amenity through the provision of public open spaces and wildlife habitat.
- Replicating natural drainage patterns, including the recharge of groundwater so that base flows are maintained.

SuDS Maintenance

6.5.7 Two infiltration basins will form the main attenuation feature within the development Site.

6.5.8 Maintenance of the SuDS features would be in line with the SuDS Manual (CIRIA C753, 2015), as detailed in Figure 6.1. It is standard for SuDS features within a new development to be maintained by a private maintenance company unless the council adopt it. This will ensure maintenance throughout the lifetime of the development.

[22] CIRIA (2004) Report C609, Sustainable Drainage Systems – Hydraulic, Structural and Water Quality advice.

6.5.9 Details of other SuDS features and maintenance would be considered further at detailed design when a detailed layout has been produced. The level of detailed provided within this FRA should be sufficient at outline stage to demonstrate that SuDS would be deliverable.

Figure 6.1: Infiltration Basin Operation and Maintenance Requirements (Table 13.2 of the SuDS Manual)

TABLE 13.2 Operation and maintenance requirements for infiltration basins		
Maintenance schedule	**Required action**	**Typical frequency**
Regular maintenance	Remove litter, debris and trash	Monthly
	Cut grass – for landscaped areas and access routes	Monthly (during growing season) or as required
	Cut grass – meadow grass in and around basin	Half yearly: spring (before nesting season) and autumn
	Manage other vegetation and remove nuisance plants	Monthly at start, then as required
Occasional maintenance	Reseed areas of poor vegetation growth	Annually, or as required
	Prune and trim trees and remove cuttings	As required
	Remove sediment from pre-treatment system when 50% full	As required
Remedial actions	Repair erosion or other damage by reseeding or re-turfing	As required
	Realign the rip-rap	As required
	Repair or rehabilitate inlets, outlets and overflows	As required
	Rehabilitate infiltration surface using scarifying and spiking techniques if performance deteriorates	As required
	Relevel uneven surfaces and reinstate design levels	As required
Monitoring	Inspect inlets, outlets and overflows for blockages, and clear if required	Monthly
	Inspect banksides, structures, pipework etc for evidence of physical damage	Monthly
	Inspect inlets and pre-treatment systems for silt accumulation; establish appropriate silt removal frequencies	Half yearly
	Inspect infiltration surfaces for compaction and ponding	Monthly

Drainage Design Summary

6.5.10 Surface water runoff would be directed to the drainage system through drainage gullies located around the perimeter of the buildings and through contouring of the hardstanding areas.

6.5.11 Landscaped areas should be incorporated into the layout where possible, and the associated gardens of each unit will allow a proportion of the rainfall to infiltrate into the soil substrate.

6.5.12 Surface water will be directed to onsite infiltration basins, positioned to achieve a gravity connection from the developable area.

6.5.1 An indicative drainage layout is included in Drawing ENZ-XX-XX-DR-D-0001.

Attenuation Requirements

6.5.2 Attenuation storage is required to reduce the post-application surface water runoff from the Site to calculated greenfield runoff rates, up to and including the 1 in 100-year (+45%CC) rainfall event.

6.5.3 Infiltration testing was carried out across the Site. The two basins have been positioned in the topographically low points of the Site to allow for a gravity network, hereafter referred to as the 'northern basin' and 'southern basin'. Soakaway Test results from the respective basin positions have been utilised for the scaling of the attenuation feature. The testing was undertaken in accordance with DG:365 and the 'worst-case' infiltration rate from each of the three runs is the one utilised.

6.5.4 The Site naturally drains in two directions with a ridge line roughly in the centre of the Site. As such 55% of the catchment drains in a northerly direction and 45% in a southerly direction. This has been replicated in the drainage strategy to replicate existing conditions and provide a gravity system.

6.5.5 The following input parameters were assumed in the calculations:

- Impermeable Area: 4ha (38.2%);
  - Northern Basin: 2.2ha
  - Southern Basin: 1.8ha
- Cv (proportion of rainfall forming surface water runoff): 75% summer, 84% winter;
- Infiltration losses:
  - Northern Basin: $1.37E^{-04}$m/s (TP1).
  - Southern Basin: $2.63E^{-04}$m/s (TP4).

6.5.6 The attenuation volume for the 1 in 100-year event (plus climate change) is 2377m^3.

- Northern Basin: 1389m^3
- Southern Basin: 988m^3

6.5.7 Attenuation calculations are included in Appendix 6. The calculated runoff rates and attenuation volumes will be reviewed at detailed design stage.

6.6 Exceedance Routes

6.6.1 The infiltration basin will be designed with a capacity up to a 1 in 100-year (plus 45% climate change) event, with a +300mm freeboard allowance, based on the worst-case infiltration rate in the position situated. This provides a betterment (reduction) in runoff when compared to existing undeveloped conditions, where runoff is uncontrolled across all return periods.

6.6.2 A storm event in excess of this design standard would be extreme and would cause the infiltration basin to surcharge and overtop (with no sudden deluge) and would then shed overland following the topography, as per existing conditions (Drawing 007).

6.6.3 Finished floor levels of new dwellings will be set above external levels, which will mitigate the residual risk of overtopping.

6.7 Foul Drainage

6.7.1 It is proposed that foul flow is discharged to the Ø150mm public foul sewer along Halterworth Lane at MH2503. The topography of the Site would require a pumped connection.

6.7.2 Correspondence with Southern Water confirmed that there is adequate capacity in the local sewerage network to accommodate a foul flow of 3.44l/s at manhole 2503. There is not currently capacity at manholes 2101 or 4901.

6.7.3 An outline foul drainage layout is in Drawing ENZ-XX-XX-DR-D-0001.

6.7.4 All foul sewerage should be designed in accordance with Building Regulations Part H[23]. In areas where sewers are to be adopted by Southern Water, sewerage should be designed in accordance with Design and Construction Guidance document and supplemented with additional standards provided by Southern Water. An application to enter into a Section 104 agreement for sewer adoption must be made in writing to Southern Water prior to any works commencing on Site. A connection point should be agreed with Southern Water.

[23] HM Government (published 2002 and updated October 2015) The Buildings Regulations 2010 - Drainage and Waste Disposal: Part H [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/442889/BR_PDF_AD_H_2015.pdf].

7.0 Summary and Conclusions

7.1 Introduction

7.1.1 A site-specific Flood Risk Assessment (FRA) has been undertaken for a proposed residential development, located on a 12.8ha Site located on land east of Halterworth Lane, Romsey, Hampshire.

7.2 Flood Risk

7.2.1 The risk of flooding is assessed as follows:

- The risk of surface water flooding is assessed as negligible for most of the Site, with an area of low risk associated with surface water ponding.
- The risk of groundwater flooding is assessed as negligible above ground but low above ground.
- The risk of flooding form sewers is assessed as negligible for most of the Site but low along any overland flow pathways .
- The risk of flooding from all other sources is assessed as negligible.

7.3 Mitigation Measures

7.3.1 Flood risk can be mitigated to a negligible level through the following approach:

- Set finished floor levels above external levels.
- Adoption of a surface water management strategy.
- Provide a development free easement along onsite public foul water sewer assets, or re-direct through the Site boundary.
- No below surface habitable buildings (i.e., basements).

7.4 Flood Guidance

7.4.1 The proposed residential use is classified as more vulnerable. More vulnerable uses are considered acceptable in terms of flood risk in Flood Zone 1 (low risk). There is however a risk of flooding from other sources. Subject to the implementation of the above mitigation measures, the Sequential Test would be passed, and the Exception Test would not be required.

7.5 Site Drainage

Surface Water

7.5.1 The proposed development will increase the area of impermeable surfaces and therefore increase the amount of runoff without mitigation.

7.5.2 Surface water runoff from the proposed development would be attenuated on-site, in infiltration basins, up to and including the 1 in 100-year event, plus 45% climate change. This approach offers a betterment to existing conditions with uncontrolled runoff across all return periods.

7.5.3 A SuDS drainage scheme is proposed to manage excess runoff from the development, comprising infiltration basins, designed to maintain runoff at pre-development rates.

Foul Water

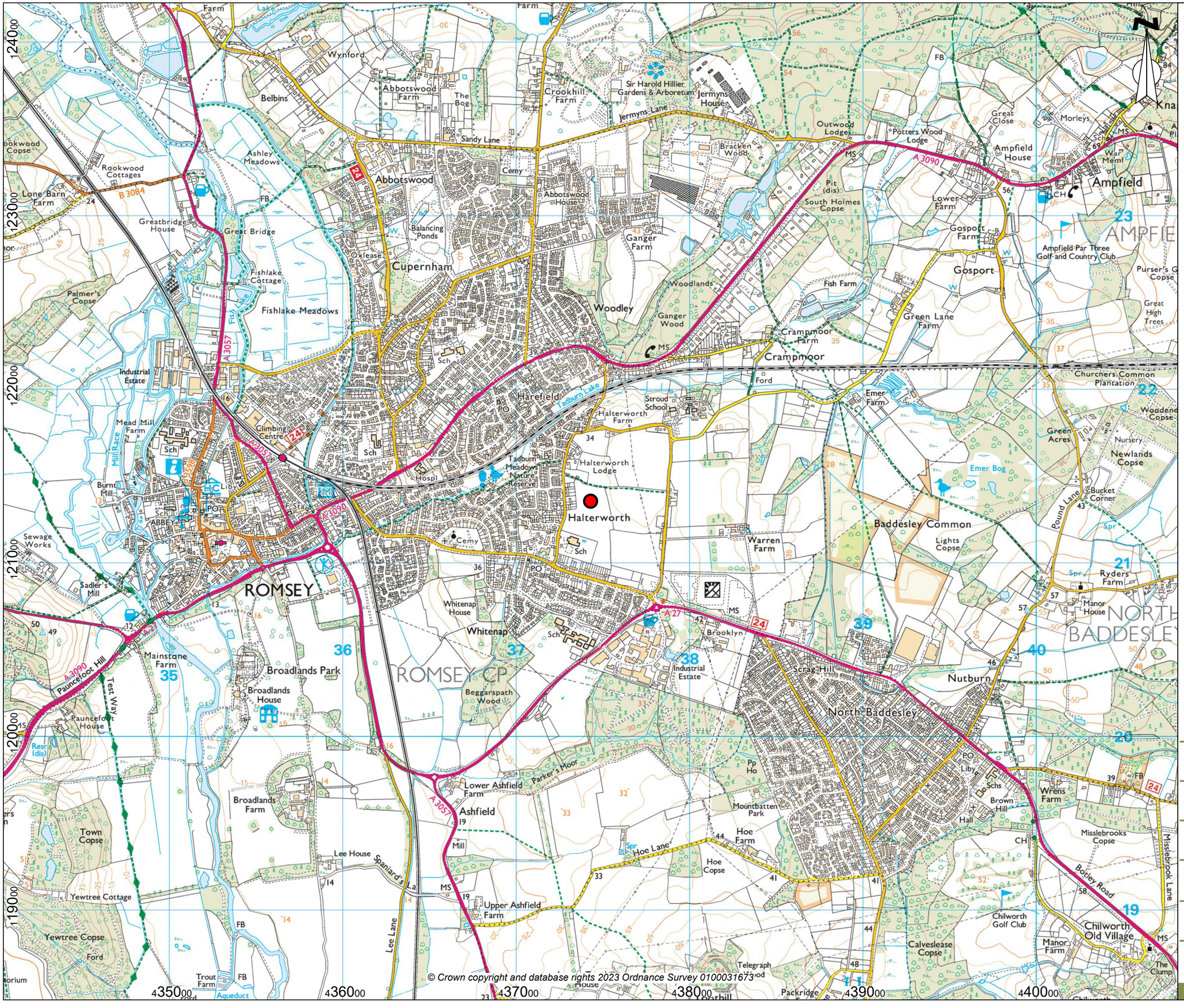
7.5.4 It is proposed that foul flows will discharge to Halterworth Lane via a pumped solution.

7.6 Conclusion

7.6.1 This FRA demonstrates the proposed development would be operated with minimal risk from flooding, would not increase flood risk elsewhere and is compliant with the requirements of national policy and guidance.

7.6.2 The development should therefore not be precluded on the grounds of flood risk, as well as surface water and foul drainage.

DRAWINGS



enzygo
environmental consultants

Samuel House, 5 Fox Valley Way, Stocksbridge, Sheffield, S36 2AA

CLIENT: Gladman Developments Ltd

SCALE: 1:20,000@A3

PROJECT REF: SHF.1132.258

DRAWN: LW

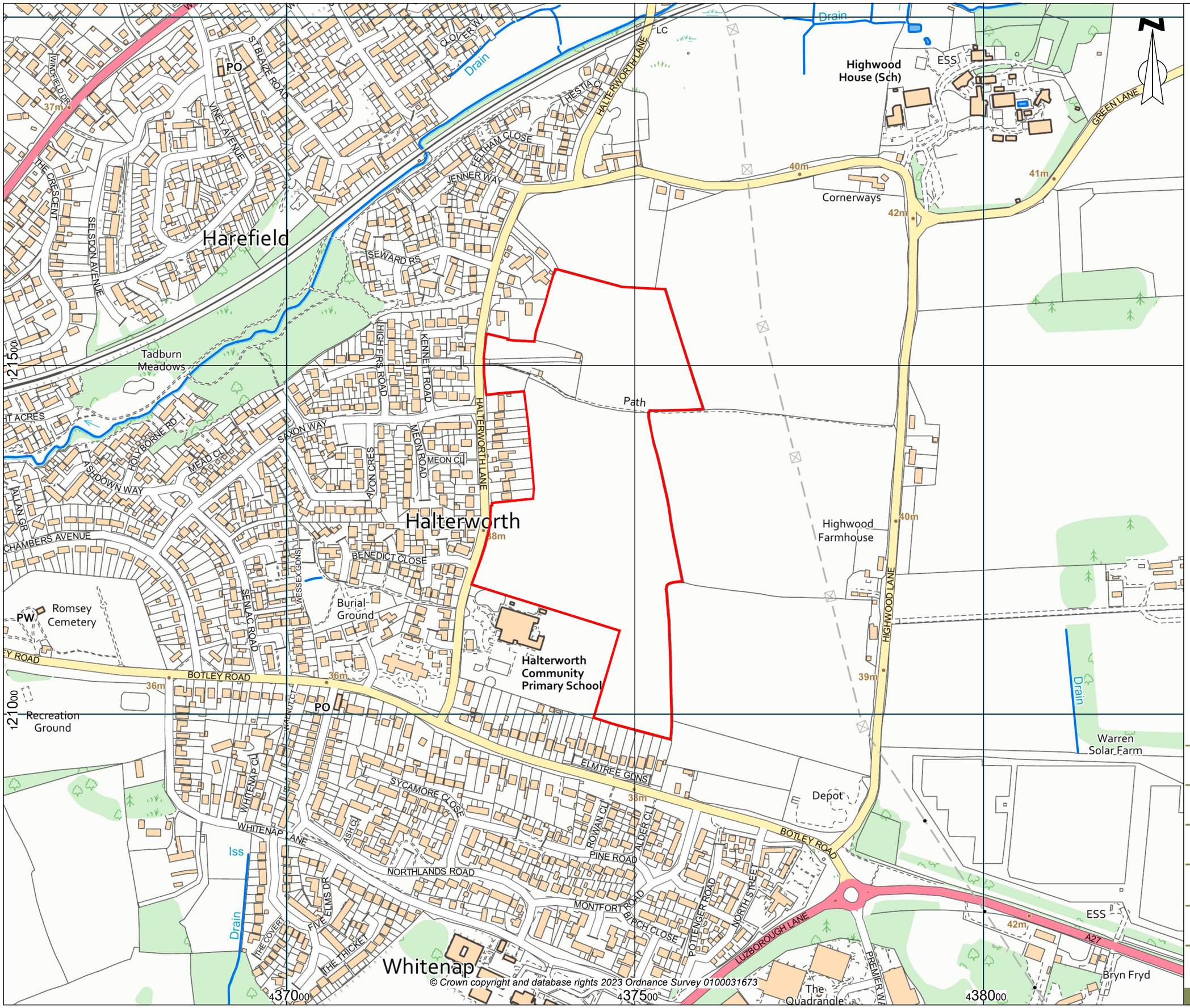
CHECKED: DA

DATE: Sept 2023

PROJECT: Halterworth Lane, Romsey

TITLE: Site Location Plan

DRAWING NO: SHF.1132.258.HY.D.001



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environmental consultants

Samuel House, 5 Fox Valley Way, Stocksbridge, Sheffield, S36 2AA

CLIENT: Gladman Developments Ltd

SCALE: 1:5,000@A3

PROJECT REF: SHF.1132.258

DRAWN: LW

CHECKED: DA

DATE: Sept 2023

PROJECT: Halterworth Lane, Romsey

TITLE: Surface Water Features

DRAWING NO: SHF.1132.258.HY.D.002

Key

- Site Boundary
- Flood Zone 3
- Flood Zone 2
- Flood Zone 1

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CLIENT: Gladman Developments Ltd

SCALE: 1:5,000@A3

PROJECT REF: SHF.1132.258

DRAWN: LW

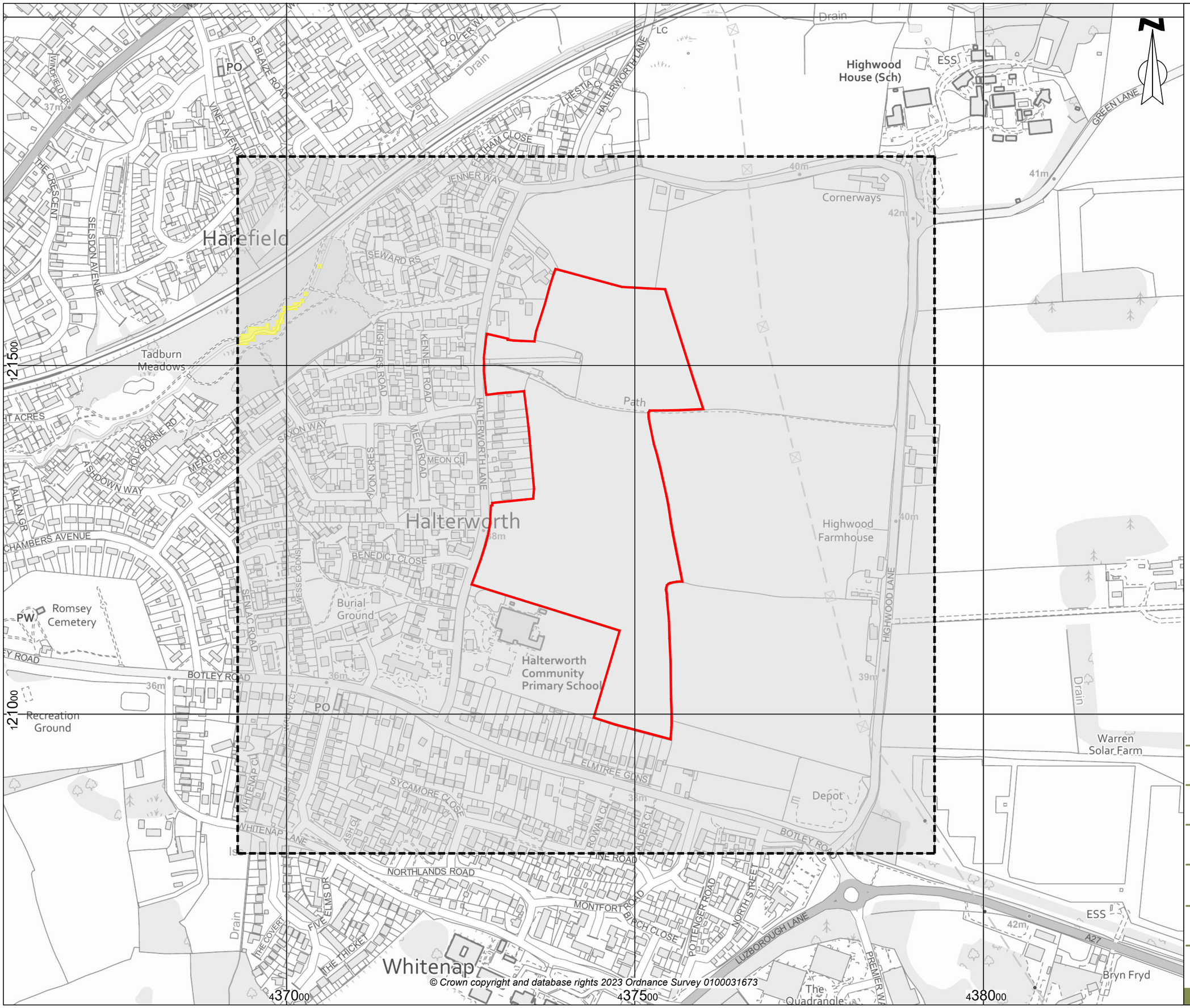
CHECKED: DA

DATE: Sept 2023

PROJECT: Halterworth Lane, Romsey

TITLE: Environment Agency Flood Zones

DRAWING NO: SHF.1132.258.HY.D.003



Key

- Site Boundary
- Search Extent
- Class 1 - High Risk
- Class 2 - Moderate Risk
- Class 3 - Low Risk
- Class 4 - Negligible Risk

Notes:

GEOSMART GROUNDWATER FLOOD RISK MAP GW5
Version 2.4© - www.geosmartinfo.co.uk

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CLIENT: Gladman Developments Ltd

SCALE: 1:5,000@A3

PROJECT REF: SHF.1132.258

DRAWN: LW

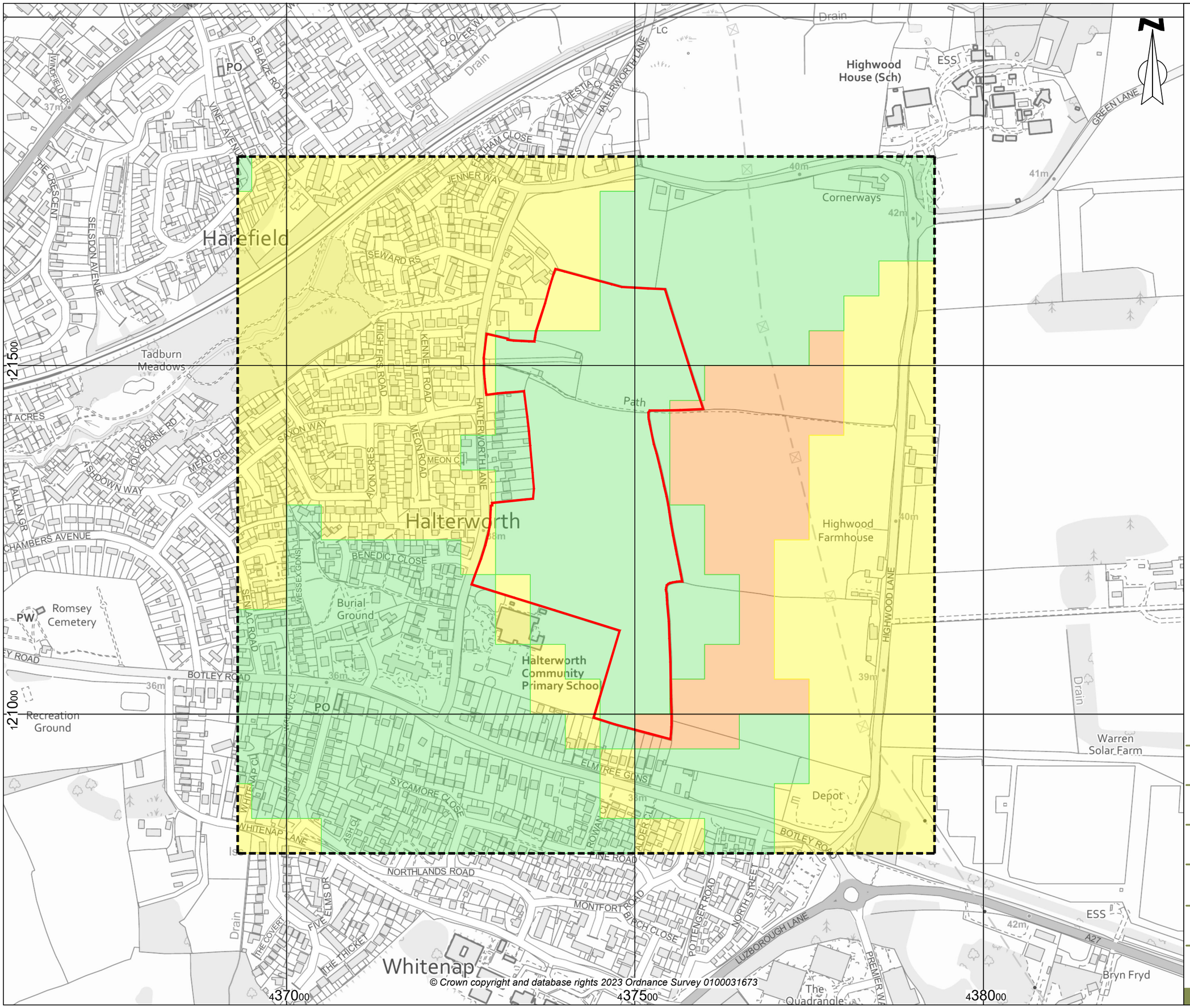
CHECKED: DA

DATE: Sept 2023

PROJECT: Halterworth Lane, Romsey

TITLE: Groundwater Flood Risk Map

DRAWING NO: SHF.1132.258.HY.D.004



Key

- Site Boundary
- Search Extent
- High Potential
- Moderate Potential
- Low Potential

Notes:

GEOSMART SUDS INFILTRATION POTENTIAL MAP SD50
Version 1.0© - www.geosmartinfo.co.uk

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CLIENT: Gladman Developments Ltd

SCALE: 1:5,000@A3

PROJECT REF: SHF.1132.258

DRAWN: LW

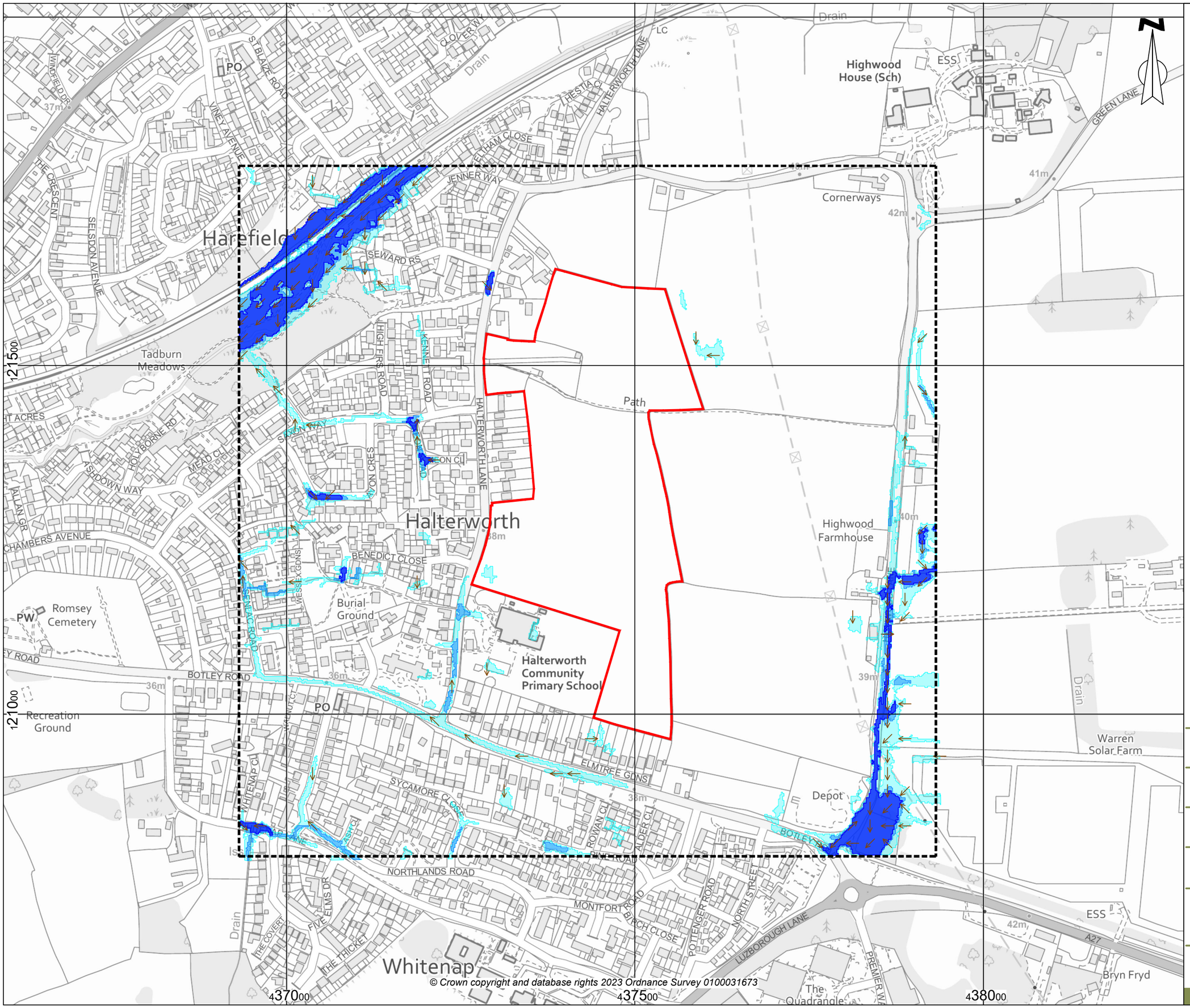
CHECKED: DA

DATE: Sept 2023

PROJECT: Halterworth Lane, Romsey

TITLE: SuDS Infiltration Potential Map

DRAWING NO: SHF.1132.258.HY.D.005



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environmental consultants

Samuel House, 5 Fox Valley Way, Stocksbridge, Sheffield, S36 2AA

CLIENT: Gladman Developments Ltd

SCALE: 1:5,000@A3

PROJECT REF: SHF.1132.258

DRAWN: LW

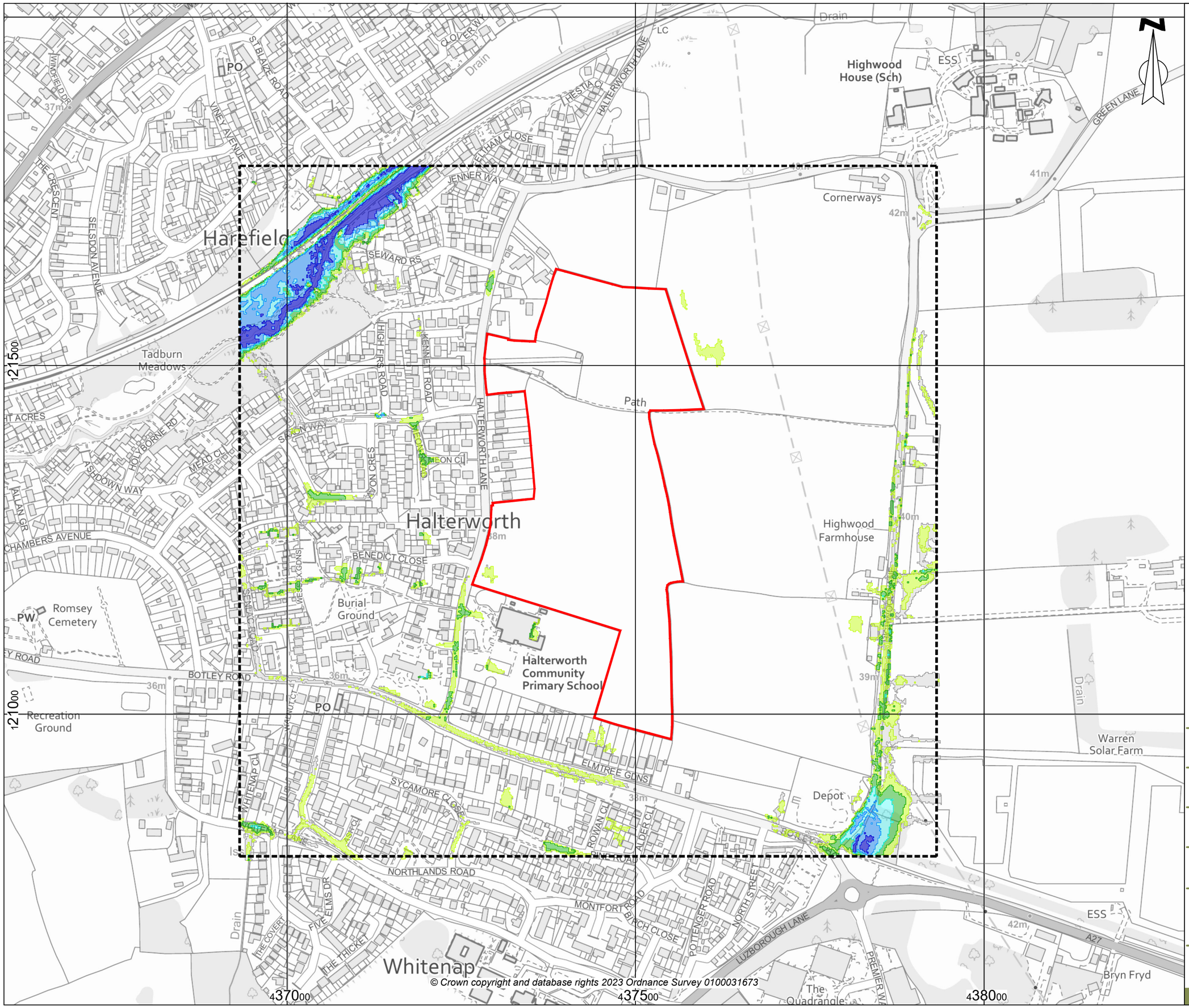
CHECKED: DA

DATE: Sept 2023

PROJECT: Halterworth Lane, Romsey

TITLE: Environment Agency Surface Water Flow Paths

DRAWING NO: SHF.1132.258.HY.D.006.1



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CLIENT: Gladman Developments Ltd

