

BDW North Thames

Land at Talbot Way, Letchworth

Construction Drainage Management Plan

**REPORT REF.
2502330-ACE-XX-XX-RP-C-0302**

February 2026

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Document Control Sheet

REV	ISSUE PURPOSE	AUTHOR	CHECKED	APPROVED	DATE
-	Draft Issue	MC	EF	BB	16.02.26

Distribution

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1. Introduction

1.1. Ardent Consulting Engineers have been instructed by BDW North Thames to prepare a Construction Surface Water Management Plan (CSWMP) in relation to the following consented development: -

"The proposals seek Reserved Matters (RM) permission for a residential development comprising 120 residential units (40% affordable) including the detailed appearance, landscaping, layout and scale in line with the approved outline application (ref. 21/00504/OP) and the design principles within the LGCHF LG3 Design Framework."

1.2. The Local Planning Authority is North Herts Council (NHC) and the Lead Local Flood Authority (LLFA) is Hertfordshire County Council (HCC).

Planning Status

1.3. The development proposals seek Reserved Matters permission for a residential development of comprising 120 residential units (40% affordable) including detailed appearance, landscaping, layout and scale in line with the approved outline application (ref. 21/00504/OP) and the design principles within the LGCHF LG3 Design Framework

1.4. This CSWMP has been prepared to discharge Condition 5 of the Decision Notice which states that:

1.5. *"The development hereby permitted shall not commence until details and a method statement for interim and temporary drainage measures during the construction phases have been submitted to and approved in writing by the Local Planning Authority. This information shall provide full details of who will be responsible for maintaining such temporary systems and demonstrate how the site will be drained to ensure there is no increase in the off-site flows, not any pollution, debris and sediment to any receiving watercourse or sewer system. Where temporary discharges to a sewer are proposed, written confirmation from the sewer owner that these have been accepted shall be provided. The site works and construction phase shall thereafter be carried out in accordance with the approved method statement, unless alternative measures have been subsequently approved by the Local Planning Authority."*

Legislation Context and Guidance

- 1.6. *Water Environment (Water Framework Directive) (England and Wales) Regulations 2017* – These Regulations came into force in 2017, with the purpose (within the context of these works) of protecting and improving the water environment.
- 1.7. *Land Drainage Act 1991* – This Act came into force in 1991, with the purpose (within the context of these works) of ensuring that water bodies are appropriately maintained so that the free flow of water is not impeded.
- 1.8. *BS 8582:2013 Code of practice for surface water management for development sites.*
- 1.9. *Control of water pollution from construction sites - guide to good practice (SP156).*
- 1.10. *Control of water pollution from construction sites – guidance for consultants and contractors (C532).*
- 1.11. *Control of water pollution from linear construction projects – technical guidance (C648).*
- 1.12. *Control of water pollution from linear construction projects – site guide (C649).*
- 1.13. *Environmental good practice – site guide (C650).*

Objective

- 1.14. With consideration of the noted planning condition, policy and guidance, a CSWMP is primarily required to ensure that the quality and quantity of surface water discharged from the site during the construction works does not pose an undue risk to the downstream water environment. This would be considered as achieved by aligning the interim conditions with the approved final development drainage strategy.

Site Location

1.15. The site is situated on the north-east of Letchworth Garden City to the east of Talbot Way and north of Flint Road. The site is bounded by allotments and then residential properties on the western side. The northern side is bounded by an existing public right of way and further residential properties. On the southern and eastern sides are some existing woodland areas that bound the site. This woodland separates the southern edge of the site from an existing industrial estate off Flint Road.

1.16. The site and the surrounding area are shown in **Figure 2-1**.



Figure 2-1: Site and surrounding area (Google maps)

1.17. The Local Planning Authority (LPA) for the site is North Hertfordshire District Council (NHC), and Hertfordshire County Council (HCC) are the Lead Local Flood Authority (LLFA). The site is entirely greenfield and has never been developed with the exception to an existing track serving the allotments adjacent to the site. There are existing hedgerows and tree lines on the site, with a woodland area on the south of the site. The approximate centre of the site is at grid coordinates 523275m easting, 234085m northing.

1.18. The site is referenced as 'LG3' within North Hertfordshire District Council's Local Plan 2011-2031. This document is part of the council's Development Plan which is used to determine planning applications. Within the Local Plan, 'LG3', is one of the twelve sites in Letchworth that have been allocated with an aim to be built over the plan period.

Development Proposals

1.19. The development proposal is for the construction of a residential development comprising up to 120 units. The site benefits from outline planning and this report has been prepared to demonstrate a suitable drainage management plan can be implemented during the construction period for the site

1.20. The proposed development is illustrated in **Figure 1-2**, with full development proposals included within **Appendix A**.



Figure 1-2 Proposed Development Plan

2. Roles and Responsibilities

2.1. The key roles and companies involved within the design and delivery of the drainage for the project are as outlined within **Table 2-1**.

Role	Company details	Responsible person	Contact details
Client	BDW North Thames	Project Manager – Nick Rowe	Nick.rowe@bdwhomes.co.uk
Architect	Carlton Design	Derek Eastall	Derek.eastall@carltondesignpartnership.com
Engineer	Banners Gate	David Allbright	david.allbright@bannersgate.com
Principal Contractor	TBC	-	-

Table 2-1 Project Directory

3. Baseline Conditions

Topography

- 3.1. The topographical survey, which was undertaken by Greenhatch Group Ltd. in April 2019, is included in **Appendix B**. The site is generally flat around the highpoint of 89.05m on the northern/western part of the site. The land then slopes down from the higher areas at circa 1:16 slope toward the fence line on the lower points of the site on the south to circa 76.10m. Beyond the fence line is some dense trees and vegetation that slope steeply down toward the low point of circa 74.45m in the south-eastern corner of the site.
- 3.2. Elevations across the site are in the order of 88.59mAOD in the north-west corner to 76.09mAOD on the south-east corner. The topographical survey shows a prevailing slope from north to south, and generally from west to east.

Flood Risk

- 3.3. Reviewing current Environment Agency (EA) flood mapping, the site is noted to be within Flood Zone 1 and therefore, considered to be at very low likelihood of flooding.
- 3.4. Notwithstanding the low probability of flooding from rivers, there is a greater possible risk to the site from surface water (pluvial) flooding. With this, the Contractor should stay aware of potential adverse weather events which could give rise to a flood event, and in-particular those which are assigned an alert level.
- 3.5. A summary of actions that should be taken by the Contractor to reasonably protect the site and downstream environment during severe weather events are as per **Table 3-1**.

Alert level	Definition	Actions
Yellow: Be Aware	Yellow warnings can be issued for a range of weather situations, with many issued when it is likely that the weather will cause some low-level impacts. Other yellow warnings are issued when the weather could bring more severe impacts to many people, but the certainty of those impacts occurring is much lower.	Be aware of weather issues for the site and surrounding area, in-particular upstream of the site; store plant/materials on higher ground where possible; follow the guidance issued with the warning.

Alert level	Definition	Actions
Amber: Be Prepared	There is an increased likelihood of impacts from severe weather, which could disrupt your works plans. This means there is the possibility of travel delays, road and rail closures, power cuts and the potential risk to life and property.	Be aware of weather issues for the site and surrounding area, in-particular upstream of the site; store plant/materials on higher ground where possible; follow the guidance issued with the warning.
Red: Take Action	Dangerous weather is expected and, if you haven't already done so, you should act now to keep yourself and your works force safe from the impact of the severe weather. It is very likely that there will be a risk to life, with substantial disruption to travel and energy supplies.	Be prepared to suspend works, close site and evacuate when required due to flooding or other extreme occurrences; either remove plant and materials from site or secure on higher ground; follow the guidance issued with the warning.

Table 3-1: Severe Weather Actions

Hydrology

- 3.6. There are no existing watercourses or waterbodies within or adjacent to the site. As such, discharge to a watercourse is not considered a viable option for this development.
- 3.7. Infiltration is not a practical or reliable option for the development. The combination of limited test success, poor soakage performance, and excessive storage requirements therefore renders an infiltration-based strategy unviable for this site.

Existing Sewer Infrastructure

- 3.8. Anglian Water sewer asset plans (**Figure 3-1 and Appendix C**) show there are no existing surface water sewers located within the application boundary. South of the site, a 375mm diameter surface water sewer extends southwards along Flint Road. Adjacent to this, a 225mm diameter foul water sewer also extends southwards along Flint Road.



Figure 3-1 Extract from Anglian Water Asset Plan

Ground Conditions

- 3.9. The approved Outline drainage strategy utilised infiltration to dispose of runoff. The infiltration rates used on the strategy, based off testing completed by G7 Geotech (see **Appendix D**) completed in October 2021, used the most favourable value (1.41×10^{-5} m/s). However, as stated in the SuDS Manual section 25.3, "*the worst-case infiltration rate value should be used unless sound justification for doing otherwise is demonstrated*". Given that there is no noticeable change in ground conditions across the site, there is no justification to use the more favourable rate. Examining the potential to utilise infiltration for the proposed drainage strategy, the worst-case rate should be used (2.06×10^{-6} m/s).

4. Drainage Management Plan

Proposed Surface Water Drainage Discharge Location

- 4.1. The means of discharging surface water from the site in the permanent state was reviewed against the drainage hierarchy, listed below in order of preference for surface water disposal:
- **Rainwater re-use** (rainwater harvesting/greywater recycling).
 - An adequate soakaway or other **infiltration** system.

- **Hybrid solution of infiltration** and discharging to a **surface water body**.
 - To a **surface water body** (e.g. an ordinary watercourse).
 - To a **surface water sewer, highway drain, or other drainage system**.
 - To a **combined sewer**.
- 4.2. From this, the solution of a pumped discharge using the permanent basins that are to be located in the lowest part of the site, to the existing Anglian Water network on a temporary basis, was proposed, with justification for not utilising other methods on the hierarchy given within the following.
- 4.3. The anticipated water usage of the development will be low. With this, the volume of water generated by high frequency return period storms will exceed the demand, making rainwater harvesting an unfeasible means for disposing of development surface water run-off.
- 4.4. In-situ infiltration testing on the soils would deem infiltration potential for the surface water discharge as unfeasible. Furthermore, given the protection status of the groundwater and regardless of the geo-hydrological conditions, infiltration to ground would not be supported by the LLFA.
- 4.5. A review of EA main river mapping, OS mapping and topographical survey confirms there are no existing watercourses or waterbodies within or adjacent to the site. As such, discharge to a watercourse is not considered a viable option for this development.
- 4.6. The Anglian Water sewer asset plans and the topographic survey confirm there is South of the site, a 375mm diameter surface water sewer extends southwards along Flint Road.

Existing and Proposed Discharge Rate

- 4.7. The site would be considered as brownfield, as is currently occupied by a combination of industrial units and allotments. The overall site area extends to 3.63ha.
- 4.8. The primary development area of the site equates to the same 3.63ha, which under the proposals includes for up to 120 units and boundary landscaping. With relation to impermeable areas for the proposals, these equate to a total of 2.35ha.

4.9. Following correspondence with Anglian Water, the proposed discharge rate of 8l/s into the sewer network south of the site, has been agreed. The email confirmation is included in **Appendix H**. This connection is still subject to a completed Section 106 agreement.

