Flood Risk Assessment

Land off Eyhorne Street, Hollingbourne, ME17 1UA

Client

Cantium Land and Development

Ref: 13690

Date: October 2025

Consulting Engineers

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Issue	Issue date	Compiled	Checked
First Draft Issue	22/10/2025	AW	FVV
First Issue	23/10/2025	AW	FVV

Executive Summary

- The planning application is submitted on behalf of Cantium Land and Development to Maidstone Borough Council for the development of Land off Eyhorne Street, Hollingbourne, ME17 1UA. The Application Proposal is described in Section 1.
- This Flood Risk Assessment ("FRA") aims to address the requirements of relevant Local Plan Policies and demonstrate compliance with the National Planning Policy Framework ("NPPF") and relevant planning practice guidance, in particular "Flood risk and coastal change" (PPG).
- The Site is located entirely within Flood Zone 1 and is not affected by Surface Water Flood Risks based on the available EA modelling.
- Infiltration testing conducted at the site location found rates varying across the site, from $7x10^{-4}$ m/s in the southwestern corner nearest to the site low point to $1x10^{-8}$ m/s at the higher elevations to the north. Due to the varying nature of the infiltration rates found at the site and the shallow groundwater levels, infiltration is not considered a suitable method to appropriately manage the surface water runoff from the proposed development.
- Attenuated runoff from the development is to be discharged to the existing ditch on the south-western boundary. Flows will be limited to the minimum runoff rate of 3l/s/ha in accordance with national SuDS standards.
- Sustainable Drainage Systems ("SuDS") storage features include an open pond and permeable paving. These have been sized to serve the surface water catchment with sufficient volume provided to cater for the 1 in 100 (1%) annual probability ("AP") plus 45% climate change rainfall events, and an additional 10% allowance has been included on roof areas for 'urban creep'.
- The proposed SuDS components will improve the treatment of runoff water to protect the downstream water environment. A small section of the site access will need to be directed towards the existing highway, in line with the existing fall of the land. This is not expected to have a significant impact on the existing highway drainage.
- Foul drainage from the development will be directed to the existing Southern Water foul sewer network under Eyhorne Street, subject to S106 consent.

1 Introduction

1.1 The full planning application is submitted on behalf of Cantium Land and Development to Maidstone Borough Council for the development of Land off Eyhorne Street, Hollingbourne at ME17 1UA.

1.2 The description of the Proposed Development is as follows:

> *"Residential development (C3), consisting of 17 new units, as well as new pavements, hard and soft landscaping and all engineering, ancillary and associated works including a SuDS basin."*

1.3 GTA Civils & Transport Ltd was appointed by Cantium Land and Development to provide an FRA to support the planning application to Maidstone Borough Council as described above. No responsibility is accepted to any third party for all or part of this study in connection with this or any other development.

1.4 This FRA has been prepared in accordance with the National Planning Policy Framework (NPPF) (2025) and relevant planning practice guidance, in particular "Flood risk and coastal change" (PPG ID7, updated September 2025).

2 Policy Context

Local Plan

2.1 The Maidstone Borough Local Plan Review 2021 – 2038 was adopted in March 2024 setting out the policies to guide future development to 2038. The Local Plan Review replaces the Maidstone Borough Local Plan (2017) with some of the 2017 policies retained. This Local Plan Review sets out policies relevant to this FRA as follows:

Policy LPRSP14(A) – Natural Environment:

- *"3. Development proposals will control pollution to protect ground and surface waters where necessary and mitigate against the deterioration of water bodies and adverse impacts on Groundwater Source Protection Zones and principal aquifers, and incorporate measures to improve the ecological status of water bodies as appropriate; Major developments will not be permitted unless they can demonstrate that new or existing water supply, sewage and wastewater treatment facilities can accommodate the new development."*

- *"4. Wastewater treatment and supply infrastructure must be fit for purpose and meet all requirements of both the permitting regulations and the Habitats Regulations (for example in relation to nutrient neutrality at the Stodmarsh SAC/SPA/Ramsar site)."*

- *"7. Any required publicly accessible open space should be designed as part of the overall green and blue infrastructure and layout of a site, taking advantage of the potential for multiple benefits including increased physical activity, enhanced play, wildlife, sustainable urban drainage, tree planting and landscape provision. The form and function of green and blue infrastructure will reflect a site's characteristics, nature, and location."*

- *"8. e) Wastewater treatment and supply infrastructure must be fit for purpose and meet all requirements of both the permitting regulations and the Habitats Regulations (for example in relation to nutrient neutrality at the Stodmarsh SAC/SPA/Ramsar site).*

- *"14. New development involving the creation of surface water runoff will be required to provide SuDS. Where possible, such SuDS will need to integrate with on-site blue-green infrastructure in order to increase biodiversity."*

Policy LPRSP14(C) - Climate Change

- *"5. Require the integration of blue-green infrastructure into major new development in order to mitigate urban heat islands, enhance urban biodiversity, and to contribute to reduced surface water run-off through the provision of SuDS."*
- *"6. New dwellings should be built to ensure that wholesome water consumption is not greater than 110 litres/person/day".*
- *"8. Require new development involving the creation of new dwellings, retail floorspace and/or employment floorspace to plan for respond to the impacts of climate change."*
- *"9. Require new development to include a Flood Risk Assessment where the site is located within Flood Zones 2 or 3 or is over 1 hectare in size."*
- *"10. Require development to have regard to surface water management plans."*

Policy LPRSP15 – Principles of Good Design

- *"6. New development involving the creation of surface water runoff will be required to provide SuDS. Where possible, such SuDS will need to integrate with on-site blue-green infrastructure in order to increase biodiversity."*
- *"10. Development shall have regard to relevant national and local design guides and codes."*

Evidence Base

2.2 The Local Plan is supported by an evidence base which includes documents relevant to this FRA such as a Strategic Flood Risk Assessment (SFRA). The Maidstone Borough Council Level 1 SFRA update and Level 2 SFRA Final report was published in August 2020.

2.3 The Level 1 SFRA sets out an overview of flood risk from various sources within the borough to inform land use planning. The Level 2 SFRA focuses on potential development sites within known flood risk areas. The Land off Eyhorne Street is not included in any of the Level 2 study areas. Other findings of the SFRA in relation to the Site are discussed in Section 3.

2.4 The Infrastructure Delivery Plan (IDP) was updated in September 2021. The IDP identifies infrastructure projects required to service growth in the Borough. In relation to wastewater, the IDP includes item UT11 which sets out that development sites across the Borough which will require reinforcement of the sewerage network in advance of occupation. This will be funded by Southern Water's infrastructure charges with solutions for each scheme developed during or following the development management process.

Supplementary Planning Document

2.5 The Council has adopted supplementary planning documents and endorsed supplementary guidance documents. The Design and Sustainability Development Plan Document (DPD) was formally withdrawn by Full Council on 19th February 2025 and has not yet been replaced.

Surface Water Management Plan

2.6 Kent County Council (KCC) published the Maidstone Stage 1 Surface Water Management Plan (SWMP) in October 2013. The SWMP defines the site as being in the Loewer Medway catchment, which is under Policy 3. Policy 3 states "Continue with existing or alternative actions to manage flood risk at the current level".

2.7 A map of historic flooding was included in the SWMP, and it has been included in Appendix D.

Legislative Context

2.8 The Flood and Water Management Act 2010 (FWMA) updated legislation to ensure better protection from flooding, manage water more sustainably, improve public

services and secure water resources during periods of drought. The FWMA helps reduce flood risk by:

- clarifying who is responsible for managing all sources of flood risk;
- encouraging more sustainable forms of drainage in new developments; and
- making it easier to resolve misconnections to sewers.

2.9 The FWMA established the creation of the Lead Local Flood Authority (LLFA) at county or unitary level to manage local flood risk. Each LLFA is required to prepare a Local Flood Risk Management Strategy which considers all sources of flood risk and identifies objectives to manage local flood risk to local communities.

2.10 The LLFA relevant to the Development is Kent County Council.

2.11 The FWMA also laid the groundwork for national Sustainable Drainage Systems (SuDS) standards to be created. No legislation has yet been passed for this, but Defra has published non-statutory technical standards for SuDS which are frequently referred to by LLFAs in establishing suitable standards for development.

2.12 The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 tie the UK into the EU Water Framework Directive (WFD) which sets environmental objectives for water bodies. The Regulations set out how the Environment Agency (EA) monitors the ecological and chemical status of surface water bodies and the chemical and quantitative status of groundwater. The EA has published River Basin Management Plans (RBMP) to coordinate the WFD objectives in each river basin district. The RBMP information relevant to the Site is discussed later in this report.

3 Existing Site & Current Flood Risk

Site Location

3.1 The site is situated in the northeast of the village of Hollingbourne, which is approximately 7km east of Maidstone town centre. The site is a 1.1 hectare greenfield site, and is bounded by railway tracks to the northeast, Eyhorne Street to the northwest, and an existing ditch to the southeast and southwest.

3.2 A location plan is in Appendix A.

Topography

3.3 The site levels fall globally from the northeast corner at a maximum level of 67.90m AOD, down towards the southwest corner at a minimum level of 64.50m AOD.

3.4 Survey data is in Appendix B.

Hydrology

3.5 The nearest Main River to the site is the River Len, located approximately 4.4km west of the site (measured from the point it starts being defined as a Main River).

3.6 There is an existing ditch along the eastern site boundary, issuing in the northeast corner nearest to the railway embankment, and flowing away from the site halfway along the southern boundary. The ditch then flows southwards towards a series of ponds and ditches, eventually making its way to the River Len.

Geology

3.7 The published bedrock geology for the site comprises Gault Formation - Mudstone. Superficial deposits are mapped across the majority of the site. Where they are mapped, they consist of Head (clay, silt, sand and gravel).

3.8 With regards to groundwater vulnerability, the southwest half of the site is mapped as 'Unproductive', while the northeast half of the site is mapped as 'Low'. A groundwater vulnerability map is included in Appendix D.

3.9 The site is not situated within a groundwater source protection zone.

3.10 A Site Investigation (SI) was carried out by 'Ground and Environmental Services Limited' on the 25th April 2025, which included 5 falling head soakage tests carried out

throughout the site.

3.11 Measured infiltration rates vary across the site, from $7x10^{-4}$ m/s in the southwestern corner nearest to the site low point to $1x10^{-8}$ m/s at the higher elevations to the north. The geology encountered is predominantly clay, with varying gravel contents explaining the varying rates. Shallow groundwater levels up to 0.8m below ground levels were encountered at the lowest elevations.

3.12 Relevant extracts from the Soil Investigation (SI) Report are included in Appendix C.

Flood Zone

3.13 The EA's Flood Map for Planning shows the Site lies within Zone 1 – Low Probability, having less than a 1 in 1,000 (0.1%) annual exceedance probability (AEP) of river flooding.

3.14 The EA's "Flood Map for Planning" is in Appendix D.

Surface Water Flood Risk

3.15 Surface water flooding occurs when excess rainwater does not infiltrate into the ground, or is not intercepted by urban drainage systems, and instead flows across the surface.

3.16 The EA's surface water flood extents map is shown in Appendix D. This shows the extent of surface water flooding in 30yr, 100yr and 1000yr scenarios (High/Medium/Low Risk respectively). Extracts from the EA mapping is included in Appendix D.

3.17 The EA mapping shows that the site is not affected by surface water flooding. There is an area of risk along the existing ditch on the southeast and southwest site boundaries, but these are constrained to the ditch banks.

Reservoir Flood Risk

3.18 There are no impounded water features in the immediate vicinity, and the Site is not close to any reservoir flood risk area shown on the EA's mapping.

3.19 The EA's "Flood Risk Map from Reservoirs" is in Appendix D.

Groundwater Flood Risk

3.20 The impermeable mudstone bedrock at the site is classed as unproductive, and the

overall risk of groundwater flooding is therefore likely to be low.

3.21 The SI found some shallow groundwater in the lowest areas of the site, correlating to the areas with the highest measures infiltration rates. These are likely linked to perched groundwater pockets, associated with the more gravelly pockets of ground surrounded by the more impervious ground. This is unlikely to result in a significance risk of groundwater emergence at the site and will be managed by the proposed drainage strategy (outlined in Section 5).

Climate Change

3.22 The site lies within the Medway Management Catchment. The applicable peak rainfall allowances are 35% for the 1 in 30 AEP events and 45% for the 1 in 100 AEP events.

3.23 A Climate Change (2070 to 2125) layer was added to the Flood Map for Planning by the EA on 27 August 2025. This dataset is intended to show how the combined extent of Flood Zones 2 and 3 could increase with climate change over the next century, ignoring the benefits of any existing flood defences and assuming no changes to flood defences or land-use during that time. There are no further impacts to the site as a result of climate change.

Historical Flooding

3.24 A review of the available data and documents has not identified any records of flooding incidents at or close to the site.

Existing Sewers

3.25 An extract of Southern Water's sewer record mapping is included in Appendix E. The records show a 150mm diameter foul sewer under Eyhorne Street running from northeast to southwest.

3.26 Eyhorne Street also benefits from some highway drainage, based on Kent County Council records.

Existing Drainage Characteristics

3.27 The existing site is greenfield, and so there are no existing drainage features on site. Based on the existing geology and the findings from the SI, it is contended that at present, small rainfall events are allowed to infiltrate into the ground which likely would saturate very quickly. Larger/subsequent storm runoff would then flow from northeast to southwest, with the upper end of the site directed to the existing ditch, and the lower

end of the site towards Eyhorne Street directly.

3.28 Using the Flood Estimation Handbook (FEH) 2022 rainfall data and the simple modified rational approach, existing greenfield runoff rates have been calculated as shown below. See Appendix G for calculations.

1 in 1 AEP	1.2 litres per second per hectare (l/s/ha)
Qbar (1 in 2 AEP)	1.4 l/s/ha
1 in 30 AEP	3.1 l/s/ha
1 in 100 AEP	4.3 l/s/ha.

4 Proposed Flood Risk Mitigation

4.1 The Site lies entirely within Flood Zone 1. All types of development are appropriate within this Zone in terms of flood risk according to the NPPF and planning practice guidance.

4.2 The existing surface water flood extents associated with the ditch corridors will be preserved. This ensures that there is no impact on flood risks both within and outside the development site.