SCALE: 1:5,000@A3

PROJECT REF: SHF.1132.258

DRAWN: LW

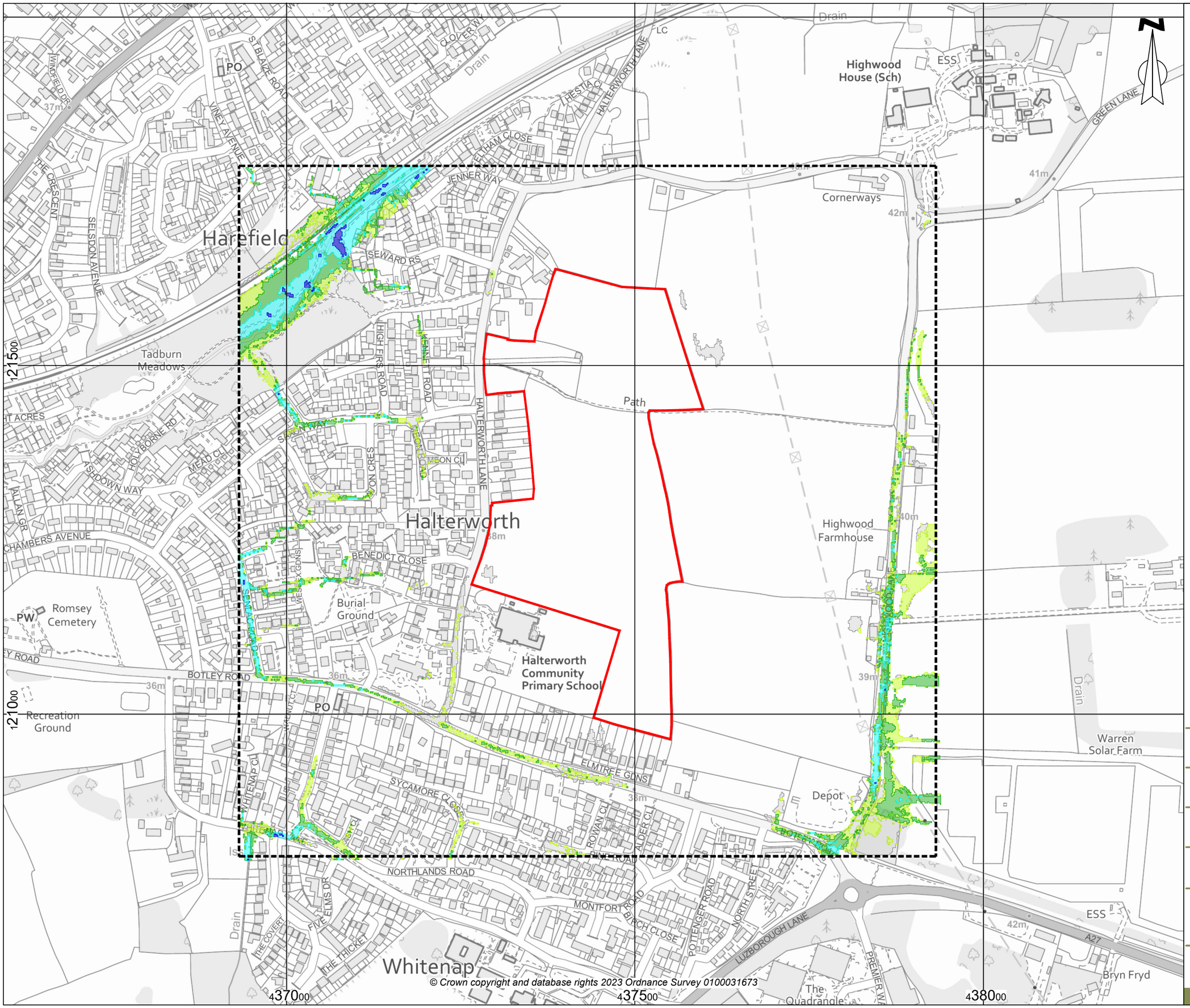
CHECKED: DA

DATE: Sept 2023

PROJECT: Halterworth Lane, Romsey

TITLE: Environment Agency 1 in 1000 Year Surface Water Depth

DRAWING NO: SHF.1132.258.HY.D.006.2



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environmental consultants

Samuel House, 5 Fox Valley Way, Stocksbridge, Sheffield, S36 2AA

CLIENT: Gladman Developments Ltd

SCALE: 1:5,000@A3

PROJECT REF: SHF.1132.258

DRAWN: LW

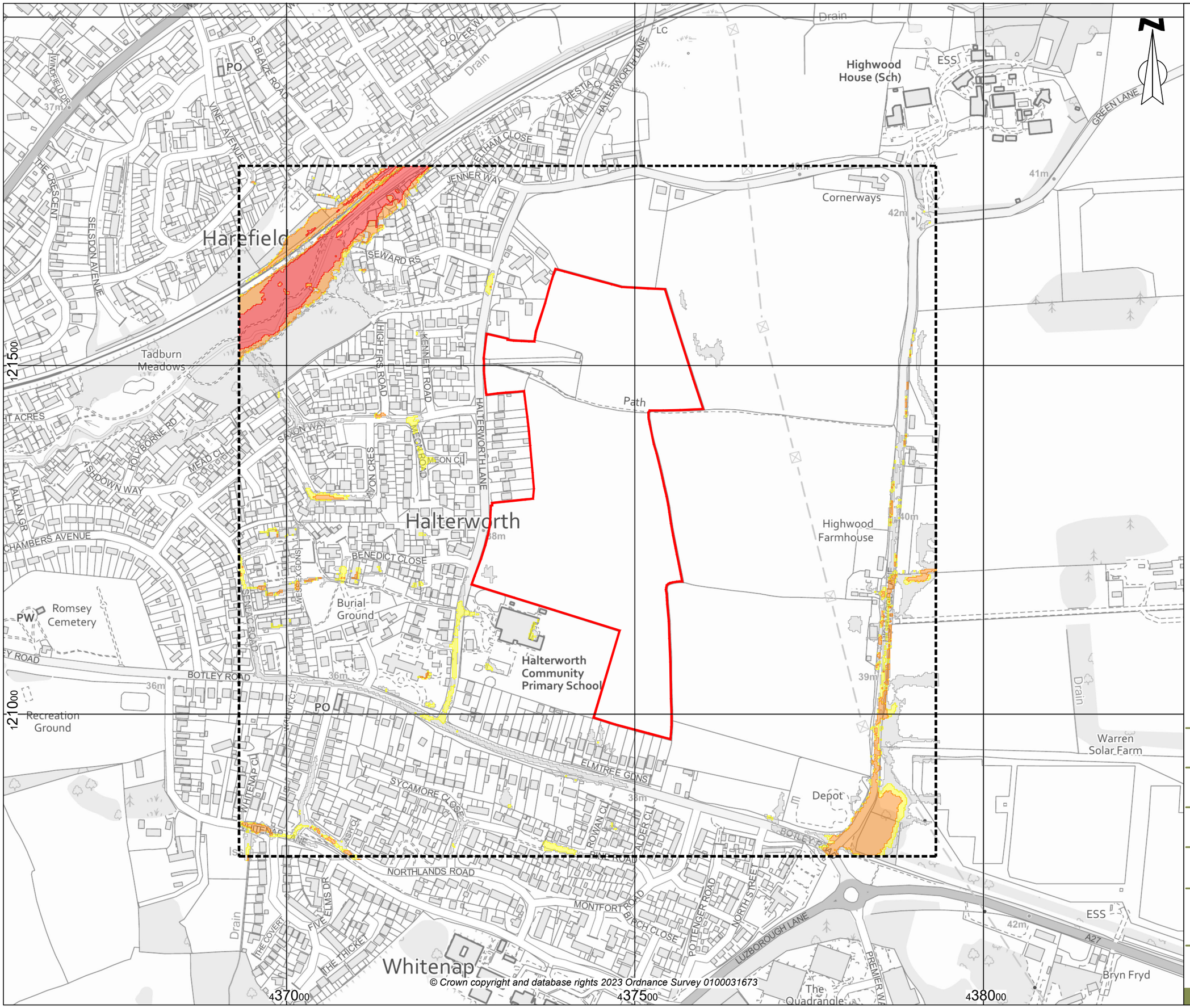
CHECKED: DA

DATE: Sept 2023

PROJECT: Halterworth Lane, Romsey

TITLE: Environment Agency 1 in 1000 Year Surface Water Velocity

DRAWING NO: SHF.1132.258.HY.D.006.3



Key

- Site Boundary
- Search Extent
- Extreme Hazard (> 2.0)
- Significant Hazard (1.25 - 2.00)
- Moderate Hazard (0.75 - 1.25)
- Low Hazard (0.50 - 0.75)

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CLIENT: Gladman Developments Ltd

SCALE: 1:5,000@A3

PROJECT REF: SHF.1132.258

DRAWN: LW

CHECKED: DA

DATE: Sept 2023

PROJECT: Halterworth Lane, Romsey

TITLE: Environment Agency Surface Water 1000 Year Hazard Rating

DRAWING NO: SHF.1132.258.HY.D.006.4

Key

- Site Boundary
- Contours
  1.0m Intervals (mAOD)
- Surface Water Flow Path

Notes:

Ground Model Specification: 2m DTM LIDAR data

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CLIENT: Gladman Developments Ltd

SCALE: 1:5,000@A3

PROJECT REF: SHF.1132.258

DRAWN: LW

CHECKED: DA

DATE: Sept 2023

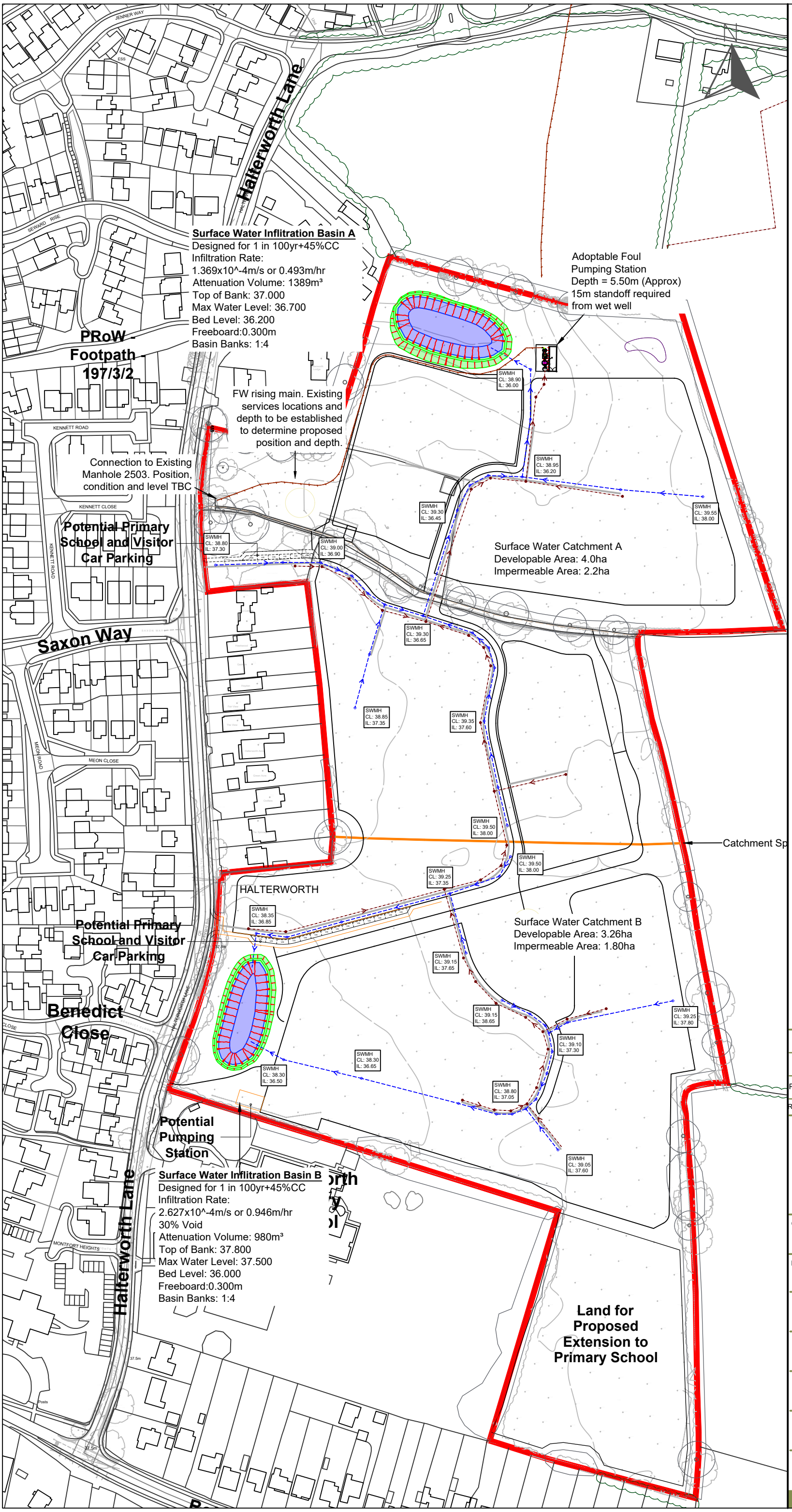
PROJECT: Halterworth Lane, Romsey

TITLE: Exceedance Routes

DRAWING NO: SHF.1132.258.HY.D.007

0 100 200 400m

Scale 1:5,000@A3



NOTES

1. Do not scale from this drawing
2. All dimensions are in meters unless stated otherwise
3. This drawing is to be read in conjunction with all relevant drawings and documents associated with this project.
4. All surveyed information including levels and layout is provided by others
5. All existing and proposed dimensions, levels and locations to be checked and verified by the main contractor on site prior to the commencement of the works and any anomalies reported to the engineer.
6. All works, workmanship and materials on private drainage to be in accordance with the civil engineering specification for water industry 7th edition published by the water research council.

Key

- Site Boundary
- Surface Water Sewer
- Foul Water Sewer
- Foul Rising Main

REV:	DATE:	DETAIL:	DES:	CHK:	APP:
P01	22/12/23	First Issue	RB	EOC	EOC

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CLIENT: Gladman Developments Ltd

PROJECT: Halterworth Lane, Romsey

DRAWING TITLE: Drainage Strategy

DRAWN:	DESIGNED:	CHECKED:	APPROVED:
RB	RB	EOC	EOC

DATE:	SCALE @ A3:
22/12/2023	1:2000

PROJECT NO.:	DRAWING NO.:
SHF.1132.258	ENZ-XX-XX-DR-D-0001

DRAWING STATUS:	ISSUE:
Preliminary	P01

APPENDICES

Appendix 1 – Topographic Survey

TREE SCHEDULE

No.	DIAM.	SPREAD Ø	HEIGHT
TE/1	0.65	16	16
TE/2	1.10	20	18
TE/3	1.30	20	20
TE/4	1.60	14	20
TE/5	1.10	20	16
TE/6	0.80	16	16
TE/7	0.40	8	16
TE/8	0.40	12	16
TE/9	0.65	15	17
TE/10	0.65	15	17
TE/11	0.65	15	17
TE/12	0.95	18	17
TE/13	0.70	18	16
TE/14	0.40	4	3
TE/15	0.40	4	3
TE/16	0.15	4	6
TE/17	0.20	6	6
TE/18	0.50	4	6
TE/19	0.35	10	6
TE/20	0.20	8	6
TE/21	0.20	8	6
TE/22	0.20	8	6
TE/23	0.50	12	8
TE/24	0.20	8	8
TE/25	0.20	8	8
TE/26	0.20	8	8
TE/27	0.20	4	6
TE/28	0.20	4	6
TE/29	0.15	4	6
TE/30	0.15	4	6
TE/31	0.20	6	6
TE/32	0.20	4	3
TE/33	0.30	8	10
TE/34	0.20	8	6
TE/35	0.20	8	6
TE/36	0.20	8	6
TE/37	0.20	8	6
TE/38	0.20	8	6
TE/39	0.20	8	6
TE/40	0.20	6	6
TE/41	0.15	4	6
TE/42	0.15	4	6
TE/43	0.15	4	6
TE/44	0.15	4	6
TE/45	0.20	6	8
TE/46	0.20	6	8
TE/47	0.20	4	6
TE/48	0.20	4	6
TE/49	0.20	6	6
TE/50	0.20	6	6
TE/51	0.65	14	12
TE/52	0.40	6	8
TE/53	0.20	4	6
TE/54	0.95	22	19
TE/55	0.80	10	10
TE/56	0.65	20	12
TE/57	0.20	4	6
TE/58	0.20	4	6
TE/59	0.20	4	6
TE/60	0.20	4	6
TE/61	0.20	4	6
TE/62	0.35	10	6
TE/63	0.25	6	6
TE/64	0.30	10	10
TE/65	0.70	14	14
TE/66	1.40	24	18
TE/67	1.00	18	18
TE/68	0.80	16	8
TE/69	0.60	8	8
TE/70	1.20	18	15
TE/71	1.30	14	14
TE/72	1.30	22	17
TE/73	0.90	22	17
TE/74	0.90	16	16
TE/75	0.90	16	16
TE/76	1.00	22	18
TE/77	1.00	18	18
TE/78	1.20	16	18
TE/79	1.00	14	12
TE/80	0.60	14	16
TE/81	0.80	20	16
TE/82	0.70	8	10
TE/83	0.15	4	10
TE/84	0.15	4	10
TE/85	0.15	4	10
TE/86	0.15	4	10
TE/87	0.50	16	14
TE/88	0.80	20	18
TE/89	0.60	18	18
TE/90	0.90	22	18
TE/91	1.00	22	18
TE/92	0.80	16	10
TE/93	0.40	8	8
TE/94	0.45	8	8
TE/95	0.40	8	8
TE/96	0.40	8	8
TE/97	0.65	8	8
TE/98	0.65	8	8
TE/99	0.30	5	5
TE/100	0.70	12	10
TE/101	0.40	8	10
TE/102	0.85	12	10
TE/103	0.40	10	10
TE/104	0.55	12	10
TE/105	0.80	16	12
TE/106	0.40	10	10
TE/107	0.35	8	8
TE/108	1.50	28	18
TE/109	1.20	14	14
TE/110	1.30	20	16
TE/111	0.30	8	8
TE/112	1.00	22	16

TREE DIAMETER MEASURED APPROXIMATELY 1.5M ABOVE GROUND LEVEL. TREE SPREADS ARE SYMBOLIC ONLY AND ARE REPRESENTATIVE OF THE GENERALISED CANOPY SIZE. TREE BOLE MAY NOT SIT CENTRALLY TO THE CANOPY. TREE HEIGHT ESTIMATED FROM GROUND LEVEL.

0 5 10 20 30 40 50 1:500
0 10 20 30 40 50

N

NOTES

THIS SURVEY IS ORIENTATED TO ORDNANCE SURVEY GRID NORTH. THE SURVEY IS TO A PLANE GRID. HORIZONTAL MEASUREMENTS TAKEN FROM THIS SURVEY WILL BE GROUND DISTANCES.

SITE CENTRE: E 437424, N 121309

LOCAL SCALE FACTOR: 0.9996185

ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM GENERATED BY ACTIVE GPS NETWORK.

DRAINAGE:-

NO ALLOWANCE HAS BEEN MADE FOR SUB SURFACE ACCESS TO MANHOLES OR CHAMBERS. ANY PIPE SIZES, DEPTHS OR BELOW GROUND DIMENSIONS ARE TAKEN FROM THE SURFACE AND THUS WILL ONLY BE APPROXIMATE. ANY FLOW TYPES (FOUL WATER, SURFACE WATER OR COMBINED) ARE ASSUMED AND THEREFORE REQUIRE VERIFICATION.

ROAD MARKINGS:-

ROAD MARKINGS DISPLAYED ARE SYMBOLIC. LENGTH, SPACING AND THICKNESS ETC. ARE INDICATIVE ONLY.

LEGEND

30.29 SPOT LEVEL
SURVEY STATION
SAPLING
BUSHES/SHRUB
TREE (INDICATIVE ONLY)
HEDGE/AREA OF UNDERGROWTH
99.90 CONTOUR
GATE
OVERHEAD CABLE
FENCE
1 PHOTOGRAPH LOCATION AND NUMBER

ABBREVIATIONS

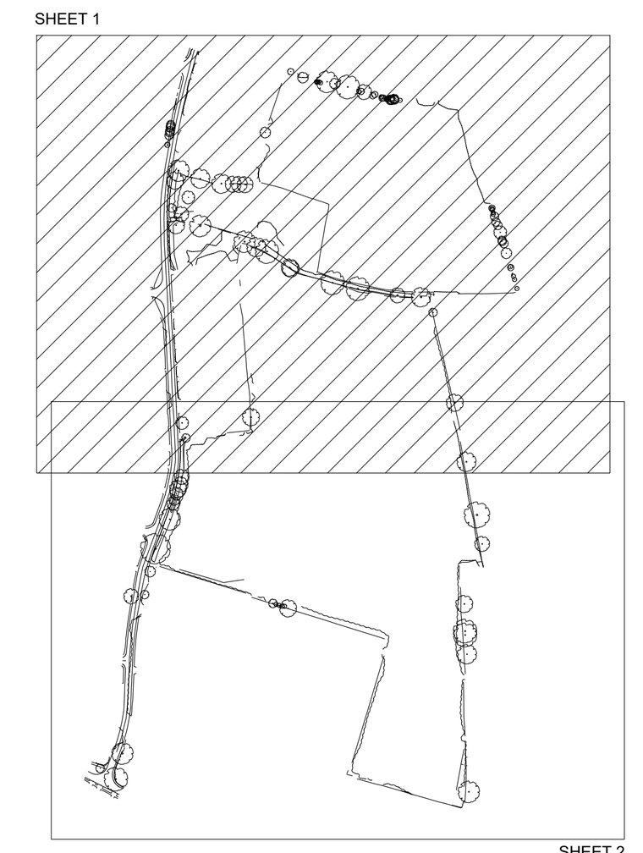
ArL	ARCH LEVEL	LB	LETTER BOX
AV	AIR VALVE	LP	LAMPOST
B	BOLLARD	MH	MANHOLE
BB	BELISHA BEACON	MKR	MARKER
BH	BOREHOLE	OHC	OVERHEAD CABLE
BL	BED LEVEL	OpL	OPENING LEVEL
BS	BUS STOP	OSBM	OS BENCHMARK
BT	BT COVER	P	POST
C/B	CLOSED BOARD FENCE	P/R	POST AND RAIL FENCE
C/L	CHAIN LINK FENCE	P/W	POST AND WIRE FENCE
CATV	CABLE TELEVISION COVER	PEC	PEDESTRIAN CROSSING
CC	CONTROL CABIN	PM	PARKING METER
COL	COLUMN	RE	RODDING EYE
Conc/p	CONCRETE PANEL FENCE	RWL	RETAINING WALL
CPY	CANOPY	SAP	SAPLING
CrL	CROWN LEVEL	SEC	SECURITY CAMERA
Csty	CABLE STAY	SGY	STRIP GULLY
CTV	CABLE TELEVISION POINT	SoL	SOFFIT LEVEL
CYR	CYCLE RACK	SP	SIGNPOST
DK	DROPPED KERB	SpL	SPRINGING LEVEL
DP	DOWNPIPE	SV	STOP VALVE
EiP	ELECTRIC INLET POINT	Tac	TACTILE PAVING
EL	ELECTRIC INSPECTION COVER	TCB	TELEPHONE BOX
EP	ELECTRICITY SUPPLY POLE	TE/?	TREE + NUMBER
ER	EARTH ROD	THL	THRESHOLD LEVEL
FH	FIRE HYDRANT	TL	TRAFFIC LIGHT
G	GULLY	ToF	TOP OF FENCE
G/DP	GULLY AND DOWNPIPE	ToW	TOP OF WALL
GP	GATE POST	TP	TELEPHONE POLE
Gpi	GAS PIPE	W/M	WIRE MESH FENCE
GV	GAS VALVE	W/P	WOODEN PANEL FENCE
IC	INSPECTION CHAMBER	WLV	WATER LEVEL
IL	INVERT LEVEL	WM	WATER METER
I/R	IRON RAILING FENCE	WO	WASH OUT
KO	KERB OUTLET		

STATION CO-ORDINATES

STATION	EASTING	NORTHING	LEVEL	DESCRIPTION
STN/1	437287.33	121504.25	38.05	Survey Nail
STN/4	437270.29	121504.24	37.78	Survey Nail
STN/8	437252.01	121188.89	37.73	Survey Nail
STN/9	437285.71	121609.09	34.27	Survey Nail
STN/10	437274.65	121408.18	38.22	Survey Nail
STN/11	437287.29	121309.89	38.11	Survey Nail
STN/12	437270.86	121239.79	37.97	Survey Nail
STN/13	437243.15	121044.46	37.68	Survey Nail
STN/14	437219.25	120980.24	37.69	Survey Nail

PLOT LOCATIONS

SHEET 1



SHEET 2

Rev	Date	Revision notes	By
*	*	*	*

DO NOT SCALE

Status

INFORMATION

Project

Halterworth Lane, Romsey.

Title

TOPOGRAPHICAL SURVEY
AS OF 08.06.21
SHEET 1 OF 2

GLADMAN
Gladman House, Alexandria Way
Congleton Business Park
Congleton, Cheshire
CW12 1LB
Tel: 01260 288800
Fax: 01260 288801
www.gladman.co.uk

Drawn By	Publish Date	Scale(s)	Sheet Size
JW/JH	15.06.21	1:500	A0

Project no.	Drawing no.	Revision
2016-136	Topo_01_2D	0

TREE SCHEDULE

No.	DIAM.	SPREAD Ø	HEIGHT
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TE/2	1.10	20	18
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TE/4	1.60	14	20
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TE/7	0.40	8	16
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TE/12	0.95	18	17
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TE/74	0.90	16	16
TE/75	0.90	16	16
TE/76	1.00	22	18
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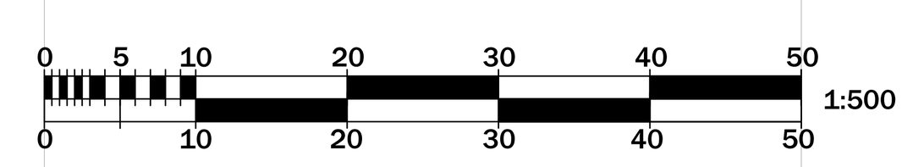
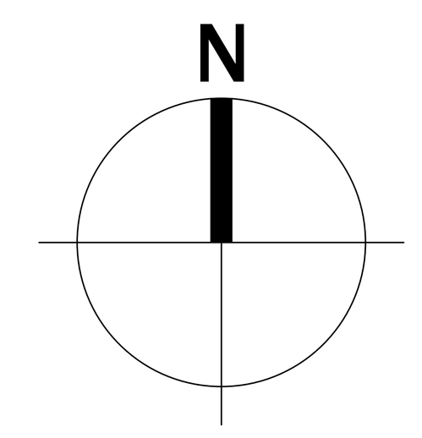
TE/89	0.60	18	18
TE/90	0.90	22	18
TE/91	1.00	22	18
TE/92	0.80	16	10
TE/93	0.40	8	8
TE/94	0.45	8	8
TE/95	0.40	8	8
TE/96	0.40	8	8
TE/97	0.65	8	8
TE/98	0.65	8	8
TE/99	0.30	5	5
TE/100	0.70	12	10
TE/101	0.40	8	10
TE/102	0.85	12	10
TE/103	0.40	10	10
TE/104	0.55	12	10
TE/105	0.80	16	12
TE/106	0.40	10	10
TE/107	0.35	8	8
TE/108	1.50	28	18
TE/109	1.20	14	14
TE/110	1.30	20	16
TE/111	0.30	8	8
TE/112	1.00	22	16

TREE DIAMETER MEASURED APPROXIMATELY 1.5M ABOVE GROUND LEVEL. TREE SPREADS ARE SYMBOLIC ONLY AND ARE REPRESENTATIVE OF THE GENERALISED CANOPY SIZE. TREE BOLE MAY NOT SIT CENTRALLY TO THE CANOPY. TREE HEIGHT ESTIMATED FROM GROUND LEVEL.





NOTES

THIS SURVEY IS ORIENTATED TO ORDNANCE SURVEY GRID NORTH. THE SURVEY IS TO A PLANE GRID. HORIZONTAL MEASUREMENTS TAKEN FROM THIS SURVEY WILL BE GROUND DISTANCES.

SITE CENTRE: E 437424, N 121309

LOCAL SCALE FACTOR: 0.9996185

ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM GENERATED BY ACTIVE GPS NETWORK.

DRAINAGE:-

NO ALLOWANCE HAS BEEN MADE FOR SUB SURFACE ACCESS TO MANHOLES OR CHAMBERS. ANY PIPE SIZES, DEPTHS OR BELOW GROUND DIMENSIONS ARE TAKEN FROM THE SURFACE AND THUS WILL ONLY BE APPROXIMATE. ANY FLOW TYPES (FOUL WATER, SURFACE WATER OR COMBINED) ARE ASSUMED AND THEREFORE REQUIRE VERIFICATION.