4.10. The net surface water runoff from the development is restricted to 8.0 l/s prior to outfall to the existing Anglian Water sewer via gravity. The overall storage provision across the basins and tank is sufficient to accommodate all rainfall events up to and including the 1 in 100 year plus 40% climate change allowance, with an additional 300 mm freeboard incorporated for exceedance management.

4.11. To ensure no undue increase in downstream flood risk is brought through the development, it is proposed to restrict the outgoing surface water discharge to a rate of not greater than 8.0l/s, for up to the 100-year event with 40% climate change allowance.

Sustainable Drainage Systems and Water Quality

4.12. Department for Environment Food and Rural Affairs (DEFRA) issued the non-statutory technical guidance for Sustainable Drainage Systems (SuDS) in March 2015. This document along with policy guidelines and the CIRIA Guidance C753 (The SuDS Manual) have been used to determine the appropriate SuDS strategy, which considers the spatial and environmental constraints of the site. **Table 4-1** provides an overview of the various SuDS proposed to be utilised within the end state, with commentary on how early implementation of these would assist with the management of the construction stage surface water run-off.

SuDS Component	Infiltration Devices	
Constraints	Given that the site is suspected to have limited infiltration soakage capacity, infiltration devices are not considered a viable drainage option.	
Opportunities	None.	
SuDS Component	Lined Permeable Paving (Source Control)	
Constraints	The treatment and conveyance benefits of permeable paving rely on regular maintenance. While value engineering may be applied at the detailed design stage,	

	incorporating alternative sustainable treatment stages is recommended to manage water quality effectively.	
Opportunities	Permeable paving can be used to provide a stage of treatment in private drives around the site, should this be required as part of the treatment train.	
SuDS Component	Swales (Permeable Conveyance)	
Constraints:	In order to provide practicable attenuation benefits 1:3 side-slope swales tend to require a significant land requirement.	
Opportunities:	Where possible swales will be incorporated along roads and in open spaces in coordination with the architect and landscape architect. These can be underdrained where required to reduce landtake.	
SuDS Component	Attenuation Ponds/Basins (Retention/Detention)	
Constraints:	In order to provide practicable attenuation benefits, 1:3 side slopes ponds/basins tend to require significant land requirement. There are also existing treelines/hedge lines on the edges of the site that are likely to be retained for the development. Any ponds/basins and associated reprofiling of levels will need to be located outside the root protection areas for these trees.	
Opportunities:	There is space within the development to allow basins to be used to provide stormwater storage and treatment.	
SuDS Component	Attenuation Tanks (Retention/Detention)	
Constraints:	Attenuation Tanks require a significant land requirement which would need to be strategically placed and correctly aligned within the above construction type.	
Opportunities:	Where required to provide supplementary attenuation tanks can be used where readily accessible such as parking spaces and open spaces, these will be designed as part of the SuDS treatment train to ensure source control is provided upstream to remove sediment and other contaminants.	

Table 4-1: SuDS Appraisal

Surface Water Drainage Connection Consent

4.13. With a proposed surface water connection to the existing Anglian Water network, approval has been granted as shown in **Appendix H**.

Additional Construction Stage Measures

4.14. In addition to implementing end state SuDS components for the construction stage works, further construction stage specific measures should be allowed for, as per **Table 4-2** and **Appendix E**.

Element	Construction stage function
Reduced site strip	The clearance of soft and hard landscaping surfaces to leave open ground should be minimised and phased, so to reduce the potential sediment burden brought on the downstream drainage network and environment.
Use of Hay bales at Basin outfall	Whilst construction is taking place, hay bales (or similar) shall be sited at the outfall of the basins to provide additional filtration of sediments.
Temporary bunding	To assist in removing sediment from any direct overland run-off, temporary bunding to be provided around the site, with an area of vegetation maintained behind.
Settlement lagoon(s)	Consideration should be given to locally (and for the construction stage only) deepening swales and the basin at outfall points to allow water to pool and sediments to settle.
Existing gully filters	In the short term whilst existing hard standing areas may be retained and draining to the downstream sewer network, proprietary gully guards should be located within pots so to capture silts within the run-off. Regular checks and clearance to be carried out.

Table 4-2: Additional Construction Stage Measures

4.15. Based upon the above and following the basis of the end development proposals, a strategy drawing for the construction stage drainage is provided within **Appendix F**.

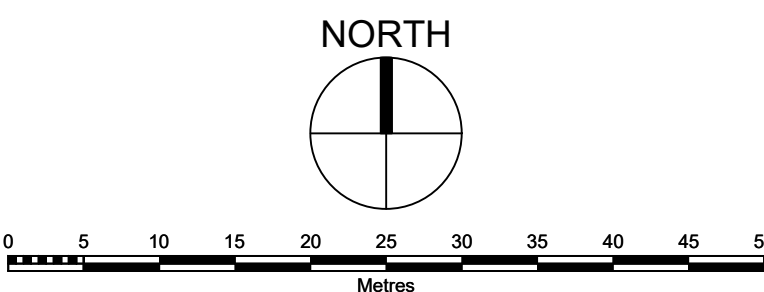
Pre-Occupation Measures

4.16. Prior to the drainage system being fully commissioned for the end-use, cleansing of the onsite drainage should be completed, with inspection and as appropriate renewal of SuDS and their associated landscaping components completed. The maintenance of all SuDS components will be in accordance with the best practices and the CIRIA Manual C753, with an excerpt of the recommended operation and maintenance requirements contained within **Appendix G**.

4.17. The suitability of the drainage prior to handover for the end use should also be verified through a CCTV condition survey, with validation reporting to be approved by the LPA prior to occupation, as required under Condition 5 of permission ref. 21/00504/OP.

Appendix A
Development Proposals

Do not scale from drawings unless by agreement with HTA. Use figured dimensions only.
Check all dimensions on the print to corroborate the works. Drawing to be read in conjunction with other relevant consultant information.
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Drawing to be read in conjunction with specification.



- Site Boundary
- 56 Plot number
- 96 Car parking plot number
- VP Visitor car parking
- SP Temporary Sales Arena car parking
- Affordable Rent
- Shared Ownership
- Social Rent

D	21.11.25	JPA	Misc amendments to plots 93/94, 96/99 and various other plots, parking for substation relocated
C	31.10.25	SAE	Road Design Amended
B	08.10.25	JPA	Affordable houses and HMOs added - social rent plots 10, 20. Plots 35, 36 changed from YHS2 to YHS0; plots 40, 41 changed from YHS4 to YHS2
A	29.09.25	JPA	Various plots updated with different house types: plots 13, 14, 17, 46, 55, 66, 51, 97, 98
Rev	08.09.25	JPA	Particular material retained. Sales centre parking relocated.
Date			Initial Issue Pre-Planning Pack to Foundation.
Drawn			

PLANNING
BDW North Thames
Letchworth LG3
Proposed Site Layout

Drawing number: HTA-A_DR_0100
Scale: 1:500
HTA Design LLP
London | Edinburgh | Manchester | Bristol

revision: D
checked by: JPA
approved by: JPA
BMR-LGC
hta

Appendix B

Site Topographical Survey with Utility Scan



Year	Domestic	Foreign	Total
1997	1,000,000	2,000,000	3,000,000
1998	1,200,000	2,200,000	3,400,000
1999	1,400,000	2,400,000	3,800,000
2000	1,600,000	2,600,000	4,200,000
2001	1,800,000	2,800,000	4,600,000

[illegible]

Legend

Water	Blue	Water	Blue
Forest	Green	Forest	Green
Barren	Yellow	Barren	Yellow
Urban	Red	Urban	Red
Grassland	Light Green	Grassland	Light Green
Shrubland	Light Yellow	Shrubland	Light Yellow
Wetland	Dark Green	Wetland	Dark Green
Desert	Orange	Desert	Orange
Mountain	Brown	Mountain	Brown
Plateau	Light Brown	Plateau	Light Brown
Valley	Dark Brown	Valley	Dark Brown
Coastal	Light Blue	Coastal	Light Blue
Island	Dark Blue	Island	Dark Blue
Bay	Light Blue	Bay	Light Blue
Strait	Dark Blue	Strait	Dark Blue
Channel	Light Blue	Channel	Light Blue
Harbor	Dark Blue	Harbor	Dark Blue
Port	Light Blue	Port	Light Blue
Shipyard	Dark Blue	Shipyard	Dark Blue
Marina	Light Blue	Marina	Light Blue
Beach	Yellow	Beach	Yellow
Dune	Light Yellow	Dune	Light Yellow
Cliff	Dark Brown	Cliff	Dark Brown
Rock	Light Brown	Rock	Light Brown
Sand	Yellow	Sand	Yellow
Mud	Light Brown	Mud	Light Brown
Silt	Dark Brown	Silt	Dark Brown
Clay	Light Brown	Clay	Light Brown
Gravel	Dark Brown	Gravel	Dark Brown
Coarse Sand	Light Brown	Coarse Sand	Light Brown
Fine Sand	Dark Brown	Fine Sand	Dark Brown
Silt	Light Brown	Silt	Light Brown
Clay	Dark Brown	Clay	Dark Brown
Gravel	Light Brown	Gravel	Light Brown
Coarse Sand	Dark Brown	Coarse Sand	Dark Brown
Fine Sand	Light Brown	Fine Sand	Light Brown
Silt	Dark Brown	Silt	Dark Brown
Clay	Light Brown	Clay	Light Brown
Gravel	Dark Brown	Gravel	Dark Brown
Coarse Sand	Light Brown	Coarse Sand	Light Brown
Fine Sand	Dark Brown	Fine Sand	Dark Brown
Silt	Light Brown	Silt	Light Brown
Clay	Dark Brown	Clay	Dark Brown
Gravel	Light Brown	Gravel	Light Brown
Co			

n	12/12/98	Recovery for 1000 (gross, \$M)	10000
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greenhatch

21 Telecommunications Services
 22 Info Engineering
 23 Sales / OTC Services
 24 Microsoft Building Services
 25 122 Laker Square
 26 440 S. Elm Street

Kroyen House
 10000 Road
 10000 Road
 10000 Road
 10000 Road
 10000 Road

[illegible]

Letchworth Garden City
Heritage Foundation

Talbot Way,
Letchworth Garden City,
SG6 1HJ

Topographical
Survey

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Discharge information (where applicable) has been visually inspected from the surface and deemed correct as printed on appropriate sign.

Appendix C
Anglian Water Asset Plans



(c) Crown copyright and database rights 2025 Ordnance Survey AC0000813445 Date: 07/05/25 Scale: 1:1250 Map Centre: 523364,233875 Data updated: 30/04/25 Our Ref: 1763254 - 1 Wastewater Plan A4 Powered by digdat

This plan is provided by Anglian Water pursuant to its obligations under the Water Industry Act 1991 sections 198 or 199. It must be used in conjunction with any search results attached. The information on this plan is based on data currently recorded but position must be regarded as approximate. Service pipes, private sewers and drains are generally not shown. Users of this map are strongly advised to commission their own survey of the area shown on the plan before carrying out any works. The actual position of all apparatus MUST be established by trial holes. No liability whatsoever, including liability for negligence, is accepted by Anglian Water for any error or inaccuracy or omission, including the failure to accurately record, or record at all, the location of any water main, discharge pipe, sewer or disposal main or any item of apparatus. This information is valid for the date printed. This plan is produced by Anglian Water Services Limited (c) Crown copyright and database rights 2025 Ordnance Survey AC0000813445. This map is to be used for the purposes of viewing the location of Anglian Water plant only. Any other uses of the map data or further copies is not permitted. This notice is not intended to exclude or restrict liability for death or personal injury resulting from negligence.