4.3 The proposed development follows the sequential approach outlined in the NPPF as it will be located on land with least flood risk. No further specific flood risk mitigation measures are required beyond the management of development runoff. This is discussed in the next section.

5 Proposed Surface Water Strategy

5.1 Defra published the National standards for SuDS ("NSS") on 19 June 2025. The key principles underpinning the NSS include a natural approach to managing water and an early and integrated design. The proposed SuDS strategy is illustrated in Appendix F and has been prepared in accordance with these key principles. There are 7 core standards set out in the NSS and these are discussed in turn as follows:

Standard 1: runoff destinations.

5.2 The NSS hierarchy sets the priority as collecting runoff for non-potable use. Rainwater harvesting (RwH) solutions need to be considered with the architectural and building services design and hence will be considered at detailed stage. Water butts will be included as a minimum. Unless supersized storage tanks are provided in excess of the demand sizing, it must be assumed that any RwH systems are full and quickly overflowing at the time of an extreme storm event. Onward discharge must therefore be considered.

5.3 The 2nd priority is to infiltrate runoff to ground. The site investigation report found varying infiltration rates, and due to the varying nature of the infiltration rates found and the shallow groundwater levels, infiltration is not considered a suitable method to appropriately manage the surface water runoff from the proposed development in all storm events.

5.4 The 3rd priority is to discharge runoff to an above ground surface water body. The strategy for the development is therefore to discharge runoff to the existing ditch watercourses at the site. The outfall location is illustrated on the Drainage Layout plan in Appendix F.

5.5 Due to the rapidly dropping site levels at the access onto Eyhorne Street, the runoff from a small section of the proposed access road will be directed to the existing highway surface water network. The only alternative to this would be to pump the runoff back up to the proposed drainage network, which is considered a less sustainable solution to manage surface water runoff.

Standard 2: management of everyday rainfall (interception)

5.6 An integrated SuDS approach has been prepared for the built development. The proposed strategy includes unlined permeable paving and a detention basin, which will take advantage of the latent infiltration properties of the existing ground to manage

everyday rainfall.

5.7 The locations of the proposed SuDS features are shown on the strategy plan in Appendix F.

Standard 3: management of extreme rainfall and flooding

5.8 The NSS guidance sets out that the peak allowable discharge rate from the development to the watercourses should be limited to the 1 in 2 (50%) AEP greenfield runoff rate, or 3 l/s/ha, whichever is the greater. As shown in Section 3 above, the 1 in 2 AEP greenfield runoff rate for the site is 1.4 l/s/ha (see Appendix G). The peak allowable discharge rate for the development is therefore 3 l/s/ha, and with 0.368ha of proposed impermeable area, the proposed outfall rate is 1.1l/s.

5.9 Discharges will be limited to the applicable rate by means of flow controls with attenuation storage provided within the attenuation basin. The location, levels and capacity of each component are shown on the strategy plan included in Appendix F. Flow network calculations are included in Appendix G to demonstrate that sufficient storage volume has been provided to cater for the 1 in 100 AEP + 45% storm events. The calculations include a 10% urban creep allowance.

Standard 4: water quality

5.10 The proposed SuDS strategy includes a multi-stage treatment train to protect water quality in the receiving water environment.

5.11 Based on the Simple Index Approach described in CIRIA C753 (The SuDS Manual) the development's pollution hazard indices are outlined in Table 5-1 below along with the relevant SuDS mitigation indices for the proposed SuDS components.

Pollutant type	TSS	Metals	Hydrocarbons
Pollution hazard indices			
Residential roofs – Very low	0.2	0.2	0.05
Vehicular areas – Low	0.5	0.4	0.4
SuDS mitigation indices			
Permeable pavement	0.7	0.6	0.7
Pond	0.7	0.7	0.5
Paving → Pond	1	0.95	0.95

Table 5–1: Runoff Treatment - Simple Index Approach

5.12 Table 5-1 demonstrates that the proposed SuDS treatment train will sufficiently protect

the water environment.

Standard 5: amenity

5.13 The strategic SuDS features have been integrated into the landscape proposals to ensure their amenity potential is realised. The attenuation basin will represent a positive destination for recreation as part of the green infrastructure. Softened embankment slopes are proposed, with a maximum gradient of 1 in 3 where needed, to improve visual impact and safety. For more information, refer to the landscape architect's documents. Further details will be provided at the next stage.

Standard 6: biodiversity

5.14 The proposed SuDS strategy offers significant potential for biodiversity gains due to the array of rich water habitat creation. For more information, refer to the ecology consultant's documents.

Standard 7: design of drainage for construction, operation, maintenance, decommissioning and structural integrity

5.15 Management of issues affecting the water environment is typically addressed by condition with a Construction Environmental Management Plan (CEMP). Construction of the surface water drainage scheme will be carried out in line with best practice methods and controls. More information will be included within the CEMP in due course.

5.16 Ownership and maintenance: A draft Drainage Maintenance Plan (DMP) outlining ownership and maintenance responsibilities is included in Appendix H. This is a draft version based on the information currently available at this stage; the DMP will be updated as the design of each phase is developed and will remain a live document over the duration of the project. A summary of the various ownership responsibilities is as follows:

- Individual property drainage will be cared for by the property owner.
- Highway drainage and SuDS will be the responsibility of KCC as the Highway Authority. The final extent of adopted roads will be confirmed at the next stage.
- Adopted sewers and qualifying SuDS components will be the responsibility of Southern Water, or will be vested in a sewerage company under a NAV agreement. The final arrangements will be confirmed at the next stage.
- The remaining drainage features along with the site-wide infrastructure will be

cared for the Estate Management Company set up by the developer.

- The developer will be responsible for maintaining completed SuDS components in advance of transfer to / adoption by the relevant party.

6 Foul Drainage Strategy

6.1 Foul drainage from the development will drain via gravity to the existing Southern Water foul water sewer network under Eyhorne Street.

6.2 As mentioned in section 2, the IDP for the Borough sets out that any reinforcement required to serve the proposed development site across the borough will be funded by Southern Water's infrastructure charged, under Section 94 of the Water Industry Act 1991.

6.3 Prior to a planning submission, Southern Water only offers a simple check to identify whether the required capacity for wastewater is available in the piped network local to the Proposed Development. If capacity is not available for consented development, Southern Water will provide network reinforcement subject to the new connections charging rules as directed by Ofwat.

6.4 The nature of the off-site upgrades is to be determined following modelling work which will take place following planning consent being granted, should they be required. Southern Water will deliver the off-site upgrades, which are funded by the Infrastructure Charges payable by all developers for new connections, as also outlined by the IDP.

6.5 All new connections will be subject to a S106 application (Water Industry Act) with Southern Water, to be progressed following planning consent.

7 Conclusions

7.1 The site lies entirely within Flood zone 1, and the risk from all other sources of flooding has been assessed as Low. The development is appropriate in terms of flood risk.

7.2 The proposed SuDS strategy has been developed in line with Defra's National Standards for SuDS. The strategy includes source control measures, a multi-stage treatment train and attenuated discharge limited to 1.1l/s.

7.3 The proposed SuDS components will capture pollutants to protect water quality in the receiving water environment.

7.4 The development complies with the NPPF and relevant planning practice guidance in terms of flood risk and water management. The proposed SuDS and foul drainage strategies comply with Local Plan Policies LPRSP14(A), LPRSP14(C) and LPRSP15.

Appendix A

Location Plan

Aerial Photo

Appendix B

Site Survey

LEGEND

AV	AIR VALVE
B	BOLLARD
BL	BASE LEVEL
CATV	CABLE TV INSPECTION COVER
CL	COVER LEVEL
DP	DOWN PIPE
EIC	ELECTRICAL INSPECTION COVER
EP	ELECTRICITY POLE
FH	FIRE HYDRANT
FL	FLOOR LEVEL
G	GULLY
GIC	GAS SERVICE INSPECTION COVER
IC	INSPECTION COVER
IL	INVERT LEVEL
JB	JUNCTION BOX
LC	LIGHTING COLUMN
MH	MANHOLE COVER
	(S) STORM, (F) FOUL, (C) COMBINED
MK	SERVICES MARKER
P	POST
RE	RODDING EYE
RNP	ROAD NAME PLATE
RS	ROAD SIGN
RWP	RAINWATER PIPE
SC(G)	STOP COCK (GAS)
SC(W)	STOP COCK (WATER)
STN	SURVEY CONTROL STATION WITH LEVEL
SU	STEP UP
SV	STOP VALVE
SVP	SOIL VENT PIPE
THL	THRESHOLD LEVEL
TIC	TELECOM INSPECTION COVER
TOW	TOP OF WALL
TP	TELECOM POLE
WIC	WATER SERVICE INSPECTION COVER
WM	WATER METER
WO	WASH OUT

TREE DESCRIPTION

SYCAMORE	=SPECIES
ht=12m	= TREE HEIGHT
2 boles	= EXTRA INFORMATION

NOTES

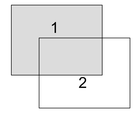
1. ALL LEVELS RELATED TO ORDNANCE SURVEY DATUM DERIVED FROM GPS OBSERVATIONS.
2. SURVEY GRID IS RELATED TO ORDNANCE SURVEY DATUM DERIVED FROM GPS OBSERVATIONS WITH A SCALE FACTOR OF 1.
3. NO RESPONSIBILITY CAN BE TAKEN FOR THE INCORRECT IDENTIFICATION OF TREE, HEDGE OR VEGETATION SPECIES.
4. TREE BOLE AND CANOPY SPREADS HAVE BEEN SHOWN TO SCALE AND WHERE POSSIBLE THE EXTENT OF TREE CANOPIES HAVE BEEN SURVEYED
5. CONTOUR INTERVAL 0.5 METRES

SURVEY STATIONS

Name	Easting	Northing	Height	Remark
1	583827.632	154812.712	66.808	Peg
2	583884.295	154755.295	67.007	Peg
3	583786.409	154826.236	64.442	Survey Nail

ORDNANCE SURVEY DIGITAL DATA SHOWN IN GREY

SHEET LAYOUT (NOT TO SCALE)



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Tel. 01227 710316
email. alan@ansurveys.co.uk
WWW.ansurveys.co.uk

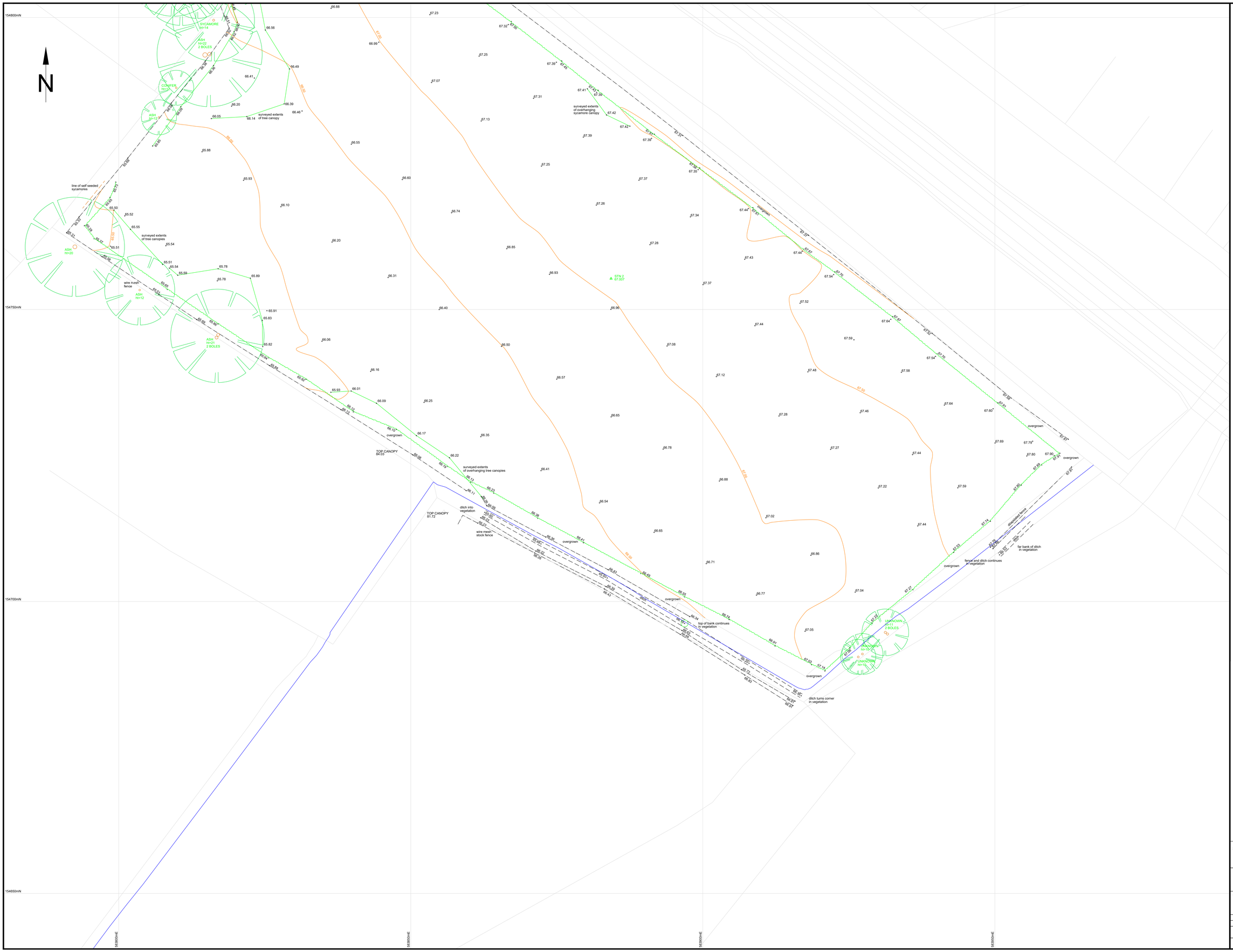
Drawing Title

TOPOGRAPHICAL SURVEY OF LAND AT EYHORNE STREET, HOLLINGBOURNE, KENT, ME17 1TX

Client

CANTIUM LAND AND DEVELOPMENT LTD

Drawing Number	1
Original Sheet Size and Scale	A0 AT 1/200
Drawn By: A.NICHOLSON	Cad Filename : EYHORNE STREET FINAL.dwg
Date 16th October 2024	Revision :



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Drawing Title

TOPOGRAPHICAL SURVEY OF LAND AT EYHORNE STREET, HOLLINGBOURNE, KENT, ME17 1TX

Client

CANTIUM LAND AND DEVELOPMENT LTD

Drawing Number	2
Original Sheet Size and Scale	A0 AT 1/200
Drawn By: A.NICHOLSON	Cad Filename : EYHORNE STREET FINAL.dwg
Date 16th October 2024	Revision :

Appendix C

SI Data

Ground and Environmental Services Limited
Unit 2 Montpelier Business Park
Dencora Way
Ashford
Kent
TN23 4FG
01233 646237

Julian Wilkinson
Cantium Land and Development Ltd

Date: 6th May 2025

Our ref: 13479

Dear Julian,

RE: SOAKAGE TESTING – Land off Eyhorne Street, Hollingbourne

Introduction

Ground and Environmental Services Ltd (GES) was commissioned by Cantium Land and Development Ltd to undertake soakage testing on Land off Eyhorne Street, Hollingbourne, Kent.

