MEC Consulting Group

FLOOD RISK & DRAINAGE

Land off Longfield Road, Meopham
Flood Risk Assessment
September 2025

Report Ref: 29473-FLD-0102

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REPORT REF: 29473-FLD-0102

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REGISTRATION OF AMENDMENTS

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EXECUTIVE SUMMARY

Site Address	Land off Longfield Road, Meopham. Grid Reference E:563982, N:166811.
Site Description and Setting	The development site consists of existing greenfield land and is approximately 5.44ha in size. It is located to the south of Longfield Road. The site is bound to the north by Longfield Road, to the east by residential development, to the south and the west by agricultural fields.
Proposed Development	Outline application for the erection of up to 120 residential dwellings, public open space and associated works. Approval is sought for the principal means of vehicular access from Longfield Road and all other matters are reserved.
Fluvial and Pluvial Flooding	The Flood Map for Planning shows the site is located wholly within Flood Zone 1 (FZ1). FZ1 is defined as land assessed as having an annual probability of river or seas flooding of less than 0.1%. The Environment Agency Flood Risk from Surface Water Map indicates the entirety of the site is at low surface water flood risk. All other sources of flood risk on site are considered as low.
Surface Water Drainage Strategy	In accordance with the National SuDS Standards, the strategy involves conveying surface water flows to an infiltration basin before discharging into the ground via infiltration. Surface water flows for an impermeable area of 1.92ha, including Urban Creep will be conveyed to the proposed infiltration basin onsite. Surface water flows within the infiltration basin will infiltrate at a conservative rate of $6.75x10^{-6}$ m/s based on rates taken during soil infiltration rate testing by MEC at soakage pit SA02 Test 2. A total storage volume of 4,147.83m^3 will the available within the infiltration basin to allow sufficient time to infiltrate and cater for all storm events. Due to the factor of safety applied the infiltration basin exceeds the 24-hour criteria, a safety factor of 10 was applied. It has therefore been modelled on the basis of the volume required for the 100-year event plus change is initially accommodated to identify a maximum water level and the volume for the 30-year event is added on top of this maximum water levels. This provided a peak water level for the basin from the two events and the cumulative level of storage has been calculated for each basin. Additional drainage features such as permeable paving and rain gardens could be included as part of the proposed development to provide extra storage and provide a first treatment stage for any runoff.
Foul Water Drainage Strategy	Sewer records and a developer enquiry have been obtained from Southern Water (SW)**.** The closest foul sewer to the site is a 225mm foul sewer located along Longfield Road to the southeast of the site approximately 65m away. SW has confirmed that foul flows generated by the site can discharge into MH2701 along Longfield Road approximately 65m from the site. Given the levels on site foul water will need to be pumped from the site to connect into MH2701.
Conclusions	With the above measures in place, the development of the site will not create any flood risk issues to the wider area.
This summary should be read in conjunction with the full report and reflects an assessment of the site based on information received by MEC at the time of production.	

CONTENTS

1.0	INTRODUCTION	5
2.0	POLICY CONTEXT	7
3.0	SITE DESCRIPTION	9
4.0	FLOOD RISK TO SITE	11
5.0	FLOOD RISK ASSESSMENT	14
6.0	SURFACE WATER MANAGEMENT STRATEGY	18
7.0	FOUL WATER STRATEGY	25
8.0	CONCLUSION AND SUMMARY	26

APPENDICES

A. SITE LOCATION
B. DEVELOPMENT FRAMEWORK PLAN
C. TOPOGRAPHIC SURVEY
D. SOUTHERN WATER CORRESPONDENCE
E. MEC SOIL INFILTRATION RATE TESTING (29473-CALC-0402)
F. DRAINAGE STRATEGY (29473_01_230_02)
G. ATTENUATION CALCULATIONS (29473-CALC-0102)
H. MAINTENANCE AND MANAGEMENT PLAN

1.0 INTRODUCTION

1.1 MEC Consulting Group Ltd (MEC) has been commissioned by Richborough (hereafter referred to as 'the Client') to undertake a Flood Risk Assessment in support of a proposed residential development on Land off Longfield Road, Meopham (hereafter referred to as 'the Site'). A site location plan is provided in **Appendix A**

1.2 The development proposals comprise:

Outline application for the erection of up to 120 residential dwellings, public open space and associated works. Approval is sought for the principal means of vehicular access from Longfield Road and all other matters are reserved.

1.3 A development framework plan is provided in **Appendix A**.

1.4 A review of relevant information and guidance from a range of sources has been undertaken and includes the following key documents;

- National Planning Policy Framework (NPPF) - December 2024
- Flood Risk and Coastal Change Planning Practice Guidance (PPG) - August 2022
- Environment Agency Flood Map for Planning and Risk of Flooding from Surface Water datasets from the DEFRA Spatial Data Catalogue
- DEFRA Magic Map, 2025
- British Geological Survey Geology Viewer, 2025
- The Kent Thameside Delivery Board Strategic Flood Risk Assessment of Kent Thameside, December 2005
- The Gravesham Local Plan Core Strategy, September 2014
- The Kent County Council Preliminary Flood Risk Assessment Report, September 2011
- The Kent Local Flood Risk Management Strategy 2024-2034, June 2024
- The Kent County Council Flood Risk to Communities Gravesham, September 2017

1.5 The Local Planning Authority is Gravesham Borough Council whilst the Lead Local Flood Authority for the site is Kent County Council (KCC). The site falls within the Southern Water (SW) Catchment.

1.6 Pre-Application Advice was received from KCC on the 28th August 2025. The response can be seen within **Appendix I** and relevant comments have been incorporated into this report and the appended drainage strategy.

Disclaimer

1.7 MEC has completed this report for the benefit of the individuals referred to in paragraph 1.1 and any relevant statutory authority which may require reference in relation to approvals for the proposed development. Other third parties should not use or rely upon the contents of this report unless explicit written approval has been gained from MEC.

1.8 MEC accepts no responsibility or liability for:

- The consequence of this documentation being used for any purpose or project other than that for which it was commissioned;
- The issue of this document to any third party with whom approval for use has not been agreed.

2.0 POLICY CONTEXT

National Planning Policy Framework

2.1 The National Planning Policy Framework (NPPF) was published and updated most recently in December 2024 by the Ministry of Housing, Communities and Local Government.

2.2 The NPPF is the primary source of national planning guidance in England, setting out the Government's planning policies for England, and how they are expected to be applied by local councils.

2.3 'Chapter 14: Meeting the challenge of climate change, flooding, and coastal change' outlines the guiding principles for managing flood risk as part of the planning process, notably paragraphs 161 - 186.

2.4 The Planning Practice Guidance (PPG) sets out the vulnerability to flooding of different land uses. It encourages development to be in areas of lower flood risk where possible and stresses the importance of preventing increases in flood risk off-site to the wider catchment.

2.5 The PPG also states that alternative sources of flooding, other than fluvial (river flooding), should be considered when preparing an FRA. The document also includes a series of tables that define Flood Zones, the flood risk vulnerability classification of development land use, and 'compatibility' of development within the defined Flood Zones.

2.6 Therefore, this FRA has been completed in line with the guidance and requirements of the NPPF and PPG.

Local Plan

2.7 The Gravesham Local Plan Core Strategy was adopted by in September 2014. The Local Plan Core Strategy sets out how land within the authorities' boundaries can be used and developed, providing policies which the Council uses to determine planning applications. The plan aims to ensure future growth and changes to the district are appropriate to local needs now and in the future.

2.8 More generally, the lists policies that guide the design and principles of all development within the authority's land. Those relevant to this FRA are summarised as follows;

- Policy CS18: Climate Change

Local SFRA

2.9 The Kent Thameside Delivery Board Strategic Flood Risk Assessment of Kent Thameside (SFRA) was published in December 2005. The SFRA was produced to provide an appropriate evidence base for the Local Plan and provide a summary of flood risk across the district.

2.10 Appropriate background information has been used to inform this FRA and will be referenced accordingly.

Local PFRA

2.11 The Kent County Council Preliminary Flood Risk Assessment Report (PFRA) was published in September 2011 and was prepared to assist Kent County Council meet its duties to manage local flood risk and deliver any legal requirements placed on it as Lead Local Flood Authority (LLFA) under the Flood Risk Regulations 2009.

2.12 Appropriate background information has been used to inform this FRA and will be referenced accordingly.

Local Flood Risk Management Strategy

2.13 The Kent Local Flood Risk Management Strategy 2024-2034 (LFRMS) was published in June 2024 to comply with Section 9 of the Flood and Water Management Act 2010 and aims to provide a framework for meeting its requirements to develop, maintain, apply, and monitor a local strategy for flood risk management and how Kent County Council aim to achieve this.

2.14 The FRMS provides further information regarding surface water runoff, groundwater and sewer flooding and flood risk around the County and the introduction of flood risk alleviation schemes at various scales, including SuDS.

Supplementary Planning Documents

2.15 The Kent County Council Flood Risk to Communities Gravesham was published in September 2017. This report aims to provide a summary of the main flood risks to the county, the key flood risk management assets/structures and any flood risk management plans or strategies that are in place for the area of Gravesham.

3.0 SITE DESCRIPTION

Site Location and Features

3.1 The development site consists of existing greenfield land and is approximately 5.44ha in size. It is located to the south of Longfield Road. The site is bound to the north by Longfield Road, to the east by residential development, to the south and the west by agricultural fields. The site location is shown in Figure 3.1.

Figure 3.1: Site Location Plan

Note: Red line boundary is approximate

Topographic Data

3.2 Full details of the topographical survey are included in **Appendix C**. The information indicates the site slopes generally from southwest to northeast. The lowest part of the site is within the northeastern boundary. Site levels range from 116.63m AOD to 106.00m AOD.

Flood Zone Maps & Flood Defence Data

3.3 Information relating to the current flood risk to the application site has been obtained from the Environment Agency and gov.uk websites. There is no recorded evidence of flood defences within 250m of the site.

Watercourses & Hydrology

3.4 The closest designated Main River is the River Medway, located approximately 6.87km east of the site. There are no smaller watercourses located nearby to the site.

Historic Flooding

3.5 The EA historical map shows that there are no known flood incidents within the vicinity of the site within 250m of the site.

Geological Data

3.6 British Geological Survey (BGS) mapping indicates that the majority of the site is underlain by bedrock geology of the Lewis Nodular Chalk Formation, Seaford Chalk Formation and Newhaven Chalk Formation. The Thanet Formation is mapped in the southeastern corner of the site. There are no recorded superficial deposits.

Sewers

3.7 Sewer records and a developer enquiry have been obtained from SW see **Appendix D.** The sewer records show there are no surface water sewers within the vicinity of the site. The closest sewer to the site is a 225mm foul sewer located along Longfield Road to the southeast of the site approximately 65m away.

4.0 FLOOD RISK TO SITE

Flood Zone Allocation

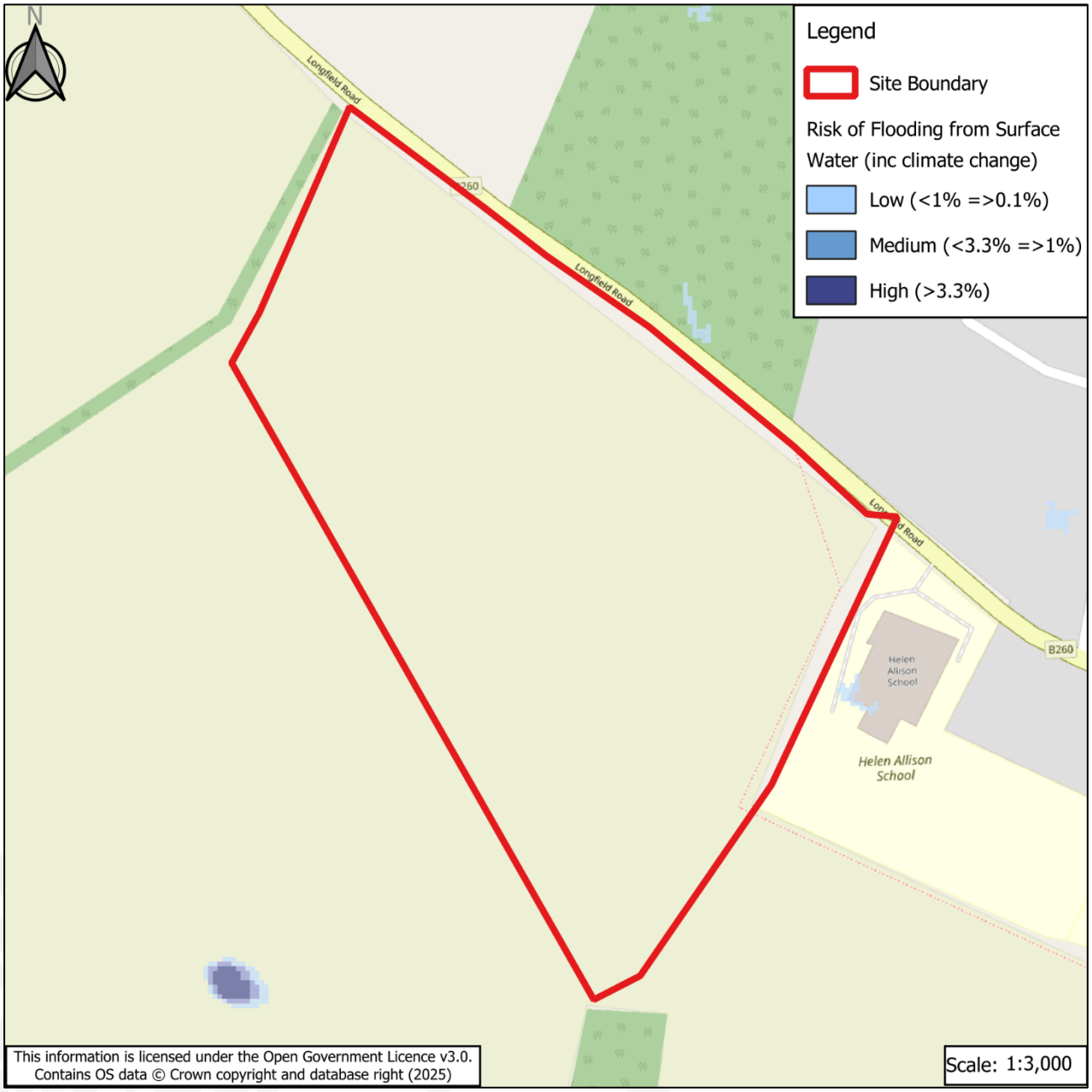
4.1 The Flood Map for Planning is shown in Figure 4.1. The map shows the site is located wholly within Flood Zone 1 (FZ1). FZ1 is defined as land assessed as having an annual probability of rivers or seas flooding of less than 0.1%.