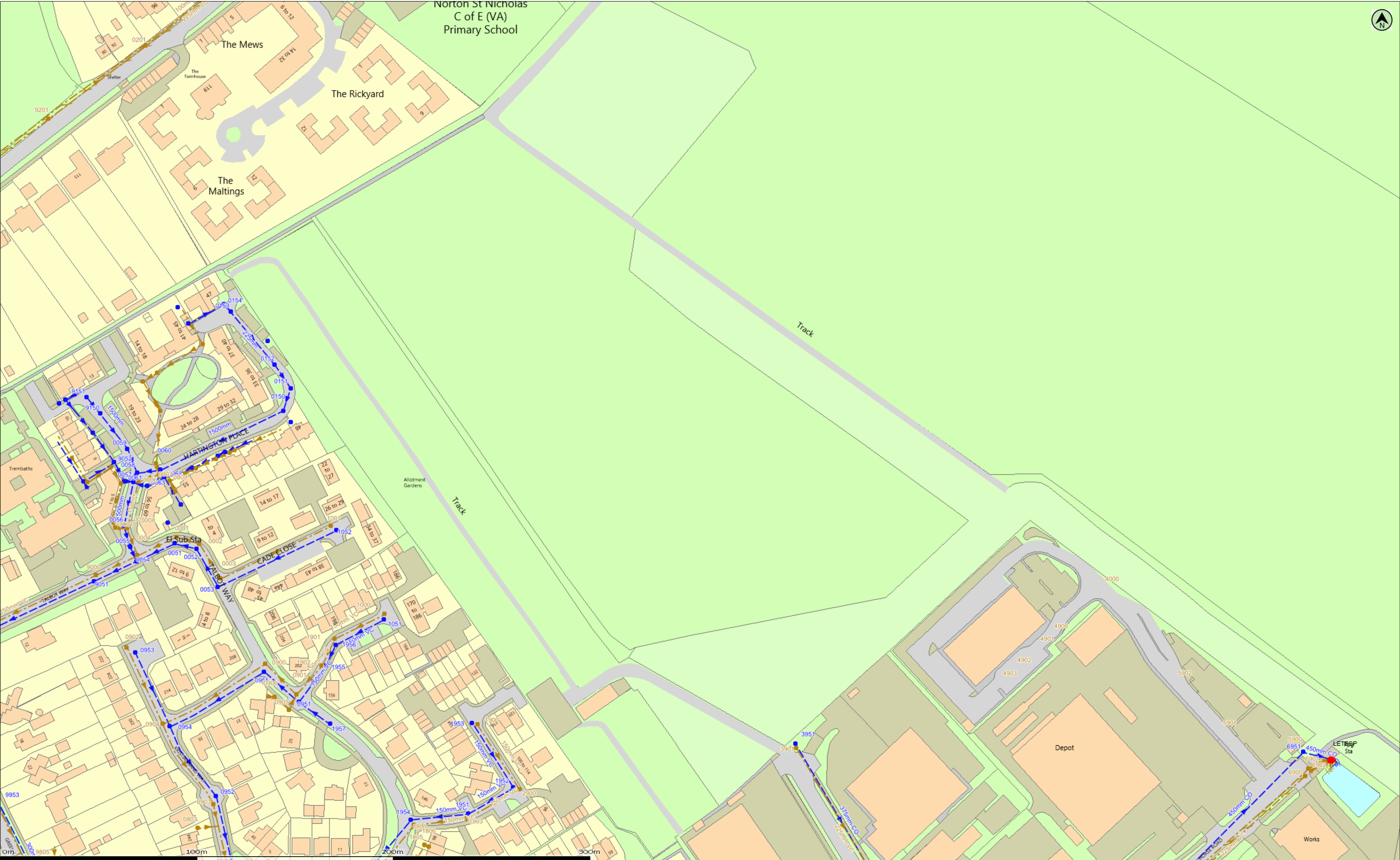
Foul Sewer	--- -- --	Outfall*	⊕	Sewage Treatment Works	□
Surface Sewer	---		⊕	Public Pumping Station	●
Combined Sewer	---		⊕	Decommissioned Pumping Station	●
Final Effluent	---	Inlet*	⊕		
Rising Main*	--- -- --		⊕		
Private Sewer*	---	Manhole*	⊕		
Decommissioned Sewer*	---		⊕		

*(Colour denotes effluent type)

dchronin@ardent-ce.co.uk

Talbot Way 2502330

love every drop
anglianwater



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Date: 07/05/25

Scale: 1:1250

Map Centre: 523295,234100

Data updated: 30/04/25

Our Ref: 1763244 - 1

Wastewater Plan A2
Powered by digdat

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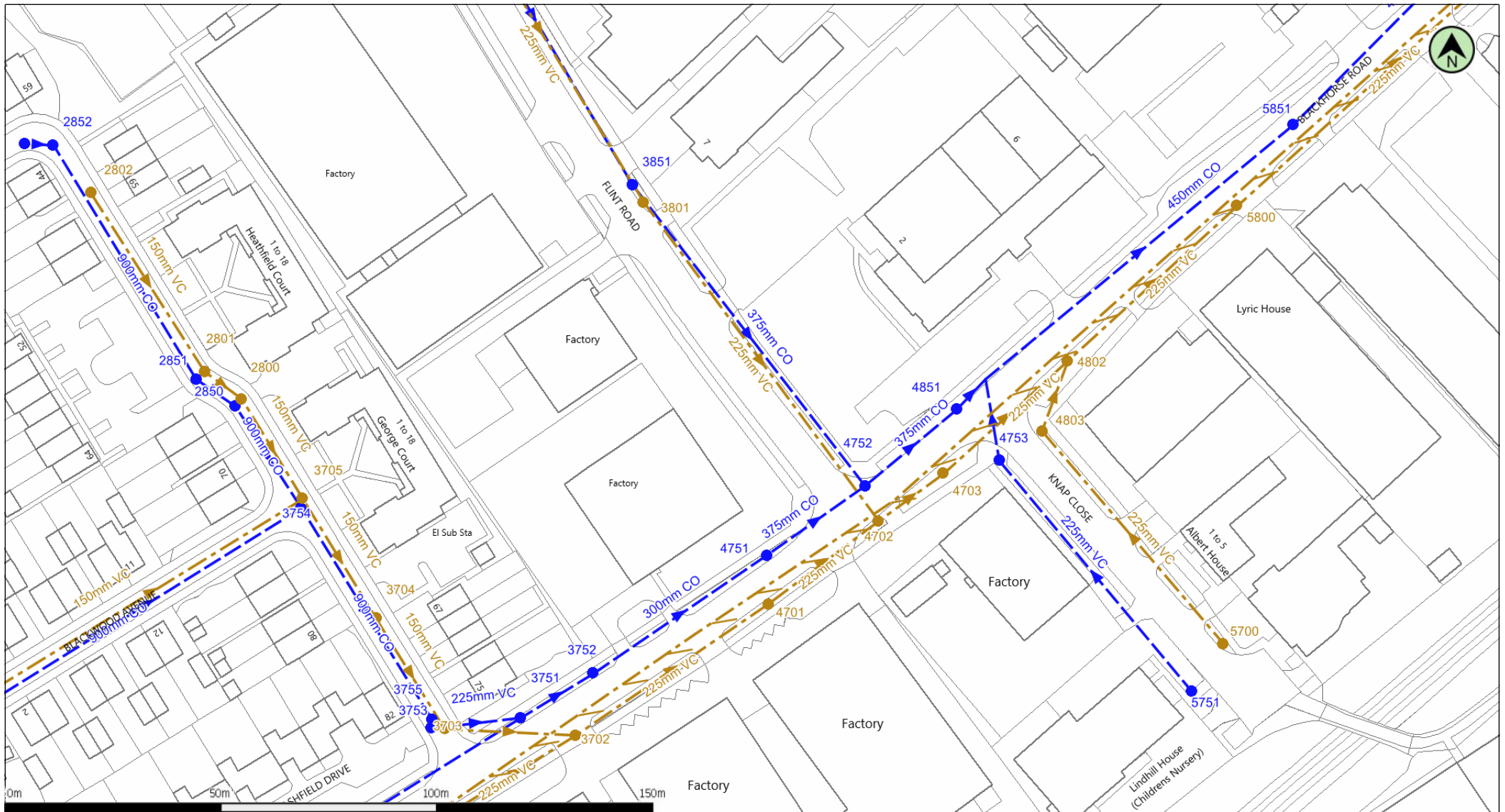
Foul Sewer		
Surface Sewer		Outfall*
Combined Sewer		
Final Effluent		Inlet*
Rising Main*		
Private Sewer*		Manhole*
Decommissioned Sewer*		

	Sewage Treatment Works	
	Public Pumping Station	
	Decommissioned Pumping Station	

*(Colour denotes effluent type)

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Talbot Way 2502330	





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Foul Sewer	--- --	Outfall*	⊕	Sewage Treatment Works	□
Surface Sewer	---		⊕	Public Pumping Station	●
Combined Sewer	---		⊕	Decommissioned Pumping Station	●
Final Effluent	---	Inlet*			
Rising Main*	--- --				
Private Sewer*	---				
Decommissioned Sewer*	---	Manhole*			

*(Colour denotes effluent type)

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Talbot Way 2502330	

Appendix D
Site Investigation Report

REPORT ON TRIAL PIT SOAKAGE TESTS

Report 1277: Rev 0

9th November 2021

PROPOSED RESIDENTIAL DEVELOPMENT:

**LAND EAST OF TALBOT WAY, LETCHWORTH GARDEN CITY,
HERTFORDSHIRE SG6**



Client:	THE ENVIRONMENTAL PROTECTION GROUP LTD Warrington Business Park Long Lane Warrington WA2 8TX
On Behalf of:	LETCWORTH GARDEN CITY HERITAGE FOUNDATION

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HERTFORDSHIRE SG6**

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G7 Geotech reports are independently checked

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1.0 INTRODUCTION

A new residential development is proposed on land east of Talbot Way in the Norton area of Letchworth Garden City.

G7 Geotech Ltd have been instructed by The Environmental Protection Group Ltd to undertake soakage tests in trial pits in general accordance with BRE 365 (2016), 'Soakaway Design', with the aim of providing design data for infiltration surface water drainage.

This Report on Trial Pit Soakage Tests includes factual exploratory records, field test results, a summary of the ground conditions encountered and concludes with an assessment for the proposed sustainable drainage provision.

2.0 SITE DESCRIPTION

The site is situated to the east of Talbot Way in the Norton area of Letchworth Garden City, Hertfordshire SG6. National grid reference 523270E 234090N has been derived near the centre of the proposed development area.