The purpose of the ground investigation was to carry out soakage testing in order to obtain infiltration characteristics for use in assessing the feasibility of adopting shallow soakaways.

This report specifically excludes comment or advice with regards to contaminated land or pollution related issues.

Fieldwork

The site works were carried out on the 25th April 2025 and comprised the following:

- Falling Head Soakage Testing;

Window Sampling

Five window sample holes designated WS1, WS2, WS3, WS4 and WS5 were excavated to depths of 3.0, 3.0, 2.8, 3.0 and 2.3mbegl (metres below ground level) respectively using a tracked window sampling rig.

Logs of the window sample holes are enclosed.

Falling Head Soakage Testing

Falling head soakage testing was carried out in all window sample holes using water introduced by 25L water containers. The testing involved monitoring the fall in water level against time.

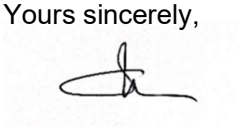
The results are enclosed and are summarised below:

Trial Pit ID	Test No	Test Depth (m)	Test duration (minutes)	Infiltration rate (m/s)	Comment
WS1	1	3.0	249	1×10^{-8}	Estimated rate as H/Ho=0.37 not achieved. Negligible Infiltration potential – 20l water added
WS2	1	3.0 GWL at 0.8m	7	1×10^{-3}	Water level at 0.8m in WS prior to test. Good infiltration potential of soils back to groundwater level – 25l water added
WS2	2	3.0 GWL at 0.8m	14	9.66×10^{-4}	Water level at 0.8m in WS prior to test. Good infiltration potential of soils back to groundwater level – 25l water added
WS2	1	3.0 GWL at 0.8m	64	6.9×10^{-4}	Water level at 0.8m in WS prior to test. Good infiltration potential of soils back to groundwater level – 20l water added
WS3	1	2.8	203	1.0×10^{-8}	Estimated rate as H/Ho=0.37 not achieved. Negligible Infiltration potential – 15l water added
WS4	1	3.0	166	1.0×10^{-8}	Estimated rate as H/Ho=0.37 not achieved. Negligible Infiltration potential – 15l water added.
WS5	1	2.3 GWL at 1.65m	134	2.13×10^{-5}	Water level at 1.65m in WS prior to test. Moderate infiltration potential of soils back to groundwater level – 25l water added.

We trust that this is satisfactory and addresses your requirements, but should you have any queries please do not hesitate to contact this office.

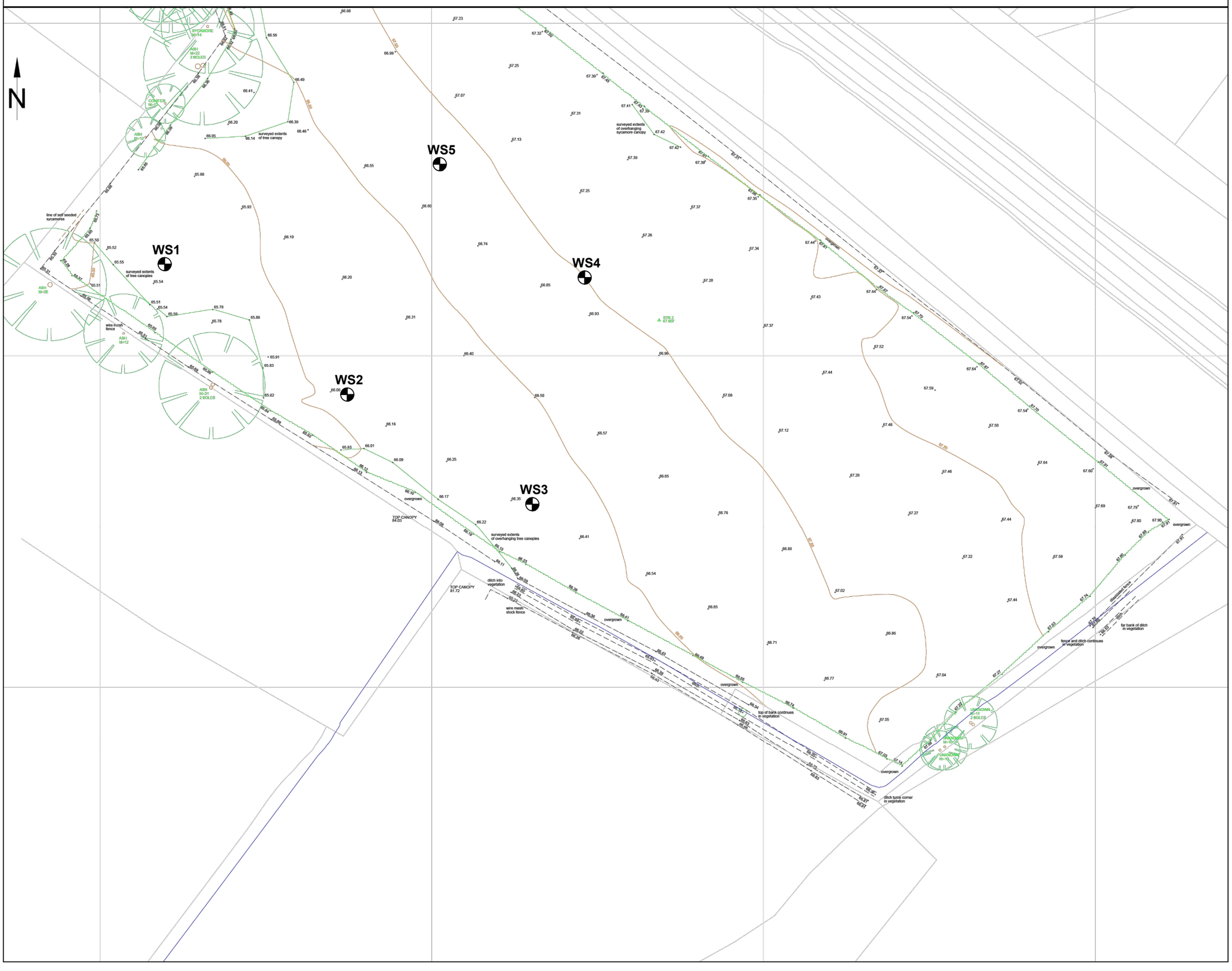
We look forward to hearing from you in the near future.

Yours sincerely,



Craig Spanton
Director
Ground and Environmental Services Limited

Enc:
Test Location Plan
Window Sample Logs
Falling Head Test Results



KEY:

- WS - WINDOW SAMPLE
- BH - BOREHOLE
- (I) - INSTALLATION
- TP - TRIAL PIT
- HDTP - HAND DUG TRIAL PIT
- SP - SOAKAGE PIT
- DCP - DYNAMIC CONE PENETRATION
- DP - DYNAMIC PROBE
- HA - HAND AUGER
- PT - PERCOLATION TEST
- GM - GAS MONITORING STANDPIPE
- S - SAMPLE LOCATION

CLIENT:
Cantium Land and Development

SITE ADDRESS:
Land off Eyhorne Street
Hollingbourne

DRAWING NO.:
Figure 1

DRAWING TITLE:
Exploratory Hole Location Plan

PROJECT NO.:
13479

DATE:
04/2025

DRAWN:
PJ

REVISION:
00

GROUND AND ENVIRONMENTAL SERVICES (GES) LIMITED
UNIT 2
MONTPELIER BUSINESS PARK
DENCORA WAY
ASHFORD
KENT TN23 4FG
TEL: 01233 646 237

Ground and Environmental Services Limited

Unit 2 Montpelier Business Park
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Window
Sampler Log No. WS1

Sheet: 1 of 1

Equipment & Methods. Premier 110 Compact _Backfill: 35mm installation	Project Name: Land off eyhorne street Project Location: Hollingbourne Client: Cantium Land and Development	Job No: 13479
Co-ordinates: E: N:	Ground Level (m):	Date Started:25/04/2025 Date Completed:25/04/2025

Samples and In situ Testing				Field Records	DESCRIPTION	Reduced Level (m)	Legend	Depth (Thick) (m)
Depth (m)	No.	Type	Result					
					TOP SOIL: soft (low strength) dark brown sandy clayey silt, Speckled grey			(0.65)
					Soft (low strength) greyish brown very silty CLAY	-0.65		0.65 (0.20)
					Soft to firm (low strength) light greyish brown gravelly silty CLAY, Gravel is coarse flint	-0.85		0.85 (0.20)
					Soft to firm (low strength) light orangeish brown with white gravelly very silty CLAY, Gravel is fine chalk and fine to medium flint	-1.05		1.05 (0.50)
					Firm (medium strength) brownish grey with orange very silty CLAY	-1.55		1.55 (1.45)
						-3.00		3.00

End of W/S 3.00 m
(Thickness of basal layer not proven)

Remarks:
Dry upon completion

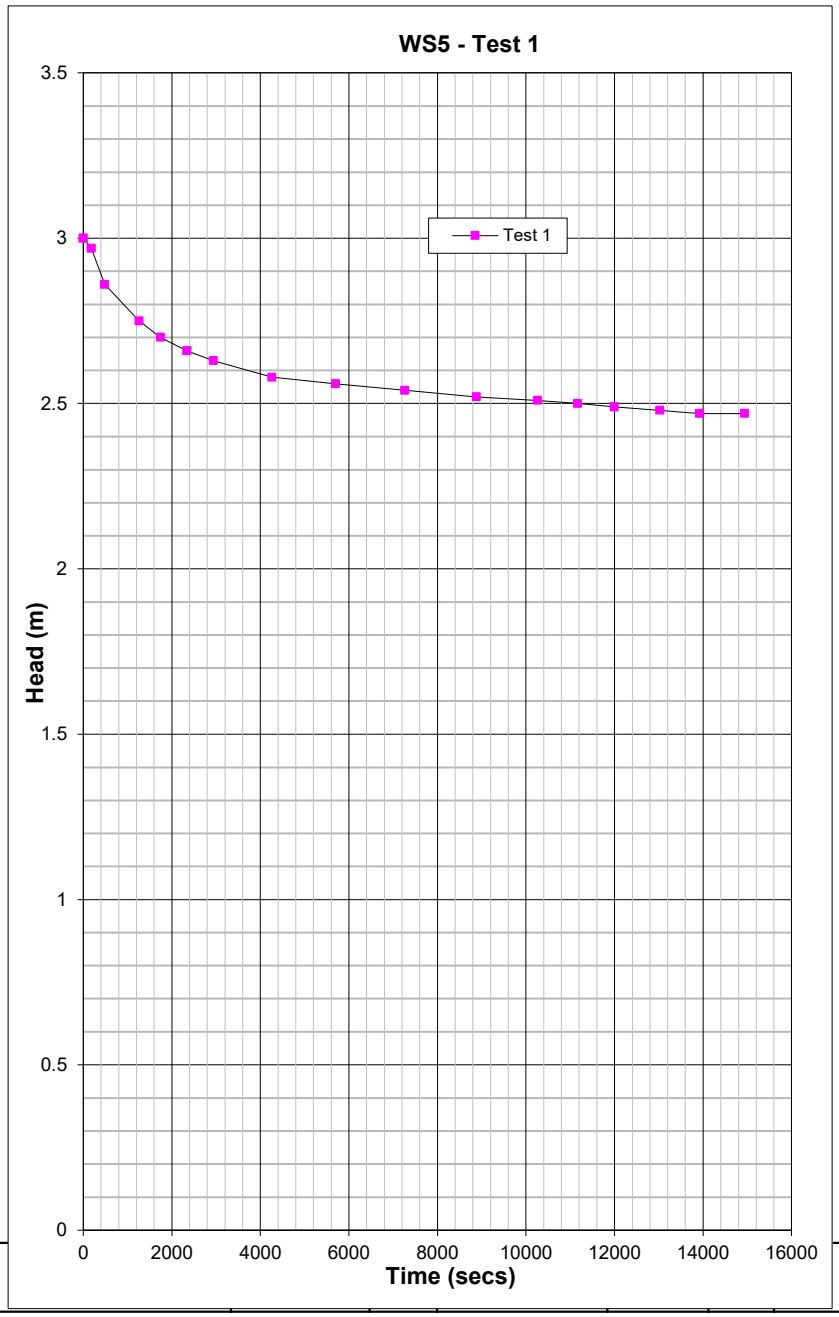
Logged By:	Checked By:
CS	PAD
Scale: 1:20	Approved By:
FIG No.	

Notes: For explanation of symbols and abbreviations, see Key Sheet.