Figure 4.1: Extract from Environment Agency's Flood Map for Planning (Rivers and Sea).

Surface Water Flooding Risk Allocation

4.2 The Environment Agency Flood Risk from Surface Water Map, which includes climate change for the 2050's epoch (2022 to 2060) (refer to Figure 4.2), indicates the entirety of the site is at low surface water flood risk.

Figure 4.2: Environment Agency's Flood Risk from Surface Water Extents Map including climate change for the 2050's epoch.



Flooding from Artificial Watercourses

4.3 The Environment Agency Mapping shows that the site is not at risk of reservoir flooding; as such, the risk of flooding from reservoirs is low.

4.4 The site is far removed from any canals. Due to the distance and intervening topography, the risk of flooding from this source is negligible.

Groundwater Flood Risk

4.5 No groundwater was encountered during soil infiltration rate testing undertaken by MEC in April 2025, included as **Appendix E**. Three tests were undertaken and an additional two trial pits to depths of 3.30m bgl.

4.6 The site is located in a Groundwater Source Protection Zone (SPZ) 2. No groundwater abstractions are recorded within 500m of the site.

4.7 It is determined that groundwater risk to the site is low. It is however recommended further groundwater testing is undertaken at the detailed stage and incorporating the winter period.

Sewer Flood Risk

4.8 According to the SFRA there has been recorded issues regarding sewer flooding within the Gravesham and Meopham area, however it is unknown if this is directly in relation to the site. Given the topography of the site and the distance from the nearest sewer it is assumed that sewers pose a low flood risk to the site.

5.0 FLOOD RISK ASSESSMENT

Flood Risk Assessment Methodology & Objectives

5.1 It is recognised that developments that are designed without regard to flood risk may endanger lives, damage property, cause disruption to the wider community, damage the environment, be difficult to insure and require additional expense on remedial works. Current guidance on development and flood risk identifies several key aims for development to ensure that it is sustainable in flood risk terms.

5.2 These aims are as follows:

- The development should not be at significant risk of flooding and should not be susceptible to damage due to flooding;
- The development should not be exposed to flood risk such that the health, safety and welfare of the users of the development, or the population elsewhere, are threatened;
- Safe access/egress to and from the development should be possible during flood events;
- The development should not increase flood risk elsewhere;
- The development should not prevent safe maintenance of watercourses or maintenance and operation of flood defences;
- The development should not be associated with an onerous or difficult operation and maintenance regime to manage flood risk. The responsibility for any operation and maintenance required should be clearly defined;
- Future users of the development should be made aware of any flood risk issues relating to the development;
- The development should not lead to the degradation of the environment; and
- The development should meet all of the above criteria for its entire lifetime, including consideration of the potential effects of climate change.

5.3 This Flood Risk Assessment is undertaken with due consideration of these sustainability aims and has been prepared to inform the proposed scheme.

Project Scope

5.4 In order to achieve the aims outlined above, this Flood Risk Assessment has been undertaken in accordance with current best-practice guidance, including the National Planning Practice Guidance. A scoping study was initially undertaken to identify all potential sources of flooding at the site, which may warrant further consideration. Any potential flooding issues identified in the scoping study have subsequently been considered within this Flood Risk Assessment. The aim of the scoping study is to review all available information and provide a qualitative assessment of the flood risk to the site and the impact of the site on flood risk elsewhere. The report has been undertaken with due regard to the EA's National Standing Advice on Development and Flood Risk.

Scoping Study

5.5 All potential sources of flooding must be considered for any proposed development.

5.6 Using the EA Flood Zone mapping, topographical survey and Ordnance Survey maps, a summary of the potential sources of flooding and a review of the potential risk posed by each source on the development area of the application site is presented in Table 5.1.

Table 5.1: Potential Risks posed by Flooding Sources in accordance with the gov.uk Long-Term Flood Risk Map

Source	Risk		
	High	Medium	Low
Fluvial			✓
Tidal			✓
Surface Water			✓
Groundwater			✓
Sewer			✓
Artificial water bodies			✓

Flood Risk Mitigation

5.7 It is vital that the correct mitigation is put in place to minimise the flood risk to the development. In accordance with the NPPF, this includes preventing harm from occurring to the users of the site as well as ensuring the development itself is protected.

Fluvial Flood Risk Mitigation

5.8 The proposed development falls entirely in Flood Zone 1. Given the site is in Flood Zone 1 and at low risk of fluvial flooding, there would be no requirements to provide any further formal mitigation at this development site.

Surface Water Flood Risk Mitigation

5.9 The Environment Agency Flood Risk from Surface Water Map, which includes climate change for the 2050's epoch (2022 to 2060), indicates the entirety of the site is at low risk from surface water flooding. There would be no requirements to provide any further formal mitigation at this development site.

Vulnerability Classification of Proposed Development

5.10 The National Planning Practice Guidance: Flood Zone and Flood Risk Tables provide information on the vulnerability classification of various developments. The proposed residential development end use of this site falls in the "more vulnerable" classification. A comparison of the "more vulnerable" use with the development proposals within Flood Zone 1 areas shows development proposals are acceptable and in accordance with NPPF, as shown in Table 5.2.

Table 5.2: Flood risk vulnerability and flood zone 'compatibility' from Flood Risk and Coastal Change – Planning Practice Guidance

Flood Risk Vulnerability classification		Essential Infrastructure	Water compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Flood Zone	Zone 1	✓	✓	✓	✓	✓
	Zone 2	✓	✓	Exception Test Required	✓	✓
	Zone 3a	Exception Test required	✓	x	Exception Test Required	✓
	Zone 3b 'Functional Floodplain'	Exception Test Required	✓	x	x	x

Key: ✓ Development is appropriate X Development should not be permitted

Sequential Test

5.11 The Sequential Test gives preference for locating new developments in low-risk areas from all sources of flooding. The PPG states the aim of the sequential test is to:

"… ensure that areas at little or no risk of flooding from any source are developed in preference to areas at higher risk. This means avoiding, so far as possible, development in current and future medium and high flood risk areas considering all sources of flooding including areas at risk of surface water flooding".

5.12 Paragraph 175 of the NPPF states:

"The sequential test should be used in areas known to be at risk now or in the future from any form of flooding, except in situations where a site-specific flood risk assessment demonstrates that no built development within the site boundary, including access or escape routes, land raising or other potentially vulnerable elements, would be located on an area that would be at risk of flooding from any source, now and in the future (having regard to potential changes in flood risk)."

5.13 A recent update of the PPG at paragraph 027, provides more clarify on the application of paragraph 175 and states:

"In applying paragraph 175 a proportionate approach should be taken. Where a site-specific flood risk assessment demonstrates clearly that the proposed layout, design, and mitigation measures would ensure that occupiers and users would remain safe from current and future surface water flood risk for the lifetime of the development (therefore addressing the risks identified e.g. by Environment Agency flood risk mapping), without increasing flood risk elsewhere, then the sequential test need not be applied"

5.14 All development is located within Flood Zone 1 and the entirety of the site is at low risk from surface water flooding.

Exception Test

5.15 Based on the above the proposed development is in accordance with paragraphs 161 to 181 of the NPPF, as such an exception test is not required.

6.0 SURFACE WATER MANAGEMENT STRATEGY

6.1 It is essential that the proposed development does not increase flood risk to adjacent land or downstream of the site and protects the development from flooding itself. To ensure that the flood risk is minimised, the drainage design will incorporate the following flood mitigation measures:

- Site levels will be designed 150mm above the adjacent road levels and to direct all overland surface water flows away from the dwellings by following the natural topography and any proposed green corridors.
- The proposed development will include a surface water drainage system that will intercept runoff generated within the development. This will minimise the risk of flooding to the new buildings and also reduce the incidence of overland flows.
- The surface water drainage system will convey flows to the infiltration features on site. The surface water flows generated within the development up to and including a 1%AEP45CC will be stored on-site.

Surface Water Outfall

6.2 Surface water arising from developed sites should, as far as practical, be managed in a sustainable manner to mimic the surface water flows arising from the undeveloped site. When considering the surface water discharge the SuDS hierarchy needs to be adhered to. The SuDS hierarchy states that the options below must be adhered to in order of sustainability or evidenced otherwise before moving down to a less sustainable discharge method;

- Water reuse, where a need is identified;
- Discharge at source (soakaway)
- Watercourse or waterbody
- To a surface water sewer, highway drain, or other drainage systems
- To a combined sewer

Water Reuse

6.3 Consideration should be given to the implementation of rainwater harvesting systems, including but not limited to; water butts on residential dwellings, and rain gardens to ensure water re-use.

6.4 The first 5mm of rainfall will be collected via rainwater techniques. However, given the scale of development, and attenuation requirements calculated, it is, at this stage, not considered feasible to have collection of rainwater for non-potable uses to provide a wholesale means of surface water runoff attenuation within the site boundary.

6.5 As such, an alternative method of disposal should be investigated, with non-potable use further considered within the detailed designed of the proposed development.

Discharge at Source

6.6 British Geological Survey (BGS) mapping indicates that the majority of the site is underlain by bedrock geology of the Lewis Nodular Chalk Formation, Seaford Chalk Formation and Newhaven Chalk Formation. The Thanet Formation is mapped in the southeastern corner of the site. There are no recorded superficial deposits.

6.7 Soil Infiltration Rate Testing was completed by MEC in April 2025 within three trial pit locations (SA01- SA03), to a maximum depth of 2.0bgl. Testing was undertaken within the Thanet Formation. Testing was undertaken to BRE365 Standards, soakaway testing results and locations are included in **Appendix E**. Out of the five tests that were undertaken only one provided insufficient soakage results. Rates varied between $6.75x10^{-6}$ to $9.73x10^{-6}$ m/s, results can be seen in Table 6.1. No groundwater was encountered during testing.

Table 6.1: Summary of Soil Infiltration Rate Test Results April 2025

Trial Pit	Test No.	Infiltration rate (m/s)
SA01	**1**	$1.13x10^{-6}$
SA02	**1**	$9.73x10^{-6}$
	2	**$6.75x10^{-6}$**
	3	$9.16x10^{-6}$
SA03	**1**	Insufficient Soakage
Results show in bold reflect the lowest infiltration rate for design purposes		

6.8 It is recommended additional soakage testing is completed at the detailed design stage.

Discharge to Watercourse

6.9 In accordance with the drainage hierarchy, surface water will discharge into the ground.

Discharge to Sewers

6.10 In accordance with the drainage hierarchy, surface water will discharge into the ground.

Land Use

6.11 In order to calculate the drainage requirements an understanding of the land use on-site needs to be known. Table 6.2, below summarises the proposed land uses within the site. The site currently consists of open green space and the current land use has been calculated using the existing site plan and the post-development land use has been measured from the illustrative layout.

Table 6.2: Land Use Summary

Land Use Type	Existing Site Areas		Proposed Site Areas	
	ha	%	ha	%
Impermeable Areas	0	0	1.75	32
Green Landscape / Permeable areas	5.44	100	3.69	68
Total	**5.44**	**100**	**5.44**	**100**

Urban Creep Allowances

6.12 Urban creep is the conversion of permeable surfaces to impermeable ones over time, e.g., extensions to existing buildings. It has been shown that, over the lifetime of development, urban creep can increase impermeable areas by as much as 10%. An allowance of 10% for increases in the impermeable area due to urban creep over the lifetime of the development will be included within the drainage calculations. The impermeable area is therefore adjusted to 1.92ha.

Climate Change Allowances

6.13 The influence of climate change on rivers and watercourses is likely to increase the frequency of flood events and the overall volume of water that passes the site. When considering surface water runoff from the site, the increase in peak rainfall intensity varies over the lifetime of the development. Where residential developments with a lifetime beyond the 2070s are proposed the Flood Risk Assessments: Climate Change Allowances Guidance requires the use of the Upper-End Allowance for the 2070s epoch (2061 to 2125). However, in some locations, the allowance for the 2050s epoch is higher than that for the 2070s epoch. If the 2050s epoch is higher than that for the 2070s epoch then the higher of the two allowances should be applied.

6.14 For the Medway Management Catchment, the 2050s epoch is higher than that for the 2070s for the 1%AEP and as such a 45% allowance will be applied with the design, see Table 6.3.

Table 6.3: Peak Rainfall intensity allowance in small and urban catchments from the Flood Risk Assessments: Climate Change Allowances Guidance

	Total potential change anticipated for the '2050s' (2022 to 2060)		Total potential change anticipated for the '2070s' (2061 to 2125)	
Annual Exceedance Probability	Central	Upper End	Central	Upper End
3.3 % AEP	20%	35%	25%	35%
1 % AEP	20%	45%	20%	40%

Drainage Strategy

6.15 The overall drainage strategy has been based on the land use table, infiltration rates and the current site layout presented in **Appendix B**. In accordance with the National SuDS Standards, the strategy involves conveying surface water flows to an infiltration basin before discharging into the ground via infiltration.

6.16 The proposed drainage strategy is shown on drawing 29473_01_230_02 in **Appendix F** and supporting calculations can be found in **Appendix G**.

6.17 Surface water flows for an impermeable area of 1.92ha, including Urban Creep will be conveyed to the proposed infiltration basin onsite. Surface water flows within the infiltration basin will infiltrate at a conservative rate of $6.75x10^{-6}$ m/s based on rates taken during soil infiltration rate testing by MEC (**Appendix E**). A total storage volume of 4,147.83m^3 (2,505.05m^3 for the 100-year +45 CC event and 1,642.78m^3 for the subsequent 30-year + 35 CC event) will the available within the infiltration basin to allow sufficient time to infiltrate and cater for all storm events.

6.18 A factor of safety of 10 has been applied to the basin due to the proximity of existing roads. The factor of safety is derived from Table 25.5 of the SuDS Manual CIRIA document C753. This indicates that one of the largest uncertainties when designing infiltration systems is that the infiltration rate may reduce over time, particularly if effective pre-treatment is not included, and/or system maintenance is poor. To account for this a factor of safety has been introduced to reduce the value of the infiltration rate. The factor of safety used depends upon the consequences of the system failure and engineering judgement.