ROAD MARKINGS:-

ROAD MARKINGS DISPLAYED ARE SYMBOLIC. LENGTH, SPACING AND THICKNESS ETC. ARE INDICATIVE ONLY.

LEGEND

- 30.29 — SPOT LEVEL
- SURVEY STATION
- SAPLING
- BUSHES/SHRUB
- TREE (INDICATIVE ONLY)
- HEDGE/AREA OF UNDERGROWTH
- 99.90 — CONTOUR
- GATE
- OVERHEAD CABLE
- FENCE
- 1 — PHOTOGRAPH LOCATION AND NUMBER

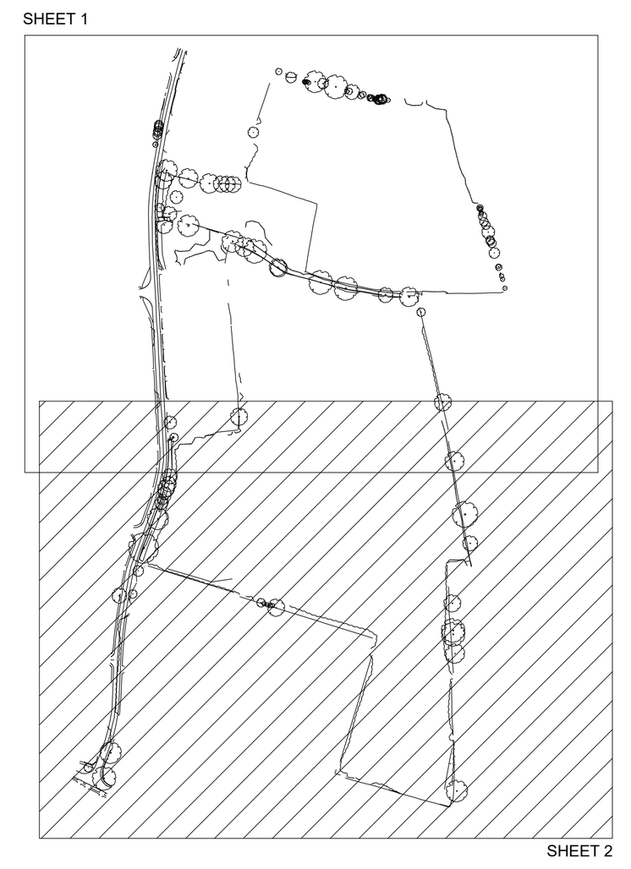
ABBREVIATIONS

ArL	ARCH LEVEL	LB	LETTER BOX
AV	AIR VALVE	LP	LAMPOST
B	BOLLARD	MH	MANHOLE
BB	BELISHA BEACON	MKR	MARKER
BH	BOREHOLE	OHC	OVERHEAD CABLE
BL	BED LEVEL	OpL	OPENING LEVEL
BS	BUS STOP	OSBM	OS BENCHMARK
BT	BT COVER	P	POST
C/B	CLOSED BOARD FENCE	P/R	POST AND RAIL FENCE
C/L	CHAIN LINK FENCE	P/W	POST AND WIRE FENCE
CATV	CABLE TELEVISION COVER	PEC	PEDESTRIAN CROSSING
CC	CONTROL CABIN	PM	PARKING METER
COL	COLUMN	RE	RODDING EYE
Conc/p	CONCRETE PANEL FENCE	RWL	RETAINING WALL
CPY	CANOPY	SAP	SAPLING
CrL	CROWN LEVEL	SEC	SECURITY CAMERA
Csty	CABLE STAY	SGY	STRIP GULLY
CTV	CABLE TELEVISION POINT	SoL	SOFFIT LEVEL
CYR	CYCLE RACK	SP	SIGNPOST
DK	DROPPED KERB	SpL	SPRINGING LEVEL
DP	DOWNPIPE	SV	STOP VALVE
EiP	ELECTRIC INLET POINT	Tac	TACTILE PAVING
EL	ELECTRIC INSPECTION COVER	TCB	TELEPHONE BOX
EP	ELECTRICITY SUPPLY POLE	TE/?	TREE + NUMBER
ER	EARTH ROD	THL	THRESHOLD LEVEL
FH	FIRE HYDRANT	TL	TRAFFIC LIGHT
G	GULLY	ToF	TOP OF FENCE
G/DP	GULLY AND DOWNPIPE	ToW	TOP OF WALL
GP	GATE POST	TP	TELEPHONE POLE
Gpi	GAS PIPE	W/M	WIRE MESH FENCE
GV	GAS VALVE	W/P	WOODEN PANEL FENCE
IC	INSPECTION CHAMBER	WLV	WATER LEVEL
IL	INVERT LEVEL	WM	WATER METER
I/R	IRON RAILING FENCE	WO	WASH OUT
KO	KERB OUTLET		

STATION CO-ORDINATES

STATION	EASTING	NORTHING	LEVEL	DESCRIPTION
STN/1	437287.33	121504.25	38.05	Survey Nail
STN/4	437270.29	121504.24	37.78	Survey Nail
STN/8	437252.01	121188.89	37.73	Survey Nail
STN/9	437285.71	121609.09	34.27	Survey Nail
STN/10	437274.65	121408.18	38.22	Survey Nail
STN/11	437287.29	121309.89	38.11	Survey Nail
STN/12	437270.86	121239.79	37.97	Survey Nail
STN/13	437243.15	121044.46	37.68	Survey Nail
STN/14	437219.25	120980.24	37.69	Survey Nail

PLOT LOCATIONS



Rev	Date	Revision notes	By
*	*	*	*

DO NOT SCALE

Status

INFORMATION

Project

Halterworth Lane, Romsey.

Title

**TOPOGRAPHICAL SURVEY
AS OF 08.06.21
SHEET 2 OF 2**

GLADMAN
Gladman House, Alexandria Way
Congleton Business Park
Congleton, Cheshire
CW12 1LB
Tel: 01260 288800
Fax: 01260 288801
www.gladman.co.uk

Drawn By	Publish Date	Scale(s)	Sheet Size
JW/JH	15.06.21	1:500	A0

Project no.	Drawing no.	Revision
2016-136	Topo_02_2D	0

Appendix 2 – Southern Water Correspondence

Order received: 4 April 2019
Order completed: 5 April 2019

Drainage and water enquiry

Commercial

Order reference: LS/U1430652
Your reference: SF27619971000 LKS/Romsey 2016-136

Search address:

Land at Halterworth Lane
Romsey
Hampshire
SO51 9AE

Ordered by:

Searchflow
42 Kings Hill Avenue
West Malling
Kent
ME19 4AJ

For enquiries regarding the information provided in this report, please contact the LandSearch team:

Tel: 0845 270 0212
0330 303 0276 (individual consumers)

Email: searches@southernwater.co.uk

Web: www.southernwater.co.uk

LandSearch
Southern Water Services
Southern House
Capstone Road
Chatham
Kent

COMMERCIALDW
DRAINAGE AND WATER ENQUIRY

Southern Water

Order received: 4 April 2019
Order completed: 5 April 2019

ME5 7QA

COMMERCIALDW
DRAINAGE AND WATER ENQUIRY

Southern Water

What you need to know about...

Private sewer transfer

On 1 October 2011, ownership of private sewers and lateral drains changed in accordance with The Water Industry (Schemes for Adoption of Private Sewers) Regulations 2011. The contents of this search may not reflect these changes.

For further information please visit our website: www.southernwater.co.uk/sewer-ownership-changes.

Records searched

The following records were searched in compiling this report: the Map of Public Sewers, the Map of Waterworks, water and sewerage records, the Register of Properties subject to Internal Foul Flooding, the Register of Properties subject to Poor Water Pressure and the Drinking Water Register. Should the property not fall entirely within Southern Water's region, a copy of the records held by the relevant water company was searched.

Competition in the non-household retail market

From April 2017 non-household customers in England can choose their retailer. 'Retail' refers to the way in which customers are billed for their water and sewerage as well as customer services including meter reading.

The 'wholesale' part of the water industry was not opened for competition in April 2017. This means Southern Water continues to look after the pipes and infrastructure for all its customers across Kent, Sussex, Hampshire and the Isle of Wight.

Moving

There can be a lot to do and remember when you're moving. Whether you are moving within our area, moving into our area or moving out of the area please let your retailer know.

Your order summary

	Maps	
1.1	Where relevant, please include a copy of an extract from the public sewer map.	Map provided
1.2	Where relevant, please include a copy of an extract from the map of waterworks	Map provided
	Drainage	
2.1	Does foul water from the property drain to a public sewer?	No
2.2	Does surface water from the property drain to a public sewer?	No
2.3	Is a surface water drainage charge payable?	See answer
2.4	Does the public sewer map indicate any public sewer, disposal main or lateral drain within the boundaries of the property?	Yes
2.4.1	Does the public sewer map indicate any public pumping station or any other ancillary apparatus within the boundaries of the property?	No
2.5	Does the public sewer map indicate any public sewer within 30.48 metres (100 feet) of any buildings within the property?	No
2.5.1	Does the public sewer map indicate any public pumping station or any other ancillary apparatus within 50 metres of any buildings within the property?	No
2.6	Are any sewers or lateral drains serving, or which are proposed to serve the property, the subject of an existing adoption agreement or an application for such an agreement?	No
2.7	Has any sewerage undertaker approved or been consulted about any plans to erect a building or extension on the property over or in the vicinity of a public sewer, disposal main or drain?	No
2.8	Is the building which is or forms part of the property at risk of internal flooding due to overloaded public sewers?	No
2.9	Please state the distance from the property to the nearest boundary of the nearest sewage treatment works.	See answer
	Water	
3.1	Is the property connected to mains water supply?	No
3.2	Are there any water mains, resource mains or discharge pipes within the boundaries of the property?	No
3.3	Is any water main or service pipe serving, or which is proposed to serve the property, the subject of an existing adoption agreement or an application for such an agreement?	No
3.4	Is the property at risk of receiving low water pressure or flow?	No
3.5	What is the classification of the water supply for the property?	See answer
3.6	Is there a meter installed at this property?	See answer
	Charging	
4.1.1	Who is responsible for providing the sewerage services for the property?	Southern Water
4.1.2	Who is responsible for providing the water services for the property?	Southern Water
4.2	Who bills the property for sewerage services?	See answer
4.3	Who bills the property for water services?	See answer
	Trade effluent information	
4.4	Is there a consent on this property to discharge trade effluent under Section 118 of the Water Industry Act (1991) into the public sewerage system?	No

Maps

Public sewer map

Q. 1.1: Where relevant, please include a copy of an extract from the public sewer map.

A.: A copy of an extract from the public sewer map is provided.

Guidance notes:

The Water Industry Act 1991 defines public sewers as those which the Company has responsibility for. Other assets and rivers, watercourses, ponds, culverts or highway drains may be shown for information purpose only.

Any private sewers or lateral drains which are indicated on the extract of the public sewer map as being subject to an agreement under Section 104 of the Water Industry Act 1991 are not an "as constructed" record. It is recommended these details be checked with the developer.

Map of waterworks

Q. 1.2: Where relevant, please include a copy of an extract from the map of waterworks.

A.: A copy of an extract of the map of waterworks is provided.

Guidance notes:

Assets other than vested water mains may be shown on the plan for information only.

The Company is not responsible for private supply pipes connecting the property to the public water main and does not hold details of these. These may pass through land outside of the control of the seller, or may be shared with adjacent properties. The buyer may wish to investigate whether separate rights or easements are needed for their inspection, repair or renewal.

If an extract of the public water main record is enclosed, this will show known public water mains in the vicinity of the property. It should be possible to estimate the likely length and route of any private water supply pipe connecting the property to the public water network.

Drainage

Foul water

Q. 2.1: Does foul water from the property drain to a public sewer?

A.: The Company's records indicate that foul water from the property does not drain to the public sewerage system.

Guidance notes:

The Company is not responsible for private drains and sewers that connect the property to the public sewerage system and does not hold details of these.

The property owner will normally have sole responsibility for private drains serving the property and may have shared responsibility, with other users, if the property is served by a private sewer which also serves other properties. These may pass through land outside of the control of the seller and the buyer may wish to investigate whether separate rights or easements are needed for their inspection, repair or renewal.

An extract from the public sewer map is enclosed. This will show known public sewers in the vicinity of the property and it should be possible to estimate the likely length and route of any private drains and/or sewers connecting the property to the public sewerage system.

If foul water does not drain to the public sewerage system the property may have private facilities in the form of a cesspit, septic tank or other type of treatment plant.

Surface water

Q. 2.2: Does surface water from the property drain to a public sewer?

A.: The Company's records indicate that surface water from the property does not drain to the public sewerage system. If the property was constructed after 6 April 2015 the surface water drainage may be served by a Sustainable Drainage System. Further information may be available from the developer.

Guidance notes:

The Company is not responsible for private drains and sewers that connect the property to the public sewerage system and does not hold details of these.

The property owner will normally have sole responsibility for private drains serving the property and may have shared responsibility, with other users, if the property is served by a private sewer which also serves other properties. These may pass through land outside of the control of the seller and the buyer may wish to investigate whether separate rights or easements are needed for their inspection, repair or renewal.

An extract from the public sewer map is enclosed. This will show known public sewers in the vicinity of the property and it should be possible to estimate the likely length and route of any private drains and/or sewers connecting the property to the public sewerage system.

In some cases company records do not distinguish between foul and surface water connections to the public sewerage system. If on inspection the buyer finds that the property is not connected for surface water drainage, the property may be eligible for a rebate of the surface water drainage charge. Details can be obtained from the Company.

If surface water does not drain to the public sewerage system the property may have private facilities in the form of a soakaway or private connection to a watercourse

Surface water drainage charge

Q. 2.3: Is a surface water drainage charge payable?

A.: Records confirm that a surface water drainage charge is not applicable at this property. If the property was constructed after 6 April 2015 the surface water drainage may be served by a Sustainable Drainage System. Further information may be available from the developer.

Guidance notes:

Where surface water from a property does not drain to the public sewerage system no surface water drainage charges are applicable.

If on inspection the buyer finds that the property is not connected for surface water drainage, the buyer should contact their retailer.

Public sewers within the boundary of the property

Q. 2.4: Does the public sewer map indicate any public sewer, disposal main or lateral drain within the boundaries of the property?

A.: The public sewer map included indicates that there is a public sewer, disposal main or lateral drain within the boundaries of the property. However, from 1 October 2011 there may be additional public sewers, disposal mains or lateral drains which are not recorded on the public sewer map but which may further prevent or restrict development of the property.

Guidance notes:

The approximate boundary of the property has been determined by reference to the Ordnance Survey record or the map supplied.

The presence of a public sewer within the boundary of the property may restrict further development within it.

Southern Water Services has a statutory right of access to carry out work on their assets, subject to notice. This may result in employees of Southern Water Services or its contractors needing to enter the property to carry out work.

Please note if the property was constructed after 1 July 2011 any sewers and/or lateral drain within the boundary of the property are the responsibility of the householder.

Public pumping station within the boundary of the property

Q. 2.4.1: Does the public sewer map indicate any public pumping station or any other ancillary apparatus within the boundaries of the property?

A.: The public sewer map included indicates that there is no public pumping station within the boundaries of the property. Any other ancillary apparatus is shown on the public sewer map and referenced on the legend.

Guidance notes:

The approximate boundary of the property has been determined by reference to the Ordnance Survey record or the map supplied.

The presence of a pumping station within the boundary of the property may restrict further development within it.

Southern Water Services has a statutory right of access to carry out work on their assets, subject to notice. This may result in employees of Southern Water Services or its contractors needing to enter the property to carry out work.

It should be noted that only private pumping stations installed before 1 July 2011 will be transferred into the ownership of Southern Water Services.

Public sewers near to the property

Q. 2.5: Does the public sewer map indicate any public sewer within 30.48 metres (100 feet) of any buildings within the property?

A.: The public sewer map indicates that there are no public sewers within 30.48 metres (100 feet) of a building within the property.

Guidance notes:

From 1 October 2011 there may be additional lateral drains and/or public sewers which are not recorded on the public sewer map but are also within 30.48 metres (100 feet) of a building within the property.

The presence of a public sewer within 30.48 metres (100 feet) of a building within the property can result in the local authority requiring a property to be connected to the public sewer.

The measure is estimated from the Ordnance Survey record, between a building within the boundary of the property and the nearest public sewer.

Public pumping station near to the property

Q. 2.5.1: Does the public sewer map indicate any public pumping station or any other ancillary apparatus within 50 metres of any buildings within the property?

A.: The public sewer map included indicates that there is no public pumping station within 50 metres of any buildings within the property. Any other ancillary apparatus is shown on the public sewer map and referenced on the legend.

Guidance notes:

The measure is estimated from the Ordnance Survey record, between a building within the boundary of the property and the nearest pumping station.

It should be noted that only private pumping stations installed before 1 July 2011 will be transferred into the ownership of Southern Water Services.

Public adoption of sewers and lateral drains

Q. 2.6: Are any sewers or lateral drains serving, or which are proposed to serve the property, the subject of an existing adoption agreement or an application for such an agreement?

A.: Records indicate that the sewers serving the development, of which this property forms part, are not the subject of an application for adoption under Section 104 of the Water Industry Act 1991. Where the property is part of an established development it would not normally be subject to an adoption agreement under Section 104 of the Water Industry Act 1991.

Guidance notes:

This enquiry is of interest to purchasers of new buildings who will want to know whether or not the building will be linked to a public sewer.

Where the property is part of a very recent or ongoing development and the sewers are not the subject of an adoption application, buyers should consult with the developer to ascertain the extent of private drains and sewers for which they will hold maintenance and renewal liabilities.

Final adoption is subject to the developer complying with the terms of the adoption agreement under Section 104 of the Water Industry Act 1991.

Any sewers and/or lateral drains within the boundary of the property are not the subject of an adoption agreement and remain the responsibility of the householder. Adoptable sewers are normally those situated in the public highway.

Building over a public sewer, disposal main or drain

Q. 2.7: Has the sewerage undertaker approved or been consulted about any plans to erect a building or extension on the property over or in the vicinity of a public sewer, disposal main or drain?

A.: There are no records in relation to any approval or consultation about any plans to erect a building or extension on the property over or in the vicinity of a public sewer, disposal main or drain. However, the sewerage undertaker might not be aware of a building or extension on the property over or in the vicinity of a public sewer, disposal main or drain.

Guidance notes:

Buildings or extensions erected over a sewer in contravention of Building Control may have to be removed or altered.

From 1 October 2011 private sewers, disposal mains and lateral drains were transferred into public ownership and the sewerage undertaker may not have approved or been consulted about any plans to erect a building or extension on the property or in the vicinity of these.

Risk of flooding due to overloading public sewers

Q. 2.8: Is the building which is or forms part of the property at risk of internal flooding due to overloaded public sewers?

A.: The building is not recorded as being at risk of internal flooding due to overloaded public sewers. From 1 October 2011 private sewers, disposal mains and lateral drains were transferred into public ownership. It is therefore possible that a building may be at risk of internal flooding due to an overloaded public sewer which the sewerage undertaker is not aware of. For further information it is recommended that enquiries are made of the vendor.

Guidance notes:

A sewer is "overloaded" when the flow from a storm is unable to pass through it due to a permanent problem (e.g. flat gradient, small diameter). Flooding as a result of temporary problems such as blockages, siltation, collapses and equipment or operational failures are excluded.

"Internal flooding" from the public sewers is defined as flooding, which enters a building or passes below a suspended floor.

For reporting purposes, buildings are restricted to those normally occupied and used for residential, public, commercial, business or industrial purposes

"At Risk" properties are defined as properties that have suffered or are likely to suffer internal flooding from the public foul, combined or surface water sewers due to overloading of the sewerage system more frequently than the relevant reference period (either once or twice in ten years) as determined by the sewerage undertaker's reporting procedure.

Flooding as a result of storm events proven to be exceptional and beyond the reference period of one in ten years are not included.

Buildings may be at risk of flooding but not identified where flooding incidents have not been reported to the sewerage undertaker.

Public sewers are defined as those for which the sewerage undertaker holds statutory responsibility under the Water Industry Act 1991.

It should be noted that flooding can occur from private sewers and drains which are not the responsibility of the sewerage undertaker. This report excludes flooding from the private sewers and drains and the sewerage undertaker makes no comment upon this matter.

Sewage treatment works

Q. 2.9: Please state the distance from the property to the nearest boundary of the nearest sewage treatment works.

A.: The nearest sewage treatment works is 3.09 kilometres West of the property. The name of the sewage treatment works is ROMSEY WTW, which is the responsibility of Southern Water Services, Southern House, Yeoman Road, Worthing, West Sussex, BN13 3NX.

Guidance notes:

The nearest sewage treatment works will not always be the sewage treatment works serving the catchment within which the property is situated.

The sewerage undertaker's records were inspected to determine the nearest sewage treatment works

It should be noted that there may be a private sewage treatment works closer than the one detailed above that have not been identified.

Water

Connection to mains water supply

Q. 3.1: Is the property connected to mains water supply?

A.: Records indicate that the property is not connected to mains water supply and water is therefore likely to be provided by virtue of a private supply.

Guidance notes:

The situation should be checked with the current owner of the property.

Details of private supplies are not kept by the water undertaker.

Water mains, resource mains or discharge pipes

Q. 3.2: Are there any water mains, resource mains or discharge pipes within the boundaries of the property?

A.: The map of the waterworks does not indicate any water mains, resource mains or discharge pipes within the boundaries of the property.

Guidance notes:

The boundary of the property has been determined by reference to the Ordnance Survey record or the map supplied.

The presence of a public water main within the boundary of the property may restrict further development within it.

Water undertakers have a statutory right of access to carry out work on their assets, subject to notice. This may result in employees of the water undertaker or its contractors needing to enter the property to carry out work.

Adoption of water mains and services pipes

Q. 3.3: Is any water main or service pipe serving, or which is proposed to serve the property, the subject of an existing adoption agreement or an application for such an agreement?

A.: Records confirm that water mains or service pipes serving the property are not the subject of an existing adoption agreement or an application for such an agreement.

Guidance notes:

This enquiry is of interest to purchasers of new properties who will want to know whether or not the property will be linked to the mains water supply.

Risk of low water pressure or flow

Q. 3.4: Is the property at risk of receiving low water pressure or flow?

A.: Records confirm that the property is not recorded by the water undertaker as being at risk of receiving low water pressure or flow.

Guidance notes:

"Low water pressure" means water pressure below the regulatory reference level which is the minimum pressure when demand on the system is not abnormal.

The reference level of service is a flow of 9 litres/minute at a pressure of 10 metres head on the customer's side of the main stop tap (mst). The reference level of service must be applied on the customer's side of a meter or any other company fittings that are on the customer's side of the main stop tap.

The reference level applies to a single property. Where more than one property is served by a common service pipe, the flow assumed in the reference level must be appropriately increased to take account of the total number of properties served.

For two properties, a flow of 18 litres/minute at a pressure of 10 metres head on the customers' side of the mst is appropriate. For three or more properties the appropriate flow should be calculated from the standard loadings provided in BS6700 or Institute of Plumbing handbook.

Water companies include properties receiving pressure below the reference level, provided that allowable exclusions do not apply (i.e. events which can cause pressure to temporarily fall below the reference level). Refer to list below:

Abnormal demand: This exclusion is intended to cover abnormal peaks in demand and not the daily, weekly or monthly peaks in demand which are normally expected. Companies exclude properties which are affected by low pressure only on those days with the highest peak demands. During the year companies may exclude, for each property, up to five days of low pressure caused by peak demand.

Planned maintenance: Companies exclude low pressures caused by planned maintenance. It is not intended that companies identify the number of properties affected in each instance. However, companies must maintain sufficiently accurate records to verify that low pressure incidents that are excluded because of planned maintenance are actually caused by maintenance.

One-off incidents: This exclusion covers a number of causes of low pressure; mains bursts; failures of company equipment (such as PRVs or booster pumps); firefighting; and action by a third party. However, if problems of this type affect a property frequently, they cannot be classed as one-off events and further investigation will be required before they can be excluded.

Low pressure incidents of short duration: Properties affected by low pressures which only occur for a short period, and for which there is evidence that incidents of a longer duration would not occur during the course of the year, may be excluded.

Water hardness

Q. 3.5: What is the classification of the water supply for the property?

A.: The water supplied to the property has an average water hardness of 281mg/l calcium carbonate which is defined as "Hard" by Southern Water.

Guidance notes:

The hardness of water depends on the amount of calcium in it – the more it contains, the harder the water is.

There is no UK or European standard set for the hardness of drinking water. More information on water hardness can be found on the Drinking Water Inspectorates' website: http://www.dwi.gov.uk/

Water hardness can be expressed in various indices for example the hardness settings for dishwashers are commonly expressed in Clark's degrees, but check with the manufacturer as there are also other units. The following table explains how to convert mg/l calcium and mg/l calcium carbonate classifications.

To convert from:	to Clark degrees	to French degrees	to German degrees
mg/l calcium	multiply by 0.18	multiply by 0.25	multiply by 0.14
mg/l calcium carbonate	multiply by 0.07	multiply by 0.10	multiply by 0.056

Water meters

Q. 3.6: Is there a meter installed at this property?

A.: Records indicate that the property is not served by a water meter

Guidance notes:

Where the property is not served by a water meter and the customer wishes to consider this method of charging they should contact the water undertaker for their area.

If a property is measured (metered) upon change of occupation this property will remain as a metered property.

Charging

Sewerage undertaker

Q. 4.1.1: Who is responsible for providing the sewerage services for the property?

A.: Southern Water is responsible for providing the sewerage services for the property.

Guidance notes:

The 'wholesale' part of the water industry did not open for competition in April 2017. This means that Southern Water continues to operate the network of pipes, mains and treatment works.

As a wholesaler, Southern Water sells sewerage services to the companies who enter the retail market. In some instances, wholesalers will still need to interact directly with customers. For example, customers will still contact Southern Water to report internal sewer flooding.

Water undertakers

Q. 4.1.2: Who is responsible for providing the water services for the property?

A.: Southern Water is responsible for providing the water services for the property.

Guidance notes:

The 'wholesale' part of the water industry did not open for competition in April 2017. This means that water undertakers continue to operate the network of pipes, mains and treatment works.

As a wholesaler, water undertakers sell water services to the companies who enter the retail market. In some instances, wholesalers will still need to interact directly with customers. For example, customers will still contact water undertakers to report leaks.

Sewerage bills

Q. 4.2: Who bills the property for sewerage services?

A.: If you wish to know who bills the sewerage services for this property then you will need to contact the current owner. For a list of all potential retailers of sewerage services for the property please visit www.open-water.org.uk.

Guidance notes:

From April 2017 non-household customers in England can choose their retailer.

'Retail' refers to the way in which customers are billed for their water and sewerage as well as customer services including meter reading.

Water bills

Q. 4.3: Who bills the property for water services?

A.: If you wish to know who bills the water services for this property then you will need to contact the current owner. For a list of all potential retailers of water services for the property please visit www.open-water.org.uk.

Guidance notes:

From April 2017 non-household customers in England can choose their retailer.

'Retail' refers to the way in which customers are billed for their water and sewerage as well as customer services including meter reading

Trade effluent information

Q. 4.4: Is there a consent on this property to discharge trade effluent under Section 118 of the Water Industry Act (1991) into the public sewerage system?

A.: The trader operating at this commercial property does not hold either a Trade Effluent Consent, or an acknowledgement of a trade effluent discharge, as issued by Southern Water.

Guidance notes:

Please note, any existing consent is dependent on the business being carried out at the property and will not transfer automatically upon change of ownership.

Any change of ownership from the current incumbent of a property will require the negotiation of a new trade effluent consent or a new acknowledgement between the new incumbent and Southern Water.

Where consent or acknowledgement details have been provided, this does not represent a direct copy of the original.

Other information

Additional meter information
No further information.

Appendix one: Terms and expressions

"the 1991 Act" means the Water Industry Act 1991**(i)**;
"the 2000 Regulations" means the Water Supply (Water Quality) Regulations 2000**(ii)**;
"the 2001 Regulations" means the Water Supply (Water Quality) Regulations 2001**(iii)**;
"adoption agreement" means an agreement made or to be made under Section 51A(1) or 104(1) of the 1991 Act**(iv)**;
"bond" means a surety granted by a developer who is a party to an adoption agreement;
"bond waiver" means an agreement with a developer for the provision of a form of financial security as a substitute for a bond;
"calendar year" means the twelve months ending with 31 December;
"discharge pipe" means a pipe from which discharges are made or are to be made under Section 165(1) of the 1991 Act;
"disposal main" means (subject to Section 219(2) of the 1991 Act) any outfall pipe or other pipe which:
(a) is a pipe for the conveyance of effluent to or from any sewage disposal works, whether of a sewerage undertaker or of any other person; and
(b) is not a public sewer;
"drain" means (subject to Section 219(2) of the 1991 Act) a drain used for the drainage of one building or any buildings or yards appurtenant to buildings within the same curtilage;
"effluent" means any liquid, including particles of matter and other substances in suspension in the liquid;
"financial year" means the twelve months ending with 31 March;
"lateral drain" means:
(a) that part of a drain which runs from the curtilage of a building (or buildings or yards within the same curtilage) to the sewer with which the drain communicates or is to communicate; or
(b) (if different and the context so requires) the part of a drain identified in a declaration of vesting made under Section 102 of the 1991 Act or in an agreement made under Section 104 of that Act**(v)**;
"licensed water supplier" means a company which is the holder for the time being of a water supply licence under Section 17A(1) of the 1991 Act**(vi)**;
"maintenance period" means the period so specified in an adoption agreement as a period of time:
(a) from the date of issue of a certificate by a sewerage undertaker to the effect that a developer has built (or substantially built) a private sewer or lateral drain to that undertaker's satisfaction; and
(b) until the date that private sewer or lateral drain is vested in the sewerage undertaker;
"map of waterworks" means the map made available under section 198(3) of the 1991 Act**(vii)** in relation to the information specified in subsection (1A);
"private sewer" means a pipe or pipes which drain foul or surface water, or both, from premises, and are not vested in a sewerage undertaker;
"public sewer" means, subject to Section 106(1A) of the 1991 Act**(viii)**, a sewer for the time being vested in a sewerage undertaker in its capacity as such, whether vested in that undertaker:
(a) by virtue of a scheme under Schedule 2 to the Water Act 1989**(ix)**;
(b) by virtue of a scheme under Schedule 2 to the 1991 Act**(x)**;
(c) under Section 179 of the 1991 Act**(xi)**; or
(d) otherwise;
"public sewer map" means the map made available under Section 199(5) of the 1991 Act**(xii)**;
"resource main" means (subject to Section 219(2) of the 1991 Act) any pipe, not being a trunk main, which is or is to be used for the purpose of:
(a) conveying water from one source of supply to another, from a source of supply to a regulating reservoir or from a regulating reservoir to a source of supply; or
(b) giving or taking a supply of water in bulk;
"sewerage services" includes the collection and disposal of foul and surface water and any other services which are required to be provided by a sewerage undertaker for the purpose of carrying out its functions;
"Sewerage undertaker" means the company appointed to be the sewerage undertaker under Section 6(1) of the 1991 Act for the area in which the property is or will be situated;
"surface water" includes water from roofs and other impermeable surfaces within the curtilage of the property;
"water main" means (subject to Section 219(2) of the 1991 Act) any pipe, not being a pipe for the time being vested in a person other than the water undertaker, which is used or to be used by a water undertaker or licensed water supplier for the purpose of making a general supply of water available to customers or potential customers of the undertaker or supplier, as distinct from for the purpose of providing a supply to particular customers;
"water meter" means any apparatus for measuring or showing the volume of water supplied to, or of effluent discharged from any premises;
"water supplier" means the company supplying water in the water supply zone, whether a water undertaker or licensed water supplier;
"water supply zone" means the names and areas designated by a water undertaker within its area of supply that are to be its water supply zones for that year; and
"Water undertaker" means the company appointed to be the water undertaker under Section 6(1) of the 1991 Act for the area in which the property is or will be situated.