Land off Eyhorne Street, Hollingbourne | **WS1**

Top section	0	m	Centre section	1.5	m	Diameter of Hole	0.075	m
Bottom section	3	m	Diameter of test section	0.075	m	Length of test section	3	m
Water Level	DRY	m						

Time (Seconds)	Depth	Head
0	0	3
180	0.03	2.97
480	0.14	2.86
1260	0.25	2.75
1740	0.3	2.7
2340	0.34	2.66
2940	0.37	2.63
4260	0.42	2.58
5700	0.44	2.56
7260	0.46	2.54
8880	0.48	2.52
10260	0.49	2.51
11160	0.5	2.5
12000	0.51	2.49
13020	0.52	2.48
13920	0.53	2.47
14940	0.53	2.47



NEGLIGIBLE SOAKAGE - 0.53m drop in head over 4hours and 9minutes

After BS5930:1999 **k(approx) = 1.05 x10^{-8} m/s** **estimated**

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Dencora Way, Ashford
Kent TN23 4FG

Window
Sampler Log No. WS2
Sheet: 1 of 1

Equipment & Methods. Premier 110 Compact _Backfill: 35mm installation	Project Name: Land off eyhorne street Project Location: Hollingbourne Client: Cantium Land and Development	Job No: 13479
Co-ordinates: E: N:	Ground Level (m):	Date Started:25/04/2025 Date Completed:25/04/2025

Samples and In situ Testing				Field Records	DESCRIPTION	Reduced Level (m)	Legend	Depth (Thick) (m)
Depth (m)	No.	Type	Result					
					TOP SOIL: soft (low strength) dark brown sandy clayey silt, Speckled grey and black. rare brick and carbon fragments			(0.55)
					Soft (low strength) greyish brown very silty CLAY	-0.55		0.55 (0.35)
					Soft to firm (low strength) light greyish brown gravelly silty CLAY, Gravel is coarse flint	-0.90		0.90 (0.15)
					Soft to firm (low strength) light orangeish brown with white gravelly very silty CLAY, Gravel is fine chalk and fine to medium flint	-1.05		1.05 (0.80)
					Firm (medium strength) brownish grey with orange very silty CLAY	-1.85		1.85 (1.15)
						-3.00		3.00

End of W/S 3.00 m
(Thickness of basal layer not proven)

Remarks:
water at 0.8m upon completion

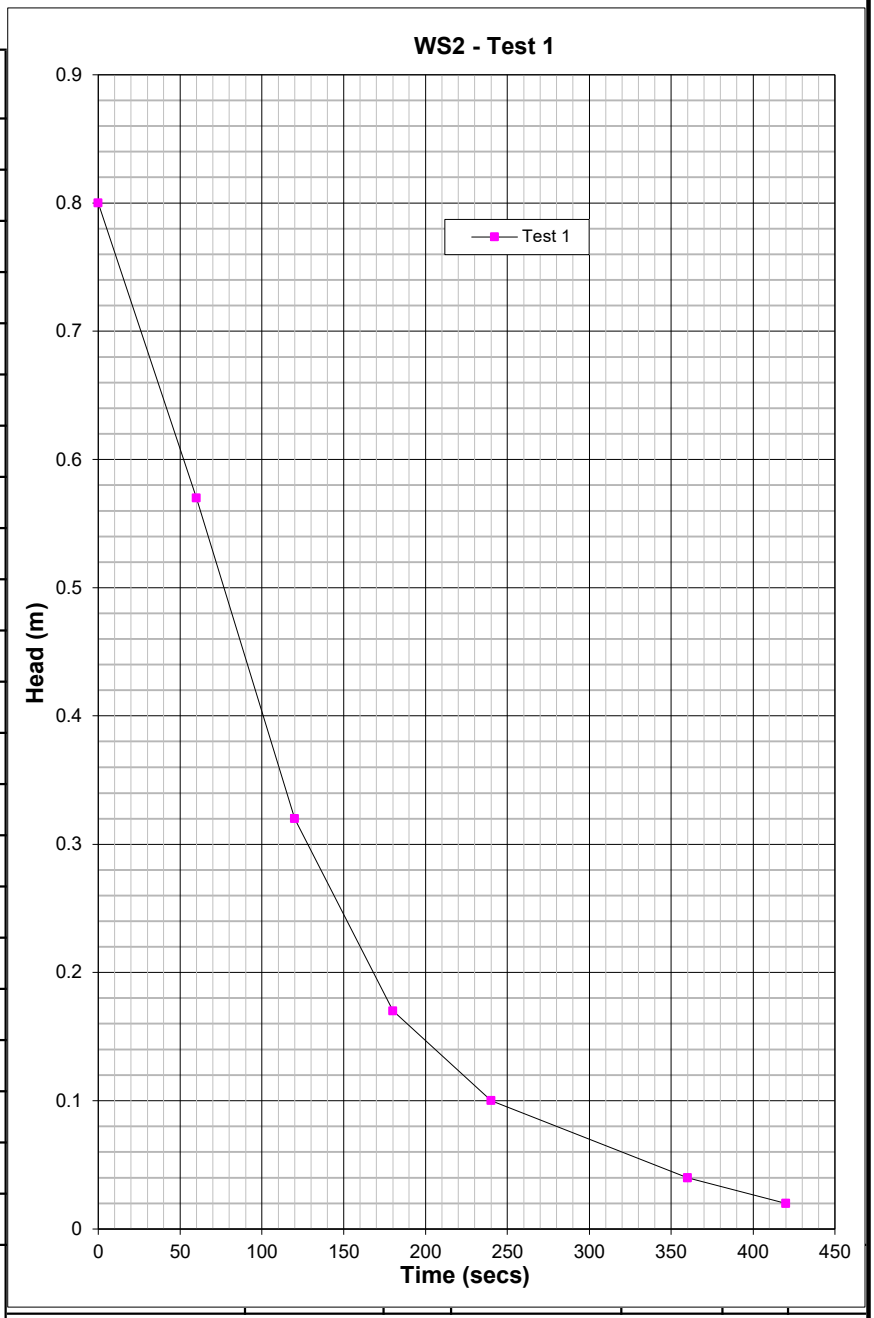
Logged By:	Checked By:
CS	PAD
Scale: 1:20	Approved By:
FIG No.	

Notes: For explanation of symbols and abbreviations, see Key Sheet.

Land off Eyhorne Street, Hollingbourne | **WS2 Test 1**

Top section	0	m	Centre section	1.5	m	Diameter of Hole	0.075	m
Bottom section	3	m	Diameter of test section	0.075	m	Length of test section	3	m
Water Level	0.8	m						

Time (Seconds)	Depth	Head
0	0	0.8
60	0.23	0.57
120	0.48	0.32
180	0.63	0.17
240	0.7	0.1
360	0.76	0.04
420	0.78	0.02



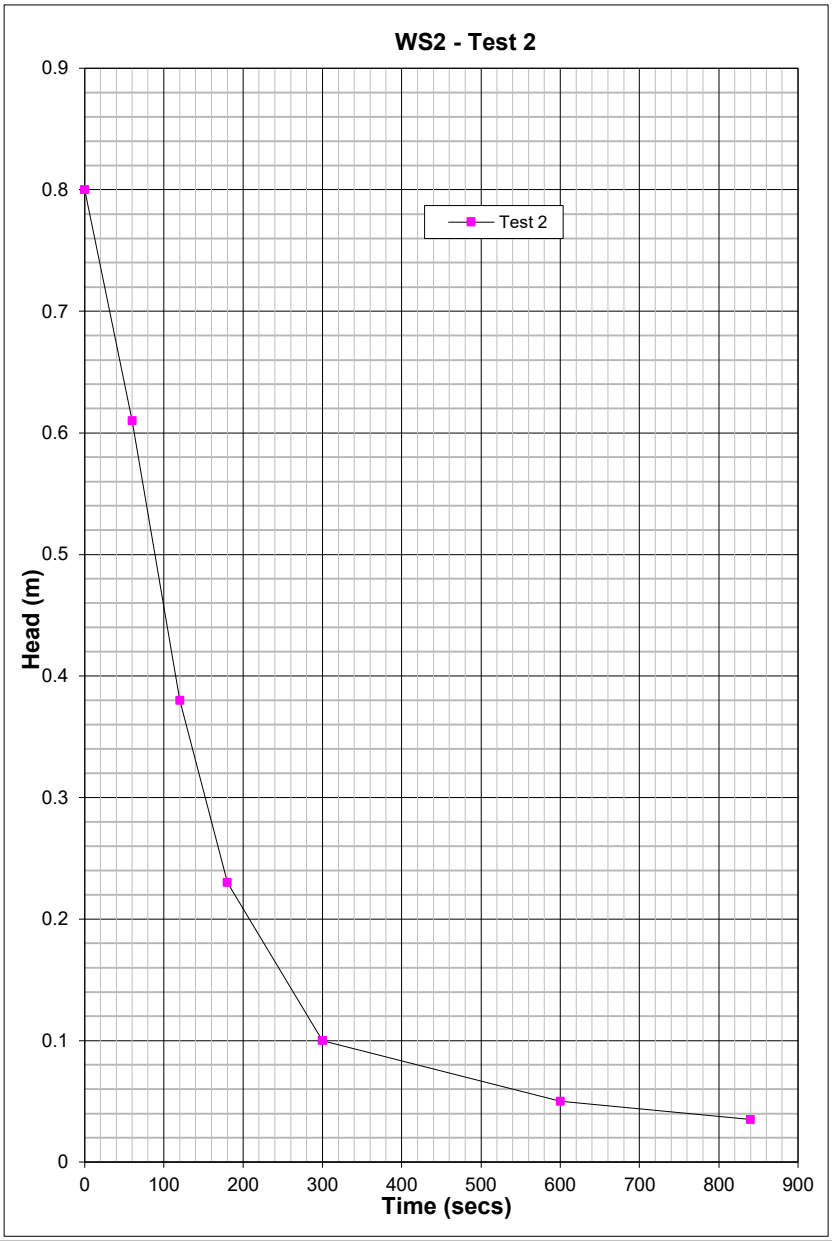
GOOD SOAKAGE - Head of water dropped quickly back to the initial groundwater at 0.8m

After BS5930:1999 **k(approx) = 1.1 x10^{-3} m/s**

	Land off Eyhorne Street, Hollingbourne	WS2 Test 2

Top section	0	m	Centre section Diameter of test section	1.5	m	Diameter of Hole	0.075	m
Bottom section	3	m		0.075	m	Length of test section	3	m
Water Level	0.8	m						

Time (Seconds)	Depth	Head
0	0	0.8
60	0.19	0.61
120	0.42	0.38
180	0.57	0.23
300	0.7	0.1
600	0.75	0.05
840	0.765	0.035



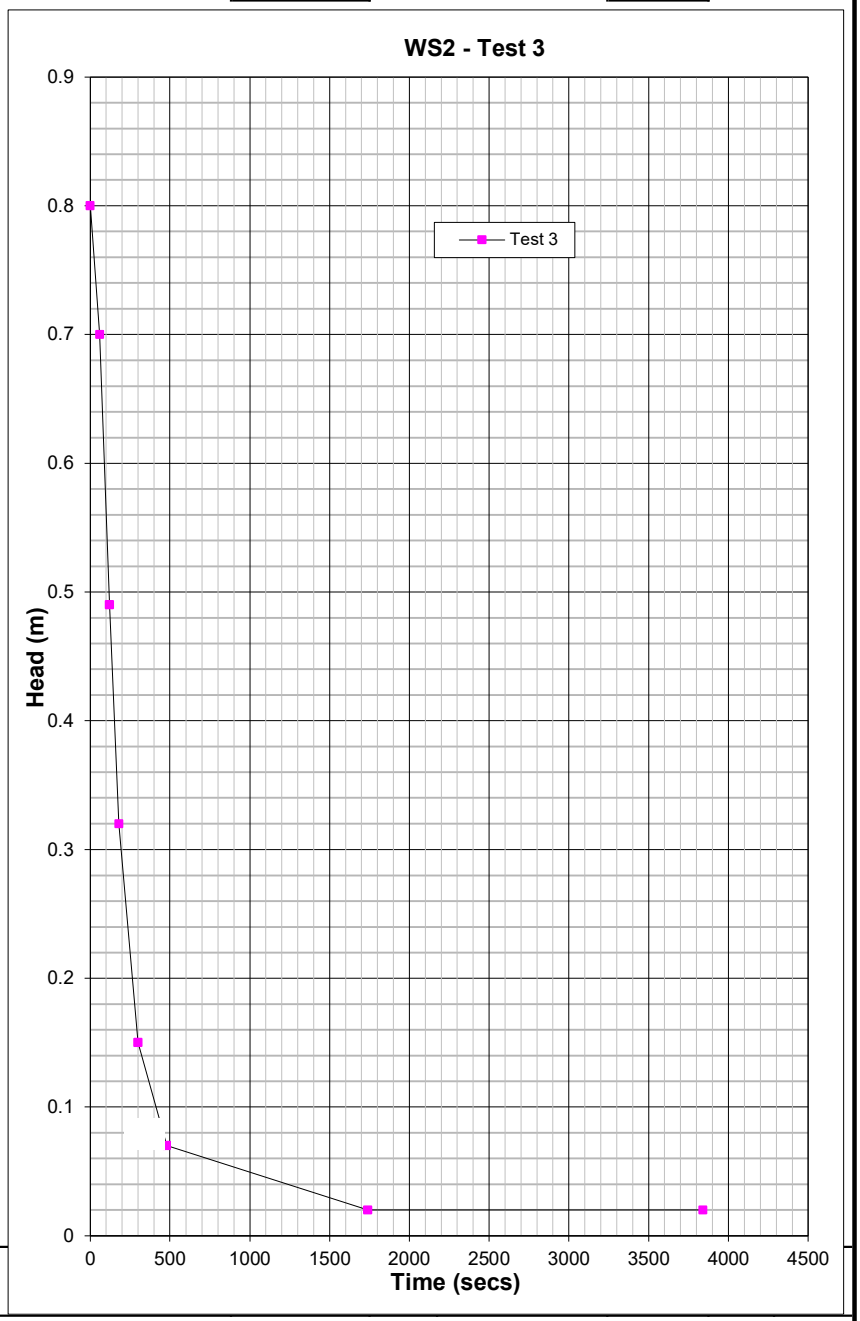
GOOD SOAKAGE - Head of water dropped quickly back to the initial groundwater at 0.8m

After BS5930:1999 **k(approx) = 9.66 x10^{-4} m/s**

Land off Eyhorne Street, Hollingbourne | **WS2 Test 3**

Top section	0	m	Centre section	1.5	m	Diameter of Hole	0.075	m
Bottom section	3	m	Diameter of test section	0.075	m	Length of test section	3	m
Water Level	0.8	m						