6.19 Due to the safety factor applied the infiltration basin exceeds the 24-hour criteria. It has therefore been modelled on the basis of the volume required for the 100-year event +45% CC is initially accommodated to identify a maximum water level and the volume for the 30-year +35% CC event is added on top of this maximum water levels. This provided a peak water level for the basin from the two events and the cumulative level of storage has been calculated for each basin.

6.20 The drainage strategy that has been presented in this report is the minimum required to ensure sufficient storage and treatment is provided. As the application is outline and the layout is illustrative, additional SuDS features such as permeable paving and rain gardens will be included at the detailed design stage. This requirement can be conditioned to any subsequent planning permission.

Applicable SuDS Techniques

6.21 The National Standards for Sustainable Drainage Systems which deals with SuDS, cover a whole range of sustainable approaches to surface water drainage management, including:

- source control measures including rainwater recycling and drainage;
- filter strips and swales, which are vegetated features that hold and drain water downhill mimicking natural drainage patterns;
- filter drains and porous pavements to allow rainwater and run-off to infiltrate into permeable material below ground and provide storage if needed; and
- basins and ponds to hold excess water after rain and allow controlled discharge that avoids flooding.

6.22 Each of the five SuDS considerations listed above is discussed below in Table 6.4, with reference to their suitability for the proposed development.

Table 6.4: Suitability of SuDS techniques

Component		Suitability	Reason
Source Control	Rainwater Harvesting	Yes	Water butts could be used to store run-off from roofs before discharge into the drainage system. Any storage is not to be included in calculations.
	Green Roofs	No	This would not be appropriate given the scope and scale of the development.
	Bio-retention Systems/ Rain Gardens	Yes	Rain Gardens could be used, but have not been included within the calculations at this stage.
Proprietary Systems	Proprietary bio-retention systems	No	More appropriate SuDS features can be accommodated within the development and are preferred.
Infiltration Devices	Permeable Paving	Yes	Permeable paving is suitable for the proposed development within private roads and parking spaces.
	Infiltration trenches/ Soakaways	Yes	Following soakage testing undertaken by MEC it was determined infiltration is a viable form of outfall from the site. An infiltration basin will be used to discharge surface water flows and provide treatment.
Filtration	Open Swales, Filter Strips/ Drains	No	Given the proposed development these features are not deemed suitable.
Retention/ Detention	Detention Basin, Attenuation Pond/ Tanks	No	Given the site will discharge via infiltration these features are not deemed necessary.

Surface Water Quality

6.23 The CIRIA SuDS Manual C753, indicates the minimum treatment indices appropriate for contributing pollution hazards for different land use classifications. To deliver adequate treatment, the selected SuDS components should have a total pollution mitigation index (for each contaminant) that equals or exceeds the pollution hazard index.

6.24 When using more than one SuDS component in series the mitigation indices are multiplied by a factor of 0.5. This is to account for the reduced performance of secondary or tertiary components associated with the already reduced inflow concentrations. The SuDS Mitigation Index from the additional components will be added together up to a maximum value of 0.95, regardless of the number of components in series.

6.25 Surface water runoff from residential roofs will have a very low pollution hazard level, whilst the residential parking areas will have a low pollution hazards index.

6.26 The pollution hazard indices, mitigation indices of each SuDS component and the accompanying calculations are provided in Table 6.5.

Table 6.5: SuDS Mitigation Indices (from CIRIA SuDS Manual)

SuDS Component	Mitigation Indices		
	Total Suspended Solids	***Metal***	***Hydrocarbons***
Residential Roofs	0.2	0.2	0.05
Residential Parking Areas and low traffic roads	0.5	0.4	0.4
Permeable Paving	0.7	0.6	0.7
Rain Gardens	0.8	0.8	0.8
Infiltration Basin	0.4	0.3	0.3
Mitigation Calculation	0.7 + 0.8 (0.5) + 0.4 (0.5)	0.6 + 0.8 (0.5) + 0.3 (0.5)	0.7 + 0.8 (0.5) + 0.3 (0.5)
SuDS Mitigation Index	**0.90**	**0.75**	**0.85**
Mitigation Requirement Met?	**Yes**	**Yes**	**Yes**

6.27 For the very low to low pollution hazard levels generated at the site, the proposed permeable paving, rain gardens and infiltration basin would provide sufficient treatment in accordance with the Simple Index Approach.

Exceedance and Flow Routing

6.28 The risk of overland flooding from adjacent land to dwellings is very low. The design of levels and features on the site will follow best practice by ensuring any overland flow on the site is routed safely away from dwellings and to areas of lowest risk on site. Any surcharging and subsequent flooding of sewers on or in the vicinity of the site will also be mitigated by the flood routing described above. As such the risk of flooding on site from exceedance events and flood flow routes is very low.

Maintenance and Management

6.29 An integrated approach to the maintenance and management of SuDS systems is a requirement of the NPPF and by the Flood & Water Management Act 2010. The aim of a maintenance and management plan is to ensure that there is a clear understanding of drainage responsibilities and that a maintenance regime is implemented for all new drainage systems for the lifetime of the development, so they can continue to function as required and will not result in additional pollution entering the watercourse.

6.30 Surface water drainage, including SuDS features, shall be offered to SW for adoption.

6.31 All private drainage systems, will be maintained by individual occupiers and landowners, or an appointed management company.

6.32 A proposed maintenance schedule that breaks down the maintenance requirements of the various proposed assets can be found in **Appendix H** and is in accordance with CIRIA C753 SuDS Manual guidance.

7.0 FOUL WATER STRATEGY

7.1 According to The Building Regulations (2010), foul water drainage from new developments should be discharged into the following in order of priority:

- A public sewer, or;
- A private sewer communicating with a public sewer, or;
- A septic tank which has an appropriate form of secondary treatment, or;
- A cesspool.

7.2 Sewer records and a developer enquiry have been obtained from SW see **Appendix D.** The closest sewer to the site is a 225mm foul sewer located along Longfield Road to the southeast of the site approximately 65m away.

7.3 SW has confirmed that foul flows generated by the site can discharge into MH2701 along Longfield Road approximately 65m from the site. Given the levels on site foul water will need to be pumped from the site to connect into MH2701.

7.4 SW has advised that this sewer currently lacks sufficient capacity to accommodate additional flows, and as such, off-site improvement works would be required to facilitate a connection at this location. SW aims to provide the reinforcement work within 24 months from the date of planning has been granted.

7.5 The proposed foul water drainage options can be seen on drawing 29473_01_230_02 in **Appendix F**. Full details of the design will be confirmed at the detailed design stage.

8.0 CONCLUSION AND SUMMARY

8.1 MEC has been commissioned by Richborough to undertake a Flood Risk Assessment to support a proposed residential development on Land off Longfield Road, Meopham. This assessment has been undertaken to ascertain the constraints of the development to the site and to assess the impact of the design, with respect to flood risk.

- The Flood Map for Planning shows the site is located within Flood Zone 1.
- The Environment Agency Flood Risk from Surface Water Map indicates the entirety of the site is designated at low risk from surface water flooding.
- The site is at low risk of flooding from all other sources.
- Soil infiltration rate testing was undertaken by MEC in April 2025 to BRE365 standards and proved infiltration is a viable source of outfall at a rate of $6.75x10^{-6}$ m/s as confirmed from soakage pit SA02 Test 2.
- In accordance with the National SuDS Standards, the strategy involves conveying surface water flows to an infiltration basin before discharging into the ground via infiltration.
- Surface water flows for an impermeable area of 1.92ha, including Urban Creep will be conveyed to the proposed infiltration basin onsite. Surface water flows within the infiltration basin will infiltrate at a conservative rate of $6.75x10^{-6}$ m/s based on rates taken during Soil Infiltration Testing by MEC. A total storage volume of 4,147.83m^3 (2,505.05m^3 for the 100-year +45 CC event and 1,642.78m^3 for the subsequent 30-year + 35 CC event) will the available within the infiltration basin to allow sufficient time to infiltrate and cater for all storm events.
- Due to the safety factor applied the infiltration basin exceeds the 24-hour criteria. It has therefore been modelled on the basis of the volume required for the 100-year +45% CC event is initially accommodated to identify a maximum water level and the volume for the 30-year +35% CC event is added on top of this maximum water levels. This provided a peak water level for the pond from the two events and the cumulative level of storage has been calculated for each basin.
- Additional drainage features such as permeable paving and rain gardens could be included as part of the proposed development to provide extra storage and provide a first treatment stage for any runoff. These features have been excluded from the calculations at this stage and can be conditioned to any subsequent planning permission.
- SW has confirmed that foul flows generated by the site can discharge into MH2701 along Longfield Road approximately 65m from the site. Given the levels on site foul water will need to be pumped from the site to connect into MH2701.

8.2 With the above measures in place, the development of the site is unlikely to create any flood risk issues to the wider area.

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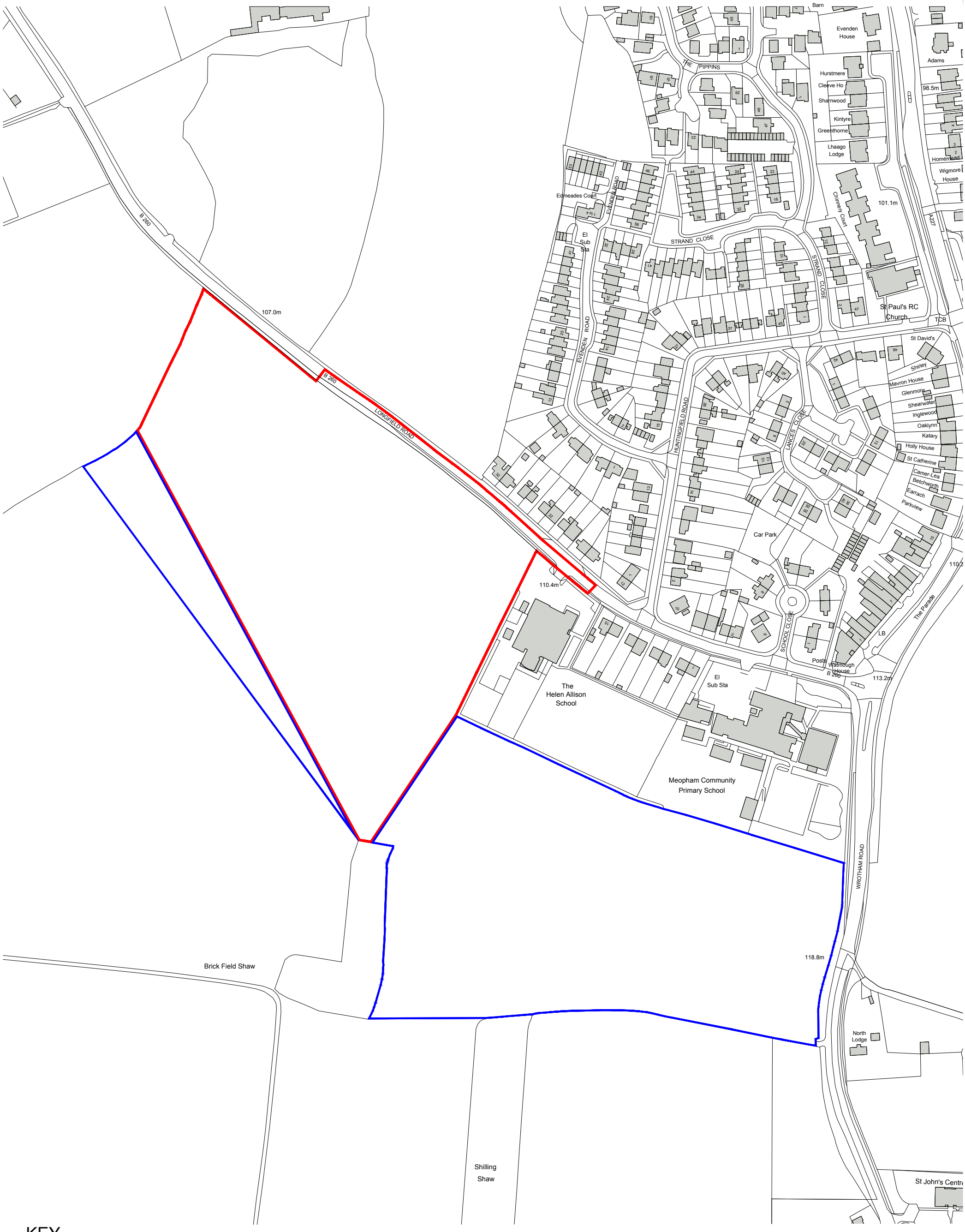
APPENDICES

APPENDIX A



KEY

SITE LOCATION
5.68 HECTARES / 14.04 ACRES

OTHER LAND IN OWNERSHIP
6.1 HECTARES / 15.08 ACRES

REV A : RLB UPDATED. 01.09.25 (SB)

LONGFIELD ROAD, MEOPHAM - SITE BOUNDARY

PEGASUS GROUP

| PEGASUSGROUP.CO.UK | TEAM/DRAWN BY: SB/EA | APPROVED BY: JW | DATE: 18.07.25 | SCALE: 1:2500@A3 | DRWG: P25-0485_DE_2001_A_1 I CLIENT: RICHBOROUGH I

MEC
Consulting Group

APPENDICES

APPENDIX B

KEY

- SITE BOUNDARY
- SITE ACCESS VIA LONGFIELD ROAD
- RESIDENTIAL DEVELOPMENT
- PUBLIC OPEN SPACE
- PRIMARY STREET
- SECONDARY STREET
- TERTIARY STREETS
- FOCAL SPACES
- PRIVATE LANES
- EXISTING PUBLIC RIGHTS OF WAY
- ACTIVE TRAVEL / CYCLE ROUTES
- FOOTPATH LINK
- EXISTING TREES
- NEW STRUCTURAL PLANTING
- NEW TREE PLANTING
- PROPOSED PLAY
- SUSTAINABLE DRAINAGE
- POTENTIAL IMPROVEMENTS TO EXISTING HIGHWAY FOR PEDESTRIAN AND CYCLE MOVEMENT
- PROPOSED TACTILE CROSSING AND FOOTWAY LINK
- SCHOOL DROP-OFF AREA

KEY PRINCIPLES

1. KEY ACTIVE TRAVEL ROUTES PROVIDING CONNECTIONS TO NEARBY MOVEMENT INFRASTRUCTURE;
2. KEY COMMONS PROVIDING EQUIPPED AREAS OF PLAY AND NODAL SPACES;
3. DEVELOPMENT EDGE TO RESPECT EXISTING DEVELOPMENT/ PUBLIC RIGHT OF WAY LINE;
4. STRUCTURAL PLANTING ALONG SOUTHERN BOUNDARY TO SCREEN DEVELOPMENT EDGE;
5. OVERFLOW PARKING FOR SCHOOL DROP-OFF;
6. MAXIMUM OUTWARD FACING DEVELOPMENT OVER NEWLY CREATED PUBLIC OPEN SPACE; AND
7. VIEW TO ST JOHNS THE BAPTIST CHURCH FROM PROW EXITING SITE .