At the time of our trial pits and soakage tests in October 2021, the site comprised a large rectangular shaped field with trees and hedges around the fenced perimeter boundaries.

Along the western side, the site is separated from the adjacent residential areas along Talbot Way by local community garden allotments. Along the northern side are similar residential developments and a school. To the east is open farmland, whilst the Flint Road light industrial estate is present along the southern side.

There was no indication of recent crop cultivation within the field with the ground surface covered in short grass. The site measures approximately 5.5 hectares. The appended Topographic Plan (Ref: GreenHatch Group Ltd drawing 33132_T, Rev 1, dated 12th December 2019), indicates ground elevations to slope down in an approximate SE direction from about +88 mOD to +75 mOD.

The appended plans show the site area with test positions and the site location.

3.0 EXPLORATORY WORK

Prior to our fieldwork a Utility Search Report was commissioned to determine the likely presence of buried services (Groundsure G7GEO-8210240). This report is appended.

The trial pits and soakage tests were carried out on the 22nd October 2021. Trial pits were excavated by a rubber tyred backhoe machine (JCB), and water was supplied by a bowser towed by a four wheeled drive vehicle commissioned by G7 Geotech Ltd. Prior to excavation, and as an additional precaution the positions were checked for buried services using CAT scanning.

The trial pit locations were specified by the client. Our investigation comprised the following elements.

Machine excavated trial pits

Four trial pits (SA01 to SA04) were excavated to depths of between 0.55m and 1.50m BGL. The investigation and testing were under the supervision of an experienced geotechnical engineer. The excavations were 'squared off' as far as reasonably practical to aid in determining accurate measurements prior to soakage testing.

All of the excavations were backfilled with arisings and made safe prior to completion of our fieldwork.

Soakage tests in trial pits

Soakage tests were undertaken in all the trial pits in general accordance with BRE 365 (2016), 'Soakaway Design'. Water was delivered by a towable bowser commissioned by G7 Geotech Ltd.

The number of cycles of soakage testing that can be completed in one day is largely determined by the rate of infiltration achieved. At this site we were able to complete three cycles of tests in SA03 and SA04. In SA01 and SA02 time only allowed for a single cycle of testing due to the much reduced rate of infiltration achieved at these locations.

The engineering trial pit records, test results and exploratory location plan are appended.

4.0 GROUND CONDITIONS

Published geological mapping from the BGS indicates the Lowestoft Formation (Glacial Till) at shallow depth (under the northern part of the site only), underlain by Holywell Nodular Chalk and New Pit Chalk Formation. The Chalk strata is shown to outcrop below the southern part of the site.

SA01 and SA02 were excavated in the central part of the southern half of the site, whilst SA03 and SA04 were located at the south-eastern corner. In all of the trial pits and below the surface topsoil/subsoil layers the Chalk was met to the full depth of excavation. The chalk initially comprised a white structureless stratum of fine to coarse gravel of chalk within a silt matrix. In SA02 a closely bedded structure was evident from about 0.80m and in SA03 and SA04 below depths of 0.50m and 0.60m respectively. Flints were absent within the chalk to the depths excavated.

Groundwater was not encountered in our trial pits which were taken to a maximum depth of 1.50m BGL.

Our soakage tests indicated the following soakage rates:

Trial Pit (and depth of test m BGL)	Soakage Rates (metres / sec)
SA01 (0.55)	2.06×10^{-6}
SA02 (1.50)	2.49×10^{-6}
SA03 (0.50)	4.61×10^{-5} , 1.64×10^{-5} , 1.48×10^{-5}
SA04 (1.50)	2.26×10^{-5} , 1.74×10^{-5} , 1.41×10^{-5}

The tests in SA03 and SA04 indicate medium permeability and good drainage conditions in the south-eastern corner of the site. The three tests in each of these positions indicated a gradually reducing soakage rate following repeated re-fills.

The tests further upslope in SA01 and SA02 indicated low permeability but nevertheless good drainage conditions in the central part of the southern half of the site. The slower infiltration rate at these positions did not allow time for repeated re-fills.

5.0 CONCLUSIONS

The proposed residential development scheme is shown on the appended 'Landscape GA plan', (The Environment Partnership Ref. D906.001 dated 30 April 2020).

Our test results indicate soakage rates of between 2.49×10^{-6} and 1.41×10^{-5} , when taking the lowest result at each test location. These results represent low to medium permeability and moderate to good drainage conditions typical of chalk. The results can be utilised in drainage design subject to the usual allowances for seasonal / weather variations, and prolonged rainfall.

There was a noticeable variation in the infiltration rates achieved between the two distinct test areas. The highest infiltration rates were noted where the closely bedded chalk occurred at shallower levels in SA03 and SA04 which were also situated at the lowest point on site. If possible, soakaways should be designed to penetrate into the closely bedded chalk.



GENERAL INFORMATION, LIMITATIONS AND EXCEPTIONS

Unless otherwise stated, our Report is a Ground Investigation Report [GIR] as defined in BS EN1997-2. Our Report is not intended to be and should not be viewed or treated as a Geotechnical Design Report [GDR] as defined in EN1997-2. If 'design' recommendations are provided, they are for guidance only and are intended to allow the designer to assess the results and implications of our investigation/testing and to permit preliminary design of relevant elements of the proposed scheme. When the title of the report is 'Factual Report on Ground Investigation' this means that geotechnical design recommendations are not provided.

The scope and methods of investigation used have been chosen taking into account project and site constraints including but not limited to access and space limitations. Where it has not been possible to reasonably undertake an EC7 compliant scope or investigation technique we have adopted a practical and economic scope and technique(s) to obtain indicative soil parameters and any interpretation is based upon our engineering experience and relevant published information.

The Report is issued on the condition that G7 Geotech Ltd will under no circumstances be liable for any loss arising directly or indirectly from ground conditions between the exploratory points which differ from those identified during our investigation. In addition G7 Geotech Ltd will not be liable for any loss arising directly or indirectly from any opinion given on the possible configuration of strata both between the exploratory points and/or below the maximum depth of the investigation; such opinions, where given, are for guidance only and no liability can be accepted as to their accuracy. The results of any measurements taken may vary spatially or with time and further confirmatory measurements should be made after any significant delay in using this Report.

Comments made relating to ground-water or ground-gas are based upon observations made during our investigation unless otherwise stated. Ground-water and ground-gas conditions may vary with time from those reported due to factors such as seasonal effects, atmospheric effects and and/or tidal conditions. We recommend that if monitoring installations have been included as part of our investigation, continued monitoring should be carried out to maximise the information gained.

Specific geotechnical features/hazards such as [but not limited to] areas of root-related desiccation and dissolution features in chalk/soluble rock can exist in discrete localised areas - there can be no certainty that any or all of such features/hazards have been located, sampled or identified. Where a risk is identified the designer should provide appropriate contingencies to mitigate the risk through additional exploratory work and/or an engineered solution.

Where spread foundations are used, we recommend that all excavations are inspected and approved by suitably experienced personnel; appropriate inspection records should be kept. This should also apply to any structures which are in direct contact with the soil where the soil could have a detrimental effect on performance or integrity of the structure.

Ground contamination often exists in small discrete areas - there can be no certainty that any or all such areas have been located, sampled or identified.

The findings and opinions conveyed in this Report may be based on information from a variety of third party sources such as commercially available desk based geological and environmental searches, historical maps, mining reports, radon reports, geotechnical laboratory testing and contamination laboratory analyses. G7 Geotech Ltd cannot and does not provide any guarantee as to the authenticity, accuracy or reliability of such information from third parties; such information has not been independently verified unless stated in our Report.

Our Report is written in the context of an agreed scope of work between G7 Geotech Ltd and the Client and should not be used in any different context. In light of additional information becoming available, improved practices and changes in legislation, amendment or re-interpretation of the assessment or the Report in part or in whole may be necessary after its original publication.

Unless otherwise stated our investigation does not include an arboricultural survey, asbestos survey, ecological survey or flood risk assessment and these should be deemed to be outside the scope of our investigation.

Issue 04 : 3rd August 2020

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APPENDIX A

PHOTOGRAPHS



Photograph No 1 : Plant and equipment at locations of SA03 and SA04



Photograph No 2 : View W and NW from SE side of site



Photograph No 3 : View S from northern margin of site.



Photograph No 4 : View NW from location of SA03

APPENDIX B

FOREWORD TO TRIAL PIT RECORDS

TRIAL PIT RECORDS

FOREWORD TO SOAKAGE TEST RESULTS

SOAKAGE TEST RESULTS

FOREWORD TO TRIAL PITS

GENERAL

The Trial Pit Records are compiled from the geotechnical engineer's description of the strata encountered, based on an examination of the soil arisings and the results of field and laboratory tests. Based on this data, the report presents an opinion on the configuration of strata within the site. However, such reasonable assumptions are given for guidance only and no liability can be accepted for changes in conditions not revealed by the trial pits.

EXCAVATION METHODS

Trial pits can be undertaken by either mechanical excavator or by the use of hand tools which allows the ground conditions to be reasonably well established. Some disturbance of the ground is inevitable which can influence field tests. Depths BGL relating to field tests undertaken on soil arisings are approximate only.

GROUNDWATER

The depth at which ground water is struck is entered on the Trial Pit Records. However, this observation may not indicate the true water level at that period. Due to the speed of excavation, natural ground water may be present at a depth slightly higher than the water strike. Moreover, ground water levels are subject to variations caused by changes in the local drainage conditions and by seasonal effects. When a moderate inflow of water does take place, excavation is suspended for at least 10 minutes to enable a more accurate short-term water level to be achieved. An estimate of the rate of inflow is also given. This is a relative term and serves only as a guide to the probable flow of water into an excavation. Further observations of the water level are made on completion.

SAMPLES

Disturbed bulk samples and small disturbed samples are taken and placed in polythene bags for geotechnical testing. Small jar samples and plastic tub samples are taken for laboratory ground contamination testing. Where ground water is encountered in sufficient quantity, a sample of the ground water is also taken.