Time (Seconds)	Depth	Head
0	0	0.8
60	0.1	0.7
120	0.31	0.49
180	0.48	0.32
300	0.65	0.15
480	0.73	0.07
1740	0.78	0.02
3840	0.78	0.02



GOOD SOAKAGE - Head of water dropped quickly back to the initial groundwater at 0.8m

After BS5930:1999 **k(approx) = 6.90 x10^{-4} m/s**

Ground and Environmental Services Limited

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Dencora Way, Ashford
Kent TN23 4FG
Tel: 01233 646237

Window
Sampler Log No. WS3
Sheet: 1 of 1

Equipment & Methods. Premier 110 Compact _Backfill: 35mm installation	Project Name: Land off eyhorne street Project Location: Hollingbourne Client: Cantium Land and Development	Job No: 13479
Co-ordinates: E: N:	Ground Level (m):	Date Started:25/04/2025 Date Completed:25/04/2025

Samples and In situ Testing				Field Records	DESCRIPTION	Reduced Level (m)	Legend	Depth (Thick) (m)
Depth (m)	No.	Type	Result					
					TOP SOIL: soft (low strength) dark brown sandy clayey silt, Speckled grey and black. rare brick and carbon fragments			(0.60)
					Soft (low strength) greyish brown very silty CLAY	-0.60		0.60 (0.30)
					Soft to firm (low strength) light orangeish brown with white gravelly very silty CLAY, Gravel is fine chalk and fine to medium flint	-0.90		0.90 (0.85)
					Firm (medium strength) brownish grey with orange very silty CLAY	-1.75		1.75 (1.25)
						-3.00		3.00

End of W/S 3.00 m
(Thickness of basal layer not proven)

Remarks:
Dry upon completion

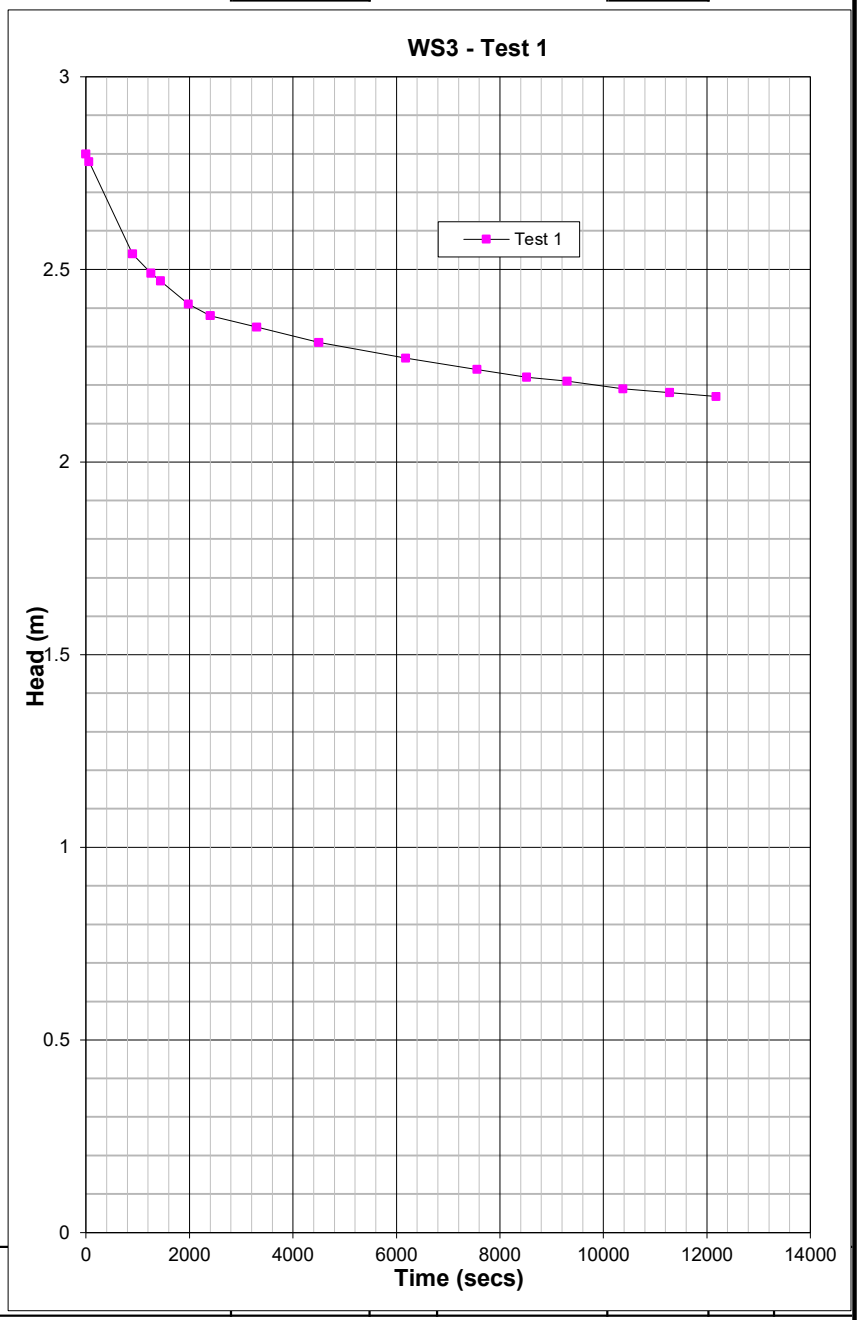
Logged By:	Checked By:
CS	PAD
Scale: 1:20	Approved By:
FIG No.	

Notes: For explanation of symbols and abbreviations, see Key Sheet.

Land off Eyhorne Street, Hollingbourne | **WS3**

Top section	0	m	Centre section Diameter of test section	1.4	m	Diameter of Hole	0.075	m
Bottom section	2.8	m		0.075	m	Length of test section	2.8	m
Water Level	DRY	m						

Time (Seconds)	Depth	Head
0	0	2.8
60	0.02	2.78
900	0.26	2.54
1260	0.31	2.49
1440	0.33	2.47
1980	0.39	2.41
2400	0.42	2.38
3300	0.45	2.35
4500	0.49	2.31
6180	0.53	2.27
7560	0.56	2.24
8520	0.58	2.22
9300	0.59	2.21
10380	0.61	2.19
11280	0.62	2.18
12180	0.63	2.17



NEGLIGIBLE SOAKAGE - 0.63m drop in head over 3hours and 23minutes

After BS5930:1999 **k(approx) = 1.0 x10^{-8} m/s** **estimated**

Ground and Environmental Services Limited

Unit 2 Montpelier Business Park
Dencora Way, Ashford
Kent TN23 4FG
Tel: 01233 646237

Window
Sampler Log No. WS4

Sheet: 1 of 1

Equipment & Methods. Premier 110 Compact _Backfill: 35mm installation	Project Name: Land off eyhorne street Project Location: Hollingbourne Client: Cantium Land and Development	Job No: 13479
Co-ordinates: E: N:	Ground Level (m):	Date Started:25/04/2025 Date Completed:25/04/2025

Samples and In situ Testing				Field Records	DESCRIPTION	Reduced Level (m)	Legend	Depth (Thick) (m)
Depth (m)	No.	Type	Result					
					TOP SOIL: soft (low strength) dark brown sandy clayey silt, Speckled grey and black. rare brick and carbon fragments			(0.70)
					Soft to firm (low strength) greyish brown silty slightly clayey CLAY, Speckled white with calcareous nodules from 0.9m	-0.70		0.70 (0.50)
					Soft to firm (low strength) light orangeish brown with white gravelly very silty CLAY, Gravel is fine chalk and fine to medium flint	-1.20		1.20 (0.80)
					Grey with white gravelly CLAY, Gravel is fine to coarse flint and fine chalk	-2.00		2.00 (0.60)
					Firm (medium strength) brownish grey with orange very silty CLAY	-2.60		2.60 (0.20)
						-2.80		2.80

End of W/S 2.80 m
(Thickness of basal layer not proven)

Remarks:
Dry upon completion

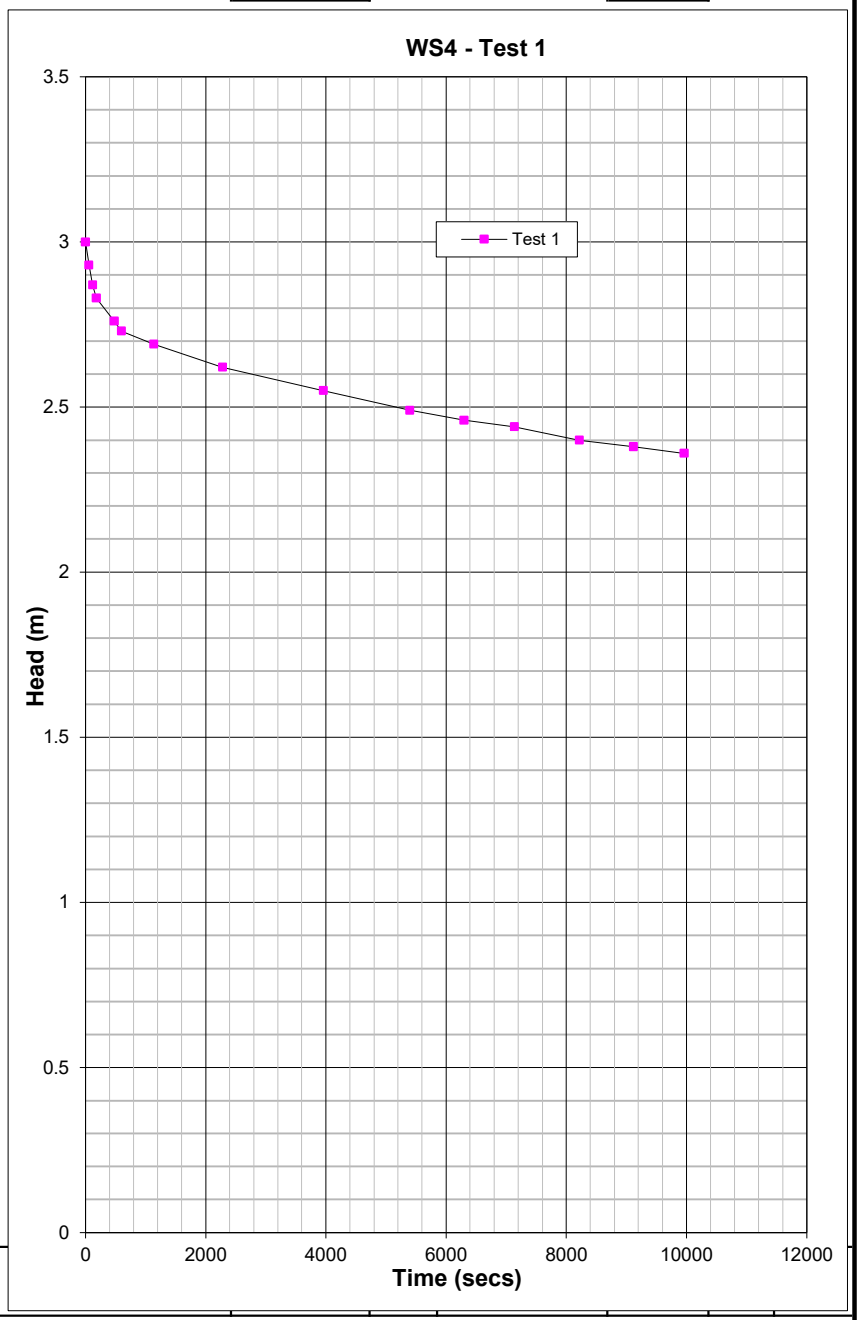
Logged By:	Checked By:
CS	PAD
Scale: 1:20	Approved By:
FIG No.	

Notes: For explanation of symbols and abbreviations, see Key Sheet.

Land off Eyhorne Street, Hollingbourne | **WS4**

Top section	0	m	Centre section Diameter of test section	1.5	m	Diameter of Hole	0.075	m
Bottom section	3	m		0.075	m	Length of test section	3	m
Water Level	DRY	m						

Time (Seconds)	Depth	Head
0	0	3
60	0.07	2.93
120	0.13	2.87
180	0.17	2.83
480	0.24	2.76
600	0.27	2.73
1140	0.31	2.69
2280	0.38	2.62
3960	0.45	2.55
5400	0.51	2.49
6300	0.54	2.46
7140	0.56	2.44
8220	0.6	2.4
9120	0.62	2.38
9960	0.64	2.36



NEGLIGIBLE SOAKAGE - 0.64m drop in head over 2hours and 46minutes

After BS5930:1999 **k(approx) = 1.0 x10^{-8} m/s** **estimated**

Ground and Environmental Services Limited
Unit 2 Montpelier Business Park
Dencora Way, Ashford
Kent TN23 4FG
Tel: 01233 646237

Window
Sampler Log No. WS5
Sheet: 1 of 1

Equipment & Methods.
Premier 110 Compact
_Backfill: 35mm installation

Project Name: Land off eyhorne street
Project Location: Hollingbourne
Client: Cantium Land and Development

Job No: 13479

Co-ordinates:
E:
N:

Ground Level (m):

Date Started:25/04/2025
Date Completed:25/04/2025

Samples and In situ Testing				Field Records	DESCRIPTION	Reduced Level (m)	Legend	Depth (Thick) (m)
Depth (m)	No.	Type	Result					
					TOP SOIL: soft (low strength) dark brown sandy clayey silt, Speckled grey and black. rare brick and carbon fragments			(0.50)
					Soft (low strength) greyish brown very silty CLAY	-0.50		0.50 (0.25)
					Light grey and grey silty SAND, Sand is fine to medium	-0.75		0.75 (0.25)
					Firm (medium strength) greyish brown silty slightly gravelly CLAY, Gravel is fine chalk.	-1.00		1.00 (0.40)
					Soft to firm (low strength) light orangeish brown with white gravelly very silty CLAY, Gravel is fine chalk and fine to medium flint	-1.40		1.40 (0.70)
					Firm (medium strength) brownish grey with orange very silty CLAY	-2.10		2.10 (0.20)
					unable to extend borehole due to water	-2.30		2.30

End of W/S 2.30 m
(Thickness of basal layer not proven)