PEGASUS GROUP

Expertly Done.

DESIGN | ECONOMICS | ENVIRONMENT | HERITAGE | LAND & PROPERTY | PLANNING | TRANSPORT & INFRASTRUCTURE

LAND OFF LONGFIELD ROAD, MEOPHAM – **ILLUSTRATIVE DEVELOPMENT FRAMEWORK PLAN**

| PEGASUSGROUP.CO.UK | TEAM/DRAWN BY: RL | APPROVED BY: JW | DATE: 30.04.25 | SCALE: 1:1250@A2 | DRWG: P25-0485_DE_2003_E_1 | CLIENT: RICHBOROUGH |

MEC
Consulting Group

APPENDICES

APPENDIX C

Level Datum:	O.S (G.P.S Verified)
Grid Orientation:	O.S (G.P.S Verified)

Station Information:

Station	Easting (m)	Northing (m)	Level (m)	Description
ST1	564383.754	166596.410	115.631	Nail
ST2	564390.675	166673.013	113.400	Nail
ST3	564419.932	166720.457	112.085	Nail
ST4	564458.259	166755.693	110.363	Nail
ST5	564479.150	166804.193	108.460	Nail
ST6	564484.384	166874.994	105.467	Nail
ST7	564545.604	166877.967	106.856	Nail

N

SURVEY NOTES

1. THIS PLAN SHOULD BE USED FOR ITS ORIGINAL PURPOSE ONLY. MEC CONSULTING GROUP ACCEPTS NO RESPONSIBILITY FOR ITS DRAWINGS IF THEY ARE SUPPLIED TO ANY OTHER PARTY OTHER THAN THE ORIGINAL CLIENT.
2. THE INFORMATION SHOWN HAS BEEN SURVEYED IN ACCORDANCE TO THE ACCURACY OUTLINED WITHIN THE ORIGINAL FEE QUOTATION.
3. BOUNDARIES SHOWN ARE PHYSICAL SITE FEATURES AND MAY NOT REPRESENT LEGALLY CONVEYED OWNERSHIP.
4. ALL FEATURES SHOWN WERE CURRENT AT THE TIME OF SURVEY. SOME FEATURES MAY HAVE BEEN MISSED OR OMITTED DUE TO ACCESS, PARKED VEHICLES, TEMPORARY STRUCTURES OR DENSE VEGETATION.
5. ALL GLOBAL NAVIGATION AND SATELLITE SYSTEM (GNSS) DETAIL AND REFERENCE STATIONS HAVE BEEN CAPTURED AND TRANSFORMED ONTO ORDNANCE SURVEY NATIONAL GRID AND DATUM OSGB35 USING THE O.S. ACTIVE NETWORK (OS NET) TRANSFORMATION AND GEOID MODEL OSTN15 & OSGM15.
6. NO SCALE FACTOR HAS BEEN APPLIED TO THE SURVEY CONTROL STATIONS AND RELATED DETAIL, THEREFORE ALL THE APPLICABLE COORDINATES SHOWN ARE NOT ON TRUE OSGB36(15), AND HAVE BEEN GEOREFERENCED USING A PSEUDO-OSGB36(15) COORDINATE ST2, AND ROTATED ON A BEARING USING A GNSS REFERENCE STATION FROM SURVEY CONTROL STATION ST6 TO ST12.
7. THE LEVELS SHOWN ARE RELATIVE TO THE MEAN AVERAGE GNSS REFERENCE STATION LEVELS CAPTURED AT ALL SURVEY CONTROL STATIONS.
8. ALL LEVELS ARE REPRESENTATIVE TO METRES ABOVE ORDNANCE DATUM.
9. PLEASE REFER TO THE SURVEY STATION TABLE TO ENABLE ESTABLISHMENT OF THE ON SITE GRID.
10. PLEASE NOTE THAT THE 3D TOPOGRAPHICAL SURVEY CAN BE ACCESSED BY TURNING ON 3D LAYERS VIA THE LAYER FILTER IN THE LAYER MANAGER.
11. REFERENCE GRID IS 20m X 20m.
12. ALL UNITS ARE IN METRES UNLESS OTHERWISE SPECIFIED.
13. SURVEY SHOWN UNDERTAKEN BY MEC CONSULTING GROUP IN MARCH 2025.
14. NOT ALL LEGEND DETAIL MAY BE APPLICABLE IN THIS DRAWING. IF ANY CLARIFICATION IS REQUIRED, PLEASE INFORM MEC CONSULTING GROUP.

TOPOGRAPHICAL LEGEND

ABBREVIATIONS

BUILDING HEIGHTS:
E: EAVES LEVEL
F: FLAT ROOF LEVEL
R: RIDGE LEVEL

FENCE TYPES:
BWF BARBED WIRE
CLF CHAIN LINK
CPF CONCRETE PANEL
IRF IRON RAILING
MF METAL FENCE
PIF POST & IRON RAIL
PRF POST AND RAIL
PWF POST & WIRE
SPF STEEL PALISADE
WMF WIRE MESH FENCE
WPF WOOD PANEL FENCE

TREE/VEGETATION:
G TREE GIRTH (METRES)
MG MULTI GIRTH TREE
TC AVG TREE CANOPY
TCL: TREE CANOPY LEVEL
VL AVG VEG LEVEL

OTHER:
CRW CONCRETE RETAINING WALL
FFL FINISHED FLOOR LVL
GW GABION WALL
LBOX LETTER BOX
RW RETAINING WALL
SP SIGN POST
SRW STONE RETAINING WALL
STL STILE
THL THRESHOLD LEVEL
TRW TIMBER RETAINING WALL
TW TOP OF WALL LEVEL

UTILITIES:
AV AIR VALVE
BO BOLLARD
BT BRITISH TELECOM
BUS BUS STOP
CCTV CLOSED CIRCUIT CAMERA
CTV CABLE TELEVISION
DP DOWN PIPE
ER EARTH ROD
EP ELECTRIC POST
FH FIRE HYDRANT
FL FLOODLIGHT
GMK GAS MARKER POST
GV GAS VALVE
IB ILLUMINATED BOLLARD
JB JUNCTION BOX
LP LAMP POST
MKR MARKER POST
MW MONITORING WELL
PM PARKING METER
RE RODDING EYE
ST STOP TAP
SV SLUICE VALVE
TL TRAFFIC LIGHT
TP TELEGRAPH POST
VP VENT PIPE
WM WATER METER
WO WASH OUT
WSC WATER SERVICE COVER

WATERCOURSE:
B.L BED LEVEL
WL WATER LEVEL

DRAINAGE

250Ø PIPE DIAMETER (mm)
BG BACK GULLY
CL COVER LEVEL
DP DOWN PIPE
GY GULLY
IC INSPECTION CHAMBER
IL INVERT LEVEL
MH MANHOLE
SO SOFFIT LEVEL

SYMBOLS

SERVICE COVER
GATE
TREE/BUSH/SAPLING
BH BOREHOLE
TH TRIAL HOLE
P1 STAKEOUT
WOODLAND
VEGETATION
PLANTED FOREST

FEATURE LINES

BOTTOM OF BANK
BUILDING
CANOPY
CHANNEL
DROP KERB
EDGE OF TREES
EDGE OF VEG
FENCE
GATE
LINE MARKING
OVERHEAD LINES
PIPELINE
RIVER EMBANKMENT
ROOTLINE
STEPS
TOP OF BANK
TOP OF KERB
TRACK
VERGE
WALL
WATER LINE

STATIONS

100.000m STATION LEVEL
MEC1 STATION AND NAME

SURFACE KEY

BP BLOCK PAVING
CPS CONCRETE PAVING SLABS
TT TACTILE PAVING

REV:	AMENDMENTS:	DRN:	CHK:	APP:	DATE:
B	CONNECTING ROAD AND EXTENSIONS	NL	DG	AB	26.09.25
A	ADDITION OF HIGHWAY, SHEET 18a AND RELOCATION OF SHEET 2a	GS	DG	AB	09.04.25
–	FIRST ISSUE	DG	GS	AB	04.04.25

PROJECT:
WROTHAM ROAD, MEOPHAM

DRAWING TITLE:
TOPOGRAPHICAL SURVEY OVERVIEW

CLIENT:
RICHBOROUGH

DRAWING NUMBER: 29473_06_170_01

REVISION: B | SHEET SIZE: A0 | SCALE: NTS

STATUS: FOR INFORMATION

MEC Consulting Group
Birmingham | Brighton | Leicester
Telephone: 01530 264 753
Email: group@m-ec.co.uk
Website: www.m-ec.co.uk

MEC
Consulting Group

APPENDICES

APPENDIX D

(c) Crown copyright and database rights 2025 Ordnance Survey AC0000808122

Date: 12/03/25

Scale: 1:1250

Map Centre: 564361,166532

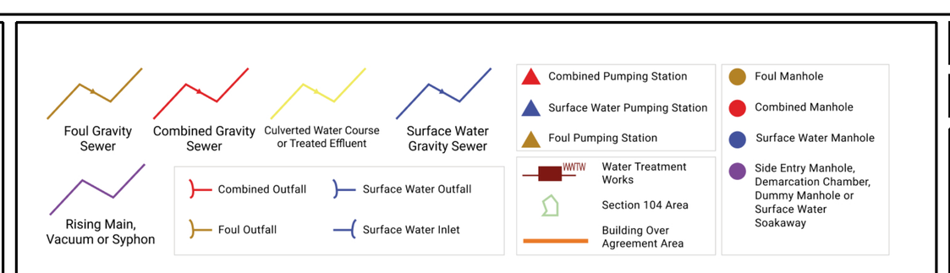
Data updated: 26/02/25

Our Ref: 1714100 - 1

Wastewater Plan A0
Powered by digdat

WARNING: BAC pipes are constructed of Bonded Asbestos Cement.

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



emma.harris@m-ec.co.uk

29473

WATER for LIFE from Southern Water.

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
1001	F	127.39	124.31	
1001	F	104.13	103.08	
1002	F	104.17	103.27	
1101	F	124.96	123.42	
1102	F	125.91	124.40	
2002	F	103.79	100.83	
2003	F	104.41	101.55	
2004	F	104.47	101.89	
2005	F	18.99	17.52	
2008	F	18.60	17.56	
2009	F	18.86	17.56	
2101	F	123.97	122.14	
2102	F	123.75	122.32	
2601	F	0.00	0.00	
2701	F	0.00	0.00	
2702	F	0.00	0.00	
2703	F	0.00	0.00	
2704	F	109.46	107.65	
2705	F	0.00	0.00	
2706	F	0.00	0.00	
2707	F	0.00	0.00	
2708	F	0.00	0.00	
2709	F	0.00	0.00	
2710	F	0.00	0.00	
2712	F	0.00	0.00	
2713	F	0.00	0.00	
2801	F	0.00	0.00	
2802	F	0.00	0.00	
2901	F	104.45	102.02	
2903	F	0.00	0.00	
2904	F	0.00	0.00	
2905	F	0.00	0.00	
2906	F	0.00	0.00	
3001	F	128.41	126.24	
3001	F	0.00	0.00	
3004	F	102.41	99.81	
3101	F	124.46	121.84	
3201	F	121.01	119.80	
3202	F	121.21	120.15	
3301	F	122.15	119.29	
3302	F	121.80	120.59	
3401	F	120.21	117.87	
3501	F	115.85	113.99	
3502	F	117.82	115.58	
3601	F	110.11	108.49	
3602	F	113.34	111.46	
3701	F	107.01	105.81	
3702	F	0.00	0.00	
3704	F	0.00	0.00	
3801	F	104.16	102.69	
3802	F	105.65	104.05	
3803	F	0.00	0.00	
3804	F	0.00	0.00	
3805	F	0.00	0.00	
3806	F	0.00	0.00	
3807	F	0.00	0.00	
3808	F	0.00	0.00	
3809	F	0.00	0.00	
3901	F	100.85	99.03	
3902	F	102.17	100.12	
3903	F	103.22	101.69	
3904	F	0.00	0.00	
3905	F	0.00	0.00	
4002	F	100.22	97.90	
4101	F	125.27	123.73	
4102	F	126.11	123.11	
4301	F	0.00	0.00	
4801	F	105.67	103.96	
4802	F	104.18	102.69	
4803	F	106.94	105.81	
4804	F	0.00	0.00	
4901	F	102.01	100.05	
4902	F	0.00	0.00	
4903	F	102.03	100.64	
4904	F	103.10	102.06	
5004	F	106.34	0.00	
5006	F	0.00	0.00	
5301	F	123.90	122.64	
5302	F	0.00	0.00	
5303	F	0.00	0.00	
5801	F	106.59	105.09	
5802	F	106.71	105.48	
5901	F	106.75	106.08	
5902	F	0.00	0.00	
6901	F	107.44	103.76	
6902	F	0.00	0.00	

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert

from Southern Water

Emma Harris
The Old Chapel
Hugglescote
Leicestershire
LE67 2GB

Your ref
19645

Our ref
DSA000041979

Date
14 July 2025

Contact
Tel 0330 303 0119

Dear Mrs Harris,

Level 1 Capacity Check Enquiry: Land West of Wrotham Road, Meopham, Gravesham, DA13 0JW.

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

Foul Water

The enquiry has been reassessed to determine the capacity available for 1.08 l/s at manhole reference TQ64662712, Grid Reference: 564206 , 166726.

There is currently inadequate capacity within the foul sewerage network to accommodate a foul flow of 1.08 l/s for the above development at manhole reference TQ64662712. The proposed development would increase flows to the public sewerage system which may increase the risk of flooding to existing properties and land. Additional off-site sewers or improvements to existing sewers will be required to provide sufficient capacity to service the development. Southern Water has a duty to provide Network capacity from the point of practical connection (point of equivalent or larger diameter pipe) funded by the New Infrastructure Charge.