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G7 Geotech G7 Geotech Ltd 49, Church Rd Leyland PR25 3AA		TRIAL PIT RECORD		Trial Pit No SA01 Sheet 1 of 1																			
Project Name: Proposed residential development		Job No 1277		Trial Pit SA01 machine excavated on 22/10/21 Groundwater not encountered. Trial Pit backfilled with arisings on completion. GL 84.5 mOD GR:523300E 234050N																			
Location: Land East of Talbot Way, Letchworth Garden City, Hertfordshire SG6																							
Client: The Environmental Protection Group Ltd																							
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G7 Geotech G7 Geotech Ltd 49, Church Rd Leyland PR25 3AA		TRIAL PIT RECORD		Trial Pit No SA02 Sheet 1 of 1																									
Project Name: Proposed residential development		Job No 1277		Trial Pit SA02 machine excavated on 22/10/21 Groundwater not encountered. Trial Pit backfilled with arisings on completion. GL 84.0 mOD GR:523295E 234065N																									
Location: Land East of Talbot Way, Letchworth Garden City, Hertfordshire SG6																													
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Photographs  																													

G7 Geotech G7 Geotech Ltd 419, Church Rd Leyland PR25 3AA		TRIAL PIT RECORD		Trial Pit No SA03 Sheet 1 of 1																														
Project Name: Proposed residential development		Job No 1277		Trial Pit SA03 machine excavated on 22/10/21 Groundwater not encountered. Trial Pit backfilled with arisings on completion. GL 77.75 mOD GR:523400E 234045N																														
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G7 Geotech G7 Geotech Ltd 48, Church Rd Leyland PR25 3AA		TRIAL PIT RECORD		Trial Pit No SA04 Sheet 1 of 1																														
Project Name: Proposed residential development		Job No 1277		Trial Pit SA04 machine excavated on 22/10/21 Groundwater not encountered. Trial Pit backfilled with arisings on completion. GL 77.0 mOD GR:523420E 234055N																														
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FOREWORD TO SOAKAGE TESTS

GENERAL

The soakage tests are undertaken in general accordance with BRE Digest 365 : 2016, Soakaway design. Soakage tests are undertaken in either machine-excavated or hand-excavated trial pits and water can be delivered either by means of a lorry mounted bowser or by portable 25 litre plastic containers, depending on the size / depth of excavation.

The BRE guidance requires soakage rates to be calculated on the basis of water levels recorded at 25% and 75% of the effective depth of the proposed soakaway. Soakage rates can vary substantially. In highly permeable granular soils the added water may drain relatively quickly, or in practically impermeable cohesive soils the water may drain very slowly, if at all. In the case of soils of low permeability or practically impermeable soils, water levels at 25% and 75% of the effective depth may not be achievable in the available time. In these circumstances, soakage rates are calculated based on alternative selected water levels and this is stated on the results sheets.

Where soakage tests are undertaken to assess the potential for infiltration drainage beneath a sports pitch, or other widescale drainage blanket, they can be undertaken in shallow trial pits of about 0.50m depth to target the proposed pitch formation level. In these circumstances, where the drainage blanket may be relatively thin or may include check dams at intervals, the effective depth of the soakaway as described in BRE Digest 365, is not necessarily relevant to the soakage rate calculation. Alternative selected water levels are therefore taken as the basis for calculation of the soakage rates.

The BRE Digest 365 requires soakage tests to be repeated to give 3 tests at each location in order to model the effects of reduced permeability resulting from saturation of the soils following prolonged rainfall. In the case of soils of low permeability or practically impermeable soils, repeat tests may not always be feasible in the available time. However, in these circumstances, soakaways may not be a suitable drainage option anyway, and a single test, can be sufficient in order to prove this negative outcome.

The Soakage Test Records are compiled from the geotechnical engineer's description of the strata encountered, based on an examination of the soil arisings and the results of field tests. Based on this data, the report presents an opinion on the configuration of strata within the site. However, such reasonable assumptions are given for guidance only, and no liability can be accepted for changes in conditions not revealed by the trial pits / soakage tests.

EXCAVATION METHODS

Trial pits can be undertaken either by mechanical excavator or by the use of hand tools which allows the ground conditions to be reasonably well established. Some disturbance of the ground is inevitable and depending on the type of excavator bucket used this can influence soakage test results.

GROUNDWATER

The depth at which ground water is struck is entered on the Soakage Test and Trial Pit Records. However, this observation may not indicate the true water level at that period. Due to the speed of excavation, natural ground water may be present at a depth slightly higher than the water strike. Moreover, ground water levels are subject to variations caused by changes in the local drainage conditions and by seasonal effects. When a moderate inflow of water does take place, excavation is suspended for at least 10 minutes to enable a more accurate short-term water level to be achieved. An estimate of the rate of inflow is also given. This is a relative term and serves only as a guide to the probable flow of water into an excavation. Further observations of the water level are made on completion.

SAMPLES

Disturbed soil samples are taken and placed in polythene bags for geotechnical testing. Small jar samples and plastic tub samples are taken for laboratory ground contamination testing. Where ground water is encountered in sufficient quantity, a sample of the ground water is also taken.

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Project Name: Proposed Residential Development

Job No
1277

Location: Land to the East of Talbot Way, Letchworth Garden City, Herts SG6

Client: EPG Ltd

Soakage test undertaken with
rubber tyred backhoe excavator (JCB)
at 0.55m depth.

SOAKAGE RATE

TP SOAKAGE TEST SA01 DEPTH 0.55 TEST No 1 DATE: 22nd October 2021

CASING DEPTH 0.00 m

DIMENSIONS

WIDTH 0.40 m

LENGTH 1.00 m

DIAMETER m

PERIMETER 2.800 m

BASE AREA 0.400 m²

Readings measured from: 0.00 m above ground level

SOIL TYPE :-
GL - 0.20 TOPSOIL
0.20 - 0.55 White CHALK

No	time	depth	Depth bgl
1	0	0.300	0.300
2	1	0.300	0.300
3	2	0.305	0.305
4	3	0.305	0.305
5	4	0.310	0.310
6	5	0.310	0.310
7	10	0.315	0.315
8	15	0.320	0.320
9	20	0.320	0.320
10	25	0.320	0.320
11	30	0.320	0.320
12	40	0.320	0.320
13	73	0.330	0.330
14	88	0.340	0.340
15	122	0.350	0.350
16	156	0.360	0.360
17	186	0.360	0.360

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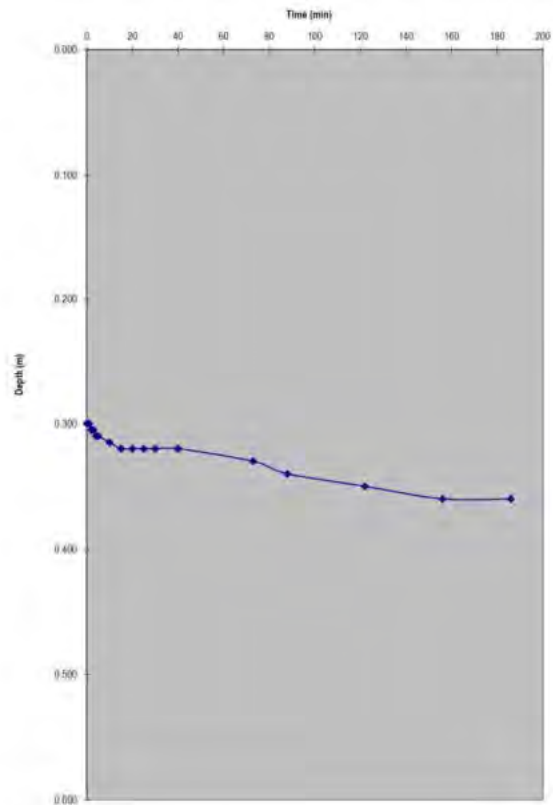
	Water Level (m)	Time sec
Top WL	7	0.32 600
Bottom WL	15	0.35 7320

Vol change = 0.0140 m³ V
 Soakage area = 1.0090 m² A
 Time = 6720 sec T

Soakage Rate 2.06E-06 m/sec

Soakage Rate is calculated using two selected water levels
 (equivalent to those at 25% and 75% of the fall in water level during
 the test) and is based on BRE Digest 305, 2010: Soakaway Design.

Water Level v Time Graph



Project Name: Proposed Residential Development

Job No
1277

Location: Land to the East of Talbot Way, Letchworth Garden City, Herts SG6

Client: EPG Ltd

Soakage test undertaken with
rubber tyred backhoe excavator (JCB)
at 1.50m depth.

SOAKAGE RATE

TP SOAKAGE TEST SA02 DEPTH 1.50 TEST No 1 DATE: 22nd October 2021

CASING DEPTH 0.00 m

DIMENSIONS

WIDTH 0.40 m

LENGTH 1.50 m

DIAMETER m

PERIMETER 3.800 m

BASE AREA 0.600 m²

Readings measured from 0.00 m above ground level

SOIL TYPE :-

GL - 0.25 TOPSOIL
0.25 - 1.50 White CHALK

No	time	depth	Depth bgl
1	0	0.630	0.630
2	1	0.650	0.650
3	2	0.650	0.650
4	3	0.650	0.650
5	4	0.660	0.660
6	5	0.670	0.670
7	10	0.670	0.670
8	15	0.680	0.680
9	25	0.690	0.690
10	30	0.690	0.690
11	35	0.700	0.700
12	45	0.710	0.710
13	60	0.720	0.720
14	93	0.750	0.750
15	106	0.760	0.760
16	141	0.780	0.780
17	180	0.790	0.790
18	209	0.810	0.810

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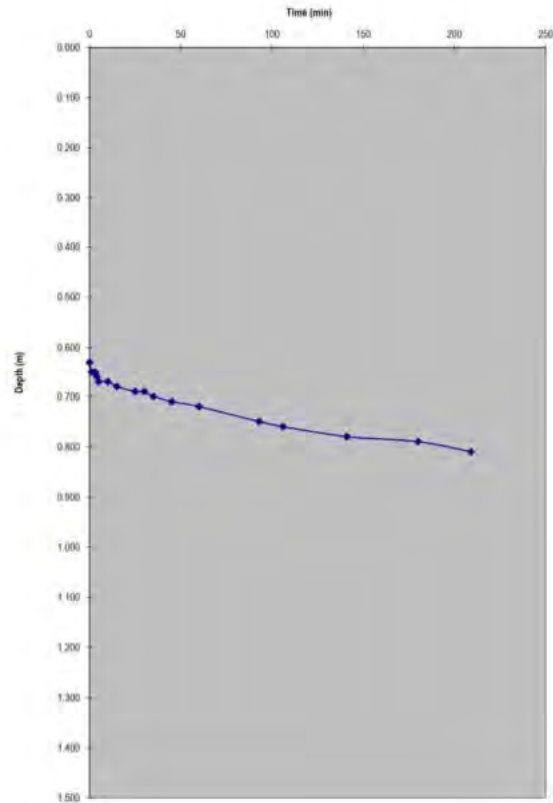
	Water Level (m)	Time sec
Top WL	6 0.67	300
Bottom WL	15 0.76	6360

Vol change = 0.0540 m³ V
 Soakage area = 3.5830 m² A
 Time = 6060 sec T

Soakage Rate 2.49E-06 m/sec

Soakage Rate is calculated using two selected water levels
 (equivalent to those at 25% and 75% of the fall in water level during
 the test) and is based on BRE Digest 305, 2010: Soakaway Design

Water Level v Time Graph



SOAKAGE TEST RESULT

Soakage Test No

SA03

Sheet 1 of 1

Project Name: Proposed Residential Development

Job No
1277

Location: Land to the East of Talbot Way, Letchworth Garden City, Herts SG6

Client: EPG Ltd

Soakage test undertaken with
rubber tyred backhoe excavator (JCB)
at 0.60m depth.

SOAKAGE RATE

TP SOAKAGE TEST SA03 DEPTH 0.60 TEST No 1 DATE: 22nd October 2021

CASING DEPTH 0.00 m

DIMENSIONS

WIDTH 0.40 m

LENGTH 1.20 m

DIAMETER m

PERIMETER 3.200 m

BASE AREA 0.480 m²

Readings measured from: 0.00 m above ground level

SOIL TYPE :-

GL - 0.10 TOPSOIL

0.10 - 0.30 Soft grey brown sandy silty gravelly CLAY.