In this report, references to a pipe, including references to a main, a drain or a sewer, shall include references to a tunnel or conduit which serves or is to serve as the pipe in question and to any accessories for the pipe.

(i) 1991 c.56.
(ii) S.I. 2000/3184. These Regulations apply in relation to England.
(iii) S.I. 2001/3911. These Regulations apply in relation to Wales.
(iv) Section 51A was inserted by Section 92(2) of the Water Act 2003 (c. 37). Section 104(1) was amended by Section 96(4) of that Act.
(v) Various amendments have been made to Sections 102 and 104 by section 96 of the Water Act 2003.
(vi) Inserted by Section 56 of and Schedule 4 to the Water Act 2003.
(vii) Subsection (1A) was inserted by Section 92(5) of the Water Act 2003.
(viii) Section 106(1A) was inserted by Section 99 of the Water Act 2003.
(ix) 1989 c.15.
(x) To which there are various amendments made by Section 101(1) of and Schedule 8 to the Water Act 2003.
(xi) To which there are various amendments made by Section 101(1) of and Schedule 8 to the Water Act 2003.
(xii) Section 199 was amended by Section 97(1) and (8) of the Water Act 2003.

Appendix two: A guide to new development

The information contained below is for general guidance only. It is recommended that Southern Water's Developer Services department be contacted for further details concerning new infrastructure development.

Wastewater information

Sewer requisitions

It may be necessary for a developer to request that Southern Water provides a public sewer to connect a development site to the existing public system. The developer is responsible for the cost of the work, although a discount will be applied based on the future predicted income from the development served by the new sewer.

Sewer diversions

If a public sewer crosses private land, it may be possible for the landowner/developer to request the sewer be diverted. In the majority of cases Southern Water will allow the developer to undertake this work under close supervision. Whether Southern Water or the developer undertakes the diversionary works the costs are the responsibility of the developer.

Building-over sewers

Public sewers are afforded statutory protection and consequently there is no right to build over or in close proximity to a public sewer. If an existing public sewer either crosses a development site or is located in close proximity to a development site it is essential that a developer contact Southern Water.

Sewer connections

A developer can serve notice on Southern Water that it wishes to make a connection to the public sewerage system. The developer must provide 21 days' notice and the work will be supervised by Southern Water.

Water information

Water requisitions

It may be necessary for a developer to request that Southern Water provides both:

(a) A public water main to connect a development site to the existing public system and,
(b) On-site public water mains to serve the individual properties.

In both cases the developer is responsible for the cost of the work, although a discount will be applied based on the future predicted income from the development.

It is possible for the developer to lay the on-site mains themselves under a Self-Lay Agreement. Further details are available from Southern Water.

Water main diversions

The building over or in close proximity to public water mains is not permitted. A developer must request that Southern Water undertakes a diversion of a water main that is affected by a development.

Water connections

A developer can request a new connection to a public water main. This work will be undertaken by Southern Water.

Contact us

For specific information on Southern Water's Developer Services service, including details on how to contact the right person, please visit our website: www.southernwater.co.uk/developers-and-builders-overview.

Appendix three: Terms and conditions

The Customer the Client and the Purchaser are asked to note these terms, which govern the basis on which this drainage and water report is supplied.

Definitions
"The Company" means the water service company operating within the Southern Water drainage area that provides information to Southern Water for this commercial search Report.
"Order" means any request completed by the Customer requesting the Report.
"Report" means the drainage and/or water report prepared by The Company in respect of the Property.
"Property" means the address or location supplied by the Customer in the Order.
"Customer" means the person, company, firm or other legal body placing the Order, either on their own behalf as Client, or, as an agent for a Client.
"Client" means the person, company or body who is the intended recipient of the Report with an actual or potential interest in the Property.
"Purchaser" means the actual or potential purchaser of the Property including their mortgage lender.

1.0 Agreement
1.1 Southern Water agrees to supply the Report subject to these terms. The scope and limitations of the Report are described in paragraph 2 of these terms. Where the Customer is acting as an agent for the Client then the Customer shall be responsible for bringing these terms to the attention of the Client.
1.2 The Customer and Client agree that the placing of an Order for a Report indicates their acceptance of these terms.

2.0 The Report
Whilst Southern Water will use reasonable care and skill in producing the Report, it is provided to the Client on the basis that they acknowledge and agree to the following:
2.1 The information contained in the Report can change on a regular basis so Southern Water cannot be responsible to the Client for any change in the information contained in the Report after the date on which the Report was produced and sent to the Client.
2.2 The Report does not give details about the actual state or condition of the Property nor should it be used or taken to indicate or exclude actual suitability or unsuitability of the Property for any particular purpose, or relied upon for determining saleability or value, or used as a substitute for any physical investigation or inspection. Further advice and information from appropriate experts and professionals should always be obtained.
2.3 The information contained in the Report is based upon the accuracy of the address supplied by the Customer or Client.
2.4 The Report provides information as to the location and connection of existing services, and details of trade effluent consents. It should not be relied upon for any other purpose. The Report may contain opinions or general advice to the Customer and the Client and Southern Water cannot ensure that any such opinion or general advice is accurate, complete or valid and accepts no liability therefore.
2.5 The position and depth of apparatus shown on any maps attached to the Report are approximate, and are furnished as a general guide only, and no warranty as to its correctness is given or implied. The exact positions and depths should be obtained by excavation trial holes.

3.0 Liability
3.1 Southern Water shall not be liable to the Client for any failure defect or non-performance of its obligations arising from any failure of or defect in any machine, processing system or transmission link or anything beyond Southern Water's reasonable control or the acts or omissions or any party for whom Southern Water is not responsible.
3.2 Where a Report is requested for an address falling within a geographical area where Southern Water and another Company separately provide water and sewerage services, then it shall be deemed that liability for the information given by Southern Water or the Company as the case may be will remain with Southern Water or the Company as the case may be in respect of the accuracy of the information supplied. Where Southern Water is supplying information which has been provided to it by another Company for the purposes outlined in this agreement, Southern Water will therefore not be liable in any way for the accuracy of that information.
3.3 Where the Customer sells this Report to a Client (other than in the case of a bona fide legal adviser recharging the cost of the Report as a disbursement) Southern Water or the Company as the case may be shall not in any circumstances (whether for breach of contract, negligence or any other tort, under statute or statutory duty or otherwise at all) be liable for any loss or damage whatsoever (save to the extent provided by clause 3.4) and the Customer shall indemnify Southern Water in respect of any claim (other than a claim covered by clause 3.4) by the Client.
3.4 Southern Water shall accept liability for death or personal injury arising from its negligence.
3.5 The entire liability of Southern Water or the Company as the case may be in respect of all causes of action arising under or in connection with the Report (whether for breach of contract, negligence or any other tort, under statute or statutory duty or otherwise at all) shall not exceed £2,000,000 (two million pounds); and Southern Water or the Company as the case may be shall not in any circumstances (whether for breach of contract, negligence or any other tort, under statute or statutory duty or otherwise at all) be liable for any loss of profit, loss of goodwill, loss of reputation, loss of business or any indirect, special or consequential loss, damage or other claims, costs or expenses.

4.0 Copyright and confidentiality
4.1 The Customer and the Client acknowledge that the Report is confidential and is intended for the personal use of the Client. The copyright and any other intellectual property rights in the Report shall remain the property of Southern Water. No intellectual or other property rights are transferred or licensed to the Customer or the Client except to the extent expressly provided.
4.2 The Customer or Client is entitled to make copies of the Report (other than any maps contained in the, or attached to the Report, where no copying is permitted).
4.3 The Customer and Client agree (in respect of both the original and any copies made) to respect and not to alter any trademark, copyright notice or other property marking which appears on the Report.
4.4 The maps contained in the Report are protected by Crown Copyright and must not be used for any purpose outside the context of the Report.
4.5 The Customer and the Client agree to indemnify Southern Water or the Company as the case may be against any losses, costs, claims and damage suffered by Southern Water or the Company as the case may be, as a result of any breach by either of them of the terms of paragraphs 4.1 to 4.4 inclusive.

5.0 Payment
5.1 Unless otherwise stated all prices are inclusive of VAT. The Customer shall pay for the price of the Report specified by Southern Water, without any set off, deduction or counterclaim. Unless the Customer or Client has an account with Southern Water for payment for Reports, payments for Reports must be received in full by Southern Water before the Report is produced. For Customers or Clients with accounts, payment terms will be as agreed with Southern Water.

6.0 General
6.1 If any provision of these terms is or becomes invalid or unenforceable, it will be taken to be removed from the rest of these terms to the extent that it is invalid or unenforceable. No other provision of these terms shall be affected.
6.2 These terms shall be governed by English law and all parties submit to the exclusive jurisdiction of the English courts.
6.3 Nothing in this notice shall in any way restrict your statutory or any other rights of access to the information contained in the Report.

These Terms and conditions are available in larger print for those with impaired vision.

Appendix four: Complaints procedure

When we get it wrong
You deserve the highest standard of service from us, but sometimes we make mistakes. If we do, please let us know and we will investigate and review your concerns.

Whilst we always try to resolve all complaints straight away, if this is not possible and you are not happy with the course of action taken by us, you can ask us to escalate the issue internally or take your complaint to an independent third party.

How you contact us
Firstly please call us and we will try to sort out your problem straight away.

You can call us between 8am and 5pm, Monday to Friday on 0845 270 0212 or 0330 303 0276 (individual consumers);

Email us at searches@southernwater.co.uk; or

Write to us at LandSearch, Southern Water Services, Southern House, Capstone Road, Chatham, Kent, ME5 7QA.

What you can expect
You will receive a full, fair and courteous response from someone who can effectively deal with your problem.

If we can remedy the problem straight away we will do it but if we cannot immediately resolve your problem we will keep you informed of actions being taken.

The process
We will try to resolve any telephone contact or complaint at the time of the call, however, if that isn't possible, we will take the details of your complaint and we will investigate and get back to you within 10 working days.

We will respond to written complaints within 10 working days of the date received, but we will always aim to respond more quickly. Depending on the scale of investigation required, we will keep you informed of the progress and update you with new timescales if necessary.

If you are still not satisfied with our response or action we will refer the matter to a Senior Manager for resolution. At your request we will liaise with a third party representative acting on your behalf.

Our commitment to you
If we do not respond to your complaint within 10 working days of receipt of your contact, we will compensate you in line with Southern Water's Customer services — Guaranteed standards of service for business customers.

If we find your complaint to be justified, or we have made any errors that substantially change the outcome in your search result, we will refund the search fee. We will also provide you with a revised search and undertake the necessary action to put things right as soon as practically possible. You will be kept informed of the progress of any action required.

If you remain dissatisfied
While we aim to resolve your complaint first time, in the event that we are unable to resolve the issue to your satisfaction, ultimately you can contact a third party. Please make sure that you have followed the process above first, if not, your complaint will be passed back to us.

SOUTHERN WATER SERVICES LIMITED

121884

120718 438458

438406

LEGEND - MAINS

- Distribution Main / Communication pipe
- Trunk Main
- RAW Raw water main
- NP Non potable
- Abandoned main
- P P Proposed Main
- FM Fire main
- Non SWS
- Sluice valve
- Closed valve
- AV Air valve
- Butterfly valve
- PRV Pressure reducing valve
- Reflux valve
- MV Motorised valve
- Clockwise closing valve
- Fire Hydrant
- WO Washout
- WOH Washout hydrant
- Meter
- Capped end
- EP Emptying plug
- Stopcock
- LNCV Leak Noise Correlator Survey Point
- Anode
- TC Telemetry cable
- AP Access point / hatchbox
- D Dialysis machine
- BP Break pressure tank
- Change node
- Pumping station
- Booster station
- Insertion Flow Meter Point
- Water tower
- Service reservoir
- Water Supply Works
- Bore hole / Well
- Intake
- Customer site
- Swab insertion point

MATERIALS

Alkathene	AK
Cast iron	CI
Spun (grey) iron	SI
Concrete	CO
Ductile iron	DI
Bonded Asbestos Cement	BAC
Glass reinforced plastic	GRP
Glass reinforced epoxy	GRE
(Unplasticised) Polyvinyl chloride	PVC
Polyethylene	PE
Steel	ST
Concrete segments bolted	CSB
Concrete segments unbolted	CSU
Galvanised iron	GI
Ductile sleeve	DS
Concrete pre-stressed	CPS
High performance polyethelene	HPE
Unknown	??

O.S. Ref. SU3721SW	Drawn by: kumaria	The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility in the event of inaccuracy. The actual position of pipes must be determined on site.	N
	Scale: 1:2500	WARNING: BAC pipes are constructed of Bonded Asbestos Cement WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement	Southern Water
Title: U1430652_Land at Halterworth	Date: 05/04/2019	Based upon Ordnance Survey Digital Data with the permission of the Controller of H.M.S.O. Crown Copyright Reserved Licence No. WU298530	

SEWER RECORDS

Node	Cover	Invert	Size	Material	Shape	
0001X			150	UNK	UNK	
0002X			150	VC	CIRC	
0003X			UNK	UNK	CIRC	
0101X	32.78	30.69	225	VC	CIRC	
0102X	33.18	31.35	225	VC	CIRC	
0103X	34.74	32.49	225	VC	CIRC	
0104X	34.37	32.75	150	VC	CIRC	
0105X	33.84	32.13	225	VC	CIRC	
0106X	34.25	33.51	150	CP	CIRC	
0107X	35.65	34.19	150	VC	CIRC	
0108X			UNK	VC	CIRC	
0109X			225	VC	CIRC	
010DX			UNK	UNK	CIRC	
0110X			UNK	UNK	CIRC	
0151X	34.59		1000	CC	RECT	
0152X	32.27	31.75	225	CP	CIRC	
0153X	34.1		100	VC	CIRC	*
0153Y	34.1		100	VC	CIRC	*
0154X	32.88	31.31	225	CP	CIRC	
017IX	−1	32.31	225	CI	CIRC	
0201X	34.92	33.22	150	VC	CIRC	
0202X	35.2	33.7	150	VC	CIRC	
0203X			UNK	VC	CIRC	
0204X			UNK	VC	CIRC	
0205X			UNK	VC	CIRC	
0206X			UNK	VC	CIRC	
0207X			UNK	VC	CIRC	
0208X			UNK	VC	CIRC	
0209X			UNK	VC	CIRC	
0210X			UNK	UNK	CIRC	
0251X	35.24	33.93	225	VC	CIRC	
0252X	33.48	32.04	150	CP	CIRC	
0253X	33.84	31.47	150	CP	CIRC	
0254Y	33.77	32.28	150	CP	CIRC	*
0254X	33.77	32.28	150	CP	CIRC	*
0255X	34.92	32.85	1000	CC	RECT	
0256X	34.41	32.82	1000	CC	RECT	
0301X	34.76	33.13	150	CP	CIRC	
0302X	34.58	32.79	150	VC	CIRC	
0303X	35.05	32.48	150	CP	CIRC	
0304X	34.48	32.36	150	CP	CIRC	
0351X	34.47	33.05	150	CP	CIRC	
0352X	35.02	32.63	225	CP	CIRC	
0353X	34.59	33.43	150	CP	CIRC	
0401X	34.65	32.5	150	CP	CIRC	
0402X	34.25	32.15	150	CP	CIRC	
0403X	32.62	30.37	150	VC	CIRC	
0404X	34.42	33.09	150	VC	CIRC	
0405X	31.88	29.44	225	VC	CIRC	
0451X	34.19	31.47	225	VC	CIRC	
0452X	32.62	31.2	150	CP	CIRC	
0453X	34.74	33.11	225	CP	CIRC	
0454X			150	UNK	UNK	
0501X			UNK	UNK	UNK	
0502X			UNK	UNK	CIRC	
0503X			UNK	UNK	CIRC	
050DX			UNK	UNK	CIRC	
0601X	21.54	19.24	300	CI	CIRC	*
0601X	35.36	31.89	150	VC	CIRC	*
0602X	22.65	21.39	225	CI	CIRC	*
0602X	35.68	32.18	150	VC	CIRC	*
0605X	35.71	33.94	150	VC	CIRC	
0611X			UNK	UNK	CIRC	
0612X			UNK	UNK	CIRC	
0613X			100	VC	CIRC	
0651X	22.37	21.07	300	VC	CIRC	*
0651X	35.67	32.78	225	VC	CIRC	*
0652X	23.01	21.96	150	VC	CIRC	
0654X	35.36	32.49	225	VC	CIRC	
0701X	21.47	19.45	300	CI	CIRC	*
0701X	35.52	32.25	150	VC	CIRC	*
0702X	34.96	33.39	150	VC	CIRC	*
0702X	24.85	20.47	225	CI	CIRC	*
0703X	26.06	20.61	225	CI	CIRC	*
0703X	35.35	32.62	150	VC	CIRC	*
0704X	25.47	20.71	225	CI	CIRC	*
0704X	36.4	33.9	150	CP	CIRC	*
0705X			300	CI	UNK	
0706X			UNK	UNK	UNK	
070DX			UNK	UNK	UNK	
0751X	25.45	21.29	450	CP	CIRC	*
0751X	35.33	33.04	225	VC	CIRC	*
0752X	25.97	21.48	450	CP	CIRC	*
0752X	34.94	33.5	225	CP	CIRC	*
0753X	36.39	33.74	600	CP	CIRC	*
0753X	25.18	22.09	150	VC	CIRC	*
0754X	35.56	32.85	225	VC	CIRC	
0801X	35.94	33.27	150	CP	CIRC	*
0801X	32.4	29.09	225	VC	CIRC	*
0802X			UNK	UNK	CIRC	*
0802X	36	33.14	150	CP	CIRC	*
0803X	36.48	33.05	225	CP	CIRC	
0804X			UNK	UNK	CIRC	
0805X			UNK	UNK	CIRC	
080DX			UNK	UNK	CIRC	
0851X	32.2	30.49	150	VC	CIRC	*
0851X	35.93	34.85	150	VC	CIRC	*
0852X	35.93	33.55	600	CP	CIRC	*
0852X	32.37	29.92	225	CP	CIRC	*
0901X	36.01	32.83	225	CP	CIRC	*
0901X	31.36	29.6	225	VC	CIRC	*
0902X	35.87	32.64	225	CP	CIRC	
0903X	36.43	32.49	225	CP	CIRC	
0904X	36.89	33.5	150	CP	CIRC	
0905X	37.1		150	CP	CIRC	
0906X			150	UNK	CIRC	
090DX			225	CP	UNK	
091DX			150	UNK	CIRC	
0951X	32.97	29.72	150	VC	CIRC	
1101X	36.51	33.33	225	VC	CIRC	
1102X	36.78	33.56	225	CP	CIRC	
1201X	35.17	33.58	150	VC	CIRC	
1202X	36.27	34.22	150	VC	CIRC	
1203X			UNK	UNK	CIRC	
120DX			UNK	UNK	CIRC	
1251X	36.21	34.64	300	VC	CIRC	
1252X	36.49	34.94	225	VC	CIRC	
1253X	35.16	33.98	300	VC	CIRC	
1301X	35.84	33.68	150	CP	CIRC	
1302X			150	VC	CIRC	
1351X	36.03	34.79	150	VC	CIRC	
1352X	35.37	34	150	CP	CIRC	
1353X	35.47	34.42	150	CP	CIRC	
1354X	35.04	33.68	150	VC	CIRC	
1401X	35.6	33.5	150	CP	CIRC	
1402X	35.69	33.28	150	CP	CIRC	
1403X	35.25	33.03	150	CP	CIRC	
1404X			150	VC	CIRC	
140DX			100	VC	CIRC	
141DX			100	VC	CIRC	
1451X	35.5	34.08	225	CP	CIRC	
1452X	35.3	33.55	225	CP	CIRC	
1453X	34.77	33.35	150	CP	CIRC	
1501X	30.79	28.89	225	CP	CIRC	
1502X	31.04	29.13	150	CP	CIRC	
1503X			225	CP	UNK	
1504X			UNK	UNK	UNK	
1551X			150	CP	CIRC	
1552X	34.95	33.55	150	CP	CIRC	
1553X	33.11	29.05	225	VC	CIRC	
1554X			225	CP	CIRC	
1555X			225	UNK	UNK	
1601X	26.35	24.65	225	CI	CIRC	*
1601X	36.32	34.49	150	VC	CIRC	*
1602X	26.97	25.21	150	VC	CIRC	
1603X	27.49	26.15	150	VC	CIRC	
1604X	30.02	27.77	150	VC	CIRC	
1605X	22.2	21	150	VC	CIRC	
1651X	23.3	21.81	300	VC	CIRC	*
1651X	36.29	34.65	225	VC	CIRC	*
1652X	24.74	23.28	300	VC	CIRC	
1653X	27.24	25.15	300	VC	CIRC	
1654X	29.01	26.77	300	VC	CIRC	
1655X	26.97	25.5	225	VC	CIRC	
1656X	27.32	25.85	150	VC	CIRC	
1657X	23.4	21.93	150	VC	CIRC	
1658X	21.17	20.28	150	VC	CIRC	
1659X	24.96	24.19	150	VC	CIRC	
1660X			UNK	UNK	CIRC	
1701X	36.82	34.05	150	CP	CIRC	*
1701X	22.95	19.84	225	CI	CIRC	*
1702X	24.37	22.69	150	VC	CIRC	*
1702X	36.92	34.38	150	CP	CIRC	*
1703X	29.79	27.53	450	CP	CIRC	*
1703X			UNK	UNK	CIRC	*
1704X	22.04	19.7	450	CP	CIRC	*
1704X			UNK	UNK	CIRC	*
1705X			UNK	UNK	CIRC	*
1705X	21.77	19.45	450	CP	CIRC	*
1706X			UNK	UNK	CIRC	
1707X			UNK	UNK	CIRC	
1708X			UNK	UNK	CIRC	
170DX			150	VC	CIRC	
171DX			UNK	UNK	CIRC	
1751X	22.45	21.02	375	CP	CIRC	*
1751X	36.88	33.94	525	CP	CIRC	*
1752X	22.2	21.16	450	CP	CIRC	
1753X	22.3	20.93	450	CP	CIRC	
1754X	22.15	20.83	450	CP	CIRC	
1755X	24.45	22.65	300	VC	CIRC	
1756X			UNK	UNK	CIRC	
1757X			UNK	UNK	CIRC	
1801X	25.06	20.82	225	CI	CIRC	*
1801X			UNK	UNK	CIRC	*
1802X	24.64	20.97	225	CI	CIRC	
1803X	24.3	21.05	225	CI	CIRC	
1804X	24.31	21.28	225	CI	CIRC	
1805X	26.94	24.02	225	BAC	CIRC	
1806X			UNK	UNK	CIRC	
1808X			UNK	UNK	CIRC	
1809X			UNK	UNK	CIRC	
180DX			UNK	UNK	CIRC	*
180DX			UNK	UNK	UNK	*
1810X			UNK	UNK	UNK	
181DX			UNK	UNK	CIRC	
1851X	24.27	21.69	450	CP	CIRC	*
1851X	36.5	35.32	150	VC	CIRC	*
1852X	26.83	23.34	300	CP	CIRC	
1853X	23.94	21.05	450	CP	CIRC	
1854X	24.69	22.32	225	CP	CIRC	
1901X			150	UNK	UNK	
190DX			UNK	UNK	CIRC	
1951X	31.26	29.22	225	CP	CIRC	
1953X	26.53	23.83	150	VC	CIRC	
2001X	38.28	35.04	150	CP	CIRC	
2002X	38.12	36.84	150	CP	CIRC	
2101X	37.4	34.1	225	CP	CIRC	
2102X	36.95	35.45	150	VC	CIRC	
2151X	36.95	35.52	225	VC	CIRC	
2201X	37.69	37	150	VC	CIRC	
2202X	37.25	34.94	150	VC	CIRC	
2203X	37.51	35.49	150	VC	CIRC	
2251X	37.5	35.77	225	VC	CIRC	
2252X	37.48	35.99	225	VC	CIRC	
2253X	37.27	35.29	300	VC	CIRC	
2301X	37.98	36.78	150	VC	CIRC	
2302X	37.89	36.52	150	VC	CIRC	
2303X	67.01	65.43	150	CP	CIRC	
2304X	35.59	34.12	150	VC	CIRC	
2305X	36.05	34.71	150	VC	CIRC	
2306X	38.04	36.28	150	VC	CIRC	
2307X			100	VC	CIRC	
2308X			100	VC	CIRC	
2309X			100	VC	CIRC	
2401X	35.71	34.43	150	VC	CIRC	
2403X	38.11	35.66	150	VC	CIRC	
2451X	35.67	34.26	150	VC	CIRC	
2452X	36.54	35.13	150	VC	CIRC	
2501X	35.12	33.61	150	VC	CIRC	
2502X	37.39	34.96	150	VC	CIRC	
2503X	37.74	35.48	150	VC	CIRC	
2504X	31.27	28.54	150	VC	CIRC	
2601X	34.24	32.64	150	VC	CIRC	
2602X	33.3	31.6	150	VC	CIRC	
2603X	32.22		UNK	UNK	CIRC	
2604X	34.5	32.43	150	VC	CIRC	
2651X	31.7	30.34	300	VC	CIRC	
2652X	32.21	30.09	300	VC	CIRC	
2653X	32.18	29.71	300	VC	CIRC	
2654X	33.1	31.69	150	VC	CIRC	
2655X	31.56	30.45	300	VC	CIRC	
265DX			300	VC	CIRC	
2701X	37.04	34.68	150	CP	CIRC	*
2701X	24.7	22.97	150	VC	CIRC	*
2702X	25.76	23.98	150	VC	CIRC	
2703X	28.31	26.33	150	VC	CIRC	
2704X	22.57	19.82	450	CP	CIRC	
2705X			UNK	UNK	CIRC	
2706X			UNK	UNK	CIRC	
271DX			UNK	UNK	CIRC	
2751X	25.72	23.91	300	VC	CIRC	*
2751X	37.02	34.31	525	CP	CIRC	*
2752X	28.2	26.34	225	VC	CIRC	*
2752X	37.09	34.38	525	CP	CIRC	*
2753X	37.09	34.35	525	CP	CIRC	*
2753X	32.37	30.51	225	VC	CIRC	*
2754X	24.74	22.81	300	VC	CIRC	
2756X	25.06	23.72	150	VC	CIRC	
2801X			150	UNK	UNK	*
2801X			225	CI	UNK	*
2802X	22.16	20.46	225	CI	CIRC	*
2802X	37.62	36.65	100	VC	CIRC	*
2803X			150	VC	CIRC	
2804X	22.54	20.62	450	CI	CIRC	*
2804Y	22.54	20.81	225	CI	CIRC	*
2805X			150	VC	CIRC	*
2805X	25.27	23.9	150	VC	CIRC	*
2806X	23.28	21.81	150	CI	CIRC	
2807X	23.27	21.66	150	CI	CIRC	
2808X	23.34	19.94	450	CP	CIRC	
2809X	22.55	19.93	450	CP	CIRC	
2810X	22.38	20.58	225	CI	CIRC	
2851X	37.46	35.71	150	VC	CIRC	*
2851X	25.5	23.54	225	VC	CIRC	*
2852X	23.12	22.04	300	CP	CIRC	*
2852X	37.22	35.28	225	VC	CIRC	*
2853X	37.45	35.77	150	VC	CIRC	*
2853X	27.41	25.9	150	VC	CIRC	*
2854X	22.6	21.28	375	CP	CIRC	*
2854X	37.62	35.75	150	VC	CIRC	*
2855X	37.63	35.88	150	CP	CIRC	
2901X	23.92	21.4	150	VC	CIRC	*
2901X	37.88	34.29	150	CP	CIRC	*
2902X	23.32	20.83	150	VC	CIRC	
2908X	25.16	23.41	150	UNK	CIRC	
2909X	26.4	24.79	150	UNK	CIRC	
2910X	26.31	25.51	150	UNK	CIRC	
2950X	23.54		375	UNK	CIRC	
2951X	24.48	22.8	375	UNK	CIRC	
2955X	26.83	25.19	225	UNK	CIRC	
2956X	26.56		225	UNK	CIRC	
2957X	26.71	25.03	150	UNK	CIRC	
2958X	25.07	23.07	225	UNK	CIRC	
3001X	38.18	35.62	150	VC	CIRC	
3002X	38.58	36.18	150	VC	CIRC	
3003X			UNK	UNK	CIRC	
300DX			150	VC	CIRC	
3301X	38.78	36.83	150	VC	CIRC	
3302X	38.77	37.77	150	VC	CIRC	
3303X	38.58	36.54	150	VC	CIRC	
3304X	38.26	36.67	150	VC	CIRC	
3401X	38.65	37.56	150	VC	CIRC	
3402X	38.68	37.45	150	VC	CIRC	
3601X	36.83	35.13	150	VC	CIRC	
3602X	35.46	34.5	150	VC	CIRC	
3603X	36.66	35.22	150	VC	CIRC	
3604X	34.82	32.94	150	CI	CIRC	
3605X	34.64	33.66	150	VC	CIRC	
3651X	37.47	36.52	150	VC	CIRC	
3701X	32.5	30.49	150	VC	CIRC	*
3701X	37.46	35.19	150	CP	CIRC	*
3702X	37.43	35.12	150	CP	CIRC	
3703X	38.01	37.36	150	VC	CIRC	
3704X	37.41	34.98	150	CP	CIRC	
3751X	34.14	32.64	225	VC	CIRC	*
3751X	37.47	35.04	450	CP	CIRC	*
3752X	37.43	34.88	450	CP	CIRC	*
3752X	34.29	32.92	150	VC	CIRC	*
3753X	33.76	32.43	225	VC	CIRC	*
3753Y	37.52		225	UNK	CIRC	*
3753X	37.52	36.01	150	VC	CIRC	*
3754X	31.79	29.85	150	VC	CIRC	
3801X	37.81	35.05	150	CP	CIRC	*
3801X	31.25	29.24	150	VC	CIRC	*
3802X	37.81	35.57	150	VC	CIRC	*
3802X	28.71	27.13	150	VC	CIRC	*
3803X	37.94	35.65	150	VC	CIRC	*
3803X	26.25	24.73	150	VC	CIRC	*
3804X	38.11		150	UNK	UNK	*
3804X	23.87	22.49	150	CI	CIRC	*
3805X			150	UNK	UNK	
3806X			150	UNK	UNK	
3807X	37.9	36.01	150	VC	CIRC	
3808X	37.91	36.94	150	VC	CIRC	
3809X	37.81	36.27	150	VC	CIRC	
3810X	37.91	36.9	150	VC	CIRC	
3851X	31.37	28.85	150	VC	CIRC	*
3851X	37.99	36.39	150	CP	CIRC	*
3852X	37.86	36.11	150	CP	CIRC	*
3852X	29.12	27.62	150	VC	CIRC	*
3853X	26.38	25.13	225	VC	CIRC	
3854X	23.81	22.89	225	VC	CIRC	
3901X	22.75	20.82	225	CI	CIRC	
390DX			UNK	UNK	CIRC	
4651X	37.58	36.37	150	VC	CIRC	
4701X	38.05	36.61	150	VC	CIRC	
4702X	37.75	35.42	150	CP	CIRC	
4703X	37.76	35.71	150	CP	CIRC	
4704X	38.09	36.27	150	CP	CIRC	
4705X	38.24	36.5	150	CP	CIRC	
4706X			150	VC	CIRC	
471DX			150	VC	CIRC	
4751X	38	36.84	225	VC	CIRC	
4752X	38.06	36.58	225	VC	CIRC	
4753X	37.65	35.71	375	CP	CIRC	
4754X	37.77	35.88	375	CP	CIRC	
4755X	37.81	37.11	150	VC	CIRC	
4801X	38.1	36.79	150	VC	CIRC	*
4801X			UNK	UNK	CIRC	*
4802X	38.03	36.78	150	VC	CIRC	
4803X	38.039		150	CP	UNK	
4804X	38.06	37.25	150	VC	CIRC	
4850X			UNK	UNK	CIRC	
4851X	38.18	36.92	225	VC	CIRC	
4901X			150	UNK	UNK	
4902X			UNK	UNK	CIRC	
4950X			UNK	UNK	CIRC	
4951X			UNK	UNK	CIRC	
5601X	38.04	36.13	150	CP	CIRC	
5651X	38.04	36.27	225	VC	CIRC	
5652X	37.81	36.67	150	VC	CIRC	
5701X	38.3	36.5	150	VC	CIRC	
5702X	37.89	36.06	150	CP	CIRC	
5703X			150	VC	CIRC	
5704X			150	VC	CIRC	
5705X			150	VC	CIRC	
5706X			150	VC	CIRC	
5751X	38.21	36.89	225	VC	CIRC	
5752X	37.96	36.27	300	CP	CIRC	
5851X	38.87	37.84	150	VC	CIRC	
5852X	38.37	36.95	150	VC	CIRC	
5901X			150	UNK	UNK	
7202X	25.71	24.27	225	VC	CIRC	
7203X	24.95	22.84	150	VC	CIRC	
7204X			225	UNK	CIRC	
7205X	28.2		225	UNK	UNK	
7206X	34.52	32.97	100	VC	CIRC	
7207X	33.71	30.57	150	VC	CIRC	
7208X	31.92	30.49	150	VC	CIRC	
7210X			UNK	UNK	UNK	
7251X			UNK	UNK	UNK	
7254X	27.27	26.05	225	VC	CIRC	
7256X	24.96	22.47	450	CP	CIRC	
7302X	22.97	20.69	150	VC	CIRC	
7303X	24.05	21.96	150	VC	CIRC	
7304X	26.14	23.45	150	VC	CIRC	
7305X	22.95	20.8	150	VC	CIRC	
7307X			150	VC	UNK	
7308X	26.59	24.66	150	VC	CIRC	
7309X	23.34	22.51	150	VC	CIRC	
7310X	23.08		150	VC	CIRC	
7311X	27.26	25.66	150	VC	CIRC	
7351X	23.45	21.71	225	CP	CIRC	
7352X	23	20.92	525	CP	CIRC	
7354X	24.68	22.91	225	CP	CIRC	
7355X	25.5	24.37	150	CP	CIRC	
7356X	24.02	21.86	450	CP	CIRC	
7357X	23.01	22.24	150	CP	CIRC	
735DX			450	CP	CIRC	
7402X	20.34	17.09	525	CP	CIRC	
7403X	20.37	18.89	225	CI	CIRC	
7404X	20.69	18.15	225	UNK	CIRC	
7405X	23.87	21.28	150	VC	CIRC	
7501X	21.34	19.44	225	CI	CIRC	
7502X	23.11	21.79	225	CI	CIRC	
7503X	25.63	22.48	225	CI	CIRC	
7504X	24.24	21.44	150	VC	CIRC	
7551X	24.12	21.7	300	VC	CIRC	
7552X			UNK	UNK	UNK	
7554X	24.41	22.12	300	VC	CIRC	
7602X	27.36	25.99	225	CP	CIRC	
7603X			150	VC	UNK	
7604X	26.71	24.01	150	VC	CIRC	
7605X	25.03	22.25	150	VC	CIRC	
7651X	35.34	31.33	225	VC	CIRC	
7701X	30.62	29.18	225	CP	CIRC	
7702X			150	UNK	UNK	
7703X			100	VC	CIRC	
7704X			UNK	UNK	CIRC	
7705X			150	VC	CIRC	
7707X			UNK	UNK	CIRC	
7708X			UNK	UNK	CIRC	
7750X			225	VC	CIRC	
7751X			225	UNK	CIRC	
7801X	33.74	31.62	225	CP	CIRC	
7851X	35.72	33.99	150	VC	CIRC	
7901X	36.14	33.31	225	CP	CIRC	
7904X	34.997		225	CP	CIRC	
7905X			150	VC	CIRC	
8001X	35.96	31.97	225	CP	CIRC	
8002X	36.03	32.01	225	CP	CIRC	
8003X	35.89	31.67	225	CP	CIRC	
8004X			225	UNK	UNK	
8051X			100	VC	UNK	
8052X			100	VC	UNK	
8101X	31.53	28.54	225	CP	CIRC	
8102X	33.39	32.05	150	VC	CIRC	
8103X	35.57	30.87	225	VC	CIRC	
8104X	28.59	26.82	225	VC	CIRC	
8105X			150	UNK	CIRC	
8106X			150	UNK	CIRC	
8107X			UNK	UNK	CIRC	
8108X			UNK	UNK	CIRC	
8151X	31.41	30.14	150	VC	CIRC	
8152X			150	UNK	UNK	
8153X	34.68	33.38	150	VC	CIRC	
8201X	28.59	27.04	225	CP	CIRC	
8202X	27.59	24.81	150	VC	CIRC	
8203X	29.61	25.41	150	VC	CIRC	
8204X	28.64	25.01	150	VC	CIRC	
8205X	30.67	29.33	150	VC	CIRC	
8206X			150	UNK	CIRC	
8207X			225	VC	UNK	
8208X	30.41		150	VC	UNK	
820DX			150	VC	CIRC	
8251X	28.1	23.86	450	CP	CIRC	
8252X	29.59	25.55	300	CP	CIRC	
8253X			150	UNK	UNK	
8254X			150	VC	UNK	
8255X	27.94	25.39	450	CP	CIRC	
8256X	28.85	27.53	225	VC	CIRC	
8257X	26.35	24.88	150	PF	CIRC	
8258X	26.98	26.28	150	PF	CIRC	
825DX			450	CP	CIRC	
8301X			150	VC	UNK	
8302X	32.89	31.72	150	VC	CIRC	
8303X	33.02	31.81	150	VC	CIRC	
8304X	32.6		150	VC	UNK	
8305X			150	VC	UNK	
8351X	27.52	25.66	225	CP	CIRC	
8352X	30.76	28.89	225	CP	CIRC	
8353X	32.63	30.92	150	CP	CIRC	
8354X	34.31	32.15	150	CP	CIRC	
8355X	34.35	32.42	150	CP	CIRC	
8356X	33.38	31.65	150	VC	CIRC	
8357X	31.43	29.89	225	CP	CIRC	
8401X	20.7	18.34	525	CP	CIRC	
8402X	20.56	18.56	225	CI	CIRC	
8403X	23.82	21.4	150	VC	CIRC	
8404X			150	VC	UNK	
8405X	24.08	22.59	150	UNK	CIRC	
8406X			UNK	UNK	CIRC	
840DX			UNK	UNK	CIRC	
8451X	24	22.8	150	CP	CIRC	
8452X	22.79	20.59	225	CP	CIRC	
8453X	24.83	23.71	150	CP	CIRC	
8501X	23.62	22.25	150	VC	CIRC	
8502X	28.81	26.18	150	VC	CIRC	
8503X			525	CP	CIRC	
8504X			150	VC	CIRC	
8551X			300	UNK	UNK	
8552X			300	VC	UNK	
8553X	23.97	22.59	300	VC	CIRC	
8554X			300	UNK	UNK	
8601X	28.07	27.12	150	VC	CIRC	
8651X	28.54	26.57	150	VC	CIRC	
8652X	32.47	30.77	150	VC	CIRC	
8653X	34.36	33.02	150	VC	CIRC	
8654X			UNK	UNK	UNK	
865DX			300	VC	UNK	