Southern Water aim to provide this within 24 months following the date that planning has been granted for developments not identified as strategic sites in our current business plan. Strategic sites are larger developments and will often take longer than 24 months for a full solution to be provided.

Please note: there is only sufficient capacity for 0.54 l/s (60 Resi Units) due to Level detriment at TQ64663701 downstream from the POC.

Please note, the assessment that has been undertaken has used an assumed pump rate of 6.0 l/s. This has been calculated using Southern Water's modelling specifications.

New Infrastructure Charging

Please note as of 1st April 2018 we have moved to the "New Connections Services Charging Arrangements". We understand that this may cause uncertainty for customers, particularly where

they may have already committed to a development based on previous charging arrangements. We have worked with our stakeholders and Water UK to agree a set of principles by which we will base our charges. Please read through our new charging arrangement documents available at the following link: Connecting Charging Arrangements - Southern Water

Alternatively, New Appointees and Variations (NAVs), also known as 'inset' companies, can provide new connection services or take ownership of the new water and wastewater connection infrastructure provided for a new development. NAVs are appointed by Ofwat and replace the regional water company. It is for the developer to choose whether to use a NAV or the regional water company to supply services for new sites, according to certain legal criteria.

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. **Any revisions in flow rate or alternative point of connection will require a new Pre-Planning Application to be submitted.**

Please get in touch via the Get Connected customer dashboard if you have any queries.

Should it be necessary to contact us please quote our above reference number in all communications 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

MEC
Consulting Group

APPENDICES

APPENDIX E

The Old Chapel, Station Road, Hugglescote, Leicestershire LE67 2GB
Telephone 01530 264753
Email group@m-ec.co.uk
www.m-ec.co.uk

MEC Consulting Group

Doc. Ref.	29473-CALC-0402
Sheet	1 of 13
Engineer	RF
Date	16.04.25
Revision	-

SOIL INFILTRATION CALCULATIONS FRONT SHEET

SCHEME	Land West of Wrotham Road, Meopham
CLIENT	Richborough
ASPECTS OF SCHEME TO BE DESIGNED	Soil Infiltration Rate Testing
CODES OF PRACTICE, DESIGN SPECIFICATIONS & BRITISH STANDARDS	Soil Infiltration Rate testing and calculations completed in general accordance with BRE Digest 365 utilising the gravel fill pit method.
NOTES	The soil infiltration rate test results reported below apply to the specific test depth ranges as stated on the calculation sheets. Testing was undertaken in three locations (SA01-SA03) within the Thanet Formation. The locations of the soil infiltration test pits are shown on the attached exploratory hole location plan. Three tests were completed within SA02, with calculated infiltration rates ranging between 6.75×10^{-6} m/s and 9.73×10^{-6} m/s. SA02 was sited at the topographical low point, close to the centre of the northern boundary. A single test was completed in SA01; however, due to the time required to reach the 25% effective storage depth (17 hours), the location was considered unlikely to accommodate further testing within the available monitoring period. The calculated infiltration rate for this test was 1.13×10^{-6} m/s. Insufficient soakage was recorded in SA03 during a single test to enable the calculation of a representative infiltration rate in accordance with BRE 365. Two additional trial pits (TP01-TP02) were advanced to depths of up to 3.30m bgl to confirm groundwater levels and the depth to the Chalk bedrock. Groundwater was not encountered in trial pits or any of the three soakaway locations prior to undertaking infiltration testing. Chalk was encountered underlying the Thanet Formation at 3.00m bgl in TP01 and at 1.10m bgl in TP02. Based on the available results, it is considered that soakaways will be feasible at the location of SA02, utilising the lowest calculated value of 6.75×10^{-6} m/s for design purposes. Soakaways in the Thanet Formation at the topographically higher positions in the north-west and south-east, are not considered feasible. The underlying Chalk bedrock may be more conducive to infiltration, and based on the recorded ground conditions, will be encountered at a variable depth underlying the Thanet Formation. Additional testing will be required should deeper soakaways be proposed for the development.

The Old Chapel, Station Road, Hugglescote, Leicestershire LE67 2GB
Telephone 01530 264753
Email group@m-ec.co.uk
www.m-ec.co.uk

INDEX

Sheets	Calculations		Checked by	Approved By	Date
3	Exploratory Hole Location Plan		JM	DT	08.05.25
4	SA01 – Test 1	Result = 1.13 x 10^{-6} m/s			
5	SA02 – Test 1	Result = 9.73 x 10^{-6} m/s			
6	**SA02 – Test 2**	**Result = 6.75 x 10^{-6} m/s**			
7	SA02 – Test 3	Result = 9.16 x 10^{-6} m/s			
8	SA03 – Test 1	Insufficient soakage to derive an infiltration rate			
9-13	Exploratory Hole Logs				

GENERAL NOTES

1. DO NOT SCALE THIS DRAWING.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ENGINEERS, ARCHITECTS AND SPECIALIST DESIGN DRAWINGS AND DETAILS.
3. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
4. THIS DRAWING IS FOR STRATEGY PURPOSES ONLY AND IS NOT TO BE USED FOR CONSTRUCTION PURPOSES.

KEY

SA01 SOIL INFILTRATION TEST PIT LOCATION

TP01 TRIAL PIT LOCATION

SITE BOUNDARY

REV:	AMENDMENTS:	DRN:	CHK:	APP:	DATE:
-	FIRST ISSUE	JM	CW	DT	08/04/25

PROJECT:
LAND WEST OF
WROTHAM ROAD
MEOPHAM

DRAWING TITLE:
EXPLORATORY HOLE
LOCATION PLAN

CLIENT:
RICHBOROUGH

DRAWING NUMBER:
29473_04_140_01.2

REVISION:	SHEET SIZE:	SCALE:
-	A1	1 : 1000

STATUS:
FOR INFORMATION / APPROVAL

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The Old Chapel, Station Road, Hugglescote, Leicestershire, LE67 2GB
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Scheme	**Land West of Wrotham Road, Meopham**	**Page No.**	4
Client	**Richborough**	**Calcs by**	RF
Job ref.	**29473**	**Checked By**	DT
		Date	15/04/25

Soil Infiltration Test - Gravel Filled Method

(In general accordance with BRE Digest 365, 2016, Soakaway Design)

Soakaway pit ref. **SA01** **Test** 1

Length **2.00** m

Width **0.45** m

Depth **2.00** m

Ground water level **N/A** m

Ground conditions

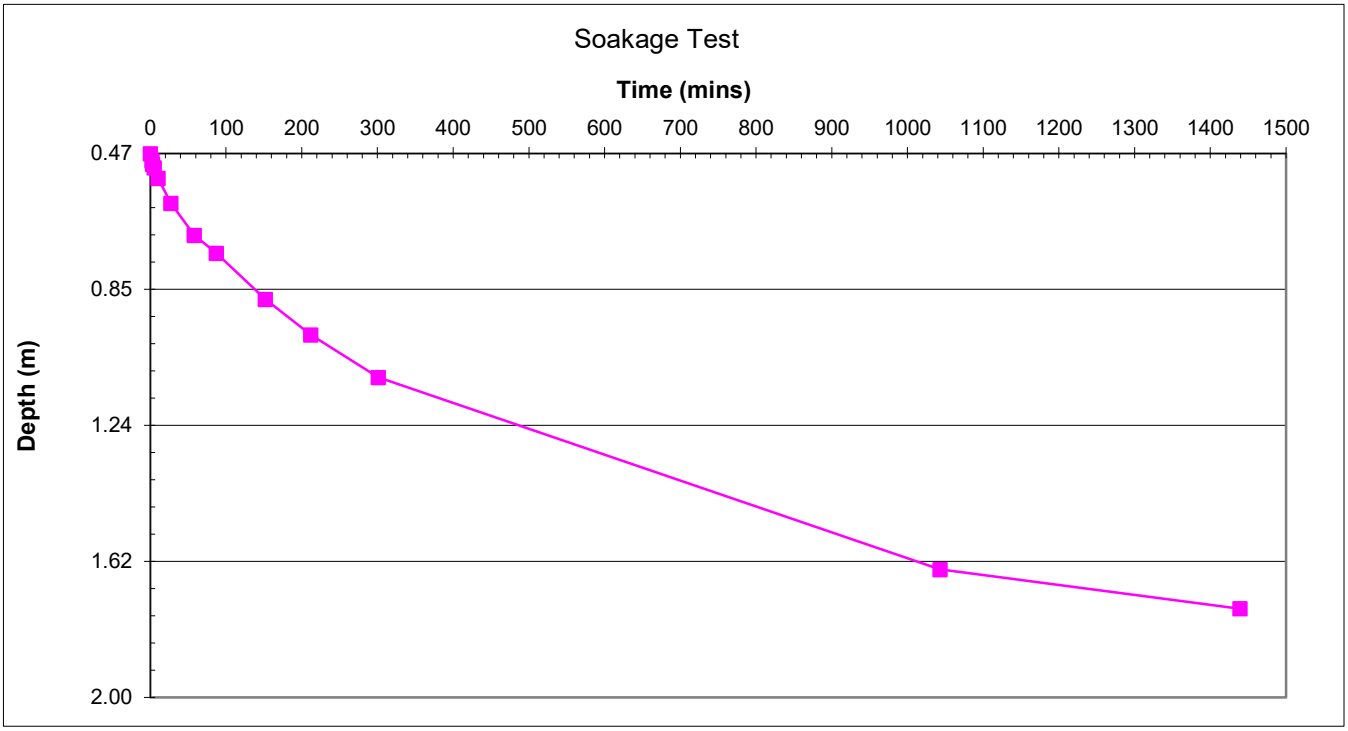
0.00-0.35m **Dark brown, sandy, silty, clay TOPSOIL with gravel sized fragments of flint.**

0.35-1.00m **Yellowish brown, clayey, silty, slightly gravelly, fine to coarse SAND. Gravels comprise subrounded, fine to coarse, flint. (THANET FORMATION)**

1.00-2.00m **Orangish brown, clayey, silty, gravelly SAND. Gravels comprise subrounded, fine to coarse flint. (THANET FORMATION)**

Time (mins)	Depth to water (m bgl)
0	0.47
2	0.49
3	0.50
5	0.51
10	0.54
27	0.61
58	0.70
87	0.75
152	0.88
212	0.98
301	1.10
1043	1.64
1439	1.75

Effective storage depth =	1.53	m
75% effective storage depth =	1.15	m
(ie depth below GL) =	0.85	m
25% effective storage depth =	0.38	m
(ie depth below GL) =	1.62	m
effective storage depth 75%-25% =	0.77	m
Time to fall to 75% effective depth =	138	mins
Time to fall to 25% effective depth =	1014	mins
Void Ratio =	40%	
V (75%-25%) =	0.28	m^3
a (50%) =	4.65	m^2
t (75%-25%) =	876.00	mins
SOIL INFILTRATION RATE =	**1.13E-06**	**m/s**



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Scheme	**Land West of Wrotham Road, Meopham**	**Page No.**	5
Client	**Richborough**	**Calcs by**	RF
Job ref.	**29473**	**Checked By**	DT
		Date	15/04/25

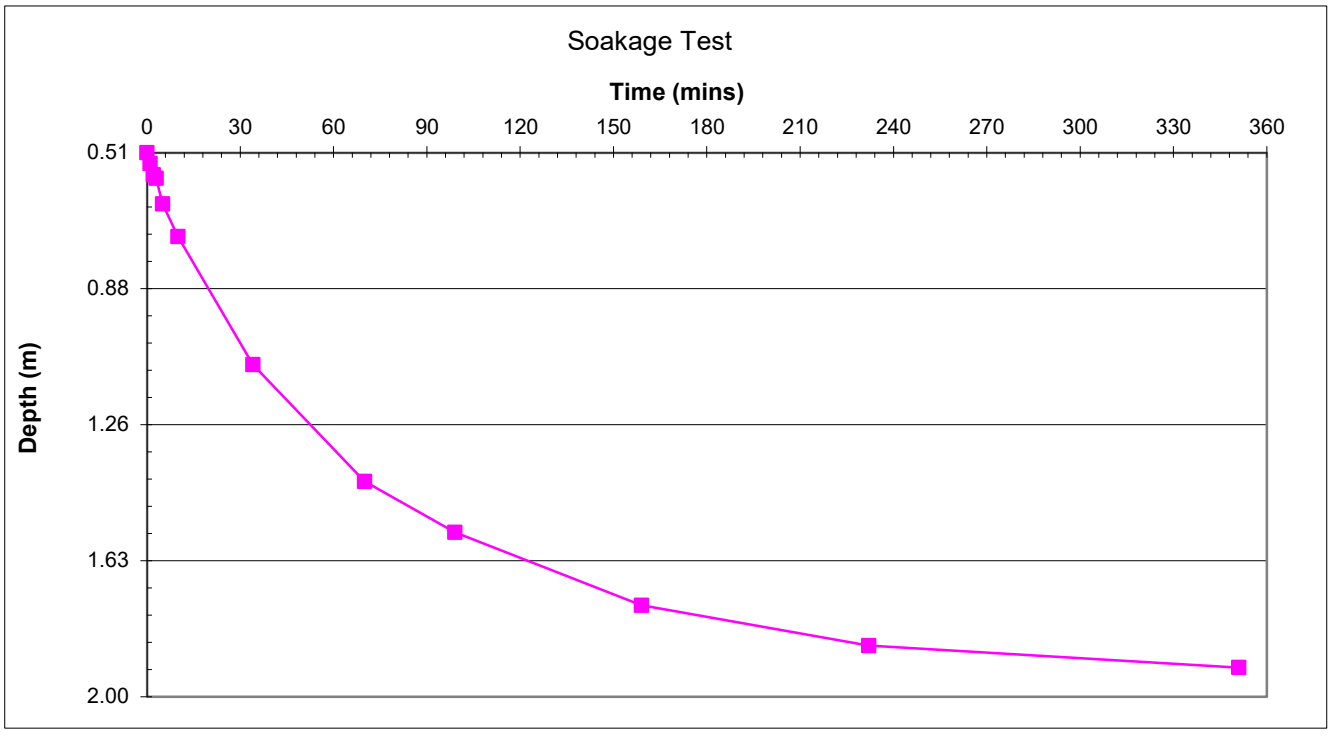
Soil Infiltration Test - Gravel Filled Method