Remarks:
water at 1.65m upon completion

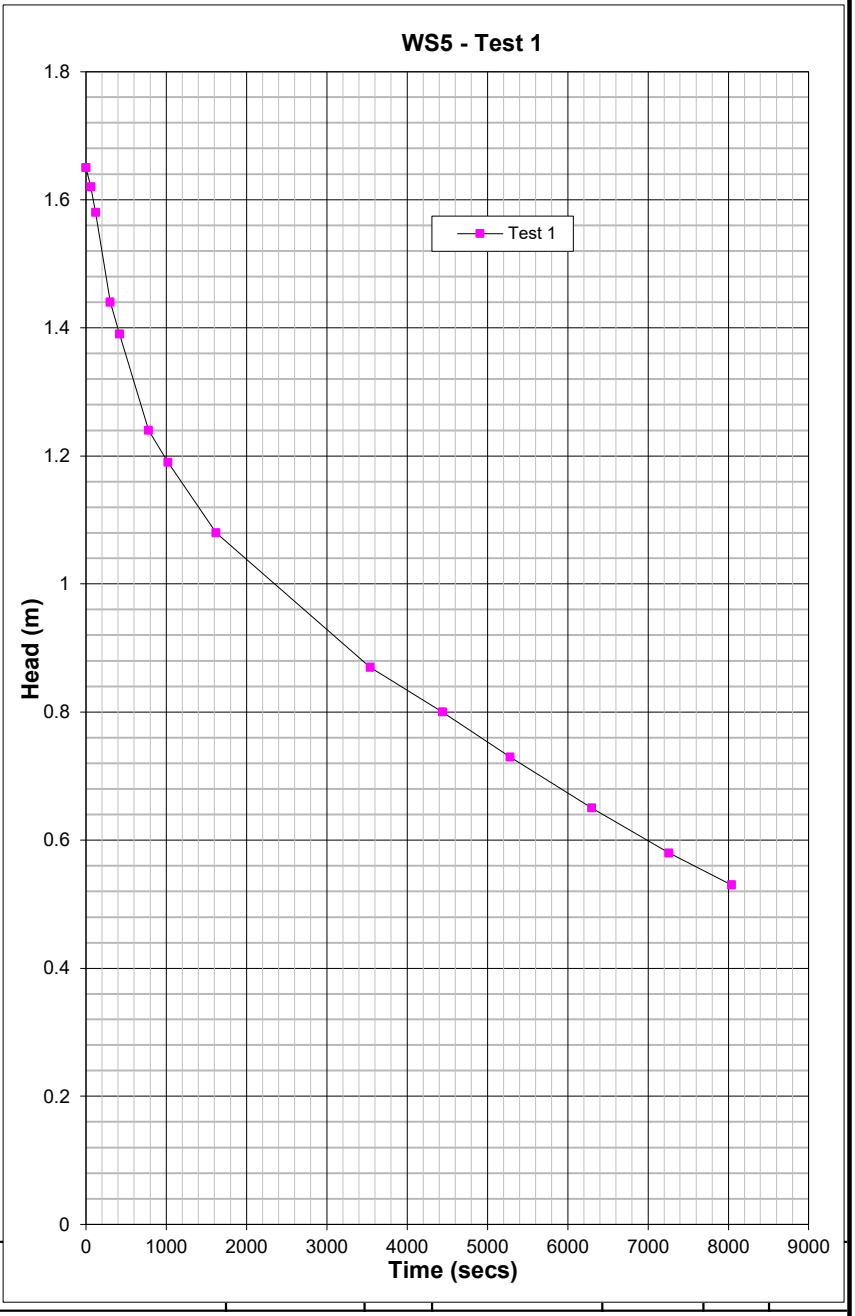
Logged By: CS
Checked By: PAD
Scale: 1:20
Approved By:
FIG No.

Notes: For explanation of symbols and abbreviations, see Key Sheet.

	Land off Eyhorne Street, Hollingbourne	WS5

Top section	0	m	Centre section	1.15	m	Diameter of Hole	0.075	m
Bottom section	2.3	m	Diameter of test section	0.075	m	Length of test section	2.3	m
Water Level	1.65	m						

Time (Seconds)	Depth	Head
0	0	1.65
60	0.03	1.62
120	0.07	1.58
300	0.21	1.44
420	0.26	1.39
780	0.41	1.24
1020	0.46	1.19
1620	0.57	1.08
3540	0.78	0.87
4440	0.85	0.8
5280	0.92	0.73
6300	1	0.65
7260	1.07	0.58
8040	1.12	0.53



MODERATE SOAKAGE - Initial groundwater level at 1.65m

After BS5930:1999 **k(approx) = 2.13x10^{-5} m/s**

Appendix D

Flood Maps

Environment Agency Main Rivers Map

Environment Agency Flood Map for Planning

The site is located in Flood Zone 1.

Environment Agency Surface Water Flood Extents Map

Environment Agency Flood Risk from Reservoirs

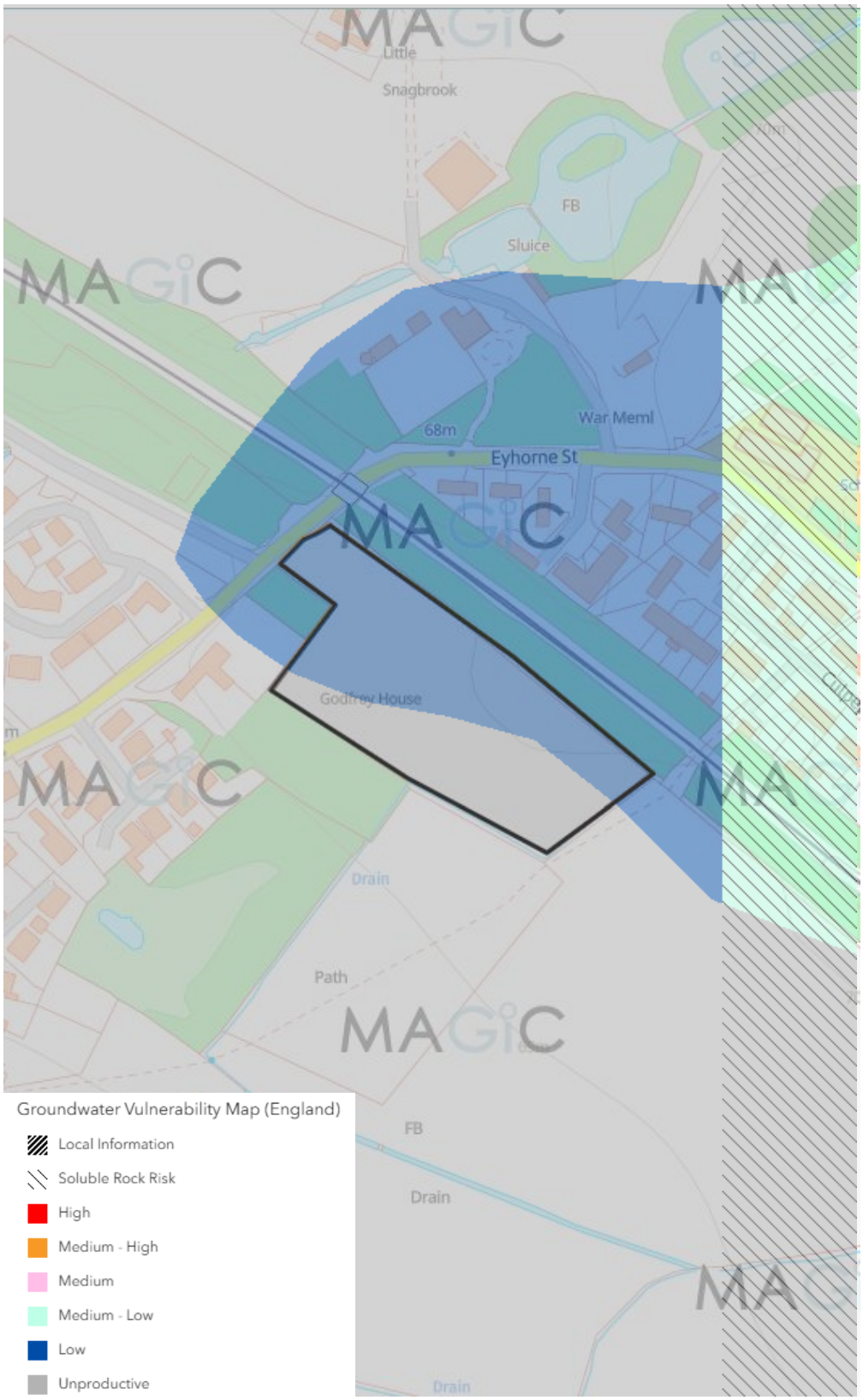
The site is clear from the risk of flooding from this source

DEFRA Historical Flooding Map

This site has not been affected by flooding in the past

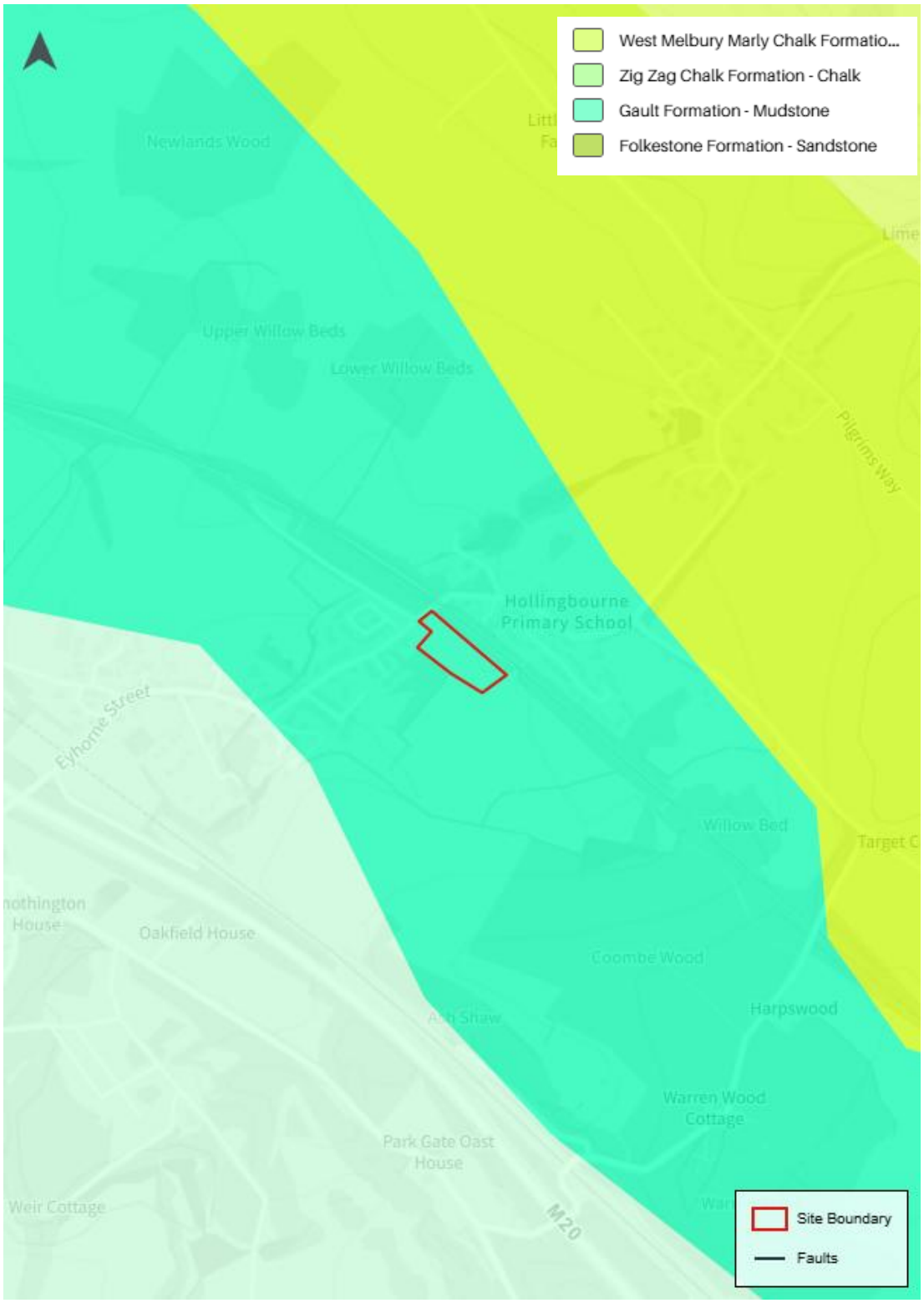
Environment Agency Groundwater Source Protection Zones Map

The site is not situated within a groundwater source protection zone.



Environment Agency Online Groundwater Vulnerability Zones Map

The site overlies a Unproductive/Low Groundwater Vulnerability Zone.