LINE STYLES / COLOURS

Brown	Foul
	Foul Syphon Sewer
	Foul Vacuum Main
	Foul Rising Main
Red	Combined
	Combined Syphon Sewer
	Combined Rising Main
	Lateral Drain
Orange	Building Over Agreement Area
Dark Blue	Treated Effluent
Purple	Sludge
	Sewer Catchment
	Section 104 Area
Light Blue	Surface Water
	Surface Water Rising Main
Yellow	Private
Green	Access Shaft
	Decommissioned

MATERIALS

AK	Alkathene
BAC	Bonded Asbestos Cement
BRC	Brick (Common)
BRE	Brick (Engineering)
CC	Concrete Box Culvert
CI	Cast Iron
CO	Concrete (In-Situ)
CP	Concrete (Pre-Cast)
CSB	Concrete Segments (bolted)
CSU	Concrete Segments (unbolted)
DI	Ductile Iron
GRC	Glass Reinforced Concrete
GRP	Glass Reinforced Plastic
MAC	Masonry in regular Courses
MAR	Masonry in random Courses
PE	Polyethylene
PF	Pitch Fibre
PP	Polypropylene
PVC	Polyvinyl Chloride
RPM	Reinforced Plastic Matrix
SI	Spun Iron
ST	Steel
VC	Vitrified Clay
XXX	Other
ZZZ	Unknown

LEGEND - SEWERS

Manhole (SW)
Manhole (F&C)
Lamp hole (SW)
Lamp hole (F&C)
Pumping Station (SW)
Pumping Station (F&C)
Side entry manhole (SW)
Side entry Manhole (F&C)
Blind shaft (SW)
Blind shaft (F&C)
Ejector station (SW)
Ejector station (F&C)
Watertight door (SW)
Watertight door (F&C)
Flushing ch. Mn-e (SW)
Flushing ch. Mn-e (F&C)
Flushing ch. No-e (SW)
Flushing ch. No-e (F&C)
Demarcation Chamber
Washout (SW)
Washout (F&C)
Rodding Eye (SW)
Rodding Eye (F&C)
Gauging point (SW)
Gauging point (F&C)
Intercept chamber (SW)
Intercept chamber (F&C)
Storm Tank (SW)
Storm Tank (F&C)
Vortex chamber (SW)
Vortex chamber (F&C)
Label ellipse
Dummy/S24 manhole
Outfall
Penstock chamber
Damboards
Storm Overflow
Backdrop manhole
Other (s)
Other
Change in sewer (s)
Change in sewer
Reflux valve
Flap valve
Cascade
Anode
Valve
Closed Valve
Air Valve
Hatch box (SW)
Hatch box (F&C)
Direction arrow
Emptying valve
Catchpit
Soakaway
Inlet
Balancing Pond
Wastewater treatment works
Marine treatment works
Outfall headworks
Vent
Vent column
Tidal storage tank
Blank end
Head of Public Sewer
Micro Pumping Station

SHAPES (S)

A	Arched	R	Rectangular
B	Barrel	S	Square
C	Circular	T	Trapezoidal
E	Egg	U	U Shape
H	Horseshoe	X	Other

NODE REFERENCING SYSTEM

1st digit: hundred metre easting identifier
2nd digit: hundred metre northing identifier
sewer type identifier
3rd digit: 0-4 = Foul/Combined
5-9 = Surface Water
4th digit: next sequential node

O.S. Ref.	SU3721SW	Drawn by:	kumaria
Scale:	1:2500	Date:	05/04/2019

Title: U1430652_Land at Halterworth

The information contained on this plan is provided as a guide to the approximate position of existing public sewers. The accuracy thereof cannot be guaranteed.

THIS INFORMATION MUST BE TREATED WITH CAUTION AND THE ACTUAL POSITION OF THE PUBLIC SEWERS MUST
BE ESTABLISHED ON SITE, IN ALL CASES.
Southern Water must be informed before lifting manhole covers or excavating trial holes.
WARNING: BAC pipes are constructed of Bonded Asbestos Cement
WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement

N

Southern Water

from Southern Water

Dani Lister
Enzygo Ltd
Samuel House
5 Fox Valley Way
Stocksbridge
Sheffield
S36 2AA

Your ref

Our ref
DSA000027233

Date
13 October 2023

Contact
Tel 0330 303 0119

Dear Ms Lister,

Level 1 Capacity Check Enquiry: Land east of Halterworth Lane, Romsey, Hampshire, SO51 9AE.

We have completed the capacity check for the above development site and the results are as follows:

Foul Water

There is currently adequate capacity in the local sewerage network to accommodate a foul flow of **3.44 l/s** for the above development at manhole reference SU3721**2503**. Please note that no surface water flows (existing or proposed) can be accommodated within the existing foul sewerage system unless agreed by the Lead Local Flood Authority in consultation with Southern Water, after the hierarchy Part H3 of Building Regulations has been complied with.

There is currently inadequate capacity in the local sewerage network to accommodate a foul flow of **3.44 l/s** for the above development at manhole reference SU3721**2101** or SU3720**4901.**

Connecting to our network

It should be noted that this information is only a hydraulic assessment of the existing sewerage network and does not grant approval for a connection to the public sewerage system. A formal Sewer Connection (S106) application is required to be completed and approved by Southern Water Services. To make an application visit: developerservices.southernwater.co.uk

Please note the information provided above does not grant approval for any designs/drawings submitted for the capacity analysis. The results quoted above are only valid for 12 months from the date of issue of this letter.

Should it be necessary to contact us please quote our above reference number relating to this application by email at southernwaterplanning@southernwater.co.uk

Yours sincerely,

Future Growth Planning Team
Developer Services

southernwater.co.uk/developing-building/planning-your-development

Appendix 3 – Environment Agency Correspondence

Dani Lister

From: Partnership and Strategic Overview team, HIOW <psohiow@environment-agency.gov.uk>
Sent: 11 October 2023 16:46
To: Dani Lister
Cc: SSD Enquiries
Subject: Flood Risk Assessment Data for Halterworth Lane - Ref: SSD/328630
Attachments: FRA Info 328630.pdf

Dear Dani,

Please find attached the flood risk assessment information (previously Product 4) attached for your site off Halterworth Lane, Romsey as requested.

Product 5, 6 and 7 – Please use the link below to download the model reports (Product 5), model output data (product 6) and model input data (Product 7):

https://ea.sharefile.com/d-s2aaad9b4b0d34de294bc936a7c44d007

Name	Product 5
Description	Romsey Model Reports
Licence	Environment Agency Conditional Licence
Conditions	1.0 You may use the Information for your internal or personal purposes and may only sublicense others to use it if you do so under a written licence which includes the terms of these conditions and the agreement and in particular may not allow any period of use longer than the period licensed to you. 2.0 Notwithstanding the fact that the standard wording of the Environment Agency Conditional Licence indicates that it is perpetual, this Licence has a limited duration of 5 years at the end of which it will terminate automatically without notice. 3.0 We have restricted use of the Information as a result of legal restrictions placed upon us to protect the rights or confidentialities of others. In this instance it is because of third party data. If you contact us in writing (this includes email) we will, as far as confidentiality rules allow, provide you with details including, if available, how you might seek permission from a third party to extend your use rights. 4.1 The Information may contain some data that we believe is within the definition of "personal data" under the Data Protection Act 1998 but we consider that we will not be in breach of the Act if we disclose it to you with conditions set out in this condition and the conditions above. This personal data comprises names of individuals or commentary relating to property that may be owned by an individual or commentary relating to the activities of an individual. 4.2 Under the Act a person who holds and uses or passes to others personal data is responsible for any compliance with the Act and so we have no option but to warn you that this means you have responsibility to check that you are compliant with the Act in respect of this personal data.

	5.0 The location of public water supply abstraction sources must not be published to a resolution more detailed than 1km2. Information about the operation of flood assets should not be published. 6.1 Where we have supplied model data which may include model inputs or outputs you agree to supply to the Environment Agency copies of any assessments/studies and related outputs, modifications or derivatives created pursuant to the supply to you of the Information, all of which are hereinafter referred to as "the Data". 6.2 You agree, in the public interest to grant to the Environment Agency a perpetual royalty free non-exclusive licence to use the Data or any part thereof for its internal purposes or to use it in any way as part of Environment Agency derivative products which it supplies free of charge to others such as incorporation into the Environment Agency's Open Data mapping products.
Information Warnings	If we have provided climate change data, it is based on UKCP09 which has now been superseded by UKCP18. We have scheduled updates to our flood models to incorporate UKCP18 data, but until this is complete the majority of our models will not provide appropriate climate change data for use within Flood Risk Assessments. The correct allowances will need to be calculated using the following data: https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances Failure to use the correct climate change data may result in us objecting to planning applications upon which we are consulted by Local Planning Authorities.
Attribution	Contains Environment Agency information © Environment Agency and/or database rights. May contain Ordnance Survey data © Crown copyright 2017 Ordnance Survey 100024198.

Name	Product 6
Description	Model Output Data for Romsey Model
Licence	Environment Agency Conditional Licence
Conditions	1.0 You may use the Information for your internal or personal purposes and may only sublicense others to use it if you do so under a written licence which includes the terms of these conditions and the agreement and in particular may not allow any period of use longer than the period licensed to you. 2.0 Notwithstanding the fact that the standard wording of the Environment Agency Conditional Licence indicates that it is perpetual, this Licence has a limited duration of 5 years at the end of which it will terminate automatically without notice. 3.0 We have restricted use of the Information as a result of legal restrictions placed upon us to protect the rights or confidentialities of others. In this instance it is because of third party data. If you contact us in writing (this includes email) we will, as far as confidentiality rules

	allow, provide you with details including, if available, how you might seek permission from a third party to extend your use rights. 4.1 The Information may contain some data that we believe is within the definition of "personal data" under the Data Protection Act 1998 but we consider that we will not be in breach of the Act if we disclose it to you with conditions set out in this condition and the conditions above. This personal data comprises names of individuals or commentary relating to property that may be owned by an individual or commentary relating to the activities of an individual. 4.2 Under the Act a person who holds and uses or passes to others personal data is responsible for any compliance with the Act and so we have no option but to warn you that this means you have responsibility to check that you are compliant with the Act in respect of this personal data. 5.0 The location of public water supply abstraction sources must not be published to a resolution more detailed than 1km2. Information about the operation of flood assets should not be published.. 6.1 Where we have supplied model data which may include model inputs or outputs you agree to supply to the Environment Agency copies of any assessments/studies and related outputs, modifications or derivatives created pursuant to the supply to you of the Information, all of which are hereinafter referred to as "the Data". 6.2 You agree, in the public interest to grant to the Environment Agency a perpetual royalty free non-exclusive licence to use the Data or any part thereof for its internal purposes or to use it in any way as part of Environment Agency derivative products which it supplies free of charge to others such as incorporation into the Environment Agency's Open Data mapping products.
Information Warnings	Please be aware that model data is not raw, factual or measured but comprises of estimations or modelled results based on the data available to us. If we have provided climate change data, it is based on UKCP09 which has now been superseded by UKCP18. We have scheduled updates to our flood models to incorporate UKCP18 data, but until this is complete the majority of our models will not provide appropriate climate change data for use within Flood Risk Assessments. The correct allowances will need to be calculated using the following data: https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances Failure to use the correct climate change data may result in us objecting to planning applications upon which we are consulted by Local Planning Authorities.
Attribution	Contains Environment Agency information © Environment Agency and/or database rights.

Name	Product 7
Description	Calibrated and Verified Model Input Data for Romsey Model
Licence	Environment Agency Conditional Licence

Conditions	1.0 You may use the Information for your internal or personal purposes and may only sublicense others to use it if you do so under a written licence which includes the terms of these conditions and the agreement and in particular may not allow any period of use longer than the period licensed to you. 2.0 Notwithstanding the fact that the standard wording of the Environment Agency Conditional Licence indicates that it is perpetual, this Licence has a limited duration of 5 years at the end of which it will terminate automatically without notice. 3.0 We have restricted use of the Information as a result of legal restrictions placed upon us to protect the rights or confidentialities of others. In this instance it is because of third party data. If you contact us in writing (this includes email) we will, as far as confidentiality rules allow, provide you with details including, if available, how you might seek permission from a third party to extend your use rights. 4.1 The Information may contain some data that we believe is within the definition of "personal data" under the Data Protection Act 1998 but we consider that we will not be in breach of the Act if we disclose it to you with conditions set out in this condition and the conditions above. This personal data comprises names of individuals or commentary relating to property that may be owned by an individual or commentary relating to the activities of an individual. 4.2 Under the Act a person who holds and uses or passes to others personal data is responsible for any compliance with the Act and so we have no option but to warn you that this means you have responsibility to check that you are compliant with the Act in respect of this personal data. 5.0 The location of public water supply abstraction sources must not be published to a resolution more detailed than 1km2. Information about the operation of flood assets should not be published.. 6.1 Where we have supplied model data which may include model inputs or outputs you agree to supply to the Environment Agency copies of any assessments/studies and related outputs, modifications or derivatives created pursuant to the supply to you of the Information, all of which are hereinafter referred to as "the Data". 6.2 You agree, in the public interest to grant to the Environment Agency a perpetual royalty free non-exclusive licence to use the Data or any part thereof for its internal purposes or to use it in any way as part of Environment Agency derivative products which it supplies free of charge to others such as incorporation into the Environment Agency's Open Data mapping products.
Information Warnings	If we have provided climate change data, it is based on UKCP09 which has now been superseded by UKCP18. We have scheduled updates to our flood models to incorporate UKCP18 data, but until this is complete the majority of our models will not provide appropriate climate change data for use within Flood Risk Assessments. The correct allowances will need to be calculated using the following data: https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances

	Failure to use the correct climate change data may result in us objecting to planning applications upon which we are consulted by Local Planning Authorities.
Attribution	Contains Environment Agency information © Environment Agency and/or database rights.

The questions you have posed regarding the climate change allowances, discharge allowance and drainage strategy would fall under our pre planning advice which is a chargeable service, more information about this service can be found on our website here.

Please get in touch if you have any further queries or contact us within two months if you'd like us to review the information we have sent.

Yours sincerely

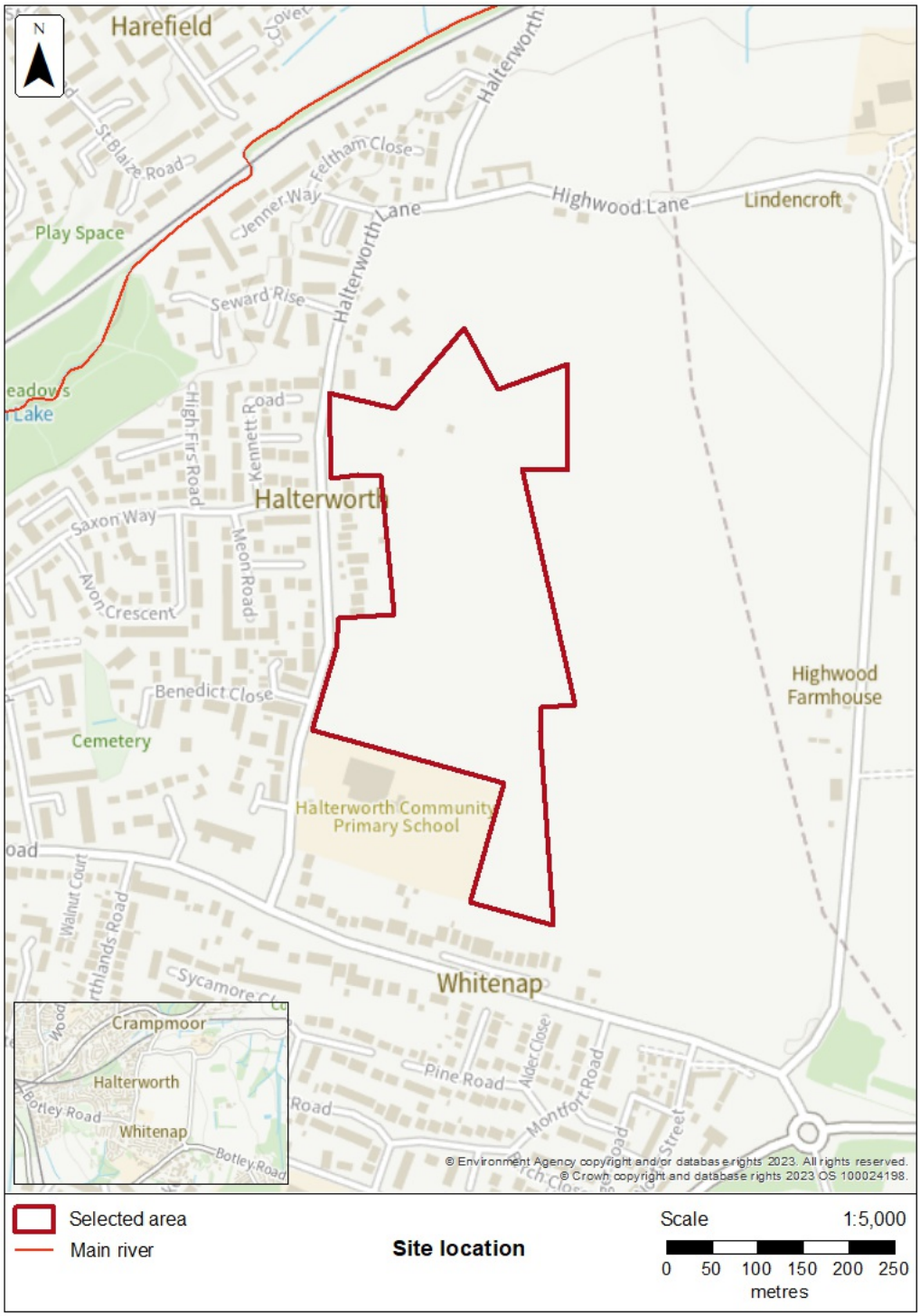
Aimee Etheridge
Partnership and Strategic Overview team, Hampshire and Isle of Wight
Environment Agency

Direct dial 020 8474 5815
Email psohiow@environment-agency.gov.uk

Flood risk assessment data

Location of site: 437428 / 121327 (shown as easting and northing coordinates)
Document created on: 11 October 2023
This information was previously known as a product 4.
Customer reference number: SSD 2 0

Map showing the location that flood risk assessment data has been requested for.



How to use this information

You can use this information as part of a flood risk assessment for a planning application. To do this, you should include it in the appendix of your flood risk assessment.

> **We recommend that you work with a flood risk consultant to get your flood risk assessment.**

Included in this document

In this document you'll find:

- how to find information about surface water and other sources of flooding
- definitions for the terminology used throughout
- flood map for planning (rivers and the sea)
- flood defences and attributes
- information to help you assess if there is a reduced flood risk from rivers and the sea because of defences
- modelled data
- information about strategic flood risk assessments
- information about this data
- information about flood risk activity permits
- help and advice

Not included in this document

This document does not include a Flood Defence Breach Hazard Map.

If your location has a reduced flood risk from rivers and sea because of defences, you need to request a Flood Defence Breach Hazard Map and information about the level of flood protection offered at your location from the Solent and South Downs Environment Agency team at ssdenquiries@environment-agency.gov.uk. This information will only be available if modelling has been carried out for breach scenarios.

Include a site location map in your request.

Information that's unavailable

This document **does not** contain:

- historic flooding
- climate change modelled data

We do not have historic flooding data for this location.

Please note that:

- flooding may have occurred that we do not have records for
- flooding can come from a range of different sources
- we can only supply flood risk data relating to floodng from rivers or the sea

You can contact your Lead Local Flood Authority or Internal Drainage Board to see if they have other relevant local flood information. Please note that some areas do not have an Internal Drainage Board.

There is not any modelled data available for this location. This is because detailed modelling hasn't been carried out in this area.

There is not any modelled climate change data for this location. This is because detailed modelling hasn't been carried out in this area. You will need to consider the latest flood risk assessment climate change allowances and factor in the new allowances to demonstrate the development will be safe from flooding.

Surface water and other sources of flooding

Use the long term flood risk service to find out about the risk of flooding from:

- surface water
- ordinary watercourses
- reservoirs

For information about sewer flooding, contact the relevant water company for the area.

About the models used

Model name: Romsey Model
Scenario(s): Defences removed fluvial,
Date: 2011

Terminology used

Annual exceedance probability (AEP)

This refers to the probability of a flood event occurring in any year. The probability is expressed as a percentage. For example, a large flood which is calculated to have a 1% chance of occuring in any one year, is described as 1% AEP.

Metres above ordnance datum (mAOD)

All flood levels are given in metres above ordnance datum which is defined as the mean sea level at Newlyn, Cornwall.

Flood map for planning (rivers and the sea)

Your selected location is in flood zone 1.

Flood zone 3 shows the area at risk of flooding for an undefended flood event with a:

- 0.5% or greater probability of occurring in any year for flooding from the sea
- 1% or greater probability of occurring in any year for fluvial (river) flooding

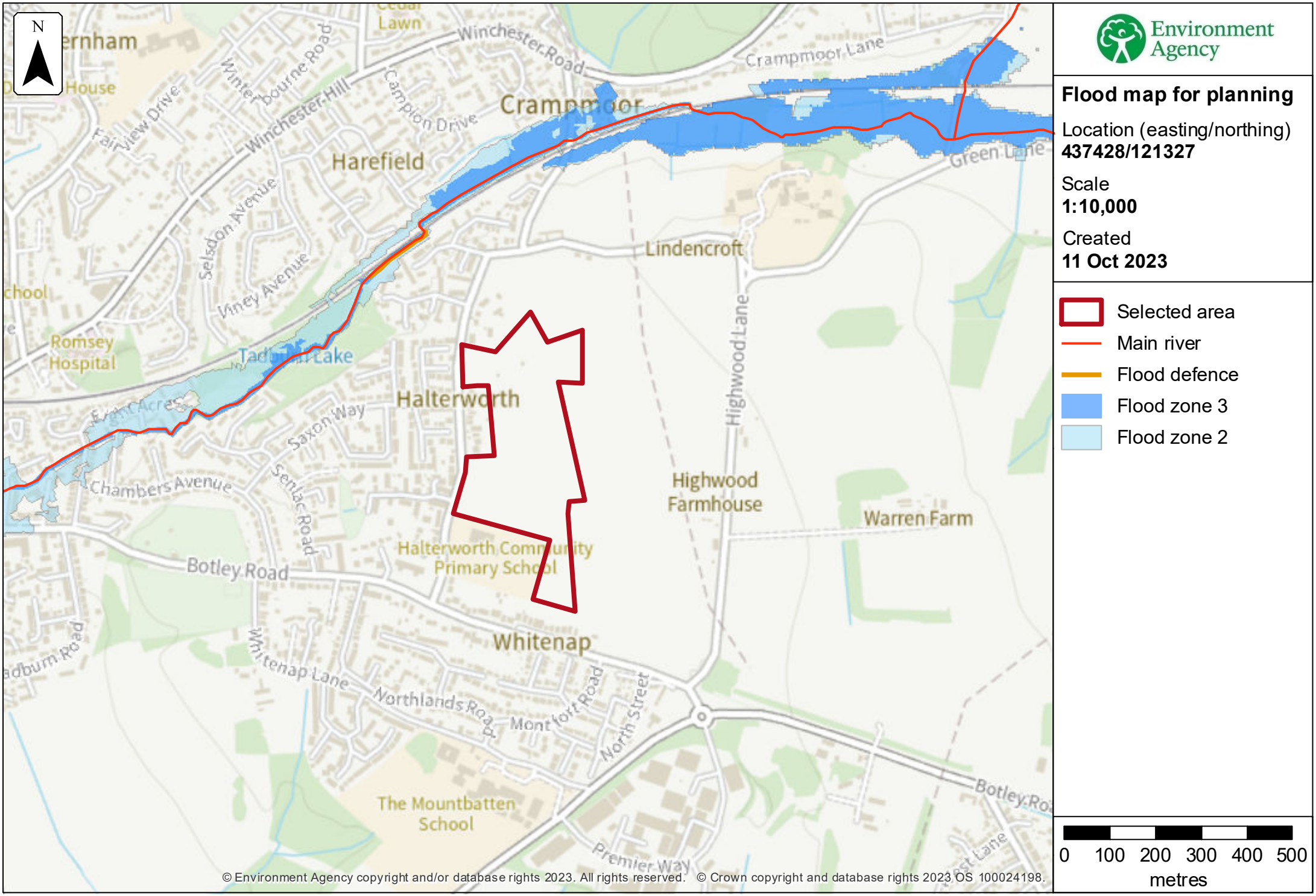
Flood zone 2 shows the area at risk of flooding for an undefended flood event with:

- between a 0.1% and 0.5% probability of occurring in any year for flooding from the sea
- between a 0.1% and 1% probability of occurring in any year for fluvial (river) flooding

It's important to remember that the flood zones on this map:

- refer to the land at risk of flooding and do not refer to individual properties
- refer to the probability of river and sea flooding, ignoring the presence of defences
- do not take into account potential impacts of climate change

This data is updated on a quarterly basis as better data becomes available.