(In general accordance with BRE Digest 365, 2016, Soakaway Design)

Soakaway pit ref.	**SA02**	**Test** 1
Length	**2.00** m	
Width	**0.45** m	
Depth	**2.00** m	
Ground water level	**N/A** m	
Ground conditions	**0.00-0.40m**	**Dark brown, sandy, silty, clay TOPSOIL with gravel sized fragments of flint.**
	0.40-0.95m	**Light brown, sandy, slightly gravelly, silty, CLAY. Gravels comprise subangular to subrounded, fine to coarse flint. (THANET FORMATION)**
	0.95-2.00m	**Yellowish brown, silty, sandy subangular to subrounded, fine to coarse GRAVEL of flint. (THANET FORMATION)**

Time (mins)	Depth to water (m bgl)
0	0.51
1	0.54
2	0.57
3	0.58
5	0.65
10	0.74
34	1.09
70	1.41
99	1.55
159	1.75
232	1.86
351	1.92

Effective storage depth =	1.49	m
75% effective storage depth =	1.12	m
(ie depth below GL) =	0.88	m
25% effective storage depth =	0.37	m
(ie depth below GL) =	1.63	m
effective storage depth 75%-25% =	0.75	m
Time to fall to 75% effective depth =	20	mins
Time to fall to 25% effective depth =	121	mins
Void Ratio =	40%	
V (75%-25%) =	0.27	m^3
a (50%) =	4.55	m^2
t (75%-25%) =	101.00	mins
SOIL INFILTRATION RATE =	**9.73E-06**	**m/s**



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Scheme	**Land West of Wrotham Road, Meopham**	**Page No.**	6
Client	**Richborough**	**Calcs by**	RF
Job ref.	**29473**	**Checked By**	DT
		Date	15/04/25

Soil Infiltration Test - Gravel Filled Method

(In general accordance with BRE Digest 365, 2016, Soakaway Design)

Soakaway pit ref. **SA02** **Test** 2
Length **2.00** m
Width **0.45** m
Depth **2.00** m
Ground water level **N/A** m
Ground conditions

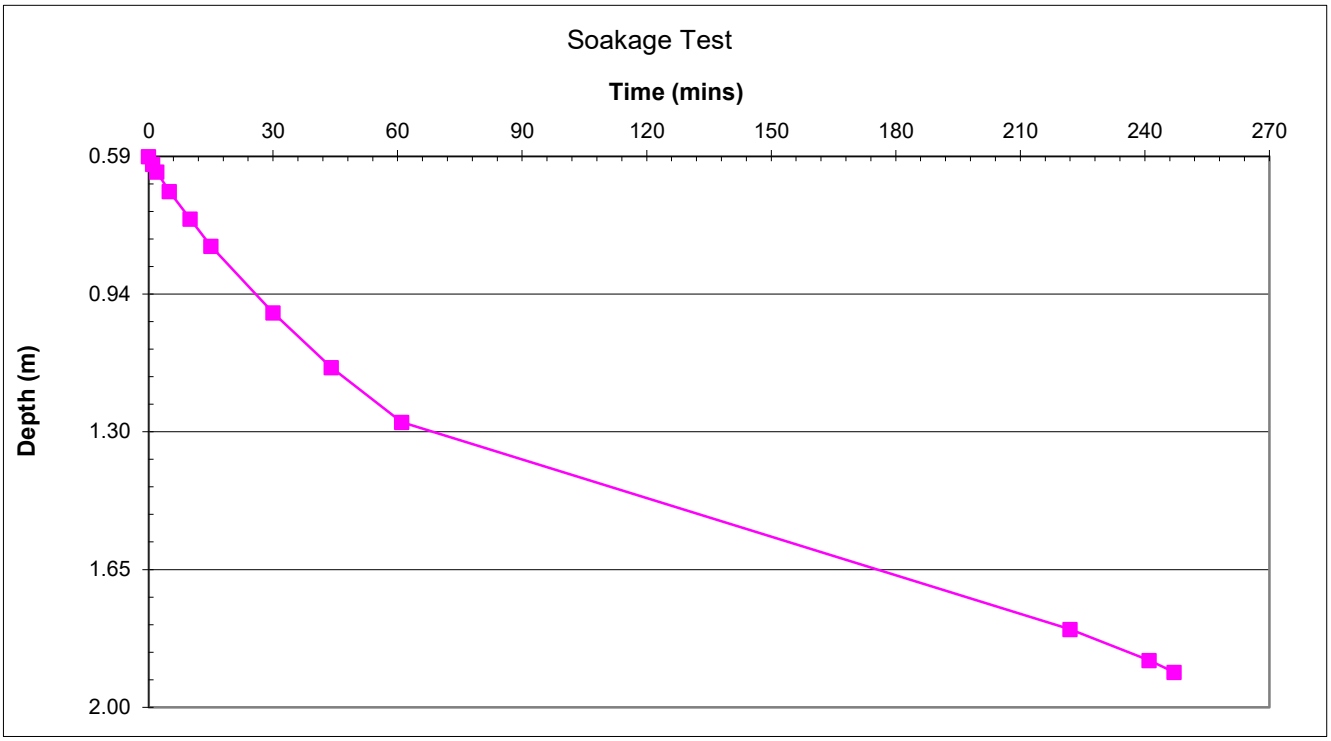
0.00-0.40m **Dark brown, sandy, silty, clay TOPSOIL with gravel sized fragments of flint.**

0.40-0.95m **Light brown, sandy, slightly gravelly, silty, CLAY. Gravels comprise subangular to subrounded, fine to coarse flint. (THANET FORMATION)**

0.95-2.00m **Yellowish brown, silty, sandy subangular to subrounded, fine to coarse GRAVEL of flint. (THANET FORMATION)**

Time (mins)	Depth to water (m bgl)
0	0.59
1	0.61
2	0.63
5	0.68
10	0.75
15	0.82
30	0.99
44	1.13
61	1.27
222	1.80
241	1.88
247	1.91

Effective storage depth =	1.41	m
75% effective storage depth =	1.06	m
(ie depth below GL) =	0.94	m
25% effective storage depth =	0.35	m
(ie depth below GL) =	1.65	m
effective storage depth 75%-25% =	0.71	m
Time to fall to 75% effective depth =	26	mins
Time to fall to 25% effective depth =	170	mins
Void Ratio =	40%	
V (75%-25%) =	0.25	m^3
a (50%) =	4.35	m^2
t (75%-25%) =	144.00	mins
SOIL INFILTRATION RATE =	**6.75E-06**	**m/s**



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Scheme	**Land West of Wrotham Road, Meopham**	**Page No.**	7
Client	**Richborough**	**Calcs by**	RF
Job ref.	**29473**	**Checked By**	DT
		Date	15/04/25

Soil Infiltration Test - Gravel Filled Method

(In general accordance with BRE Digest 365, 2016, Soakaway Design)

Soakaway pit ref. **SA02** **Test** 3

Length **2.00** m
Width **0.45** m
Depth **2.00** m
Ground water level **N/A** m

Ground conditions

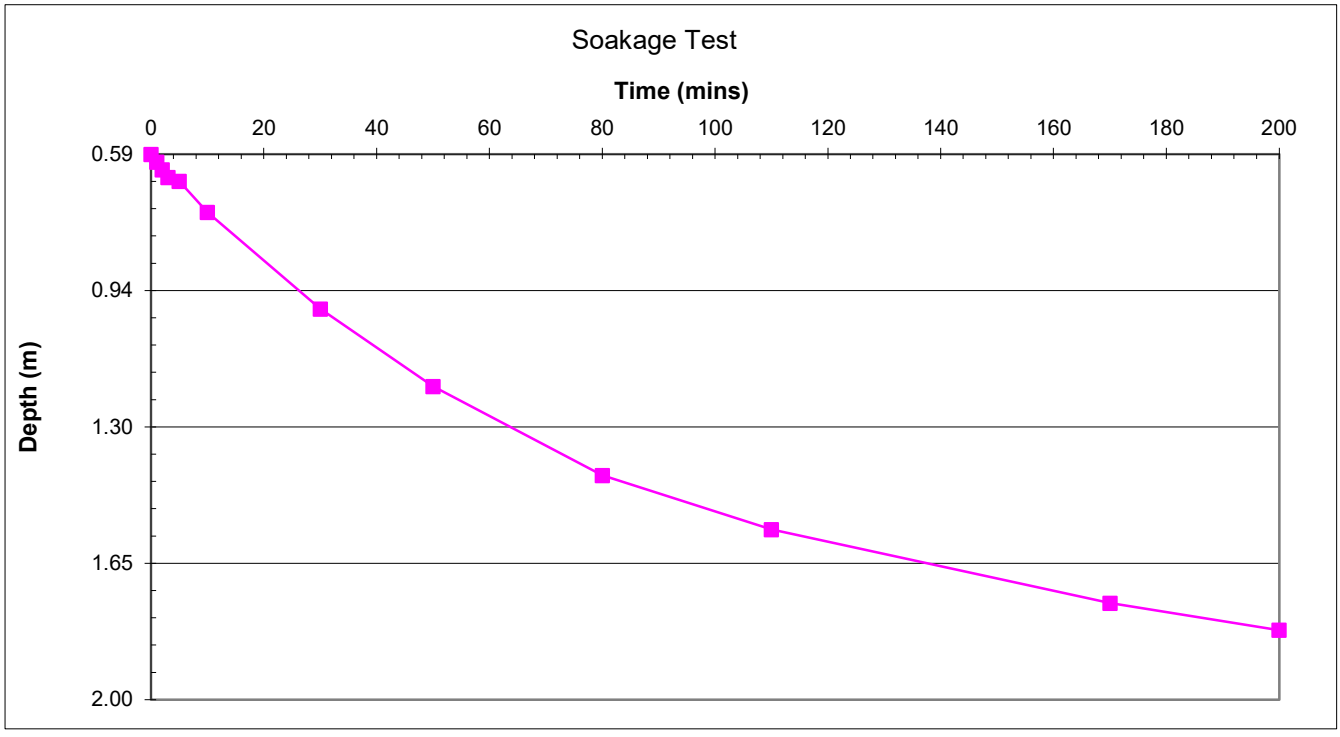
0.00-0.40m **Dark brown, sandy, silty, clay TOPSOIL with gravel sized fragments of flint.**

0.40-0.95m **Light brown, sandy, slightly gravelly, silty, CLAY. Gravels comprise subangular to subrounded, fine to coarse flint. (THANET FORMATION)**

0.95-2.00m **Yellowish brown, silty, sandy subangular to subrounded, fine to coarse GRAVEL of flint. (THANET FORMATION)**

Time (mins)	Depth to water (m bgl)
0	0.59
1	0.61
2	0.63
3	0.65
5	0.66
10	0.74
30	0.99
50	1.19
80	1.42
110	1.56
170	1.75
200	1.82

Effective storage depth =	1.41	m
75% effective storage depth =	1.06	m
(ie depth below GL) =	0.94	m
25% effective storage depth =	0.35	m
(ie depth below GL) =	1.65	m
effective storage depth 75%-25% =	0.71	m
Time to fall to 75% effective depth =	28	mins
Time to fall to 25% effective depth =	134	mins
Void Ratio =	40%	
V (75%-25%) =	0.25	m^3
a (50%) =	4.35	m^2
t (75%-25%) =	106.00	mins
SOIL INFILTRATION RATE =	**9.16E-06**	**m/s**



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Scheme	**Land West of Wrotham Road, Meopham**	**Page No.**	8
Client	**Richborough**	**Calcs by**	RF
Job ref.	**29473**	**Checked By**	DT
		Date	15/04/25

Soil Infiltration Test - Gravel Filled Method

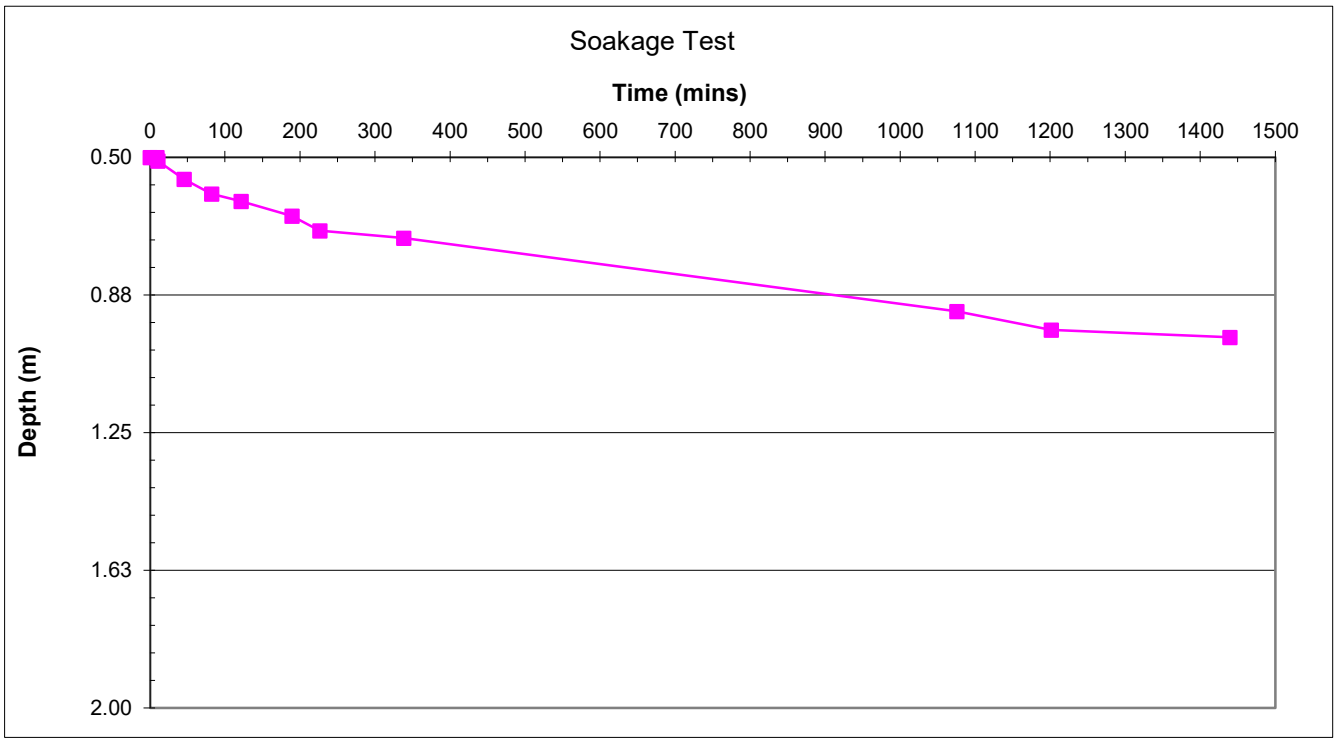
(In general accordance with BRE Digest 365, 2016, Soakaway Design)

Soakaway pit ref.	**SA03**	**Test** 1
Length	**2.20** m	
Width	**0.45** m	
Depth	**2.00** m	
Ground water level	m	
Ground conditions	**0.00-0.35m**	**Dark brown, slightly sandy, silty, clay TOPSOIL with gravel sized fragments of flint.**
	0.35-1.30m	**Brown, sandy, slightly gravelly, silty, CLAY. Gravels comprise subangular to subrounded, fine to coarse flint. (THANET FORMATION)**
	1.30-2.00m	**Yellowish brown, silty, sandy subangular to subrounded, fine to coarse GRAVEL of flint (THANET FORMATION)**

Time (mins)	Depth to water (m bgl)
0	0.5
9	0.50
10	0.51
45	0.56
82	0.60
121	0.62
189	0.66
226	0.70
338	0.72
1075	0.92
1201	0.97
1439	0.99

Effective storage depth =	1.50	m
75% effective storage depth =	1.13	m
(ie depth below GL) =	0.88	m
25% effective storage depth =	0.38	m
(ie depth below GL) =	1.63	m
effective storage depth 75%-25% =	0.75	m
Time to fall to 75% effective depth =	970	mins
Time to fall to 25% effective depth =	N/A	mins
Void Ratio =	40%	
V (75%-25%) =	0.30	m^3
a (50%) =	4.97	m^2
t (75%-25%) =	N/A	mins

Insufficient soakage to derive an infiltration rate.