0.30 - 0.60 White CHALK

No	time	depth	Depth bgt
1	0	0.350	0.350
2	1	0.370	0.370
3	2	0.380	0.380
4	3	0.390	0.390
5	4	0.400	0.400
6	5	0.410	0.410
7	10	0.450	0.450
8	15	0.470	0.470
9	20	0.490	0.490
10	25	0.510	0.510
11	30	0.530	0.530
12	35	0.550	0.550

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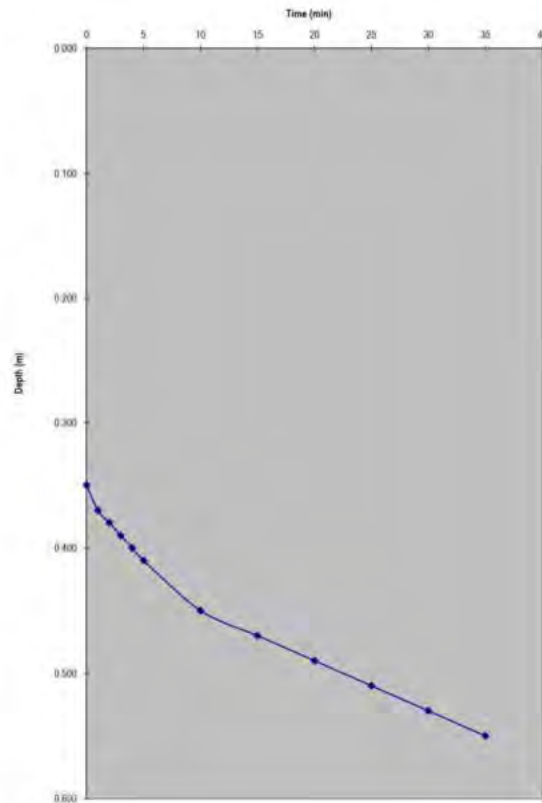
	Water Level (m)	Time sec
Top WL	5	0.40 240
Bottom WL	9	0.49 1200

Vol change = 0.0432 m³ V
 Soakage area = 0.9780 m² A
 Time = 960 sec T

Soakage Rate **4.61E-05** m/sec

Soakage Rate is calculated using two selected water levels
 (equivalent to those at 25% and 75% of the fall in water level during
 the test) and is based on BRE Digest 305, 2010: Soakaway Design.

Water Level v Time Graph



G7 Geotech Ltd 49, Church Rd Leyland PR25 3AA		SOAKAGE TEST RESULT		Soakage Test No SA03 Sheet 1 of 1	
Project Name: Proposed Residential Development			Job No 1277		Soakage test undertaken with rubber tyred backhoe excavator (JCB) at 0.60m depth.
Location: Land to the East of Talbot Way, Letchworth Garden City, Herts SG6					
Client: EPG Ltd					

SOAKAGE RATE

TP SOAKAGE TEST SA03 DEPTH 0.60

TEST No 2

DATE: 22nd October 2021

CASING DEPTH 0.00 m

DIMENSIONS

WIDTH 0.40 m

LENGTH 1.20 m

DIAMETER m

PERIMETER 3.200 m

BASE AREA 0.480 m²

Readings measured from: 0.00 m above ground level

SOIL TYPE :-

GL - 0.10 TOPSOIL

0.10 - 0.30 Soft grey brown sandy silty gravelly CLAY.

0.30 - 0.60 White CHALK

No	time	depth	Depth bgl
1	0	0.350	0.350
2	1	0.360	0.360
3	3	0.370	0.370
4	4	0.370	0.370
5	5	0.370	0.370
6	10	0.390	0.390
7	15	0.400	0.400
8	20	0.430	0.430
9	25	0.440	0.440
10	30	0.440	0.440
11	35	0.450	0.450
12	45	0.470	0.470
13	60	0.490	0.490
14	85	0.530	0.530
15	97	0.550	0.550

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	Water Level (m)	Time sec
Top WL	7	0.40 900
Bottom WL	13	0.49 3600

Vol change = 0.0432 m³ V
Soakage area = 0.9760 m² A
Time = 2700 sec T

Soakage Rate

1.64E-05 m/sec

Soakage Rate is calculated using two selected water levels (equivalent to those at 25% and 75% of the fall in water level during the test) and is based on BRE Digest 305, 2010: Soakaway Design

Water Level v Time Graph

Project Name: Proposed Residential Development

Job No
1277

Location: Land to the East of Talbot Way, Letchworth Garden City, Herts SG6

Client: EPG Ltd

Soakage test undertaken with
rubber tyred backhoe excavator (JCB)
at 0.60m depth.

SOAKAGE RATE

TP SOAKAGE TEST SA03 DEPTH 0.60 TEST No 3 DATE: 22nd October 2021

CASING DEPTH 0.00 m

DIMENSIONS

WIDTH 0.40 m

LENGTH 1.20 m

DIAMETER m

PERIMETER 3.200 m

BASE AREA 0.480 m²

Readings measured from 0.00 m above ground level

SOIL TYPE :-

GL - 0.10 TOPSOIL

0.10 - 0.30 Soft grey brown sandy silty gravelly CLAY.

0.30 - 0.60 White CHALK

No	time	depth	Depth bgt
1	0	0.380	0.380
2	1	0.390	0.390
3	2	0.400	0.400
4	3	0.410	0.410
5	4	0.410	0.410
6	5	0.410	0.410
7	10	0.430	0.430
8	15	0.440	0.440
9	20	0.450	0.450
10	45	0.490	0.490
11	60	0.520	0.520
12	70	0.540	0.540
13	80	0.550	0.550

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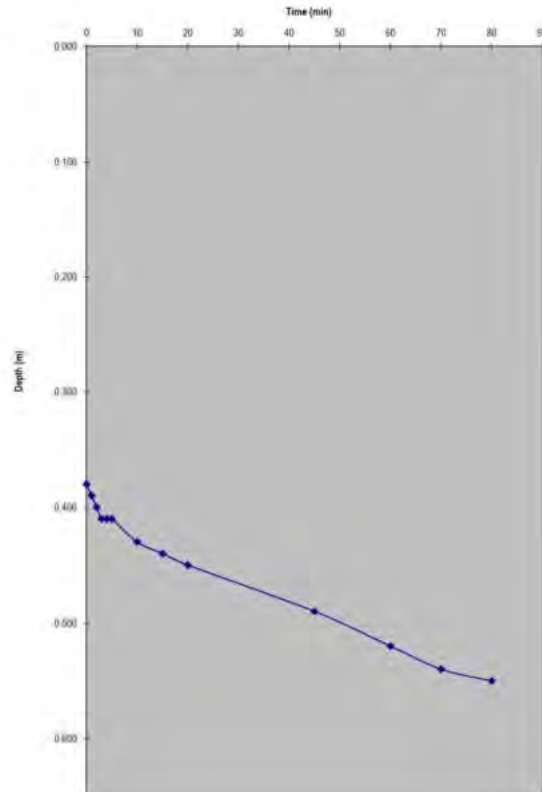
	Water Level (m)	Time sec
Top WL	7 0.43	600
Bottom WL	10 0.49	2700

Vol change = 0.0288 m³ V
 Soakage area = 0.9280 m² A
 Time = 2100 sec T

Soakage Rate 1.48E-05 m/sec

Soakage Rate is calculated using two selected water levels
 (equivalent to those at 25% and 75% of the fall in water level during
 the test) and is based on BRE Digest 305, 2010: Soakaway Design

Water Level v Time Graph



Project Name: Proposed Residential Development

Job No
1277

Location: Land to the East of Talbot Way, Letchworth Garden City, Herts SG6

Client: EPG Ltd

Soakage test undertaken with
rubber tyred backhoe excavator (JCB)
at 1.50m depth.

SOAKAGE RATE

TP SOAKAGE TEST SA04 DEPTH 1.50 TEST No 1 DATE: 22nd October 2021

CASING DEPTH 0.00 m

DIMENSIONS

WIDTH 0.40 m

LENGTH 1.40 m

DIAMETER m

PERIMETER 3.600 m

BASE AREA 0.560 m²

Readings measured from: 0.00 m above ground level

SOIL TYPE :-

GL - 0.10 TOPSOIL

0.10 - 0.30 Soft grey brown sandy silty gravelly CLAY.

0.30 - 1.50 White CHALK

No	time	depth	Depth bgl
1	0	0.800	0.800
2	1	0.830	0.830
3	2	0.850	0.850
4	3	0.860	0.860
5	4	0.870	0.870
6	5	0.890	0.890
7	10	0.930	0.930
8	15	0.970	0.970
9	20	1.000	1.000
10	25	1.030	1.030
11	30	1.060	1.060
12	40	1.100	1.100
13	45	1.130	1.130
14	60	1.190	1.190
15	98	1.270	1.270
16	105	1.300	1.300
17	120	1.370	1.370

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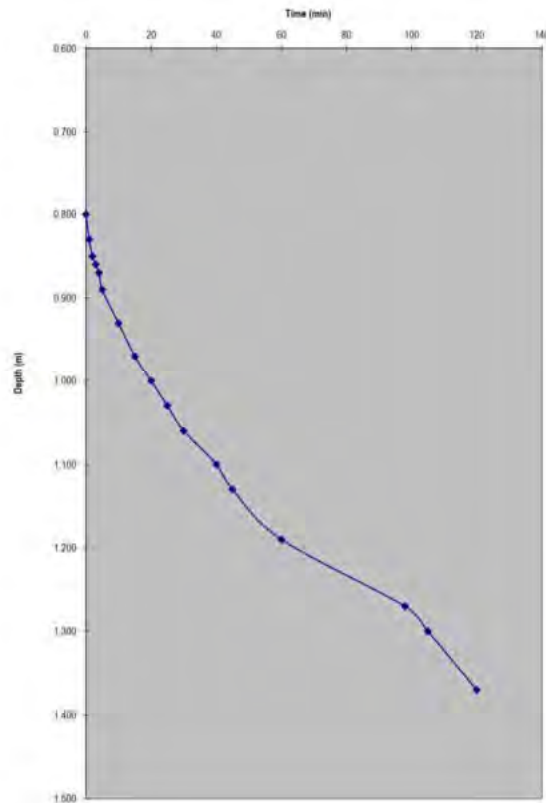
	Water Level (m)	Time sec
Top WL	7	0.93
Bottom WL	14	1.19
		3600

Vol change = 0.1456 m³ V
 Soakage area = 2.1440 m² A
 Time = 3000 sec T

Soakage Rate 2.26E-05 m/sec

Soakage Rate is calculated using two selected water levels
 (equivalent to those at 25% and 75% of the fall in water level during
 the test) and is based on BRE Digest 305, 2010: Soakaway Design

Water Level v Time Graph



Project Name: Proposed Residential Development

Job No
1277

Location: Land to the East of Talbot Way, Letchworth Garden City, Herts SG6

Client: EPG Ltd

Soakage test undertaken with
rubber tyred backhoe excavator (JCB)
at 1.50m depth.