N
Environment Agency
Flood map for planning
Location (easting/northing)
437428/121327
Scale
1:10,000
Created
11 Oct 2023
Selected area
Main river
Flood defence
Flood zone 3
Flood zone 2
0 100 200 300 400 500
metres
Crampmoor
Harefield
Halterworth
Whitenap
Lindencroft
Highwood Farmhouse
Warren Farm
Halterworth Community Primary School
The Mountbatten School
Romsey Hospital
Tadburn Lake
Winchester Road
Crampmoor Lane
Green Lane
Highwood Lane
Botley Road
Chambers Avenue
Saxon Way
Viney Avenue
Selsdon Avenue
Winterbourne Road
Winchester Hill
Campion Drive
Fair View Drive
Senlac Road
Whitenap Lane
Northlands Road
Montfort Road
North Street
Premier Way
© Environment Agency copyright and/or database rights 2023. All rights reserved. © Crown copyright and database rights 2023 OS 100024198.

Flood defences and attributes

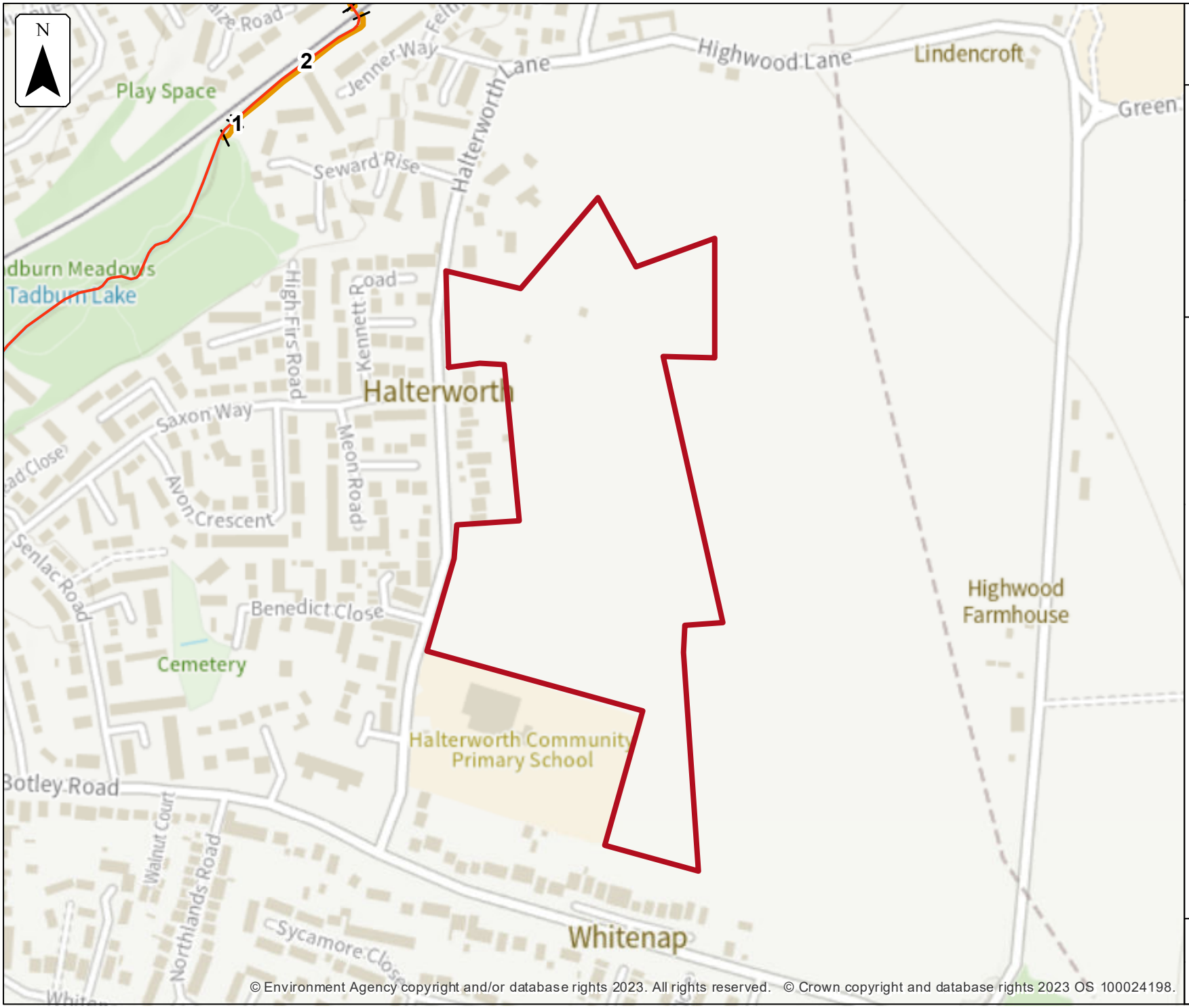
The flood defences map shows the location of the flood defences present.

The flood defences data table shows the type of defences, their condition and the standard of protection. It shows the height above sea level of the top of the flood defence (crest level). The height is In mAOD which is the metres above the mean sea level at Newlyn, Cornwall.

It's important to remember that flood defence data may not be updated on a regular basis. The information here is based on the best available data.

Use this information:

- to help you assess if there is a reduced flood risk for this location because of defences
- with any information in the modelled data section to find out the impact of defences on flood risk



Environment Agency

Flood defences

Location (easting/northing)
437428/121327

Scale
1:5,000

Created
11 Oct 2023

- Selected area
- Main river
- Flood defence

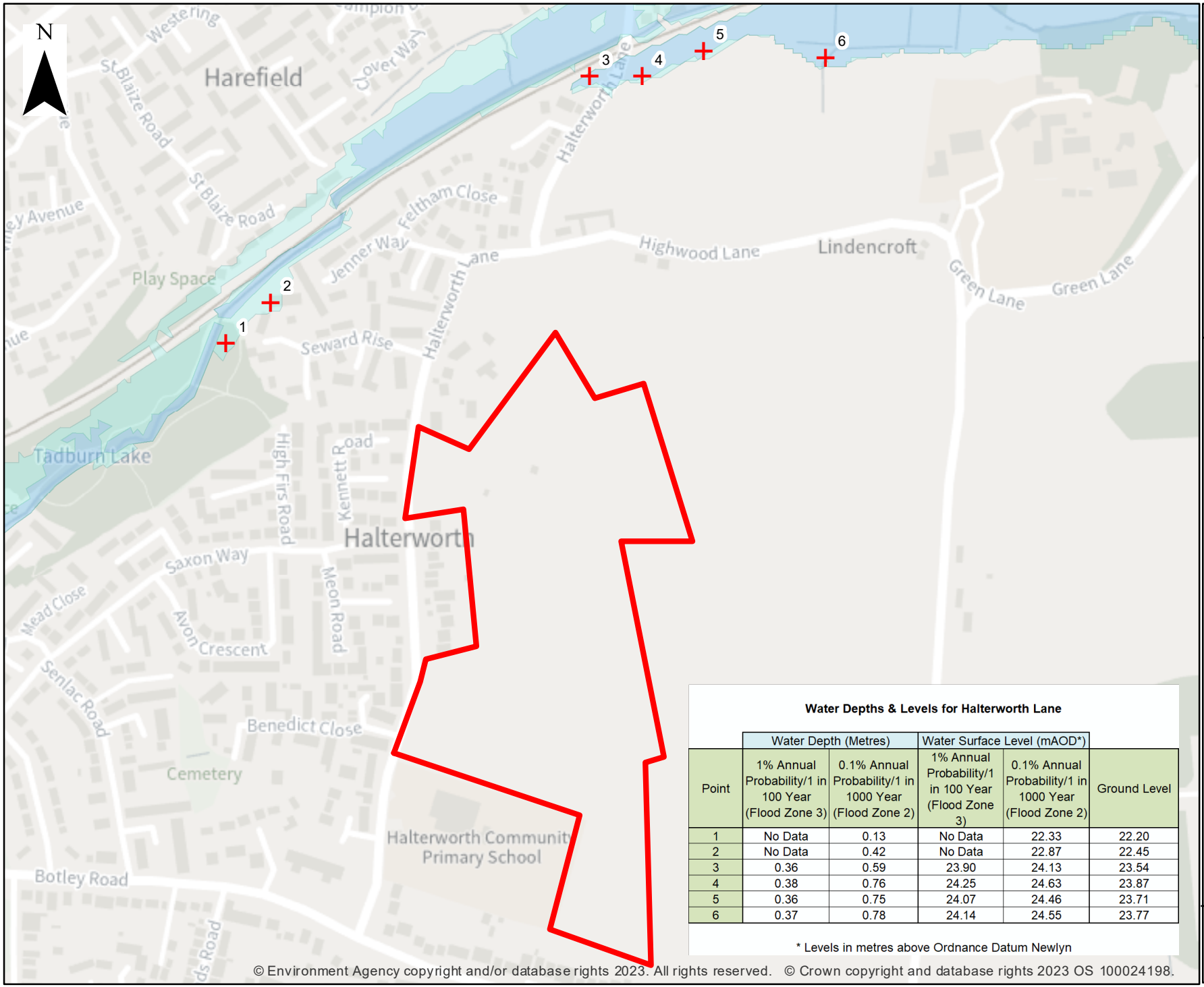
0 50 100 150 200 250
metres

Flood defences data

Label	Asset ID	Asset Type	Standard of protection (years)	Current condition	Downstream actual crest level (mAOD)	Upstream actual crest level (mAOD)	Effective crest level (mAOD)
1	510876	Embankment		Good			
2	20748	Wall	20	Fair	22.10	2.70	

Any blank cells show where a particular value has not been recorded for an asset.

20110 Romsey Model Flood Levels Centred on Grid Ref: SU 37429 21354



Water Depths & Levels for Halterworth Lane

Point	Water Depth (Metres)		Water Surface Level (mAOD*)		Ground Level
	1% Annual Probability/1 in 100 Year (Flood Zone 3)	0.1% Annual Probability/1 in 1000 Year (Flood Zone 2)	1% Annual Probability/1 in 100 Year (Flood Zone 3)	0.1% Annual Probability/1 in 1000 Year (Flood Zone 2)	
1	No Data	0.13	No Data	22.33	22.20
2	No Data	0.42	No Data	22.87	22.45
3	0.36	0.59	23.90	24.13	23.54
4	0.38	0.76	24.25	24.63	23.87
5	0.36	0.75	24.07	24.46	23.71
6	0.37	0.78	24.14	24.55	23.77

* Levels in metres above Ordnance Datum Newlyn

Environment Agency

Flood Levels Map

Location (easting/northing)
437429 / 121354

Scale
1:5,767

Created
11th October 2023

Legend

- Location Point
- Site Boundary
- flood_zone_3
- flood_zone_2

Meters
0 25 50 100 150 200

Strategic flood risk assessments

We recommend that you check the relevant local authority's strategic flood risk assessment (SFRA) as part of your work to prepare a site specific flood risk assessment.

This should give you information about:

- the potential impacts of climate change in this catchment
- areas defined as functional floodplain
- flooding from other sources, such as surface water, ground water and reservoirs

About this data

This data has been generated by strategic scale flood models and is not intended for use at the individual property scale. If you're intending to use this data as part of a flood risk assessment, please include an appropriate modelling tolerance as part of your assessment. The Environment Agency regularly updates its modelling. We recommend that you check the data provided is the most recent, before submitting your flood risk assessment.

Flood risk activity permits

Under the Environmental Permitting (England and Wales) Regulations 2016 some developments may require an environmental permit for flood risk activities from the Environment Agency. This includes any permanent or temporary works that are in, over, under, or nearby a designated main river or flood defence structure.

Find out more about flood risk activity permits

Help and advice

Contact the Solent and South Downs Environment Agency team at ssdenquiries@environment-agency.gov.uk for:

- more information about getting a product 5, 6, 7 or 8
- general help and advice about the site you're requesting data for

Appendix 4 – BGS Borehole Records

S-325E/107

Contract Name	HALTERWORTH	Borehole No. 1
		Sheet 2 of 2

Method of boring
Diameter

Ground level
Start
Finish

Daily progress	Water levels	In-situ tests	Samples	Depth (m)	Reduced level (m O.D.)	Thickness (m)	Description of Strata
						2.35	Very dense fine light brown sand
1/9		N=86	BJ				
1/9				10.95	15.31		Bottom of Borehole

10
11
12

Notes

SU32SE/108

Contract Name	HALTERWORTH	Borehole No. 2
		Sheet 1 of 1

Method of boring	Shell and Auger	Ground level	31.21 m OD
Diameter	200 mm nominal	Start	10.8.78
		Finish	11.8.78

Daily progress	Water levels	In-situ tests	Samples	Depth (m)	Reduced level (m O.D.)	Thickness (m)	Description of Strata
			B			0.35	Topsoil
			U	0.35	30.86	0.40	Firm brown sandy clay
				0.75	30.46		
		N=11	BJ	0.90	30.31	0.15	Medium dense brown sand with pockets of brown clay
						0.60	Firm light grey silty clay with brown sand pockets
			J	1.50	29.71		
			U	1.60	29.61	0.10	Medium dense grey silty sand
						0.60	Firm brown/grey mottled clay
11/8	▽	10/8	J	2.20	29.01		
	▽		J	2.40	28.81	0.20	Firm grey/light brown mottled sandy clay
	10/8	N=7	BJ				
		N=8	BJ			2.65	Loose to medium dense light brown silty sand with layers of dark and light brown/green mottled silty sandy clay and with a brown sandstone layer
		N=6	BJ				
		N=13	BJ				
				5.05	26.16		
				5.15	26.06	0.10	Firm brown/green mottled sandy clay
			J			0.25	Firm light grey/brown mottled clay with pockets of light brown sand
			U	5.40	25.81	0.70	Soft green/brown mottled clayey silty sand
				6.10	25.11		
			J				
			U			3.55	Firm grey silty sandy clay with light grey silt lenses
10/8							
			J				
			U				
			J				
11/8			U	9.65	21.56		
				10.00	21.21	0.35	Firm brown sandy clay
11/8							Bottom of Borehole

Notes

Water struck at 2.40. Rose to 1.10 after 20 minutes

Terresearch Limited	Report No. S.28/583	Appendix 1 Sheet 3

SU32SE / 118

Contract Name	HALTERWORTH	Borehole No. 12
		Sheet 1 of 1

Method of boring	Shell and Auger	Ground level	33.77 m OD
Diameter	200 mm nominal	Start	11.8.78
		Finish	12.8.78

Daily progress	Water levels	In-situ tests	Samples	Depth (m)	Reduced level (m O.D.)	Thickness (m)	Description of Strata
						0.30	Topsoil
			J U	0.30	33.47	0.90	Very stiff friable laminated brown and grey clay ith layers of grey silt and brown sand
			J	1.20	32.57		
	▽ 11/8			1.30	32.47	0.10	Brown sand
			U			2.10	Firm organic light grey silty clay with layers of grey sand and occasional medium gravel size flint stones
	▼ 12/8 ▽ 12/8						
				3.40	30.37		
		N=11	BJ				
11/8			J U				
						4.80	Firm green/brown mottled silty sandy clay with pockets of coarse brown sand
		N=20	BJ				
			J				
			U				
		N=19	BJ				
			U	8.20	25.57		
			J			1.80	Firm grey sandy silty clay with layers of grey sand
12/8			U				
			J	10.00	23.77		

Bottom of Borehole

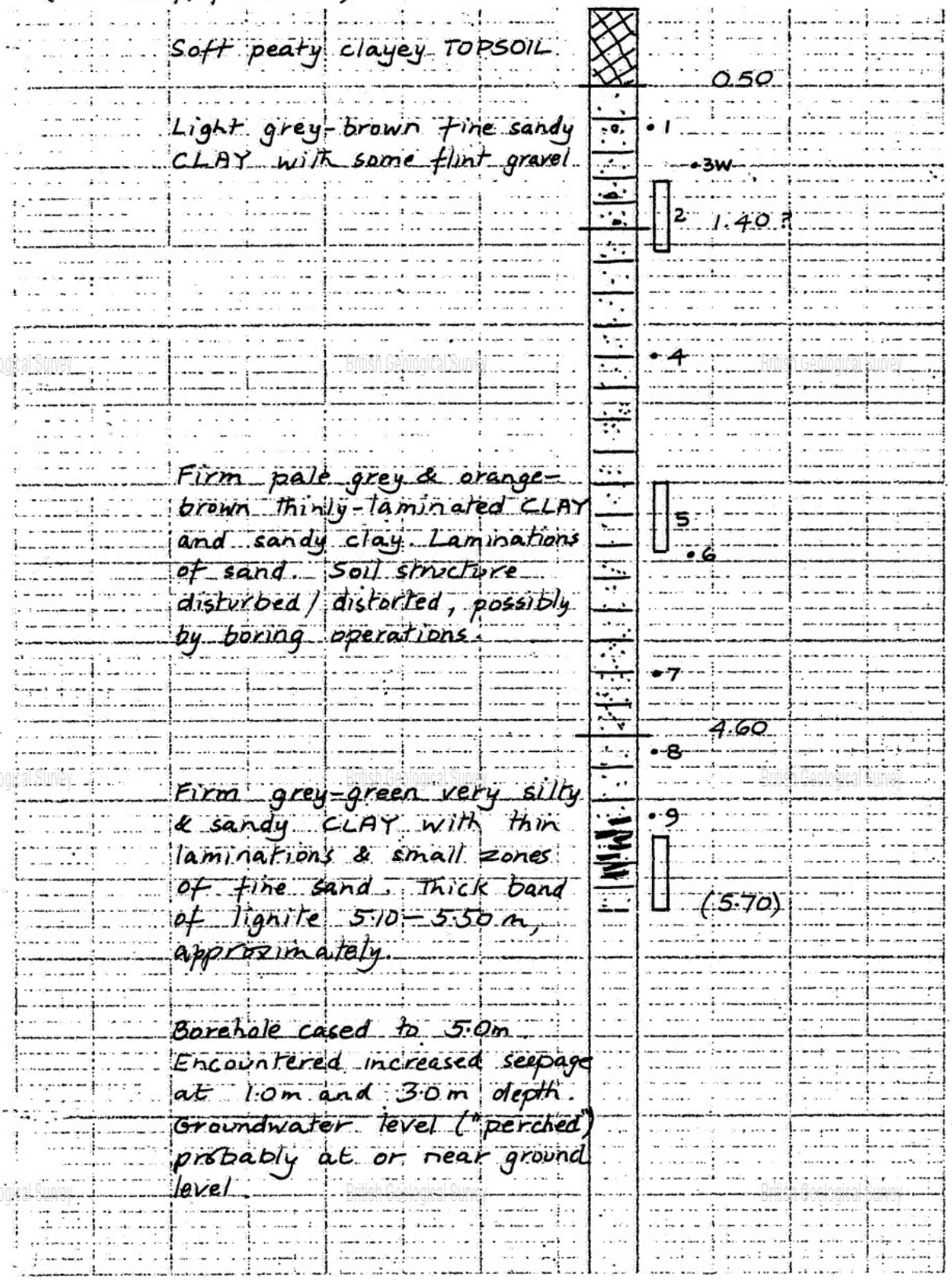
12/8

Notes

Terresearch Limited	Report No. S.28/583	Appendix 1 Sheet 14

SITE Halterworth Farm, Romsey, Hants. FIG. 4c

BOREHOLE 3 DIAMETER 150 mm DEPTH 5·70 m DATE 31/5/78
(near scarp, field 0355)



100 mm dia. core sample — NR ... non-recovery of sample

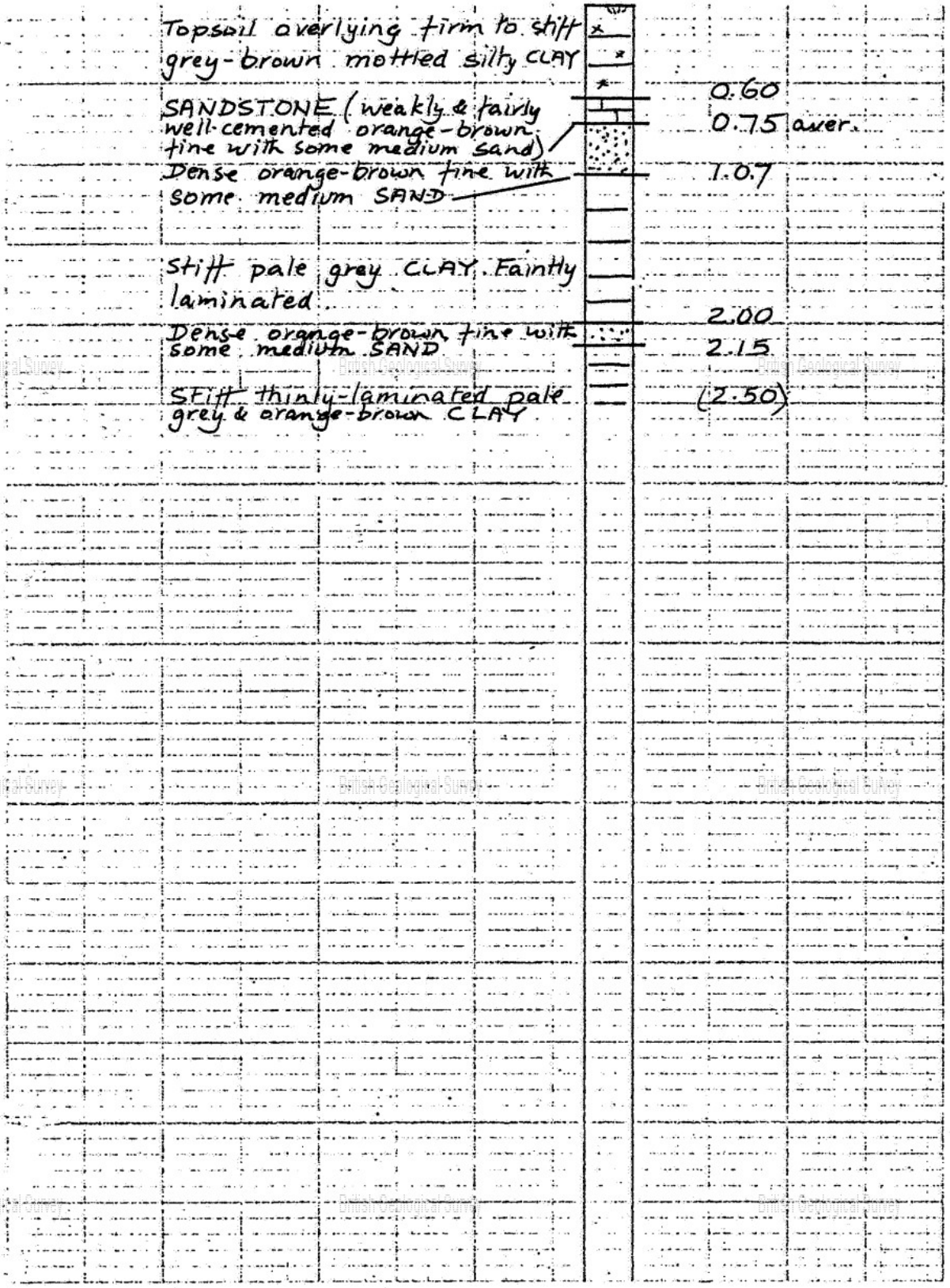
o disturbed sample — oW .... water sample

I N blows/ft in standard penetration test

Scale: 1 in for 1 m

SITE Halterworth Farm, Romsey, Hants. FIG. 5c

~~BOREHOLE~~ TP3 ~~DIAMETER~~ mm DEPTH 2·50 m DATE 26/5/78



[ ] ... mm dia. core sample

NR ... non-recovery of sample

o disturbed sample

oW .... water sample

I N blows/ft in standard penetration test

Scale: 1 in for 1 m

543 28E/10

Contract Name	HALTERWORTH	Borehole No. 1
		Sheet 1 of 2

Method of boring	Shell and Auger	Ground level	26.26 m OD
Diameter	200 mm nominal	Start	30.8.78
		Finish	1.9.78

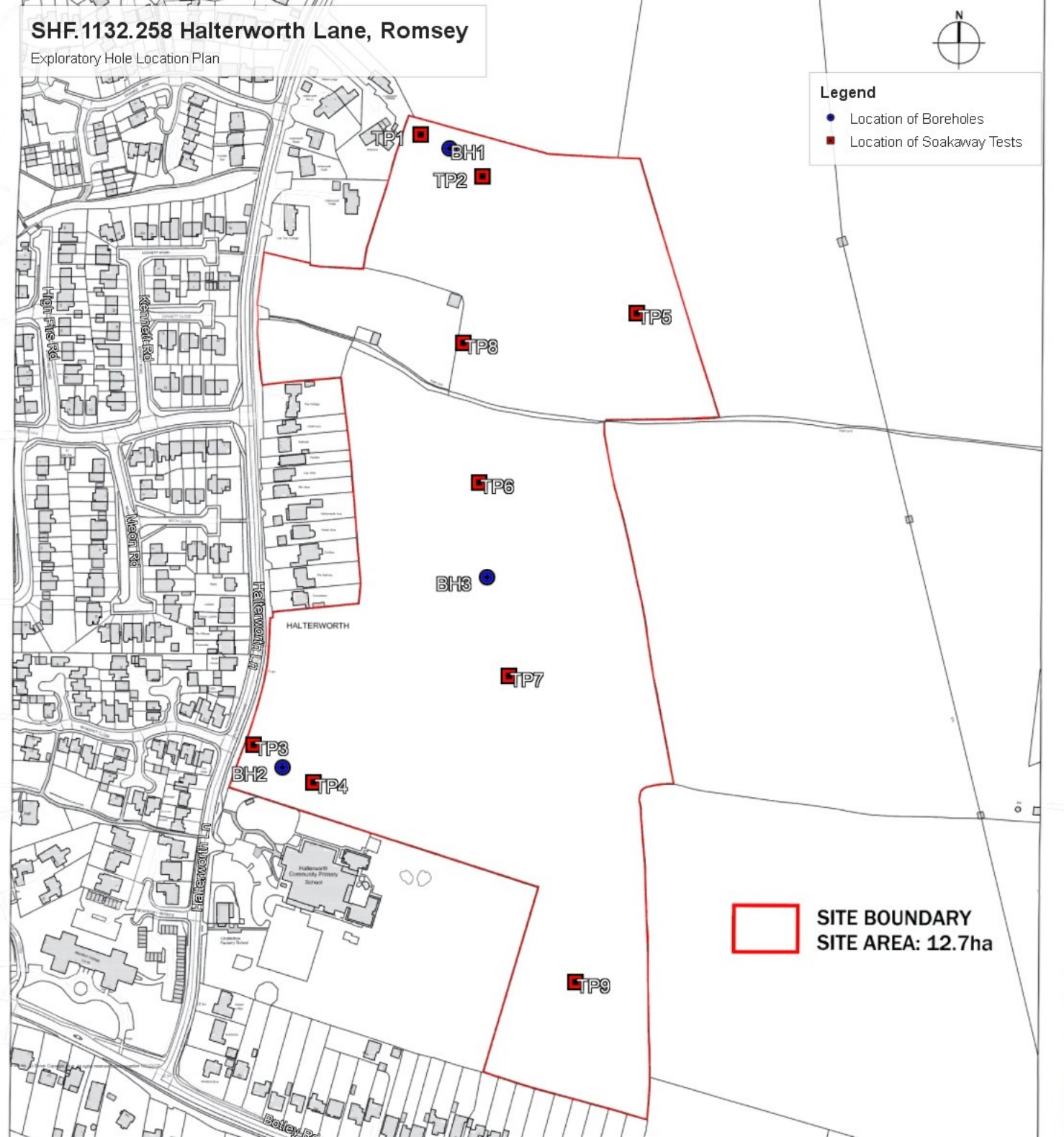
Daily progress	Water levels	In-situ tests	Samples	Depth (m)	Reduced level (m O.D.)	Thickness (m)	Description of Strata
			BW	0.45	25.81	0.45	Topsoil
			B			0.40	Loose flint gravel in a matrix of grey sandy clay
		N=9	B	0.85	25.41	0.70	Loose flint gravel in a matrix of brown sandy clay
			B	1.55	24.71	0.40	Loose flint gravel with a little brown sand
30/8		N=9	B	1.95	24.31	0.55	Loose flint gravel with some cobbles and with a little brown sand
			B U	2.50	23.76	0.70	Firm green/brown/grey mottled clayey silty sand with occasional fine gravel size stones
			J	3.20	23.06		
		N=12	BJ			3.60	Medium dense grey-green clayey silty sand
			J				
			U				
		N=13	BJ				
			J	6.80	19.46		
			U			1.80	Firm grey clayey silty sand with layers of light brown sand
			J				
31/8			U	8.60	17.66		
		N=81	BJ				Very dense fine light brown sand

Contd/..

Notes: Waiting for "special" tractor 30 hours

Morning water level 0.25 and 10.05 m above ground level on 31.8.78 and 1.9.78 respectively.