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Exploratory Hole ID:	SA01
	Sheet 1 of 1

Project:	Land West of Wrotham Road	Project No. 29473	Start Date: 07/04/2025	End Date: 07/04/2025	Plant Used: JCB 3CX
Location:	Meopham	Logged By: CC	Easting and Northing Co-ordinates: 564136.23 166773.92		Elevation (m AOD): 110.00
Client:	Richborough	Approved By: DT			

Strata Description	Legend	Depth (m)	Level (m AOD)	Samples Type	Samples Depth	Tests	Groundwater (m)
Dark brown, sandy, silty, clay TOPSOIL with gravel sized fragments of flint.							
		0.35	109.65				
Yellowish brown, clayey, silty, slightly gravelly, fine to coarse SAND. Gravels comprise fine to coarse, subrounded flint. THANET FORMATION							
		1.00	109.00				
Orangish brown, clayey, silty, gravelly SAND. Gravels comprise subrounded, fine to coarse flint. THANET FORMATION							
		2.00	108.00				
End of Trial Pit							

Remarks:

Exploratory hole location scanned with Cable Avoidance Tool and Signal Generator.
Descriptions based on visual inspection by a Geo-environmental engineer.
Groundwater was not encountered.
Visual or olfactory evidence of contamination was not observed.
Co-ordinates and elevations estimated from the topographical survey.

Stability: Stable

Dimensions:

Length: 2.00m
Width: 0.45m
Depth: 2.00m

Key:

B - Bulk Sample
D - Disturbed Sample
ES - Environmental Sample
W - Water Sample
PID - PID Reading
HSV - Hand Shear Vane Reading

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Hugglescote, Leicestershire
LE67 2GB

Exploratory Hole ID:	SA02
	Sheet 1 of 1

Project:	Land West of Wrotham Road	Project No. 29473	Start Date: 07/04/2025	End Date: 07/04/2025	Plant Used: JCB 3CX
Location:	Meopham	Logged By: CC	Easting and Northing Co-ordinates: 564033.53 166853.29		Elevation (m AOD): 106.30
Client:	Richborough	Approved By: DT			

Strata Description	Legend	Depth (m)	Level (m AOD)	Samples Type	Samples Depth	Tests	Groundwater (m)
Dark brown, sandy, silty, clay TOPSOIL with gravel sized fragments of flint.							
		0.40	105.90				
Light brown, sandy, slightly gravelly, silty, CLAY. Gravels comprise subangular to subrounded, fine to coarse flint. THANET FORMATION							
		0.95	105.35				
Yellowish brown, silty, sandy subangular to subrounded, fine to coarse GRAVEL of flint. THANET FORMATION							
End of Trial Pit		2.00	104.30				

Remarks:

Exploratory hole location scanned with Cable Avoidance Tool and Signal Generator.
Descriptions based on visual inspection by a Geo-environmental engineer.
Groundwater was not encountered.
Visual or olfactory evidence of contamination was not observed.
Co-ordinates and elevations estimated from the topographical survey.

Stability: Stable

Dimensions:

Length: 2.00m
Width: 0.45m
Depth: 2.00m

Key:

B - Bulk Sample
D - Disturbed Sample
ES - Environmental Sample
W - Water Sample
PID - PID Reading
HSV - Hand Shear Vane Reading

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Hugglescote, Leicestershire
LE67 2GB

Exploratory Hole ID: SA03

Sheet 1 of 1

Project:	Land West of Wrotham Road	Project No. 29473	Start Date: 07/04/2025	End Date: 07/04/2025	Plant Used: JCB 3CX
Location:	Meopham	Logged By: CC	Easting and Northing Co-ordinates: 563938.25 166923.26		Elevation (m AOD): 108.00
Client:	Richborough	Approved By: DT			

Strata Description	Legend	Depth (m)	Level (m AOD)	Samples Type	Samples Depth	Tests	Groundwater (m)
Dark brown, slightly sandy, silty, clay TOPSOIL with gravel sized fragments of flint.		0.35	107.65				
Brown, sandy, slightly gravelly, silty, CLAY. Gravels comprise subangular to subrounded, fine to coarse flint. THANET FORMATION		1.30	106.70				
Yellowish brown, silty, sandy subangular to subrounded, fine to coarse GRAVEL of flint. THANET FORMATION		2.00	106.00				
End of Trial Pit							

Remarks:

Exploratory hole location scanned with Cable Avoidance Tool and Signal Generator.
Descriptions based on visual inspection by a Geo-environmental engineer.
Groundwater was not encountered.
Visual or olfactory evidence of contamination was not observed.
Co-ordinates and elevations estimated from the topographical survey.

Stability: Stable

Dimensions:

Length: 2.22m
Width: 0.45m
Depth: 2.00m

Key:

B - Bulk Sample
D - Disturbed Sample
ES - Environmental Sample
W - Water Sample
PID - PID Reading
HSV - Hand Shear Vane Reading

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Hugglescote, Leicestershire
LE67 2GB

TP01

Sheet 1 of 1

Exploratory Hole ID:

Project:	Land West of Wrotham Road	Project No. 29473	Start Date: 10/04/2025	End Date: 10/04/2025	Plant Used: JCB 3CX
Location:	Meopham	Logged By: CC	Easting and Northing Co-ordinates: 563977.35 166894.13		Elevation (m AOD): 107.60
Client:	Richborough	Approved By: DT			

Strata Description	Legend	Depth (m)	Level (m AOD)	Samples Type	Samples Depth	Tests	Groundwater (m)
Dark brown, sandy, silty clay TOPSOIL with gravel sized fragments of flint.							
Orangish brown, clayey, silty, slightly gravelly SAND. Gravels comprise subangular to subrounded, fine to coarse flint. THANET FORMATION		0.35	107.25				
Structureless CHALK composed of slightly sandy, silty, subangular to subrounded, medium to coarse GRAVEL with occasional cobbles. Gravel is white. Matrix is cream. (Grade Dc) SEAFORD CHALK FORMATION		3.00	104.60				
End of Trial Pit		3.30	104.30				

Remarks:

Exploratory hole location scanned with Cable Avoidance Tool and Signal Generator.
Descriptions based on visual inspection by a Geo-environmental engineer.
Groundwater was not encountered.
Visual or olfactory evidence of contamination was not observed.
Co-ordinates and elevations estimated from the topographical survey.

Stability: Stable

Dimensions:

Length: 2.20m
Width: 0.45m
Depth: 3.30m

Key:

B - Bulk Sample
D - Disturbed Sample
ES - Environmental Sample
W - Water Sample
PID - PID Reading
HSV - Hand Shear Vane Reading

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Hugglescote, Leicestershire
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Exploratory Hole ID: **TP02**

Sheet 1 of 1

Project:	Land West of Wrotham Road	Project No. 29473	Start Date: 10/04/2025	End Date: 10/04/2025	Plant Used: JCB 3CX
Location:	Meopham	Logged By: CC	Easting and Northing Co-ordinates: 564089.39 166807.33		Elevation (m AOD): 107.50
Client:	Richborough	Approved By: DT			

Strata Description	Legend	Depth (m)	Level (m AOD)	Samples Type	Samples Depth	Tests	Groundwater (m)
Dark brown, sandy, silty clay TOPSOIL with gravel sized fragments of flint.		0.35	107.15				
Brown, slightly sandy, silty CLAY. THANET FORMATION		1.10	106.40				
Structureless CHALK composed of slightly sandy, silty, subangular to subrounded, medium to coarse GRAVEL with occasional cobbles. Gravel is white. Matrix is cream. (Grade Dc) SEAFORD CHALK FORMATION		2.30	105.20				
End of Trial Pit							

Remarks:

Exploratory hole location scanned with Cable Avoidance Tool and Signal Generator.
Descriptions based on visual inspection by a Geo-environmental engineer.
Groundwater was not encountered.
Visual or olfactory evidence of contamination was not observed.
Co-ordinates and elevations estimated from the topographical survey.

Stability: Stable

Dimensions:

Length: 2.00m
Width: 0.45m
Depth: 2.30m

Key:

B - Bulk Sample
D - Disturbed Sample
ES - Environmental Sample
W - Water Sample
PID - PID Reading
HSV - Hand Shear Vane Reading

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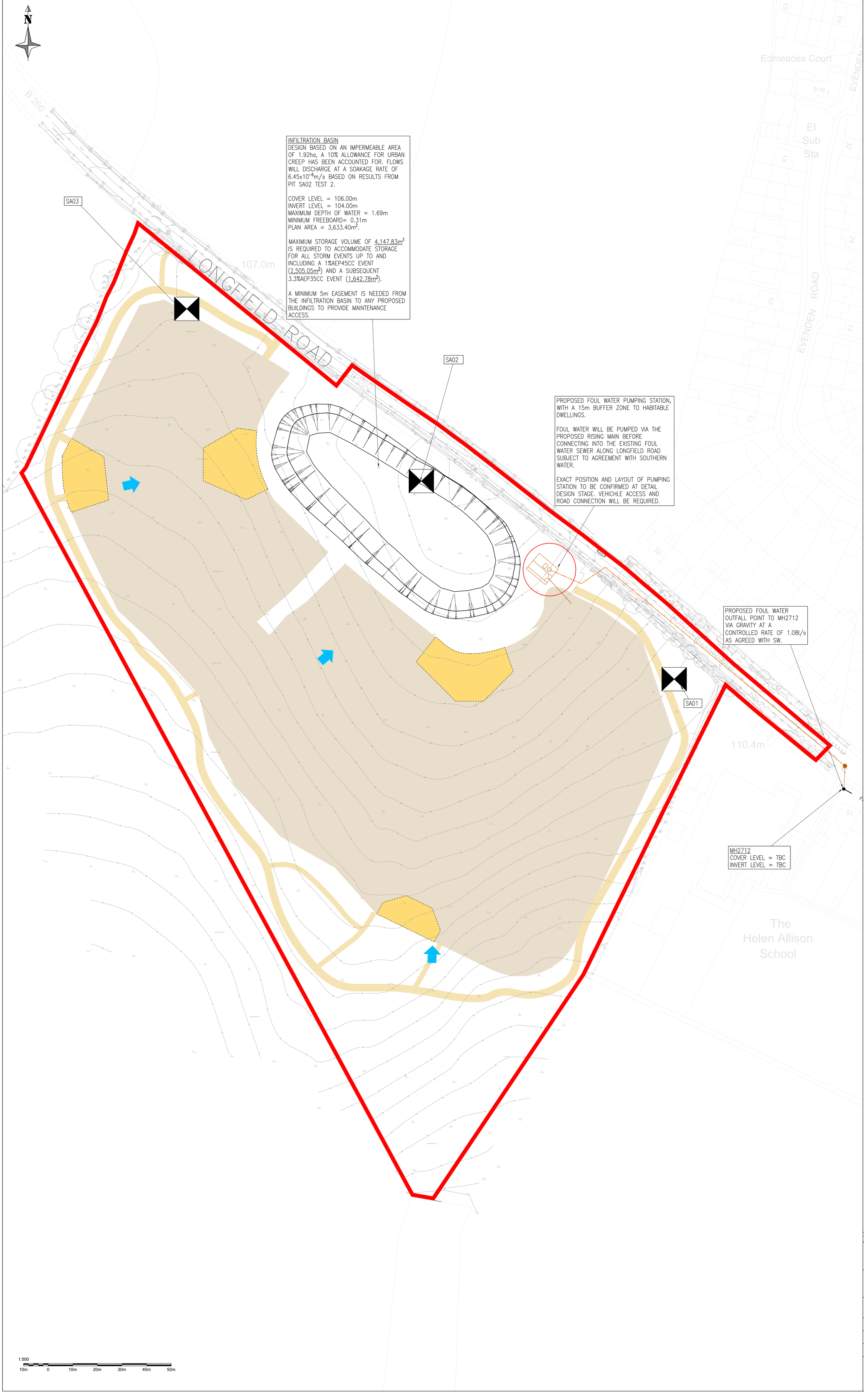
APPENDICES

APPENDIX F



NOTES:

1. DO NOT SCALE THIS DRAWING.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ENGINEERS, ARCHITECTS AND SPECIALIST DESIGN DRAWINGS AND DETAILS.
3. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE. ALL LEVELS ARE IN METRES UNLESS NOTED OTHERWISE.
4. THIS DRAWING IS FOR STRATEGY PURPOSES ONLY AND IS NOT TO BE USED FOR CONSTRUCTION PURPOSES.
5. DESIGN BASED ON EXISTING LEVELS AND SUBJECT TO CHANGE WITH EXTERNAL WORKS DESIGN / CONFIRMATION OF FFLS.
6. DRAINAGE STRATEGY IS SUBJECT TO AGREEMENT WITH RELEVANT THIRD PARTIES, INCLUDING ENVIRONMENT AGENCY, LOCAL PLANNING AUTHORITY, IDB, LEAD LOCAL FLOOD AUTHORITY AND WATER AUTHORITY.
6. CONCRETE PROTECTION TO BE PROVIDED TO ANY PIPES WITH LOW COVER.
7. THE DRAINAGE STRATEGY WILL NEED UPDATING IF THE LAYOUT IS REVISED.
8. SOAKAGE TESTING WAS UNDERTAKEN BY MEC IN APRIL 2025 TO BRE365 STANDARDS. TESTING PROVED INFILTRATION IS A VIABLE SOURCE OF OUTFALL.
9. SURFACE WATER FLOWS FROM THE SITE WILL DISCHARGE INTO THE GROUND VIA A PROPOSED INFILTRATION BASIN.
10. DUE TO A HIGH SAFETY FACTOR THE INFILTRATION BASIN HAS BEEN DESIGNED TO ACCOMMODATE A SUBSEQUENT STORM EVENT.
11. FOUL FLOWS GENERATED ON SITE WILL BE PUMPED BEFORE FORMING A GRAVITY OUTFALL INTO MH2712 AT A CONTROLLED RATE OF 1.02l/s AS AGREED WITH SW.