SOAKAGE RATE

TP SOAKAGE TEST SA04 DEPTH 1.50 TEST No 2 DATE: 22nd October 2021

CASING DEPTH 0.00 m

DIMENSIONS

WIDTH 0.40 m

LENGTH 1.40 m

DIAMETER m

PERIMETER 3.600 m

BASE AREA 0.560 m²

Readings measured from: 0.00 m above ground level

SOIL TYPE :-

GL - 0.10 TOPSOIL

0.10 - 0.30 Soft grey brown sandy silty gravelly CLAY.

0.30 - 1.50 White CHALK

No	time	depth	Depth bgl
1	0	0.770	0.770
2	1	0.790	0.790
3	2	0.800	0.800
4	3	0.810	0.810
5	4	0.820	0.820
6	5	0.830	0.830
7	10	0.850	0.850
8	15	0.870	0.870
9	21	0.900	0.900
10	25	0.920	0.920
11	30	0.950	0.950
12	45	1.010	1.010
13	60	1.090	1.090
14	72	1.120	1.120
15	80	1.150	1.150
16	90	1.160	1.160
17	100	1.190	1.190
18	125	1.240	1.240
19	140	1.270	1.270

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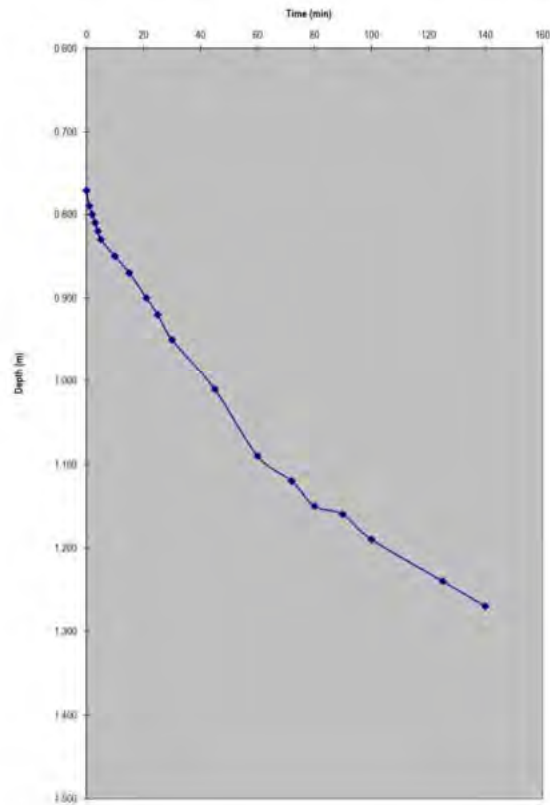
	Water Level (m)	Time sec
Top WL	9	0.90
Bottom WL	15	1.15

Vol change = 0.1400 m³ V
 Soakage area = 2.2700 m² A
 Time = 3540 sec T

Soakage Rate 1.74E-05 m/sec

Soakage Rate is calculated using two selected water levels
 (equivalent to those at 25% and 75% of the fall in water level during
 the test) and is based on BRE Digest 305, 2010: Soakaway Design

Water Level v Time Graph



Project Name: Proposed Residential Development

Job No
1277

Location: Land to the East of Talbot Way, Letchworth Garden City, Herts SG6

Client: EPG Ltd

Soakage test undertaken with
rubber tyred backhoe excavator (JCB)
at 1.50m depth.

SOAKAGE RATE

TP SOAKAGE TEST SA04 DEPTH 1.50 TEST No 3 DATE: 22nd October 2021

CASING DEPTH 0.00 m

DIMENSIONS

WIDTH 0.40 m

LENGTH 1.40 m

DIAMETER m

PERIMETER 3.600 m

BASE AREA 0.560 m²

Readings measured from 0.00 m above ground level

SOIL TYPE :-

GL - 0.10 TOPSOIL

0.10 - 0.30 Soft grey brown sandy silty gravelly CLAY.

0.30 - 1.50 White CHALK

No	time	depth	Depth bgl
1	0	0.750	0.750
2	1	0.760	0.760
3	2	0.770	0.770
4	3	0.780	0.780
5	4	0.790	0.790
6	5	0.800	0.800
7	10	0.820	0.820
8	15	0.860	0.860
9	20	0.880	0.880
10	30	0.920	0.920
11	45	0.960	0.960
12	60	1.020	1.020
13	82	1.070	1.070
14	90	1.100	1.100
15	95	1.120	1.120

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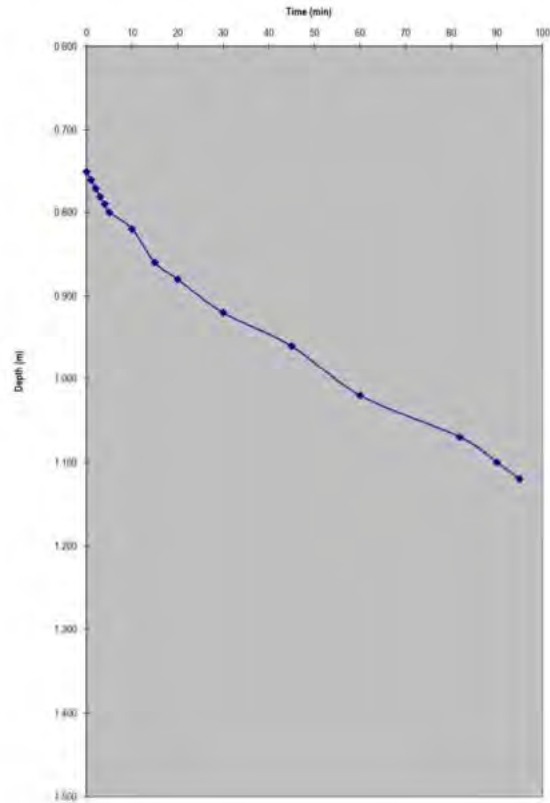
	Water Level (m)	Time sec
Top WL	7	0.82
Bottom WL	12	1.02
		3600

Vol change = 0.1120 m³ V
 Soakage area = 2.6480 m² A
 Time = 3000 sec T

Soakage Rate 1.41E-05 m/sec

Soakage Rate is calculated using two selected water levels
 (equivalent to those at 25% and 75% of the fall in water level during
 the test) and is based on BRE Digest 305, 2010: Soakaway Design.

Water Level v Time Graph



Appendix E
Product Data Sheets

Hy-Tex Ultra Dewatering Bags for Pumped Sediment Control



Hy-Tex Ultra Dewatering Bags provide an effective way to collect harmful sediments from dirty water pumped out of excavation works (such as foundations, pipe line construction, water, sewer and utility trenches, waterways and lakes) that would otherwise pollute the surrounding environment.

It is a legal requirement to prevent silty water from leaving site untreated, and a finable offence if you do not take appropriate pollution control measures. The Environment Agency Pollution Prevention Guidelines PPG6 (See side panel), in summary, require that the majority of suspended solids (gravel, sand, and silt) must be removed from site water before it is discharged into a drain, sewer or watercourse.

Traditionally settlement methods (such as straw bale structures or settlement ponds/tanks) are often ineffective, rely on slow water movement, long settlement times, expensive and time consuming tank maintenance and large works areas.

Ultra Dewatering Bags are an efficient, practical, quick, simple and cost effective alternative solution to manage this ongoing environmental problem of removing suspended solid pollutants from pumped water on construction sites.

Sediment-laden water is simply pumped into the high quality filter bags, which trap the solids inside and allow filtered water to flow freely out through the geotextile fabric to disperse into the surrounding ground or another collection point.

Ultra Dewatering Bags can also be used for gravity feed applications such as outfall pipes from site drainage or lagoons.

The silt filter bags provide a passive non-mechanical solution, without the use of excessive or specialist machinery (other than possible lifting equipment when full), and do not require a large work area.

The sediment bags are also light, compact and easy to store, with minimal cleaning up required - when full just dispose of the bag and replace with another bag.

The Ultra Dewatering Bags detain both oil and sediment, offering a combination of benefits not available in alternative products. They can also be used to contain contaminated sediment whilst treatments are applied (such as flocculants or absorbents).

The standard 1.80 x 1.80m Ultra Dewatering bags has the capacity to trap near 1 tonne of silt and cope with flow rates up to 1,890 l/min, while the larger 3.05 x 4.55m bags can trap over 4 tonnes of silt and cope with flow rates up to 5,670 l/min.

The Environment Agency

"Working at construction and demolition sites:
PPG6 Pollution Prevention Guidelines"

"Poor management of silt and silty water is a major cause of serious pollution incidents from construction sites. Silt for these purposes is a fine inert sediment derived from soil and rocks.

Silt pollution can: damage and kill aquatic life by smothering and suffocating; reduce water quality; cause flooding by blocking culverts and channels..."

"You must not discharge any silty water to a drain or watercourse without prior treatment to settle or remove suspended solids. If you've identified that you will be generating silty water, identify suitable means to treat the water before discharge; examples include: lagoons, settlement tanks, silt traps grassy areas that slow water and allow solids to settle..."

"You must have prior permission from the local sewerage provider if you intend to discharge settled water to the foul sewer because this will be regarded as a trade effluent.

You must have prior permission from [the Environment Agency] if you need to discharge anything to a watercourse. In Scotland if you comply with certain conditions, a discharge will be covered by a General Binding Rule and you will not need to contact SEPA."

Property	ASTM Test	Value
Material		Non-woven polypropylene geotextile
Grab Tensile Strength	D 4632	912 N (205 lb)
Elongation	D 4632	50%
Trapezoid Tear	D 4533	356 N (80 lb)
Puncture Resistance	D 4833	2,335N (525 lbs)
Mullen Burst	D 3786	2,896 kpa (420 psi)
Permittivity	D 4491	1.5 sec ⁻¹
Pore Size O ₉₀		180 micron
UV Stability	D 4355	70% strength retained after 500hr
Weight	D 5261	272 g/m ² (8 oz/yd ²)
Flow Rate	D 4491	3,660 l/min/m ² (90 gal/min/ft ²)

Hy-Tex Ultra Dewatering Bags for Pumped Sediment Control



Usage Guidelines

Ideally position the Ultra Dewatering Bag on a slope, so incoming water flows downhill through the bag, and, as a precaution, install Terrastop Premium silt fence down slope of the bags to control any potential run-off pollution.

The bag is fitted with a collar which fits around delivery hoses or connectors. Strap the neck of the Ultra Dewatering Bag tightly to the discharge hose using the attached tying cord.

To increase filtration efficiency place the bag on an aggregate, or a layer of Hy-Pave tiles, to maximize water flow through the under surface of the bag.

Plan ahead for removal, if the filled bags are to be lifted for disposal then place suitable lifting straps under bag prior to pumping, alternatively you can roll the bags into a digger bucket.

Regularly check the bags. The Ultra Dewatering Bag is full when it no longer can efficiently filter sediment or pass water at a reasonable rate.