Appendix 5 – Soakaway Testing Results


SHF.1132.258 Halterworth Lane, Romsey
Exploratory Hole Location Plan
N
Legend
Location of Boreholes
Location of Soakaway Tests
TP1
BH1
TP2
TP5
TP8
TP6
BH3
TP7
TP3
BH2
TP4
TP9
SITE BOUNDARY
SITE AREA: 12.7ha
High Firs Rd
Kennett Rd
Wason Rd
Halterworth Ln
HALTERWORTH
Halterworth Community Primary School
Botley Rd

Enzygo Ltd
Tel: 01454 269237
Fax: 01454 269760
Web: www.enzygo.com

Site: Halterworth Lane, Romsey

BH1

Job No	Dates	Ground Level (m)	Co-Ordinates
SHF.1132.258	Start 30-10-23 Finish 30-10-23		

Client: Gladman Develpoments

Sheet: 1 of 1

Well	Water Levels	Samples & In Situ Testing: Depth (m)	No/Type	Results	Depth (m)	Level (mAD)	Legend	Stratum Description
					0.40			Grass over brown slightly silty slightly sandy slightly gravelly TOPSOIL. Gravel is angular to subangular fine to medium of sandstone and flint. Sand is fine to coarse.
					1.60			Brown slightly clayey very sandy angular to subangular fine to coarse GRAVEL of flint and sandstone. Sand is fine to coarse. [River Terrace Deposits]
	▽	3.00	SPT	N=14				Stiff yellow slightly silty sandy CLAY. Sand is fine to coarse. [Head]
					5.70			
		6.00	SPT	N=18	6.00			Medium dense dark bluish grey silty very clayey fine to coarse SAND. [Earnley Sand Formation]
								Dense grey silty very cleyey fine to coarse SAND. [Earnley Sand Formation]
		9.00	SPT	N=35				
	▽	12.00	SPT	N=29	12.00			Borehole completed at 12.00m.
					{12.50}			

0 1 2 3 4 5 6 7 8 9 10 11 12

General Remarks

1. Hand excavated inspection pit from ground level to 1.00m begl.
2. Densities and soil consistencies are based on insitu tests.
3. No visual or olfactory evidence of contamination observed.
4. Groundwater was encoutered.
5. SPT - Standard Penetration Test; N - Number of blows.
6. Install details: 50mm plain pipe concrete raised cover from 0.00m begl to 2.00m begl; Bentonite seal between 0.20m begl to 2.00m begl; 50mm slotted pipe with gravel between 2.00m begl to 10.00m begl.

Groundwater

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)
	3.00 12.00		

All dimensions in metres
Scale 1:78.125

Logged By: RF

Enzygo Ltd
Tel: 01454 269237
Fax: 01454 269760
Web: www.enzygo.com

Site: Halterworth Lane, Romsey

BH2

Job No	Dates	Ground Level (m)	Co-Ordinates
SHF.1132.258	Start 31-10-23 Finish 01-11-23		

Client: Gladman Develpoments

Sheet: 1 of 1

Well	Water Levels	Samples & In Situ Testing: Depth (m)	No/Type	Results	Depth (m)	Level (mAD)	Legend	Stratum Description
					0.20			Grass over brown slightly silty slightly sandy slightly gravelly TOPSOIL. Gravel is angular to subangular fine to medium of sandstone and flint. Sand is fine to coarse.
								Brown slightly clayey very sandy angular to subangular fine to coarse GRAVEL of flint and sandstone. Sand is fine to coarse. [River Terrace Deposits]
		3.00	SPT	N=19	3.00			
					3.60			Stiff yellow slightly silty sandy CLAY. Sand is fine to coarse. [Head]
	▽							Medium dense dark bluish grey silty very clayey fine to coarse SAND. [Earnley Sand Formation]
					5.00			Dense grey silty very cleyey fine to coarse SAND. [Earnley Sand Formation]
		6.00	SPT	N=31				
	▽	9.00	SPT	N=33				
		10.50	SPT	N=42	10.50			Borehole completed at 10.50m.
					{12.50}			

0 1 2 3 4 5 6 7 8 9 10 11 12

General Remarks

1. Hand excavated inspection pit from ground level to 1.00m begl.
2. D - Disturbed Sample; ES - Environmental Sample; B - Bulk Sample.
3. Densities and soil consistencies are based on insitu tests.
4. No visual or olfactory evidence of contamination observed.
5. Groundwater was not encoutered.
6. SPT - Standard Penetration Test; N - Number of blows.
7. Backfilled with arisings

Groundwater

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)
	4.00 9.00	4.20	

All dimensions in metres
Scale 1:78.125

Logged By: RF

Enzygo Ltd
Tel: 01454 269237
Fax: 01454 269760
Web: www.enzygo.com

Site: Halterworth Lane, Romsey

BH3

Job No	Dates	Ground Level (m)	Co-Ordinates
SHF.1132.258	Start 30-10-23 Finish 31-10-23		

Client: Gladman Develpoments

Sheet: 1 of 1

Well	Water Levels	Samples & In Situ Testing: Depth (m)	No/Type	Results	Depth (m)	Level (mAD)	Legend	Stratum Description
					0.30			Grass over brown slightly silty slightly sandy slightly gravelly TOPSOIL. Gravel is angular to subangular fine to medium of sandstone and flint. Sand is fine to coarse.
								Brown slightly clayey very sandy angular to subangular fine to coarse GRAVEL of flint and sandstone. Sand is fine to coarse. [River Terrace Deposits]
		3.00	SPT	N=19				
	▽				3.40			Stiff yellow slightly silty sandy CLAY. Sand is fine to coarse. [Head]
					4.70			Medium dense dark bluish grey silty very clayey fine to coarse SAND. [Earnley Sand Formation]
		6.00	SPT	N=19	6.20			Dense grey silty very clayey fine to coarse SAND. [Earnley Sand Formation]
	▽	9.00	SPT	N=31				
		12.00	SPT	N=34	12.00			Borehole completed at 12.00m.
					{12.50}			

0 1 2 3 4 5 6 7 8 9 10 11 12

General Remarks

1. Hand excavated inspection pit from ground level to 1.00m begl.
2. D - Disturbed Sample; ES - Environmental Sample; B - Bulk Sample.
3. Densities and soil consistencies are based on insitu tests.
4. No visual or olfactory evidence of contamination observed.
5. Groundwater was not encoutered.
6. SPT - Standard Penetration Test; N - Number of blows.
7. Install details: 50mm plain pipe concrete flush cover from 0.00m begl to 1.00m begl; Bentonite seal between 0.20m begl to 1.00m begl; 50mm slotted pipe with gravel between 1.00m begl to 3.00m begl.

Groundwater

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)
	4.00 9.20	4.00	

All dimensions in metres
Scale 1:78.125

Logged By: RF

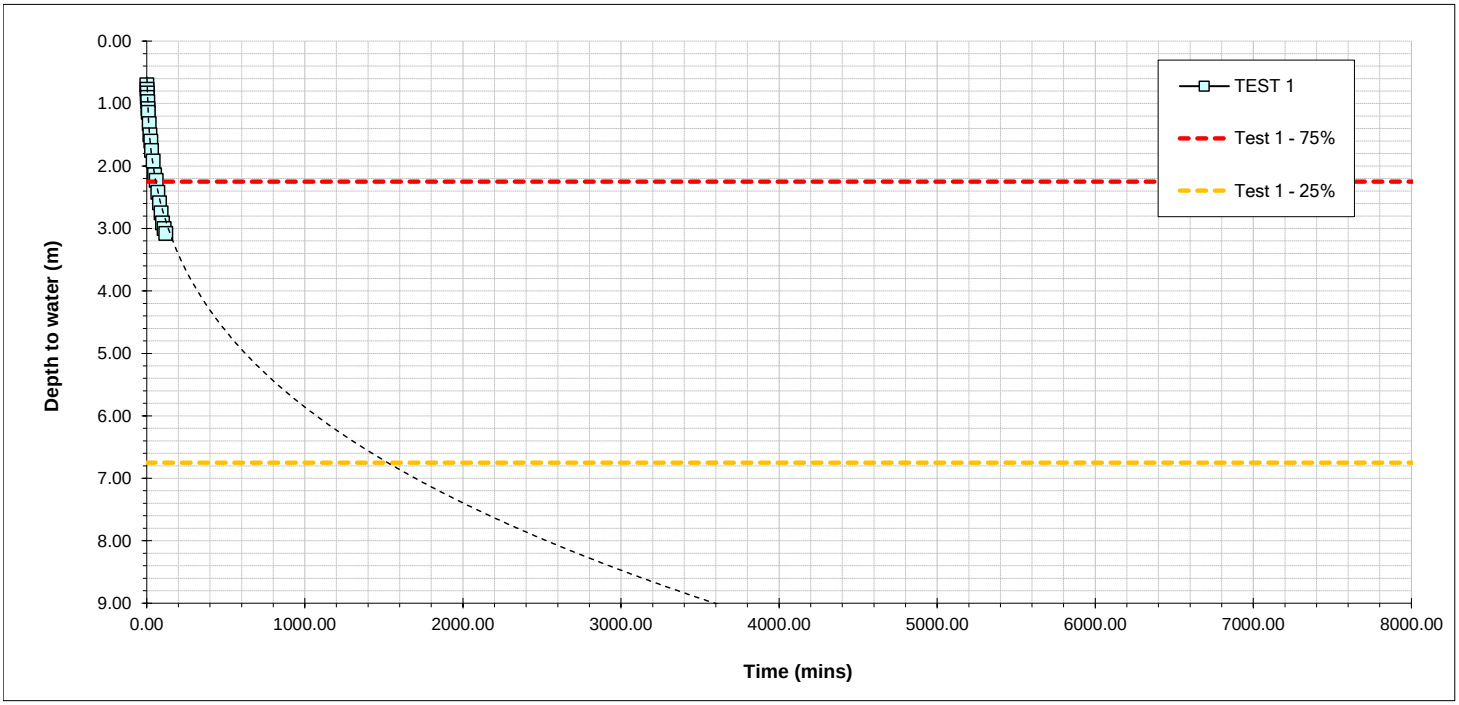
Site.....	Halterworth Lane, Romsey		Soakaway Number.....	BH3	
Job Number.....	SHF.1132.258		Diameter	0.15	m
Date of Test.....	31/10/2023		Casing Depth	4.00	m
			Borehole Depth.....	9.00	m
BOREHOLE SOIL INFILTRATION RATE TEST			Groundwater Level.....	Dry	m
See B.R.E. Digest 365, 1991, Soakaway Design.					

Remarks -
Please refer to BH3 log for ground conditions. Data has been extrapolated due to time constraints.

TEST 1		TEST 2		TEST 3	
Time(min)	Depth to Water (m)	Time(min)	Depth to Water (m)	Time(min)	Depth to Water (m)
0.0	0.00				
1.0	0.70				
2.0	0.77				
3.0	0.83				
4.0	0.90				
10.0	1.14				
15.0	1.32				
20.0	1.50				
25.0	1.60				
30.0	1.75				
40.0	1.92				
60.0	2.23				
80.0	2.59				
90.0	2.75				
100.0	2.91				
120.0	3.08				
1500.0	6.75				

Effective Storage Depth	m	9.00		
75% Effective Storage Depth	m	6.75		
(i.e. depth below GL)	m	**2.25**		
25% Effective Storage Depth	m	2.25		
(i.e. depth below GL)	m	**6.75**		
Effective Storage Depth 75%-25%	m	4.50		
Time to fall to 75% effective depth	mins	60.00		
Time to fall to 25% effective depth	mins	1500.00		
V (75%-25%)	m3	0.08		
a	m2	2.37		
t (75%-25%)	mins	1440.00		
SOIL INFILTRATION RATE	m/s	**3.88E-07**		

DESIGN SOIL INFILTRATION RATE, f	**3.88E-07**	**m/s**



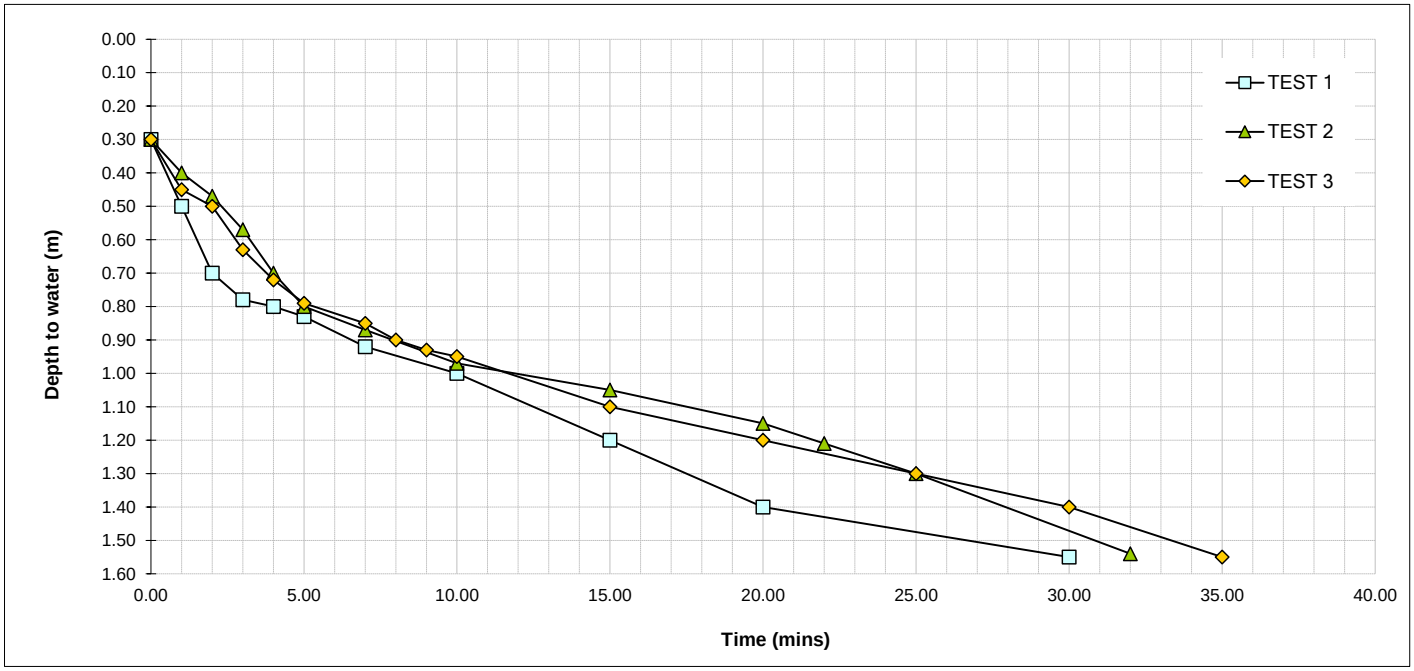
enzygo	Site.....	Halterworth Lane	Trial Pit Number.....	TP1	
	Job Number.....	SHF.1132.258	Length.....	3.00	m
	Date of Test.....	30/10/2023	Width.....	0.60	m
			Depth.....	1.60	m
	SOIL INFILTRATION RATE TEST		Groundwater Level.....	Dry	m
	See B.R.E. Digest 365, 1991, Soakaway Design.				

Remarks -
Please refer to the exploratory hole log TP1.
Slight Seepage of perched GW at 1.50m begl.

TEST 1		TEST 2		TEST 3	
Time(min)	Depth to Water (m)	Time(min)	Depth to Water (m)	Time(min)	Depth to Water (m)
0.00	0.30	0.00	0.30	0.00	0.30
1.00	0.50	1.00	0.40	1.00	0.45
2.00	0.70	2.00	0.47	2.00	0.50
3.00	0.78	3.00	0.57	3.00	0.63
4.00	0.80	4.00	0.70	4.00	0.72
5.00	0.83	5.00	0.80	5.00	0.79
7.00		7.00	0.87	7.00	0.85
10.00	1.00	10.00	0.97	8.00	0.90
15.00	1.20	15.00	1.05	9.00	0.93
20.00	1.40	20.00	1.15	10.00	0.95
30.00	1.55	22.00	1.21	15.00	1.10
		25.00	1.30	20.00	1.20
		32.00	1.54	25.00	1.30
				30.00	1.40
				35.00	1.55

Effective Storage Depth	m	1.30	1.30	1.30
75% Effective Storage Depth	m	0.98	0.98	0.98
(i.e. depth below GL)	m	**0.63**	**0.63**	**0.63**
25% Effective Storage Depth	m	0.33	0.33	0.33
(i.e. depth below GL)	m	**1.28**	**1.28**	**1.28**
Effective Storage Depth 75%-25%	m	0.65	0.65	0.65
Time to fall to 75% effective depth	mins	2.00	4.00	3.00
Time to fall to 25% effective depth	mins	20.00	25.00	25.00
V (75%-25%)	m3	1.17	1.17	1.17
a (50%)	m2	6.48	6.48	6.48
t (75%-25%)	mins	18.00	21.00	22.00
SOIL INFILTRATION RATE	m/s	**1.67E-04**	**1.43E-04**	**1.37E-04**

DESIGN SOIL INFILTRATION RATE, f	**1.37E-04**	**m/s**

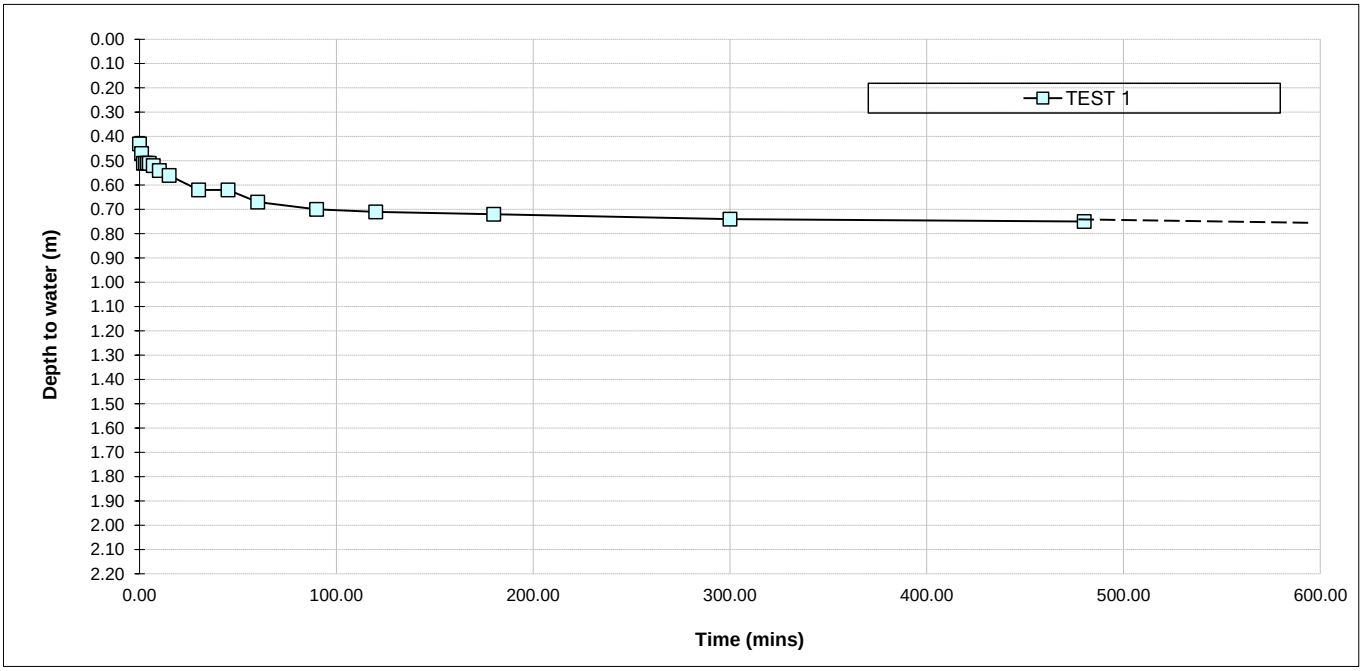


Site..... Halterworth Lane Job Number..... SHF.1132.258 Date of Test..... 30/10/2023		Trial Pit Number..... TP2 Length..... 2.10 m Width..... 0.60 m Depth..... 1.50 m	
SOIL INFILTRATION RATE TEST See B.R.E. Digest 365, 1991, Soakaway Design.		Groundwater Level..... 1.2 m	

Remarks -	TEST 1		
Please refer to the exploratory hole log TP2. SA was not undertaken do to pit instability and large water strike rising to 1.20m begl.	Time(min)	Depth to Water (m)	
	0.00		
	1.00		
	2.00		
	3.00		
	4.00		
	5.00		
	7.00		
	10.00		
	15.00		
	30.00		
	45.00		
	60.00		
	90.00		
	120.00		
	180.00		
	300.00		
	480.00		

Effective Storage Depth	m	1.50		
75% Effective Storage Depth	m	1.13		
(i.e. depth below GL)	m	**0.38**		
25% Effective Storage Depth	m	0.38		
(i.e. depth below GL)	m	**1.13**		
Effective Storage Depth 75%-25%	m	0.75		
Time to fall to 75% effective depth	mins	N/A		
Time to fall to 25% effective depth	mins	N/A		
V (75%-25%)	m3	0.95		
a (50%)	m2	5.31		
t (75%-25%)	mins	N/A		
SOIL INFILTRATION RATE	m/s	**Insufficent Uptake**		

DESIGN SOIL INFILTRATION RATE, f	**Insufficent Uptake**	**m/s**



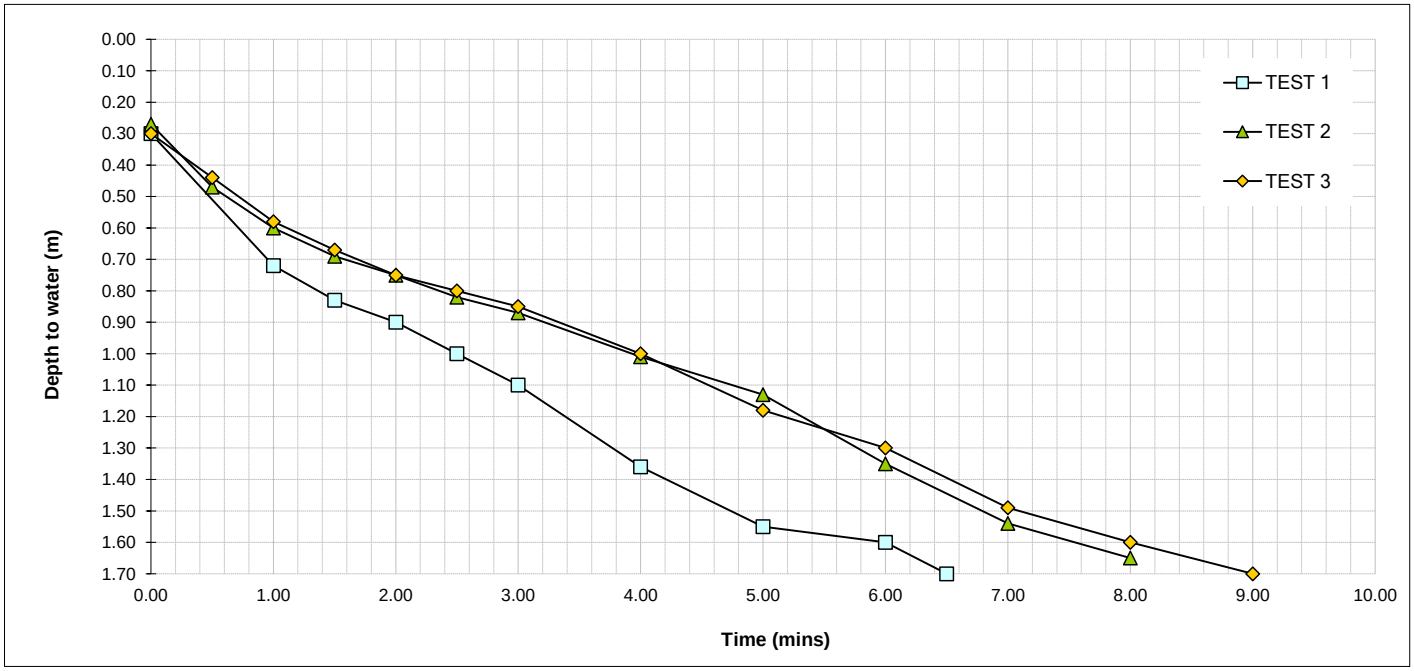
enzygo	Site.....	Halterworth Lane	Trial Pit Number.....	TP3	
	Job Number.....	SHF.1132.258	Length.....	2.00	m
	Date of Test.....	30/10/2023	Width.....	0.60	m
			Depth.....	1.70	m
	SOIL INFILTRATION RATE TEST		Groundwater Level.....	Dry	m
	See B.R.E. Digest 365, 1991, Soakaway Design.				

Remarks -
Please refer to the exploratory hole log TP3.

TEST 1		TEST 2		TEST 3	
Time(min)	Depth to Water (m)	Time(min)	Depth to Water (m)	Time(min)	Depth to Water (m)
0.00	0.30	0.00	0.27	0.00	0.30
1.00	0.72	0.50	0.47	0.50	0.44
1.50	0.83	1.00	0.60	1.00	0.58
2.00	0.90	1.50	0.69	1.50	0.67
2.50	1.00	2.00	0.75	2.00	0.75
3.00	1.10	2.50	0.82	2.50	0.80
4.00	1.36	3.00	0.87	3.00	0.85
5.00	1.55	4.00	1.01	4.00	1.00
6.00	1.60	5.00	1.13	5.00	1.18
6.50	1.70	6.00	1.35	6.00	1.30
		7.00	1.54	7.00	1.49
		8.00	1.65	8.00	1.60
		0.00	0.00	9.00	1.70
				0.00	0.00
				0.00	0.00

Effective Storage Depth	m	1.40	1.43	1.40
75% Effective Storage Depth	m	1.05	1.07	1.05
(i.e. depth below GL)	m	**0.65**	**0.63**	**0.65**
25% Effective Storage Depth	m	0.35	0.36	0.35
(i.e. depth below GL)	m	**1.35**	**1.34**	**1.35**
Effective Storage Depth 75%-25%	m	0.70	0.72	0.70
Time to fall to 75% effective depth	mins	1.00	1.50	1.50
Time to fall to 25% effective depth	mins	4.00	6.00	6.50
V (75%-25%)	m3	0.84	0.86	0.84
a (50%)	m2	4.84	4.92	4.84
t (75%-25%)	mins	3.00	4.50	5.00
SOIL INFILTRATION RATE	m/s	**9.64E-04**	**6.46E-04**	**5.79E-04**

DESIGN SOIL INFILTRATION RATE, f	**5.79E-04**	**m/s**



Site.....	Halterworth Lane	
Job Number.....	SHF.1132.258	
Date of Test.....	30/10/2023	
Trial Pit Number.....	TP4	
Length.....	2.10	m
Width.....	0.60	m
Depth.....	1.60	m
Groundwater Level.....	Dry	m

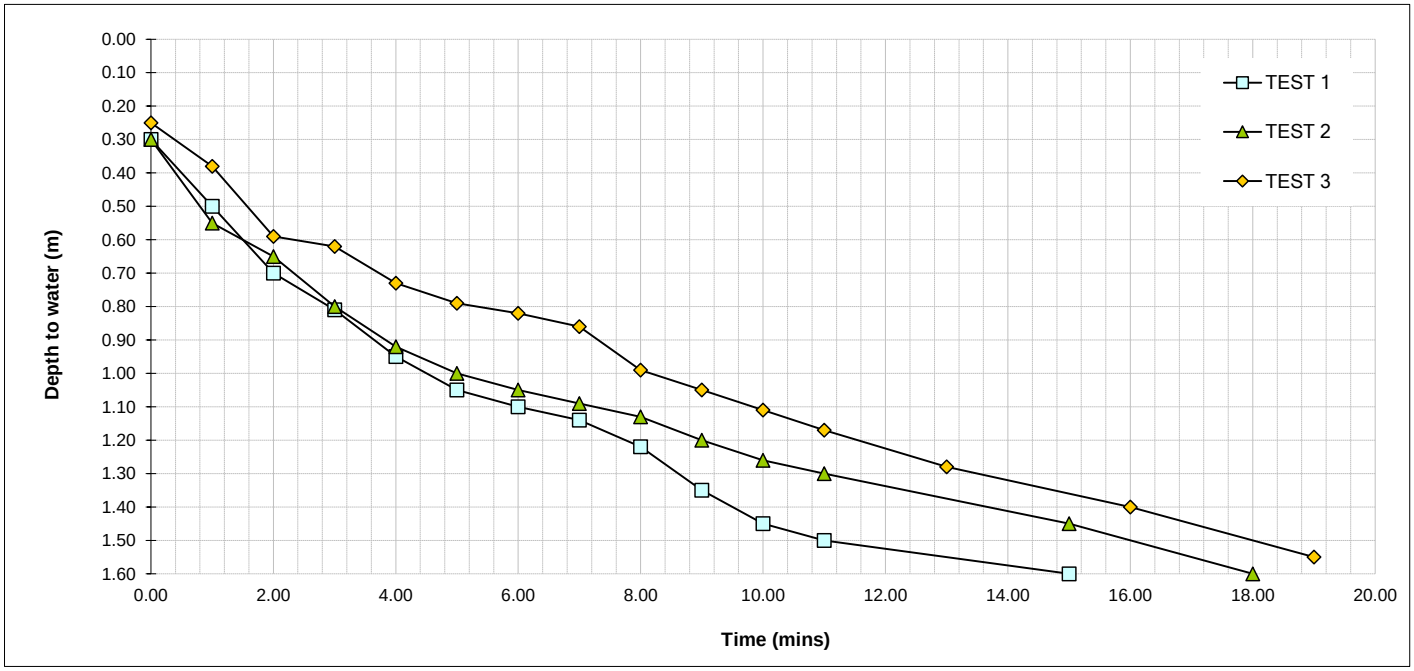
SOIL INFILTRATION RATE TEST
See B.R.E. Digest 365, 1991, Soakaway Design.

Remarks -
Please refer to the exploratory hole log TP4.