KEY

- SITE BOUNDARY
- PROPOSED FOUL WATER SEWER
- PROPOSED RISING MAIN
- FW EXISTING FOUL WATER SEWER
- PROPOSED INFILTRATION BASIN
- PROPOSED FOUL PUMPING STATION WITH 15m BUFFER
- OVERLAND FLOW ARROWS
- SOIL INFILTRATION PIT LOCATION
- EXISTING PUBLIC RIGHT OF WAY

REV:	AMENDMENTS:	DRN:	CHK:	APP:	DATE:
-	FIRST ISSUE	BO	ZJ	AB	30.09.25

PROJECT:
LAND OFF LONGFIELD ROAD
MEOPHAM

DRAWING TITLE:
DRAINAGE STRATEGY

CLIENT:
RICHBOROUGH ESTATES LTD
(HEAD OFFICE)

DRAWING NUMBER:
29473_01_230_02

REVISION:	SHEET SIZE:	SCALE:
-	A0	1:500

STATUS:
FOR INFORMATION / APPROVAL

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Website: www.m-ec.co.uk

File Location: R:\29473\drawings\01 series - hydrology\29473_01_230_02 Western Drainage Strategy_recover.dwg
Printed:30.09.2025

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APPENDICES

APPENDIX G

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MEC
Development Technical Consultants

Project No	29473-CALC-0102
Sheet	1 of 5
Engineer	B.Oyston
Date	September 2025
Revision	-

DESIGN CALCULATIONS FRONT SHEET

SITE	Land off Longfield Road, Meopham. Grid Reference E:564657, N:166640.
CLIENT	Richborough
ASPECTS OF SCHEME TO BE DESIGNED	1 in 2, 1 in 30 year + 35% climate change and 1 in 100 year + 45% climate change design simulations.
CODES OF PRACTICE, DESIGN SPECIFICATIONS & BRITISH STANDARDS	1. Design and analysis of urban storm drainage. Wallingford Procedure Vol. 1. 2. Sustainable Drainage Systems - Non-statutory technical standards for sustainable drainage systems – 2015 3. The SuDS Manual – CIRIA C753.
NOTES	Infiltration rates have been taken from Soil Infiltration Rate Testing completed to BRE365 standards by MEC in April 2025. An infiltration rate of 6.75×10^{-6} m/s has been used as the conservative rate from soakage testing. The infiltration basin have been calculated using a safety factor of 10, under the assumption that any exceedance flows will remain within the site and will flow away from the proposed dwellings In accordance with the National SuDS Standards, surface water flows generated by the site will be stored and conveyed within the proposed drainage feature. A storage volume of 4,162.97m^3 is required within the proposed drainage feature. Drainage design calculations were carried out within Flow Causeway.

INDEX

Pages	Calculations	Checked By	Date
2 – 5	Design details for the 1 in 2 (50%AEP), 1 in 30 year (3.3%AEP) + 35% climate change and 1 in 100 year (1%AEP) + 45% climate change design simulation results.	ZJ	30/09/2025

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	100	Connection Type	Level Soffits
Additional Flow (%)	0	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	✓
Maximum Rainfall (mm/hr)	100.0		

Nodes

Name	Area (ha)	Cover Level (m)	Diameter (mm)	Depth (m)
Basin	1.920	106.000	1200	2.000

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Additional Storage (m³/ha)	0.0
Summer CV	1.000	Skip Steady State	x	Check Discharge Rate(s)	x
Winter CV	1.000	Drain Down Time (mins)	240	Check Discharge Volume	x

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 %)
2	0	0	0
30	35	0	0
100	45	0	0

Node Basin Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.02430	Safety Factor	10.0	Invert Level (m)	104.000
Side Inf Coefficient (m/hr)	0.02430	Porosity	1.00	Time to half empty (mins)	13150

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	2125.0	2125.0	1.700	3381.5	6805.5	2.000	3633.4	7883.4

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute winter	Basin	1410	104.251	0.251	19.4	557.1559	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)
1440 minute winter	Basin	Infiltration	1.8

Results for 30 year +35% CC Critical Storm Duration. Lowest mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute winter	Basin	1440	104.690	0.690	52.4	1642.7820	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)
1440 minute winter	Basin	Infiltration	2.7

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute winter	Basin	1440	105.003	1.003	78.4	2505.0490	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)
1440 minute winter	Basin	Infiltration	3.3

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APPENDICES

APPENDIX H

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MAINTENANCE AND MANAGEMENT

A proposed maintenance plan is shown in the table below and breaks down the maintenance requirements of the various proposed assets in accordance with the CIRIA C753 SuDS Manual guidance.

Table 1.1: Proposed Maintenance Regime

Drainage Asset	Responsible Organisation	Maintenance Work	Frequency
Pipework / Manholes	Southern Water	Inspect pipework and clear blockages	Annually or after severe storms.
		Inspect manholes and clear blockages	
		Repair any defects in the network	
		Inspect flow control, ensure operating freely and pivoting bypass door and penstock valve operating correctly	
Headwalls	Southern Water	Inspect the structure and remove any debris/litter on the structure.	Annually or after severe storms
		Replace malfunctioning parts or structures	As required
Foul Pumping Station	Southern Water	Inspect wet well, kiosk and valve chamber	Annually or after severe storms
		Inspect structure and remove any debris from the wet well	
		Replace malfunctioning parts or structures	As required
Rainwater Harvesting	Private Ownership / Management Company	Inspection of the tank for debris and sediment build-up, inlets/outlets/withdrawal devices, overflow areas, pumps and filters	Annually (and following poor performance)
		Cleaning of the tank, inlets, outlets, gutters, withdrawal devices and roof drain filters of silts and other debris	
		Cleaning and/or replacement of any filters	3 monthly (or as required)
		Repair of overflow erosion damage or damage to the tank	As required
		Pump repairs	
Infiltration Basins	Private Ownership / Management Company	Remove litter, debris and trash	Monthly
		Cut grass – for landscaping and access routes, as well as meadow grass in and around the basin	Monthly/6 monthly or as required
		Manage other vegetation and remove nuisance plants	Monthly then as required
		Reseed areas of poor vegetation growth	Annually or as required
		Prune and trim trees and remove cuttings	As required
		Remove the sediment from pre-treatment systems when 50% full	
		Repair erosion or other damage by reseeding or re-turfing	
		Realign the rip-rap	
		Repair or rehabilitate inlets, outlets and overflows	

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		Rehabilitate infiltration surface using scarifying and spiking techniques if performance deteriorates	
		Relevel uneven surfaces and reinstate design levels	
		Inspect inlets, outlets and overflows for blockages, and clean if required	Monthly/ 6 monthly
		Inspect banksides, structures, pipework etc for evidence of physical damage	
		Inspect inlets and pre-treatment systems for silt accumulation, establish appropriate silt removal frequencies	
		Inspect infiltration surfaces for compaction and ponding	
Swales	Private Ownership / Management Company	Remove litter and debris	Monthly then as required
		Cut grass – to retain grass height within the specified design range	
		Manage other vegetation and remove nuisance plants	
		Inspect inlets, outlets and overflows for blockages and clear if required	
		Inspect infiltration surfaces for ponding, compaction, silt accumulation, record areas where water is ponding for > 48 hours	
		Inspect vegetation coverage	Monthly for 6 months, quarterly for 2 years then half-yearly
		Inspect inlets and facility surface for silt accumulation, establish appropriate silt removal frequencies	Half-yearly
		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% more of the swale treatment area
		Repair erosion or other damage by re-turfing or reseeding	As required
		Relevel uneven surfaces and reinstate design levels	
		Scarify and spike topsoil layer to improve infiltration performance, break up silt deposits and prevent compaction of the soil surface	
		Remove build-up of sediment on upstream gravel trench, flow spreader or at top of the filter strip	
		Remove and dispose of oil or petrol residues using safe standard practices	
Permeable Pavements	Private Ownership / Management Company	Brushing and vacuuming (standard cosmetic sweep over the whole surface)	Once a year after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging of manufacturer's recommendations.

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		Stabilise and mow contributing and adjacent areas	As required
		Removal of weeds or management using glyphosate applied directly into the weeds by an applicator rather than sweeping	
		Remediate any landscaping which, through vegetation maintenance of soil slip, has been raised to within 50 mm of the level of the paving	
		Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users and replace lost jointing material	
		Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required
		Initial inspection	Monthly for 3 months after installation
		Inspect for evidence of poor operation and/or weed growth – if required, take remedial action	3 monthly, 48 hours after large storms in first 6 months
		Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
		Monitor inspection chambers	

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APPENDICES

APPENDIX I

Benjamin Oyston

Flood and Water Management
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Email: suds@kent.gov.uk
Tel: 03000 41 41 41
Our Ref: NON/2025/106523
Date: 28 August 2025

Application No: N/A

Location: Wrotham Road, Meopham, DA13 0ES

Proposal: Proposed residential development with supporting infrastructure

Thank you for your submission for pre-application advice. The LLFA has reviewed your request and have the following comments to provide:

New National Standards:

The LLFA notes that the East Drainage Design drawing accompanying the pre-application request outlines a preliminary drainage strategy featuring two large infiltration basins located near the northern red line boundary adjacent to Green Lane.

As of June 2025, the Department for Environment, Food and Rural Affairs (DEFRA) has published the National Standards for Sustainable Drainage Systems. This guidance introduces seven overarching standards that should be considered when designing a drainage strategy. Kent County Council LLFA now requests that all developments adopt these principles wherever possible.

Standard 1 prioritises the destination of surface water runoff, with the first option being rainwater collection for non-potable use. Section 1.11 of the guidance states that rainwater harvesting must be considered if any of the following three criteria apply. For this site, criterion 3 is relevant whereby, developments located within a seriously water-stressed areas. Both South East Water and Southern Water are identified within this designation and as such, we request that rainwater harvesting solutions be considered.

Principles 1 to 3 emphasise managing surface water as close to its source as possible, discouraging large-scale, end-of-site solutions. The submitted drawing does not indicate whether any additional drainage measures are proposed beyond the two infiltration basins. Incorporating features such as swales along highways, permeable paving, and smaller-scale plot soakaways could reduce the size of the proposed basins.

Infiltration Testing:

The drawing suggests that infiltration testing has been undertaken, with rates of 0.044 and 0.59 m/hr (1.23×10^{-5} and 1.64×10^{-4} m/s) recorded for each basin. However, the

location and depth of each test are unclear, and there is a significant disparity between the rates.

British Geological Survey mapping indicates that the site is underlain by two geological formations: Lewes Nodular Chalk and the Thanet Formation. The Thanet Formation appears to be localised to Meopham, and its depth above the chalk is uncertain. The characteristics of these formations may influence infiltration rates across the site. Additionally, a band of head deposits may increase the depth to the underlying formations.

In accordance with BRE365 soakaway design guidance, additional testing is required for trench soakaways longer than 25m. Although the proposed basins are not trench soakaways, we recommend a minimum of three tests per basin to accurately assess infiltration rates.

Surface Water Treatment:

The LLFA requests that pollution treatment measures be considered prior to infiltration. Chapter 26 of the CIRIA SuDS Manual outlines the Simple Index Approach for treating runoff. It is essential that all contributing areas are assessed and appropriate treatment levels provided. It is important to highlight that the site is situated over a Source Protection Zone 3 for the groundwater.

With only infiltration basins currently shown on the plan, the use of additional SuDS measures such as permeable paving, filter strips, and roadside swales can aid in treating surface water before it reaches the infiltration basins. Additionally, a sediment forebay may be necessary to slow water flow and allow suspended sediments to settle before entering the basins. These measures can help maintain infiltration rates and reduce maintenance requirements.

Given the scale of the development, reliance solely on infiltration basins with “300mm underlying soil with good contaminant attenuation potential” is not considered satisfactory by the LLFA. We strongly advise incorporating additional SuDS measures throughout the site to ensure adequate treatment for the entire development.

Hydraulic Modelling and Design Parameters:

- The LLFA requires the use of the current FEH2022 rainfall dataset for drainage system performance analysis. The outdated FSR dataset is no longer accepted.
- If only impermeable areas are considered in the design, summer and winter CV values should be increased to 0.95 or 1.0 to simulate 95–100% runoff entering the drainage system.
- While a factor of safety of 2 is typically used in hydraulic design software, higher values should be considered depending on the size of catchment areas and potential flood impacts, in line with the National Standards for SuDS and the CIRIA SuDS Manual. It is important to highlight that the impact of flooding should not just be considered on site but within the surrounding areas, particularly with the adjacent road and properties being at a lower level.
- A half-drain time of 24 hours should be achieved for events up to the 3.3% AEP plus climate change.

I trust this information assists with your enquiries.

Yours faithfully,

Daniel Hoare
Senior Flood Risk Officer
Flood and Water Management

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- TRANSPORT
- FLOOD RISK & DRAINAGE
- STRUCTURES
- GEO-ENVIRONMENTAL
- ACOUSTIC AIR
- UTILITIES
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