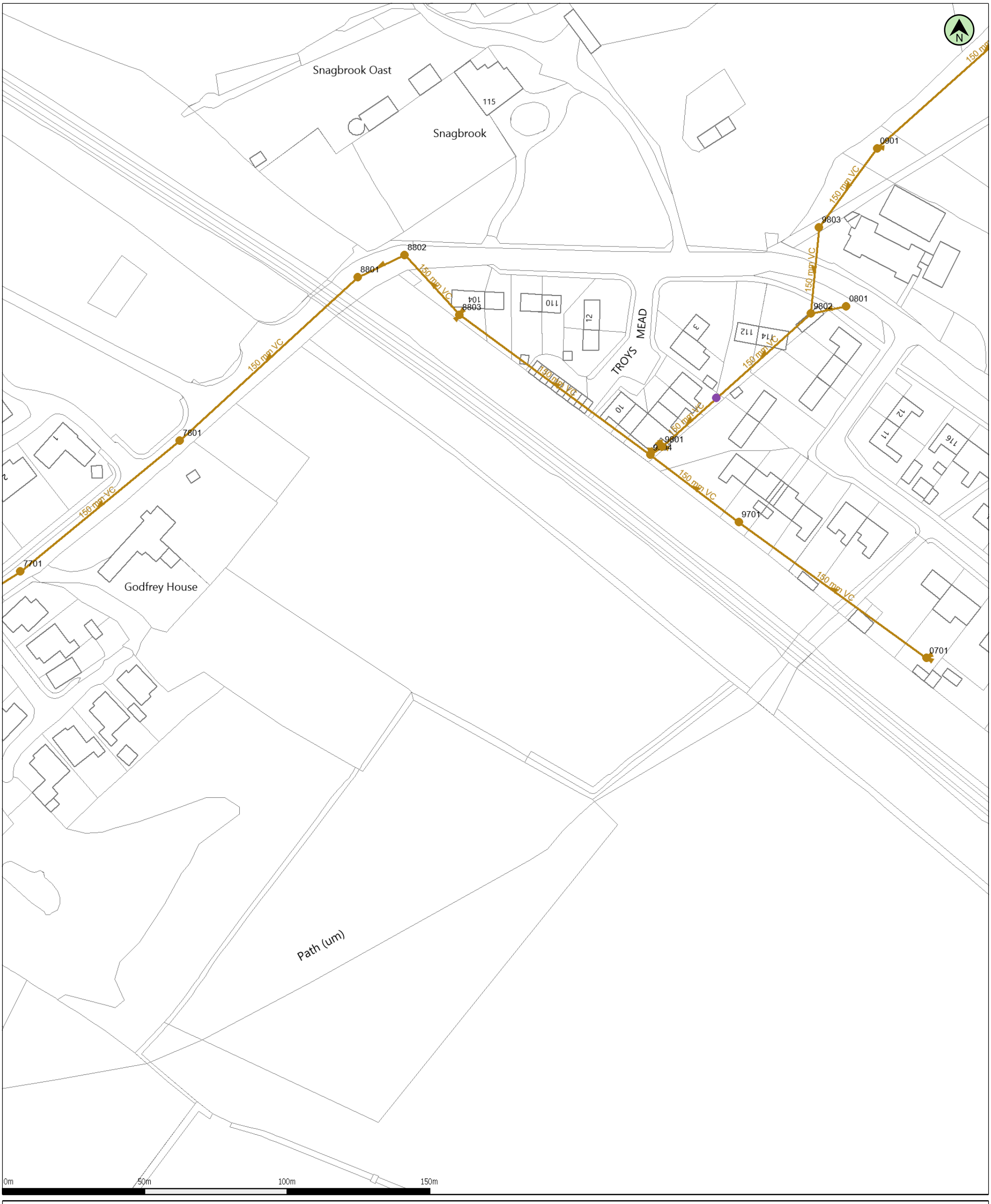


BGS Geology Map

BGS Hydrogeology Map

Appendix E

Sewer Records



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Data updated: 22/08/24 | Map Centre: 583883,154753 | Our Ref: 1554100 - 9 | Powered by digdat

Foul Gravity Sewer
Combined Gravity Sewer
Culverted Water Course or Treated Effluent
Surface Water Gravity Sewer
Rising Main, Vacuum or Syphon
Combined Outfall
Surface Water Outfall
Foul Outfall
Surface Water Inlet
Combined Pumping Station
Surface Water Pumping Station
Foul Pumping Station
WWTW Water Treatment Works
Section 104 Area
Building Over Agreement Area
Foul Manhole
Combined Manhole
Surface Water Manhole
Side Entry Manhole, Decarcation Chamber, Dummy Manhole or Surface Water Soakaway

payments.utilitysolutions@atkinsglobal.com

229812

WATER for LIFE

from Southern Water.

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 positions should be determined on site. This plan is produced by Southern Water Services Ltd (c) Crown copyright and database rights 2024 Ordnance Survey 100031673 .This map is to be used for the purposes of viewing the location of Southern Water plant only. Any other uses of the map data or further copies is not permitted.

WARNING: BAC pipes are constructed of Bonded Asbestos Cement.

WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement.

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
0701	F	70.06	68.56	
0801	F	0.00	0.00	
0901	F	72.40	70.61	
7701	F	62.12	60.60	
7801	F	63.83	62.18	
8801	F	66.50	64.52	
8802	F	67.05	65.32	
8803	F	68.80	66.88	
9701	F	69.96	68.40	
9801	F	69.38	67.79	
9802	F	70.99	69.05	
9803	F	71.13	69.22	
9804	F	69.36	67.77	

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert

Appendix F

Drawings

GENERAL NOTES

1. The location, size, depth and identification of existing services that may be shown or referred to on this drawing have been assessed from non intrusive observations , record drawings or the like. The contractor shall safely carry out intrusive investigations, trial holes or soundings prior to commencing work to satisfy himself that it is safe to proceed and that the assessments are accurate. any discrepancies shall be notified to gta prior to works commencing.

2. Tender or billing drawings shall not be used for construction or the ordering of materials.

3. Do not scale. All dimensions and levels to be site confirmed.

4. This drawing shall be read in conjunction with all relevant architects, consultants drawings and specifications, together with H&S plan requirements.

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9. Should any apparent discrepancies between the data contained within the DWG file and the current contract drawings become evident, it must be reported back to GTA Civils & Transport as soon as reasonably practicable. Precedence should be given to the current contract drawings (PDF) unless advised otherwise.

DESIGN NOTES

1. STORAGE DESIGN BASED ON 1 IN 100 YR STORM + 45 %. ADDITIONAL 10% ALLOWANCE INCLUDED ON ROOF AREAS FOR 'URBAN CREEP'.

2. OFF-SITE SURFACE WATER DISCHARGE TO BE RESTRICTED TO 1.0 l/s AS PER EXISTING GREENFIELD QBAR RATE, IN ACCORDANCE WITH NATIONAL STANDARDS FOR SuDS.

3. EXISTING TREES TO BE PROTECTED WHERE EXCAVATIONS RUN CLOSE. ANY DRAIN ROUTE THROUGH ROOT PROTECTION AREAS TO BE INSTALLED IN ACCORDANCE WITH ARBORICULTURAL SPECIALIST REQUIREMENTS.

4. PROPOSED FOUL SEWER CONNECTION SUBJECT TO AGREEMENT WITH SOUTHERN WATER.

5. CONTRACTOR TO ESTABLISH LOCATIONS OF ALL EXISTING SERVICES PRIOR TO COMMENCING.

6. DRAIN POINTS AND LOCATIONS TO BE CONFIRMED BY ARCHITECT.

KEY

EXISTING FOUL WATER SEWER
PROPOSED SURFACE WATER SEWER
PROPOSED FOUL WATER SEWER
PROPOSED FOUL WATER SEWER
PROPOSED ATTENUATION BASIN
FLOW CONTROL
DIRECTION OF FLOW

Rev	Amendments	Date	Dsn	Chk
P2	UPDATED TO REFLECT LATEST ARCHITECT LAYOUT	17.10.25	AW	FVV
P1	INITIAL ISSUE	16.10.25	AW	FVV

Status: PRELIMINARY

Client: CANTIUM LTD

Architect: GDM ARCHITECTS

Project: EYHORNE STREET HOLLINGBOURNE

Title: PROPOSED DRAINAGE STRATEGY PLAN

Date	Scale @ A0
OCTOBER 2025	1:250
Clients Ref.	Project Ref. 13690

gta Civils & Transport
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Drawing Number: 13690_1101 | Rev. P2

Greenfield runoff rate estimation tool

www.uksuds.com | Greenfield runoff rate estimation tool (https://www.uksuds.com/)

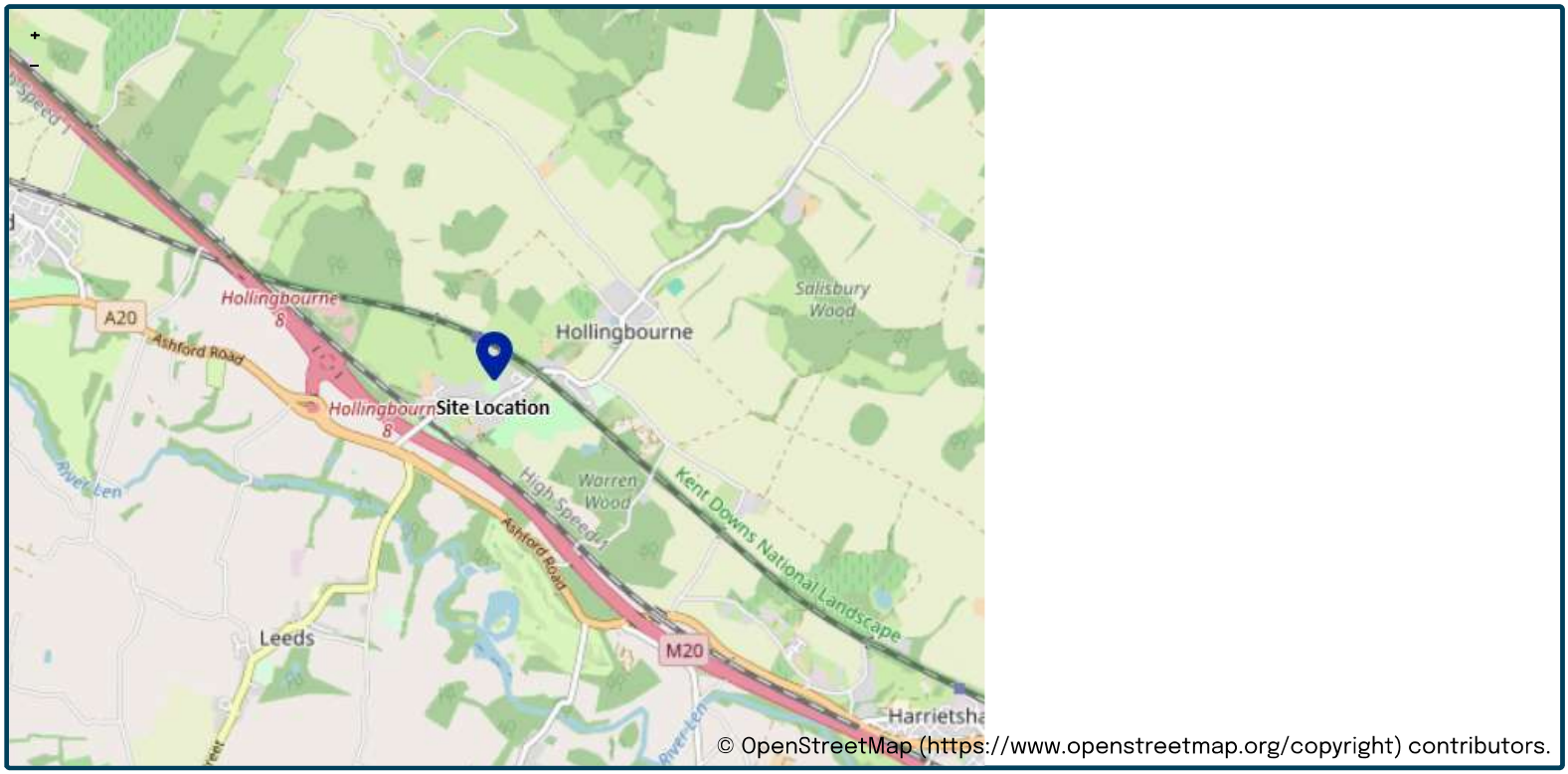
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015).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

Project details

Date	16/10/2025
Calculated by	Abbie Webb
Reference	13690
Model version	2.2.1

Location

Site name	Land off Eyhorne Street
Site location	Hollingbourne, Kent



Site easting (British National Grid)	583544
Site northing (British National Grid)	154670

Site details

Total site area (ha)	1 ha

Greenfield runoff

Method

Method	FEH statistical (2025)

FEH statistical (2025)

	My value		Map value
SAAR9120 (mm)	683 mm		
BFIHOST19scaled	0.687		
QMed-QBar conversion	1.136		1.136
QMed (l/s)	1.2 l/s		
QBar (FEH statistical 2025) (l/s)	1.4 l/s		

Growth curve factors

	My value		Map value
Hydrological region	7		7
1 year growth factor	0.85		
2 year growth factor	0.88		
10 year growth factor	1.62		
30 year growth factor	2.3		
100 year growth factor	3.19		
200 year growth factor	3.74		

Results

Method	FEH statistical (2025)	
Flow rate 1 year (l/s)	1.2	l/s
Flow rate 2 year (l/s)	1.2	l/s
Flow rate 10 years (l/s)	2.2	l/s
Flow rate 30 years (l/s)	3.1	l/s
Flow rate 100 years (l/s)	4.3	l/s
Flow rate 200 years (l/s)	5.1	l/s

Please note runoff estimation is subject to significant uncertainty. Results are therefore normally reported to only 1 decimal place. Where 2 decimal places are provided, this does not indicate accuracy to this level, it has been adopted to prevent 'zero' figures from being reported. Outputs less than 0.01 l/s are reported as 0.01 l/s.