TEST 1		TEST 2		TEST 3	
Time(min)	Depth to Water (m)	Time(min)	Depth to Water (m)	Time(min)	Depth to Water (m)
0.00	0.30	0.00	0.30	0.00	0.25
1.00	0.50	1.00	0.55	1.00	0.38
2.00	0.70	2.00	0.65	2.00	0.59
3.00	0.81	3.00	0.80	3.00	0.62
4.00	0.95	4.00	0.92	4.00	0.73
5.00	1.05	5.00	1.00	5.00	0.79
6.00	1.10	6.00	1.05	6.00	0.82
7.00	1.14	7.00	1.09	7.00	0.86
8.00	1.22	8.00	1.13	8.00	0.99
9.00	1.35	9.00	1.20	9.00	1.05
10.00	1.45	10.00	1.26	10.00	1.11
11.00	1.50	11.00	1.30	11.00	1.17
15.00	1.60	15.00	1.45	13.00	1.28
		18.00	1.60	16.00	1.40
				19.00	1.55

		TEST 1	TEST 2	TEST 3
Effective Storage Depth	m	1.30	1.30	1.35
75% Effective Storage Depth	m	0.98	0.98	1.01
(i.e. depth below GL)	m	**0.63**	**0.63**	**0.59**
25% Effective Storage Depth	m	0.33	0.33	0.34
(i.e. depth below GL)	m	**1.28**	**1.28**	**1.26**
Effective Storage Depth 75%-25%	m	0.65	0.65	0.68
Time to fall to 75% effective depth	mins	2.00	2.00	2.00
Time to fall to 25% effective depth	mins	9.00	10.00	13.00
V (75%-25%)	m3	0.82	0.82	0.85
a (50%)	m2	4.77	4.77	4.91
t (75%-25%)	mins	7.00	8.00	11.00
SOIL INFILTRATION RATE	m/s	**4.09E-04**	**3.58E-04**	**2.63E-04**

DESIGN SOIL INFILTRATION RATE, f **2.63E-04** **m/s**



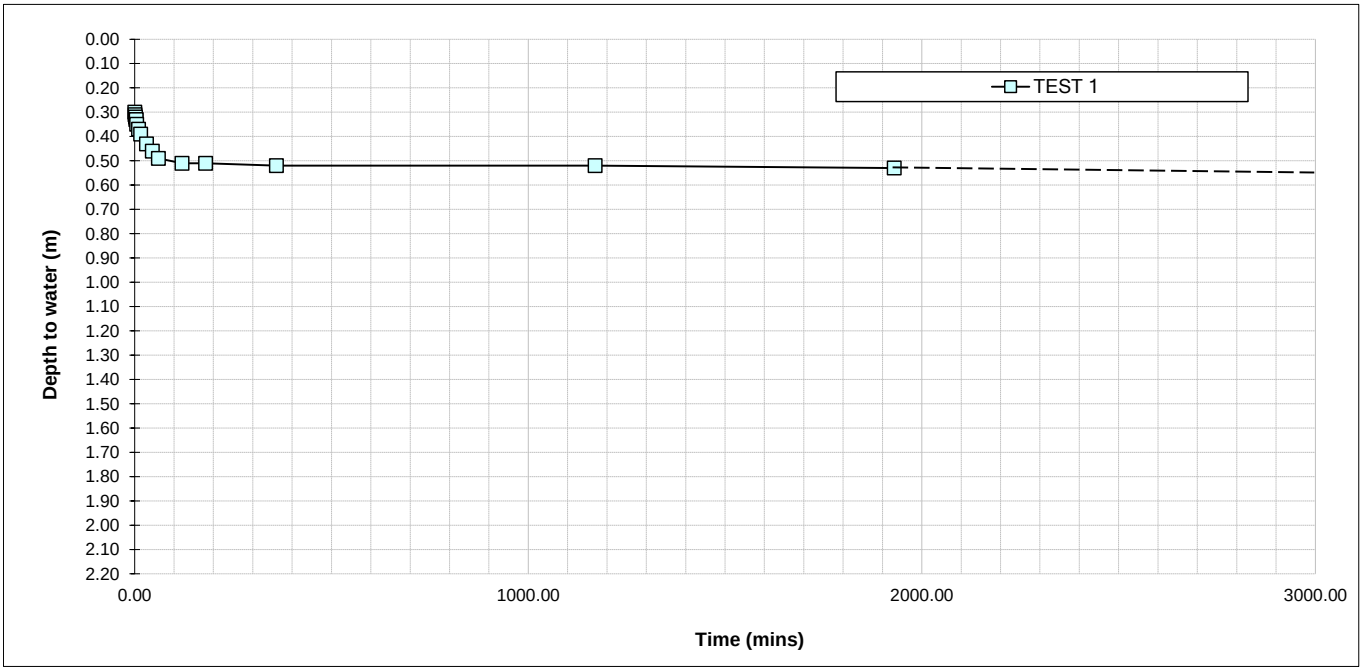
Site.....	Halterworth Lane	Trial Pit Number.....	TP5
Job Number.....	SHF.1132.258	Length.....	2.10 m
Date of Test.....	30/10/2023	Width.....	0.60 m
		Depth.....	1.70 m
SOIL INFILTRATION RATE TEST		Groundwater Level.....	Dry m
See B.R.E. Digest 365, 1991, Soakaway Design.			

Remarks -
Please refer to the exploratory hole log TP5.
Data extrapolated due to insufficient uptake.

TEST 1	
Time(min)	Depth to Water (m)
0.00	0.30
1.00	0.31
2.00	0.32
3.00	0.33
4.00	0.33
5.00	0.35
10.00	0.37
15.00	0.39
30.00	0.43
45.00	0.46
60.00	0.49
120.00	0.51
180.00	0.51
1170.00	0.52
1930.00	0.53

Effective Storage Depth	m	1.40
75% Effective Storage Depth	m	1.05
(i.e. depth below GL)	m	**0.65**
25% Effective Storage Depth	m	0.35
(i.e. depth below GL)	m	**1.35**
Effective Storage Depth 75%-25%	m	0.70
Time to fall to 75% effective depth	mins	N/A
Time to fall to 25% effective depth	mins	N/A
V (75%-25%)	m3	0.88
a (50%)	m2	5.04
t (75%-25%)	mins	N/A
SOIL INFILTRATION RATE	m/s	**Insufficent Uptake**

DESIGN SOIL INFILTRATION RATE, f **Insufficent Uptake** **m/s**

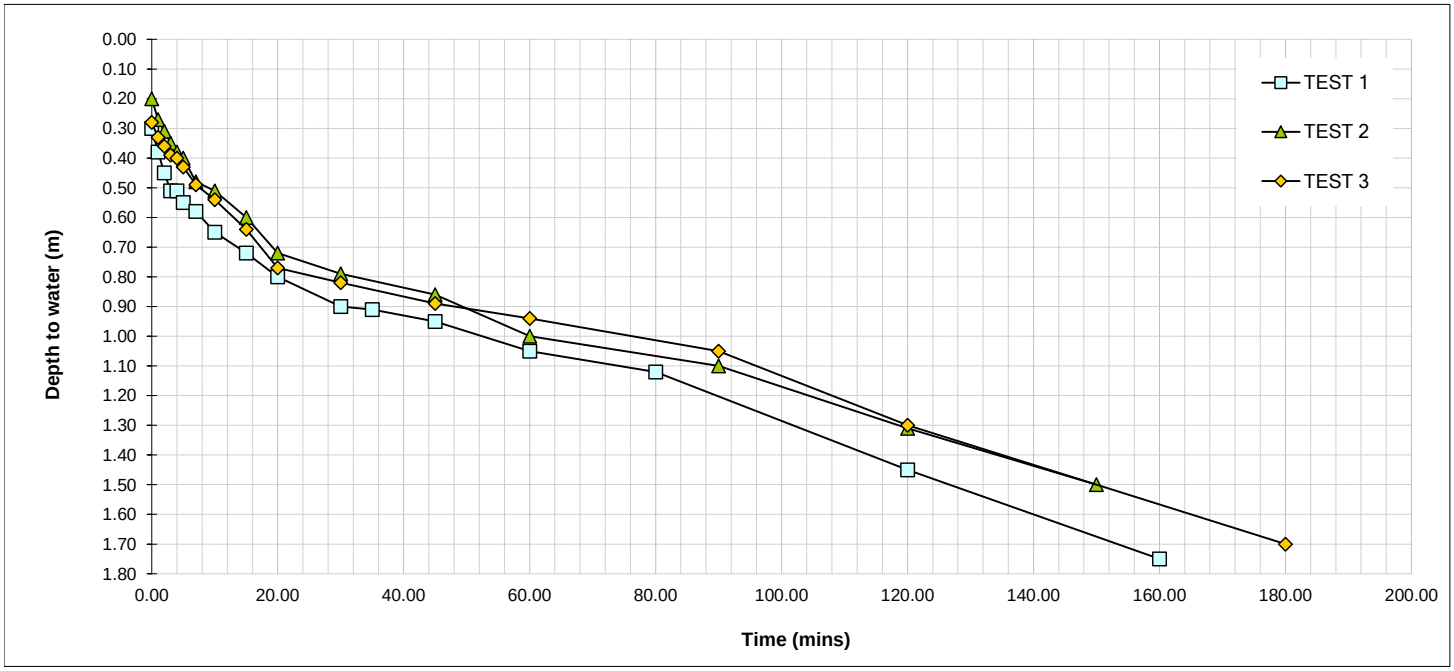


Site.....	Halterworth Lane		Trial Pit Number.....	TP6	
Job Number.....	SHF.1132.258		Length.....	2.10	m
Date of Test.....	30/10/2023		Width.....	0.60	m
			Depth.....	1.80	m
SOIL INFILTRATION RATE TEST			Groundwater Level.....	Dry	m
See B.R.E. Digest 365, 1991, Soakaway Design.					

Remarks -
Please refer to the exploratory hole log TP6.
Slight Seepage of perched GW at 1.50m begl.

		TEST 1		TEST 2		TEST 3	
		Time(min)	Depth to Water (m)	Time(min)	Depth to Water (m)	Time(min)	Depth to Water (m)
		0.00	0.30	0.00	0.20	0.00	0.28
		1.00	0.38	1.00	0.27	1.00	0.33
		2.00	0.45	2.00	0.31	2.00	0.36
		3.00	0.51	3.00	0.35	3.00	0.39
		4.00	0.51	4.00	0.38	4.00	0.40
		5.00	0.55	5.00	0.40	5.00	0.43
		7.00	0.58	7.00	0.48	7.00	0.49
		10.00	0.69	10.00	0.51	10.00	0.54
		15.00	0.72	15.00	0.60	15.00	0.64
		20.00	0.80	20.00	0.72	20.00	0.77
		30.00	0.90	30.00	0.79	30.00	0.82
		35.00	0.91	45.00	0.86	45.00	0.89
		45.00	0.95	60.00	1.00	60.00	0.94
		60.00	1.05	90.00	1.10	90.00	1.05
		80.00	1.12	120.00	1.31	120.00	1.30
		120.00	1.45	150.00	1.50		
		160.00	1.75				
Effective Storage Depth	m		1.50		1.60		1.52
75% Effective Storage Depth	m		1.13		1.20		1.14
(i.e. depth below GL)	m		**0.68**		**0.60**		**0.66**
25% Effective Storage Depth	m		0.38		0.40		0.38
(i.e. depth below GL)	m		**1.43**		**1.40**		**1.42**
Effective Storage Depth 75%-25%	m		0.75		0.80		0.76
Time to fall to 75% effective depth	mins		10.00		15.00		15.00
Time to fall to 25% effective depth	mins		120.00		150.00		180.00
V (75%-25%)	m3		0.95		1.01		0.96
a (50%)	m2		5.31		5.58		5.36
t (75%-25%)	mins		110.00		135.00		165.00
SOIL INFILTRATION RATE	m/s		**2.70E-05**		**2.23E-05**		**1.80E-05**

DESIGN SOIL INFILTRATION RATE, f	**1.80E-05**	**m/s**



Site.....	Halterworth Lane	
Job Number.....	SHF.1132.258	
Date of Test.....	30/10/2023	
Trial Pit Number.....	TP7	
Length.....	2.20	m
Width.....	0.60	m
Depth.....	1.60	m
Groundwater Level.....	Dry	m

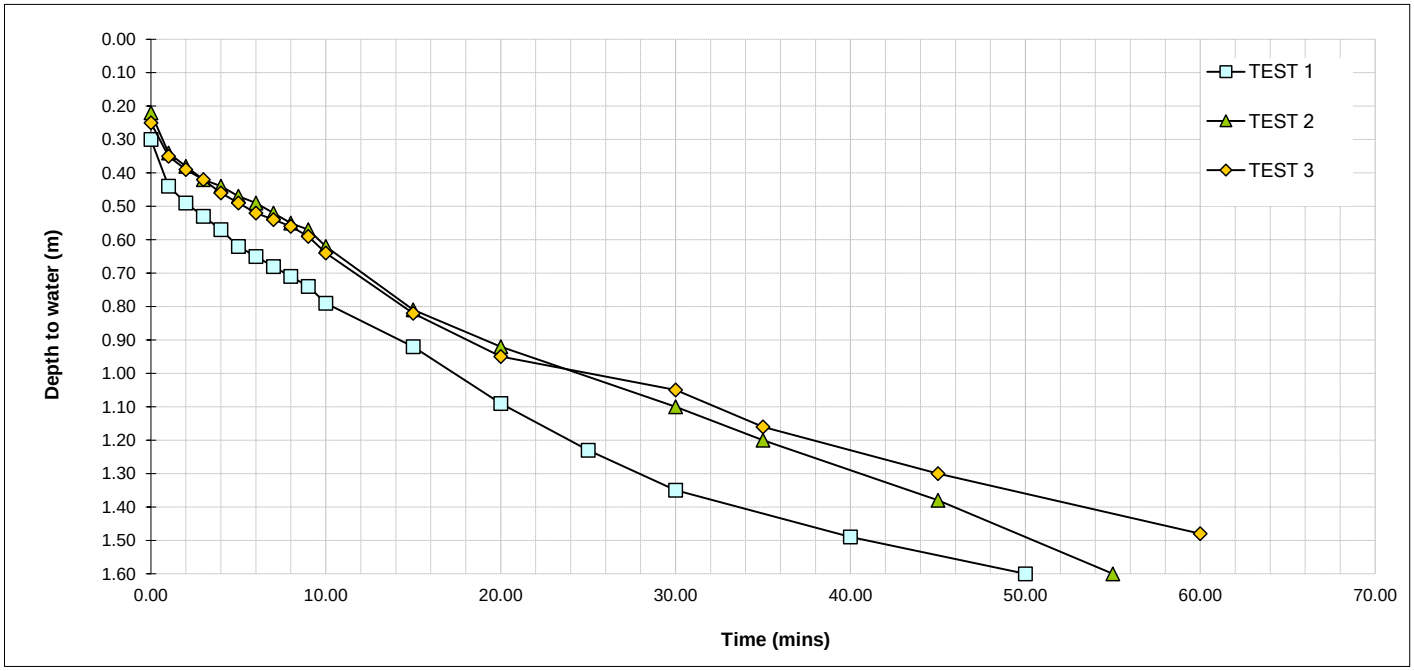
SOIL INFILTRATION RATE TEST
See B.R.E. Digest 365, 1991, Soakaway Design.

Remarks -
Please refer to the exploratory hole log TP7.
Slight Seepage of perched GW at 1.60m begl.

TEST 1		TEST 2		TEST 3	
Time(min)	Depth to Water (m)	Time(min)	Depth to Water (m)	Time(min)	Depth to Water (m)
0.00	0.30	0.00	0.22	0.00	0.25
1.00	0.44	1.00	0.34	1.00	0.35
2.00	0.49	2.00	0.38	2.00	0.39
3.00	0.53	3.00	0.42	3.00	0.42
4.00	0.57	4.00	0.44	4.00	0.46
5.00	0.62	5.00	0.47	5.00	0.49
6.00	0.65	6.00	0.49	6.00	0.52
7.00	0.68	7.00	0.52	7.00	0.54
8.00	0.71	8.00	0.55	8.00	0.56
9.00	0.74	9.00	0.57	9.00	0.59
10.00	0.79	10.00	0.62	10.00	0.64
15.00	0.92	15.00	0.81	15.00	0.82
20.00	1.09	20.00	0.92	20.00	0.95
25.00	1.23	30.00	1.10	30.00	1.05
30.00	1.35	35.00	1.20	35.00	1.16
40.00	1.49	45.00	1.38	45.00	1.30
50.00	1.60	55.00	1.60	60.00	1.48

Effective Storage Depth	m	1.30	1.38	1.35
75% Effective Storage Depth	m	0.98	1.04	1.01
(i.e. depth below GL)	m	**0.63**	**0.57**	**0.59**
25% Effective Storage Depth	m	0.33	0.35	0.34
(i.e. depth below GL)	m	**1.28**	**1.26**	**1.26**
Effective Storage Depth 75%-25%	m	0.65	0.69	0.68
Time to fall to 75% effective depth	mins	6.00	9.00	9.00
Time to fall to 25% effective depth	mins	25.00	35.00	38.00
V (75%-25%)	m3	0.86	0.91	0.89
a (50%)	m2	4.96	5.18	5.10
t (75%-25%)	mins	19.00	26.00	29.00
SOIL INFILTRATION RATE	m/s	**1.52E-04**	**1.13E-04**	**1.00E-04**

DESIGN SOIL INFILTRATION RATE, f	**1.00E-04**	**m/s**

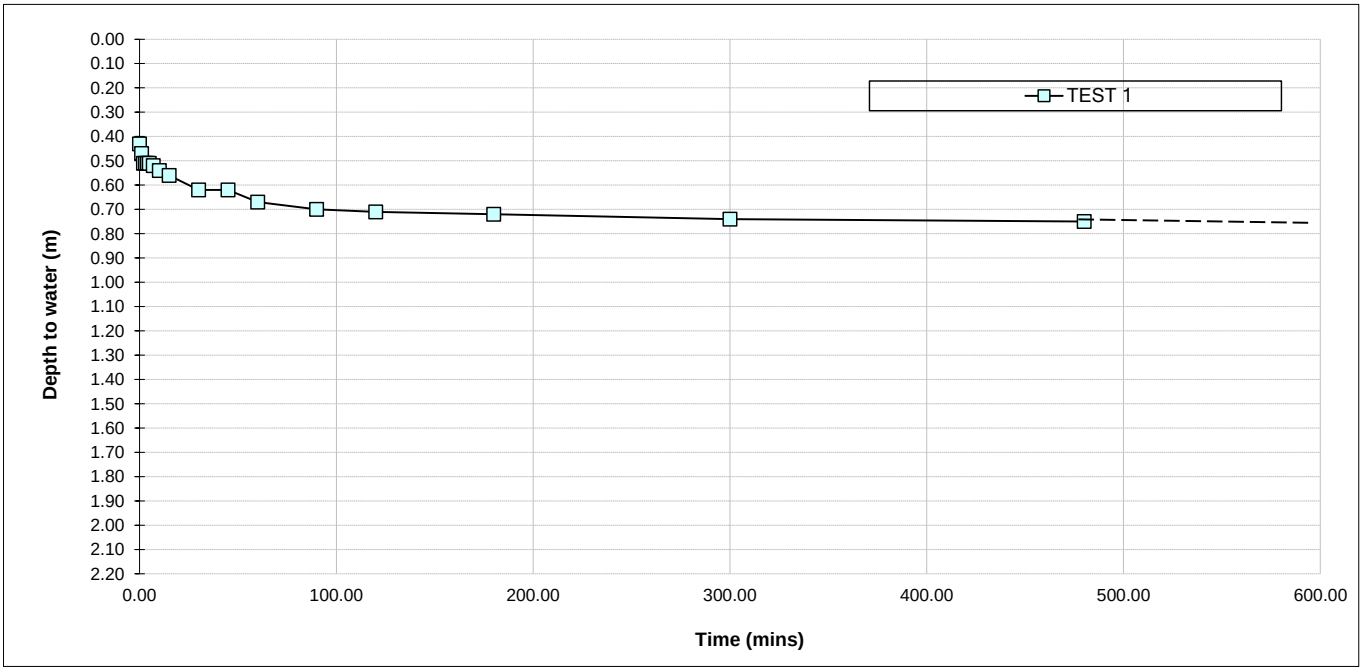


Site..... Halterworth Lane Job Number..... SHF.1132.258 Date of Test..... 30/10/2023		Trial Pit Number..... TP8 Length..... 2.80 m Width..... 0.60 m Depth..... 1.80 m	
SOIL INFILTRATION RATE TEST See B.R.E. Digest 365, 1991, Soakaway Design.		Groundwater Level..... Dry m	

Remarks -	TEST 1		
Please refer to the exploratory hole log TP8. Data extrapolated due to insufficient uptake.	Time(min)	Depth to Water (m)	
	0.00	0.43	
	1.00	0.47	
	2.00	0.51	
	3.00	0.51	
	4.00	0.51	
	5.00	0.51	
	7.00	0.52	
	10.00	0.54	
	15.00	0.56	
	30.00	0.62	
	45.00	0.62	
	60.00	0.67	
	90.00	0.70	
	120.00	0.71	
	180.00	0.72	
	300.00	0.74	
	480.00	0.75	

Effective Storage Depth	m	1.37		
75% Effective Storage Depth	m	1.03		
(i.e. depth below GL)	m	**0.77**		
25% Effective Storage Depth	m	0.34		
(i.e. depth below GL)	m	**1.46**		
Effective Storage Depth 75%-25%	m	0.69		
Time to fall to 75% effective depth	mins	N/A		
Time to fall to 25% effective depth	mins	N/A		
V (75%-25%)	m3	1.15		
a (50%)	m2	6.34		
t (75%-25%)	mins	N/A		
SOIL INFILTRATION RATE	m/s	**Insufficent Uptake**		

DESIGN SOIL INFILTRATION RATE, f	**Insufficent Uptake**	**m/s**



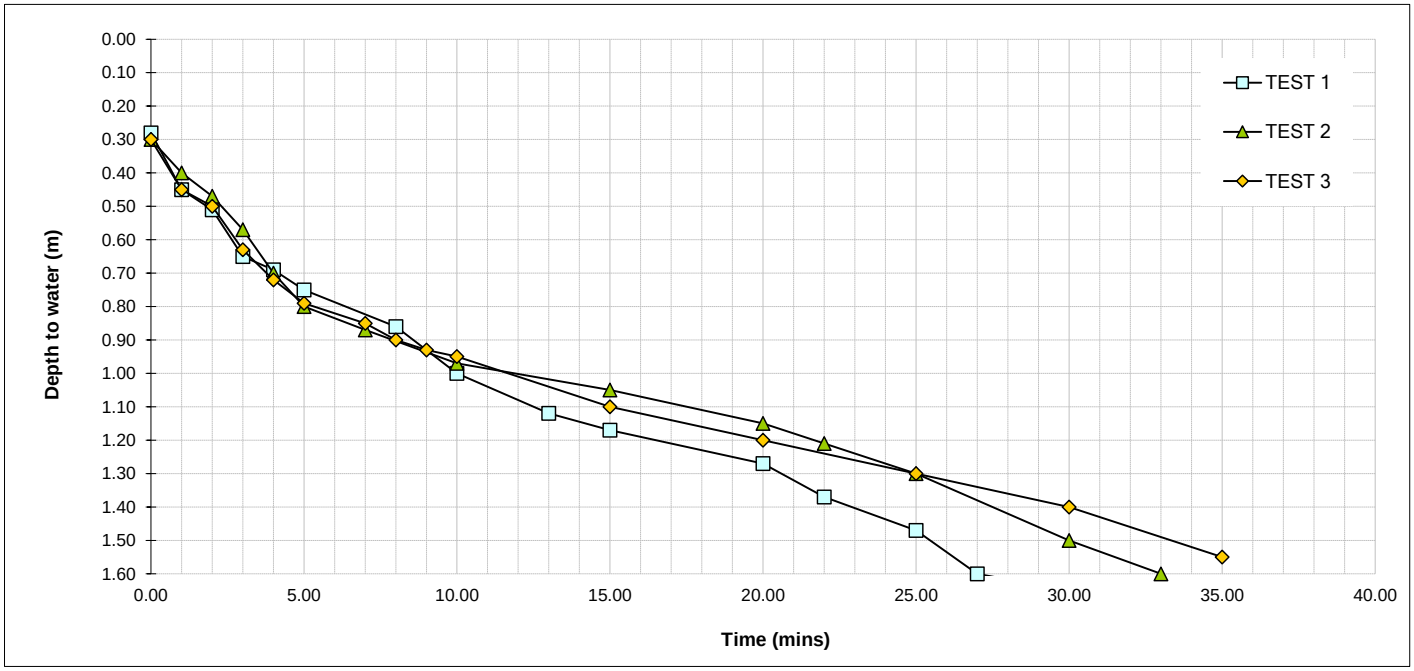
enzygo	Site.....	Halterworth Lane	Trial Pit Number.....	TP9	
	Job Number.....	SHF.1132.258	Length.....	3.00	m
	Date of Test.....	30/10/2023	Width.....	0.60	m
			Depth.....	1.60	m
	SOIL INFILTRATION RATE TEST		Groundwater Level.....	Dry	m
	See B.R.E. Digest 365, 1991, Soakaway Design.				

Remarks -
Please refer to the exploratory hole log TP9.
Slight Seepage of perched GW at 1.30m begl.

TEST 1		TEST 2		TEST 3	
Time(min)	Depth to Water (m)	Time(min)	Depth to Water (m)	Time(min)	Depth to Water (m)
0.00	0.28	0.00	0.30	0.00	0.30
1.00	0.45	1.00	0.40	1.00	0.45
2.00	0.51	2.00	0.47	2.00	0.50
3.00	0.65	3.00	0.57	3.00	0.63
4.00	0.69	4.00	0.70	4.00	0.72
5.00	0.75	5.00	0.80	5.00	0.79
8.00	0.86	7.00	0.87	7.00	0.85
10.00	1.00	10.00	0.97	8.00	0.90
13.00	1.12	15.00	1.05	9.00	0.93
15.00	1.17	20.00	1.15	10.00	0.95
20.00	1.27	22.00	1.21	15.00	1.10
22.00	1.37	25.00	1.30	20.00	1.20
25.00	1.47	30.00	1.50	25.00	1.30
27.00	1.60	33.00	1.60	30.00	1.40
				35.00	1.55

Effective Storage Depth	m	1.32	1.30	1.30
75% Effective Storage Depth	m	0.99	0.98	0.98
(i.e. depth below GL)	m	**0.61**	**0.63**	**0.63**
25% Effective Storage Depth	m	0.33	0.33	0.33
(i.e. depth below GL)	m	**1.27**	**1.28**	**1.28**
Effective Storage Depth 75%-25%	m	0.66	0.65	0.65
Time to fall to 75% effective depth	mins	3.00	4.00	3.00
Time to fall to 25% effective depth	mins	20.00	25.00	25.00
V (75%-25%)	m3	1.19	1.17	1.17
a (50%)	m2	6.55	6.48	6.48
t (75%-25%)	mins	17.00	21.00	22.00
SOIL INFILTRATION RATE	m/s	**1.78E-04**	**1.43E-04**	**1.37E-04**

DESIGN SOIL INFILTRATION RATE, f	**1.37E-04**	**m/s**



Appendix 6 – Drainage Calculations

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	Eric O'Connor
Site name:	Halterworth Lane
Site location:	Romsey

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013) , the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Site Details

Latitude:	50.99045° N
Longitude:	1.46504° W
Reference:	87648378
Date:	Dec 22 2023 12:00

Runoff estimation approach

FEH Statistical

Site characteristics

Total site area (ha):	7.26

Methodology

Q_{MED} estimation method:	Calculate from BFI and SAAR
BFI and SPR method:	Specify BFI manually
HOST class:	N/A
BFI / BFIHOST:	0.573
Q_{MED} (l/s):	
Q_{BAR} / Q_{MED} factor:	1.14

Hydrological characteristics

	Default	Edited
SAAR (mm):	788	788
Hydrological region:	7	7
Growth curve factor 1 year:	0.85	0.85
Growth curve factor 30 years:	2.3	2.3
Growth curve factor 100 years:	3.19	3.19
Growth curve factor 200 years:	3.74	3.74

Notes

(1) Is Q_{BAR} < 2.0 l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

	Default	Edited

Q_{BAR} (l/s):		25.65
1 in 1 year (l/s):		21.8
1 in 30 years (l/s):		58.99
1 in 100 year (l/s):		81.81
1 in 200 years (l/s):		95.92

Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 437438 121337 SU 37438 21337
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	1.000
Cv (Winter)	1.000
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+45

Time Area Diagram

Total Area (ha) 2.200

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.800	4	8	0.700	8	12	0.700

Time Area Diagram

Total Area (ha) 0.000

Time From:	(mins) To:	Area (ha)
0	4	0.000

Summary of Results for 100 year Return Period (+45%)

Half Drain Time : 38 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.937	0.937	153.0	488.4	O K
30 min Summer	1.094	1.094	173.0	608.6	O K
60 min Summer	1.170	1.170	182.9	671.2	O K
120 min Summer	1.088	1.088	172.3	603.9	O K
180 min Summer	1.006	1.006	161.8	540.1	O K
240 min Summer	0.936	0.936	152.8	487.5	O K
360 min Summer	0.819	0.819	138.3	405.9	O K
480 min Summer	0.723	0.723	126.6	344.2	O K
600 min Summer	0.644	0.644	117.0	295.7	O K
720 min Summer	0.576	0.576	108.9	256.7	O K
960 min Summer	0.466	0.466	96.1	197.9	O K
1440 min Summer	0.311	0.311	78.5	123.0	O K
2160 min Summer	0.167	0.167	62.6	61.6	O K
2880 min Summer	0.082	0.082	53.4	29.1	O K
4320 min Summer	0.042	0.042	41.8	14.6	O K
5760 min Summer	0.035	0.035	34.1	12.0	O K
7200 min Summer	0.030	0.030	29.5	10.5	O K
8640 min Summer	0.027	0.027	26.5	9.4	O K
10080 min Summer	0.025	0.025	24.5	8.6	O K
15 min Winter	0.937	0.937	153.0	488.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	137.250	0.0	22
30 min Summer	92.038	0.0	32
60 min Summer	59.069	0.0	50
120 min Summer	33.764	0.0	84
180 min Summer	24.338	0.0	118
240 min Summer	19.311	0.0	150
360 min Summer	13.979	0.0	214
480 min Summer	11.136	0.0	278
600 min Summer	9.348	0.0	340
720 min Summer	8.111	0.0	400
960 min Summer	6.500	0.0	520
1440 min Summer	4.768	0.0	760
2160 min Summer	3.506	0.0	1124
2880 min Summer	2.830	0.0	1472
4320 min Summer	2.111	0.0	2188
5760 min Summer	1.732	0.0	2928
7200 min Summer	1.501	0.0	3592
8640 min Summer	1.344	0.0	4264
10080 min Summer	1.231	0.0	4968
15 min Winter	137.250	0.0	22

Summary of Results for 100 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	1.095	1.095	173.1	609.1	O K
60 min Winter	1.164	1.164	182.2	666.4	O K
120 min Winter	1.057	1.057	168.2	578.9	O K
180 min Winter	0.947	0.947	154.3	496.1	O K
240 min Winter	0.853	0.853	142.5	428.8	O K
360 min Winter	0.699	0.699	123.6	328.9	O K
480 min Winter	0.578	0.578	109.2	257.7	O K
600 min Winter	0.480	0.480	97.8	205.1	O K
720 min Winter	0.401	0.401	88.6	165.0	O K
960 min Winter	0.279	0.279	74.9	108.7	O K
1440 min Winter	0.124	0.124	57.9	44.6	O K
2160 min Winter	0.045	0.045	44.4	15.5	O K
2880 min Winter	0.037	0.037	36.1	12.7	O K
4320 min Winter	0.028	0.028	27.0	9.5	O K
5760 min Winter	0.023	0.023	22.0	7.9	O K
7200 min Winter	0.020	0.020	19.0	6.8	O K
8640 min Winter	0.018	0.018	17.0	6.2	O K
10080 min Winter	0.016	0.016	15.6	5.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	92.038	0.0	33
60 min Winter	59.069	0.0	52
120 min Winter	33.764	0.0	90
180 min Winter	24.338	0.0	124
240 min Winter	19.311	0.0	158
360 min Winter	13.979	0.0	224
480 min Winter	11.136	0.0	288
600 min Winter	9.348	0.0	350
720 min Winter	8.111	0.0	410
960 min Winter	6.500	0.0	530
1440 min Winter	4.768	0.0	768
2160 min Winter	3.506	0.0	1092
2880 min Winter	2.830	0.0	1456
4320 min Winter	2.111	0.0	2196
5760 min Winter	1.732	0.0	2888
7200 min Winter	1.501	0.0	3672
8640 min Winter	1.344	0.0	4360
10080 min Winter	1.231	0.0	5136

Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 437438 121337 SU 37438 21337
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	1.000
Cv (Winter)	1.000
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+45

Time Area Diagram

Total Area (ha) 1.800

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.600	4	8	0.600	8	12	0.600

Time Area Diagram

Total Area (ha) 0.000

Time From:	(mins) To:	Area (ha)
0	4	0.000

Model Details

Storage is Online Cover Level (m) 1.800

Infiltration Basin Structure

Invert Level (m) 0.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.94600 Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.94600

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	340.0	1.500	1029.0	1.501	0.0

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