Disclaimer

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	100	Connection Type	Level Soffits
Additional Flow (%)	45	Minimum Backdrop Height (m)	0.200
CV	1.000	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	x
Maximum Rainfall (mm/hr)	50.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
S4	0.074	5.00	67.940	1350	583940.597	154728.585	1.522
S5	0.062	5.00	67.987	1200	583933.244	154738.724	1.712
S15	0.105	5.00	67.805	1350	583864.889	154730.583	1.458
S6	0.075	5.00	67.700	1350	583895.206	154767.317	1.635
S16	0.012	5.00	66.941	1350	583834.156	154814.822	0.993
S7	0.040	5.00	67.052	1350	583845.571	154805.084	1.227
S8			66.936	1500	583831.532	154785.959	1.171
S9			66.735	1350	583828.280	154777.041	0.999
S10			66.735	1350	583838.406	154746.457	1.000
S11			66.639	1350	583839.263	154738.853	0.925
S12			66.731	1350	583868.789	154719.071	1.112
S13			66.000	1350	583866.300	154713.966	0.396

Links

Name	US Node	DS Node	Length (m)	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)
1.000	S4	S5	12.524	66.418	66.350	0.068	184.2	300	5.18
1.001	S5	S6	47.587	66.275	66.065	0.210	226.6	375	5.84
2.000	S15	S6	47.629	66.347	66.065	0.282	168.9	375	5.57
1.002	S6	S7	62.370	66.065	65.900	0.165	378.0	375	6.97
3.000	S16	S7	15.003	65.948	65.900	0.048	312.6	375	5.25
1.003	S7	S8	23.725	65.825	65.765	0.060	395.4	450	7.35
1.004	S8	S9	9.492	65.765	65.736	0.029	327.3	450	7.50
1.005	S9	S10	32.217	65.736	65.735	0.001	32217.0	750	11.16
1.006	S10	S11	7.652	65.735	65.714	0.021	364.4	375	11.30
1.007	S11	S12	35.540	65.714	65.619	0.095	374.1	375	11.93

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)
1.000	1.155	81.6	19.5	1.222	1.337	0.074
1.001	1.199	132.4	35.8	1.337	1.260	0.137
2.000	1.391	153.6	27.4	1.083	1.260	0.105
1.002	0.926	102.2	82.9	1.260	0.777	0.316
3.000	1.019	112.6	3.1	0.618	0.777	0.012
1.003	1.016	161.6	96.5	0.777	0.721	0.368
1.004	1.118	177.8	96.5	0.721	0.549	0.368
1.005	0.146	64.7	96.5	0.249	0.250	0.368
1.006	0.943	104.2	96.5	0.625	0.550	0.368
1.007	0.931	102.8	96.5	0.550	0.737	0.368

Links

Name	US Node	DS Node	Length (m)	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)
1.008	S12	S13	5.679	65.619	65.604	0.015	378.6	375	12.04

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)
1.008	0.925	102.2	96.5	0.737	0.021	0.368

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Starting Level (m)	
Rainfall Events	Singular	Skip Steady State	x	Check Discharge Rate(s)	x
Summer CV	1.000	Drain Down Time (mins)	1440	Check Discharge Volume	x
Winter CV	1.000	Additional Storage (m³/ha)	0.0		

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
100	45	0	0

Node S12 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	65.619	Product Number	CTL-SHE-0049-1100-1000-1100
Design Depth (m)	1.000	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	1.1	Min Node Diameter (mm)	1200

Node S10 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	65.735
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	404.3	0.0	0.300	488.9	0.0	0.600	579.1	0.0	0.900	674.3	0.0
0.100	431.5	0.0	0.400	518.4	0.0	0.700	610.3	0.0	1.000	707.2	0.0
0.200	459.9	0.0	0.500	548.5	0.0	0.800	642.0	0.0			

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.27%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S4	11	67.907	1.489	59.8	2.1312	0.0000	FLOOD RISK
15 minute summer	S5	11	67.854	1.579	106.6	1.7860	0.0000	FLOOD RISK
15 minute summer	S15	11	67.785	1.438	84.0	2.0578	0.0000	FLOOD RISK
15 minute summer	S6	11	67.690	1.625	246.0	2.3261	0.0000	FLOOD RISK
15 minute summer	S16	10	66.704	0.756	20.0	1.0817	0.0000	FLOOD RISK
15 minute summer	S7	10	66.694	0.869	288.3	1.2438	0.0000	SURCHARGED
1440 minute summer	S8	1440	66.607	0.842	24.1	1.4882	0.0000	SURCHARGED
1440 minute winter	S9	1410	66.609	0.873	16.1	1.2487	0.0000	FLOOD RISK
1440 minute winter	S10	1440	66.608	0.873	15.7	464.8426	0.0000	FLOOD RISK
1440 minute winter	S11	1440	66.608	0.894	1.2	1.2791	0.0000	FLOOD RISK
1440 minute winter	S12	1440	66.608	0.989	1.2	1.4151	0.0000	FLOOD RISK
1440 minute winter	S13	1440	65.626	0.022	1.1	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	S4	1.000	S5	59.0	0.723	0.8819	
15 minute summer	S5	1.001	S6	108.1	0.817	5.2487	
15 minute summer	S15	2.000	S6	80.2	0.522	5.2533	
15 minute summer	S6	1.002	S7	248.2	2.428	6.8792	
15 minute summer	S16	3.000	S7	16.2	0.144	1.6548	
15 minute summer	S7	1.003	S8	289.2	1.790	3.7591	
1440 minute summer	S8	1.004	S9	24.0	0.135	1.5039	
1440 minute winter	S9	1.005	S10	15.7	0.243	14.1794	
1440 minute winter	S10	1.006	S11	1.2	0.012	0.8440	
1440 minute winter	S11	1.007	S12	1.2	0.011	3.9200	
1440 minute winter	S12	1.008	S13	1.1	0.011	0.0177	166.7

Appendix H

Draft Drainage Maintenance Plan

DRAFT

Drainage Maintenance Plan

Land off Eyhorne Street, Holllingbourne

Contents

1	Introduction	2
2	Summary Description of Drainage Systems	3
3	Ownership & Maintenance Responsibilities	4
4	Health and Safety	6
5	Schedule A – Sewers, Manholes, Gullies, Channel Drains	7
6	Schedule B – Detention Basins and Control Chambers	10
7	Schedule C – Permeable Pavements	12
8	Contamination or Dilution of Spillage	13

Schedule of Appendices

A Site Drainage Plans

Issue	Issue date	Compiled	Checked
First Draft Issue	22.10.2025	AW	FVV

1 Introduction

1.1 This report has been prepared by GTA Civils & Transport Ltd for Cantium Land and Development in relation to the development of the land off Eyhorne Street, Hollingbourne. No responsibility is accepted to any third party for all or part of this study in connection with this or any other development.

1.2 This Draft Drainage Maintenance Plan (DMP) has been prepared for inclusion as an Appendix to the Flood Risk Assessment (FRA) report required by Maidstone Borough Council as part of the Application.

1.3 The Draft DMP sets out the framework for the management of the proposed sustainable drainage systems (SuDS) at the development. The document will be updated with further information through the next stage of detailed design and coordination. At this stage, what is set out herein is intended to be sufficient to demonstrate the viability of the proposed SuDS maintenance regime for planning purposes.

2 Summary Description of Drainage Systems

2.1 Existing: the pre-development Site comprises existing greenfield land.

2.2 The proposals comprise construction of 17 residential units along with access roads, parking and soft landscaping.

2.3 Drainage design: the drainage layout drawings, by GTA Civils & Transport Ltd, are included in Appendix A (for the Draft DMP – see FRA Appendix F).

2.4 The surface water drainage design is based on treated and attenuated surface water runoff discharging to an existing local watercourse on the site boundary.

2.5 Off-site discharges are limited to 3 l/s/ha in line with the National standards for SuDS. This is achieved by attenuation volume provided within SuDS features, which include permeable paving and a detention basin.

2.6 All features mentioned above have been included in this draft DMP; however, this document will be updated at detailed design stage.

2.7 Foul drainage will connect to Southern Water's existing foul sewer network under Eyhorne Street to the north.

3 Ownership & Maintenance Responsibilities

3.1 Responsibility for the maintenance of the drainage system will be apportioned generally as follows:

- The developer will remain responsible for each drainage component until such time as it is handed over to the adopting authority, agent or end user.
- Individual property drainage will be cared for by the property owner.
- Highway SuDS will be the responsibility of Maidstone Borough Council as the Highway authority.
- Adopted sewers and SuDS components will be the responsibility of Southern Water, or will be vested in a sewerage company under a NAV agreement. The final arrangements will be confirmed at the next stage.
- The remaining drainage features along with the site-wide infrastructure will be cared for by the Estate Management Company. This includes permeable pavements in non-adopted areas and the piped systems that are not owned by the public bodies mentioned above.
- The main piped foul sewer networks downstream of each individual property will be adopted by the sewerage authority.

3.2 The drainage layout plans in Appendix A are colour-coded to illustrate the various ownerships across the development [...TO BE COMPLETED AT THE NEXT STAGE...].

3.3 The following sections set out schedules detailing the maintenance requirements for each of the main drainage items used within the scheme. The Estate Management Company will undertake the inspections and maintenance activities in accordance with these schedules. Public bodies will maintain adopted features in line with their established procedures.

3.4 Additional reference should be made to currently established best practice and guidance documents such as The SuDS Manual (CIRIA C753, 2015) and other resources available at the susdrain website (www.susdrain.org).

3.5 This DMP should be considered a live document. The frequency of maintenance intervals may need to be increased or decreased based on the observed performance of the drainage systems over time. Changes should be agreed with the drainage authority and recorded and dated in the DMP.

3.6 Important safety information is set out in the next section.

4 Health and Safety

4.1 All those responsible for and involved in the maintenance of the site drainage systems should be safety-conscious and comply with the relevant health and safety legislation. This includes:

- The Health and Safety at Work etc Act 1974
- The Management of Health and Safety at Work Regulations 1999
- The Workplace (Health, Safety and Welfare) Regulations 1992

4.2 The Estate Management Company is responsible for suitable risk assessment and management to ensure safe working conditions and practices. Measures to protect potential visitors also need to be considered.

4.3 Specialist contractors used should work to industry guidelines and be able to demonstrate safe working practices.

4.4 Employers have a duty to employees to inform them about the risks of their work environment and to decrease the risk as far as reasonably practicable. Appropriate personal protective equipment (PPE) should be provided and policies implemented based on risk assessment.

4.5 Operatives should be trained for working near water. Risks of contaminated water should be considered. Checking for open cuts and using nitrile gloves, waterproof plasters etc is advised.

4.6 Entry of pipes, chambers, tanks and culverts should be avoided. Work should be carried out from the surface using appropriate equipment. In the event that entry cannot be avoided to perform a critical task, the required safety training, protection measures and precautions must be implemented prior to entry. Lone working should never be attempted.

4.7 For further information refer to Section 36 of The SuDS Manual (CIRIA C753).

5 Schedule A – Sewers, Manholes, Gullies, Channel Drains

5.1 Regular inspection and maintenance is required to ensure the effective long-term operation of private drains, manholes, gullies & channel drains.

5.2 Prior to construction: a CCTV survey to be carried out on all receiving existing public sewer systems prior to connection with adopted sewers.

5.3 Post Completion: a CCTV survey to be carried out on all new and retained existing drainage systems and any downstream receiving systems, prior to connection with adopted sewers.

5.4 The report will be used to prove the integrity of the as-built drainage system prior to issue of practical completion certificate and will be handed over to the Client & Management Company for future reference.

5.5 Ongoing maintenance responsibility for all adopted sewers is by the sewerage authority and for adoptable highway drainage is by Bedford Borough Council. All other private gullies and drainage marked black on the layouts to be maintained by the Management Company in shared areas and the homeowner within any conveyed land. Operation and maintenance requirements for all sewers, manholes, gullies and channel drains are described in the following table:

Schedule	Action	Frequency
Regular Maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action. Common yard & car park & other hard standing areas to be swept clear of debris, to prevent possibility of blockages to the receiving drainage systems. Debris removal from gullies & channel drains (where may cause risks to performance). Lift and inspect receiving manholes to check for any blockages.	6 Monthly intervals. Monthly. 6 Monthly intervals, after autumn leaf fall, or as required based on specific observations. Monthly.
Remedial Actions	Repair any damaged gully or channel drain gratings. Replace / fix any loose channel drain covers.	As required. As required.
Monitoring	Carry out full CCTV survey to confirm ongoing integrity of all drains. Inspect all gullies and silt pits & drainage channels during the survey.	10-yearly intervals.

5.6 Where appropriate refer also to specialist drainage manufacturer's information and maintenance requirements.

5.7 In all instances, inspection and cleaning should be carried out only by a specialist contractor and in accordance with the guidelines given in `Safe Working in Sewers and

at Sewage Works' published by National Joint Health and Safety Committee for the Water Services.

5.8 Further information on safety is set out in Section 4.

6 Schedule B – Detention Basins and Control Chambers

6.1 Inspection Frequency and Maintenance Requirements: as per table below.

Schedule	Action	Frequency
Regular Maintenance	Remove litter and debris	Monthly, or as required
	Cut grass.	Monthly (during growing season),
	Manage other vegetation and remove nuisance plants.	Monthly at start, then as required.
	Inspect basin bed for silt accumulation.	Monthly for 6 months, quarterly for 2 years, then half yearly
	Inspect vegetation coverage	Monthly for 6 months, quarterly for 2 years, then half yearly
Occasional Maintenance	Reseed areas of poor vegetation growth, alter plant types to better suit conditions, if required.	As required or if bare soil is exposed over 10% or more of the treatment area
Remedial Actions	Repair erosion or other damage by re-turfing or reseeding.	As required.
	Relevel uneven surfaces and reinstate design levels.	As required.
	Remove silt accumulation. Silt removal is only to be carried out after consultation with Environmental Officers.	Monthly for 6 months, quarterly for 2 years, then half yearly
	Remove and dispose of oils or petrol residues using safe standard practices.	As required.

Control Chambers and Hydrobrakes	Check hydrobrake orifices are clear and retention tank door is closed. Check function of retention tank door and oil if necessary. Similarly, check outfalls and inlets of attenuation ponds to ensure pipes are clear and free-flowing.	First 2 years of occupation – Monthly Then annually

6.2 Safety information is set out in Section 4.

7 Schedule C – Permeable Pavements

7.1 Inspection Frequency and Maintenance Requirements: as per table below.

Schedule	Action	Frequency
Regular Maintenance	Standard road sweeper	Annually after autumn leaf fall
Occasional Maintenance	Weed removal	Annually
Remedial Actions	Remediate adjacent landscaping to original levels Paving repairs including replenishment of lost jointing material Rehabilitation of surface and upper substructure by remedial sweeping	As required As required Every 10 to 15 years or as required if infiltration is reduced by clogging
Monitoring	Initial inspection Inspection for evidence of poor operation and/or weed growth Inspection for silt accumulation to establish sweeping frequencies Monitor inspection chambers	Monthly for first three months Quarterly, 48 hrs after large storms in first six months Annually Annually

7.2 Safety information is set out in Section 4.

8 Contamination or Dilution of Spillage

8.1 In the event of a spillage it is the responsibility of the landowner to clear up any spillage before it enters the drainage system. The primary method of dealing with any spillage of hydrocarbons should be using sand to soak up the leak and prevent any hydrocarbons entering the drainage system. Once sand has been contaminated it should not be washed into the drainage system but disposed of by a Licensed Contractor.

8.2 Environment Agency – Emergency Contact Number

In the event of a spillage the Environment Agency should be contacted to notify the event and seek advice. The Environment Agency Incident Hotline is **0800 80 70 60** (Freephone 24hrs).

- End of Report -

Appendix A

Site Drainage Layouts

[Refer to FRA Appendix E]




Civil Engineering - Transport Planning - Flood Risk

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