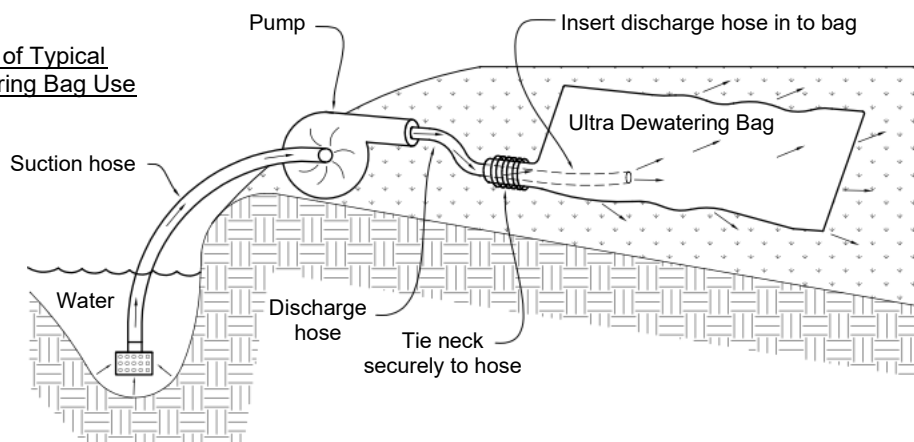
Flow rates will vary depending on the size of the Ultra Dewatering Bag, the type and amount of sediment discharged into the bag, the type of ground, rock or other substance under the bag and the degree of the slope on which the bag lies.

Under most circumstances Ultra Dewatering Bags will accommodate flow rates of up to 2,730 l/min for the 1.80 x 1.80m bags and 6,816 l/min for the 3.00 x 4.50m bags.

Use of excessive flow rates, or overfilling Ultra Dewatering Bags with sediment, may cause ruptures of the bags or failure of the hose attachment straps.

Dispose of the Ultra Dewatering Bag as directed by the site engineer. Normally allow the bags to dry in place then either cut open, spread and landscape on site or remove and dispose of the filled bags (Heavy lifting machinery may be required).

Illustration of Typical
Ultra Dewatering Bag Use



Size	Code	Surface Area	Max Flow Rate	Max Pump Size	Sediment Capacity	Oil Capacity
0.90 x 1.20 m (3 x 4 ft)	9729	2.23 m ² (24 ft ²)	1,890 l/min (500 gal/min)	10 cm (4 inch)	0.17 m ³ / 327 kg (6 ft ³ / 720 lbs)	4.5 l (1.2 gal)
1.80 x 1.80 m (6 x 6 ft)	9724	6.68 m ² (72 ft ²)	1,890 l/min (500 gal/min)	10 cm (4 inch)	0.51 m ³ / 980 kg (18 ft ³ / 2,160 lbs)	14 l (3.7 gal)
3.00 x 4.50 m (10 x 15 ft)	9725	27.87 m ² (300 ft ²)	5,670 l/min (1,500 gal/min)	15 cm (6 inch)	4.20 m ³ / 8,165 kg (150 ft ³ / 18,000 lbs)	57 l (15.1 gal)

Notes:

Flow/Dewatering rates will vary according to soil type (Sand typically dewateres at the fastest rate, while clay dewateres at the slowest). Clay may also blind over the fabric in some instances, significantly reducing flow.

Max flow rate is a cautious figure based on a significant de-rating of the clean fabric flow rate of approx 3,660 l/min/m² (90 gal/min/ft²) to allow for pump pressure build up from silt accumulation.

Sediment capacity is calculated using wet sand weight of approx 1,920kg/m³ (120 lbs/ft³) and an average bag fill height of approx 160mm

Oil capacity is estimated at low flow conditions with approx 2.09 l/m² (0.5 gal/ft²) absorption capacity

All data stated and the recommendations made herein are offered free of charge and are accurate to the best of our knowledge. Hy-Tex (UK) Ltd assumes no liability for the accuracy or completeness of this information or for the ultimate use by the purchaser. Hy-Tex disclaims any and all express, implied, or statutory standards, warranties or guarantees, including without limitation any implied warranty as to merchantability or fitness for a particular purpose or arising from a course of dealing or usage of trade as to any equipment, material, or information furnished herewith. Final determination of the use of any information or material, or how it is useful, and whether the use infringes any patents is the sole responsibility of the user.

The Gully Guard

Installation guide



1. Lever open gully grid. Gully Guard is designed to fit all size gullies.



2. Hold handles at top of the Gully Guard, work beads to top and insert base into water filled gully pot.



3. Lower the Gully Guard into the pot. The beads will fall freely into the void within the pot.



4. Tuck the holding handles to the side of the Gully Guard.



5. Close gully grid.

Forest Drainage Products Ltd

Stardens Works, Tewkesbury Road,
Newent, Gloucestershire GL18 1LG

Tel: 01531 828960 Fax: 01531 828969

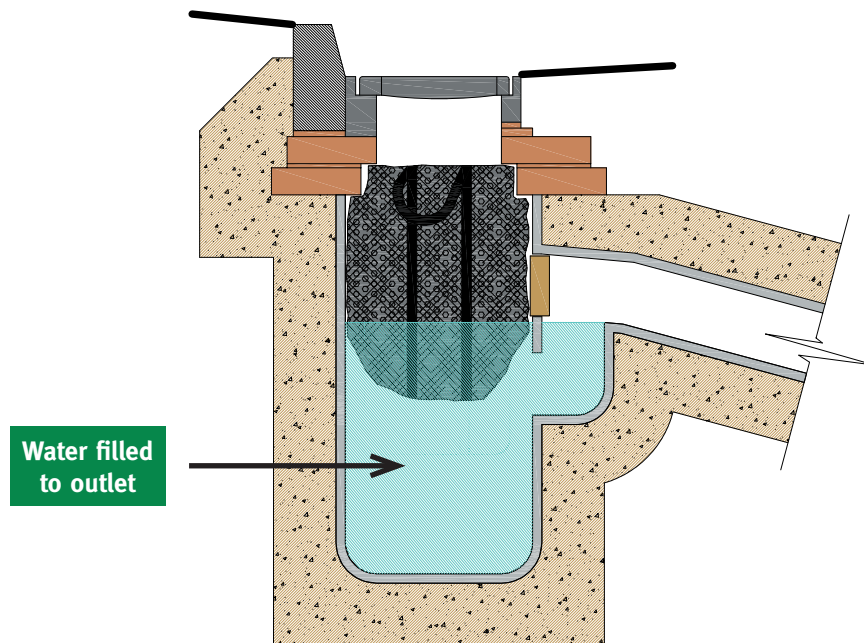
Email: info@forestgroupuk.co.uk

www.forestgroupuk.co.uk

Patent no. 2472690

The Gully Guard

Installation diagram



	Gully Grating and Frame		Stopper
	Kerb Stone		Water
	Brickwork		Gully Guard
	Gully Wall		Gully Guard Straps
	Concrete Surround		

Maintenance

The Company (Forest Drainage Products) would recommend that an inspection procedure be put in place for the product by the organisation on a 3–4 months basis depending on site conditions.

Maintenance would simply involve the removal of the Product and power hose off in a bund to contain and manage silt and any contaminants prior to reinsertion back into the gully pot.

Without prior knowledge of the type and concentration of the contaminants that each Gully Guard has been subjected to, the Company cannot advise on appropriate disposal. The Company advises that an environmental risk assessment is conducted on an individual case-by-case basis to fully evaluate the nature of contaminants. In order to determine the appropriate method of disposal the Company would recommend that you follow your organisation's environmental waste disposal policy.

Forest Drainage Products Limited (the "Company")

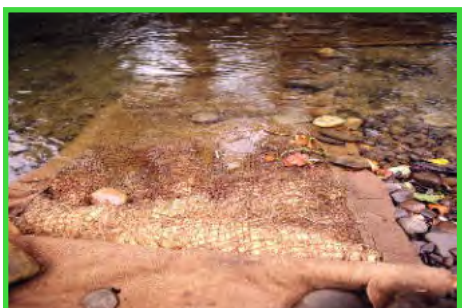
Forest Drainage Products Ltd, Stardens Works,
Tewkesbury Road, Newent, Gloucestershire GL18 1LG

Tel: 01531 828960 Email: info@forestgroupuk.co.uk

www.forestgroupuk.co.uk



The logo for The Forest Group, featuring the letters "fg" in a blue square followed by the text "The Forest Group". Below this, the tagline "High performance, versatile solutions" is written in a smaller, green font.



Sedimat™

Sedimats™ are used in waterways during in-stream construction activities (such as pipe laying or dredging) to trap disturbed sediment that may pollute aquatic habitats downstream.

They are a simple, yet effective, biodegradable matting, which are fixed to the stream bed, and do not impede water flow.

Our Sedimat™ is an effective tool for the protection of streams from sedimentation damage during in stream construction activities such as utility installation, culvert replacements, ditch maintenance, and bridge work. It is a flat 1.20 x 3.00m pad which is laid singly or in multiples on the streambed immediately downstream of the worksite.

Our Sedimat™ is packaged individually and is easy to store, handle and transport. It can be installed on a streambed using either stones or stakes and can be placed in any configuration or number to provide desired coverage. It may be used alone or in conjunction with other methods of stream protection such as coffer dams, culverts or silt screen. Since it's UK launch in 1996 by Hy-Tex (UK) Limited, our Sedimat™ has been used extensively throughout the country on a diverse range of projects.

Features/Benefits:

- Over 25 years of proven performance
- Traps sediment before it can pollute the watercourse
- Fully biodegradable
- Made from natural materials
- Easy to handle
- Secondary application - can be used to stabilise banks
- Extensive field trials in America by The New York State Electric and Gas Corporation
- Can trap up to 250kg of sediment
- Manufactured in the UK

Guidance

- Keep Sedimat™ weighted down to prevent washing away

Feature	Sedimat™
Function	Designed to trap harmful disturbed sediment by promoting settlement
Applications	Reservoirs, lakes, canals, rivers, streams and wetlands
Material	Hessian backed, encapsulating wood wool using a jute mesh and support by timber posts.
Size & Weight	1.20m x 3.00m & 11Kg each in weight

**International
Erosion Control
Association
Award Winner**



Application Categories: Sediment Pollution Control

Hy-Tex (UK) Limited
Aldington Mill, Mill Lane,
Aldington, Ashford, Kent
TN25 7AJ

01233 720097
sales@hy-tex.co.uk
www.hy-tex.co.uk
01233 720098



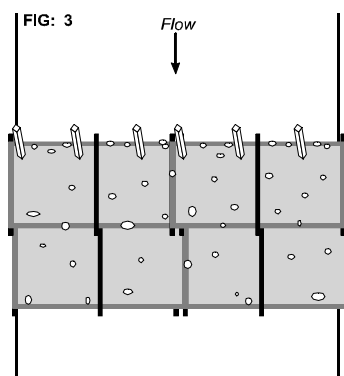
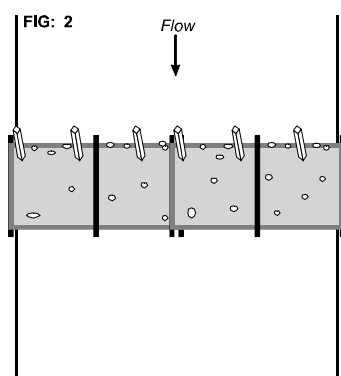
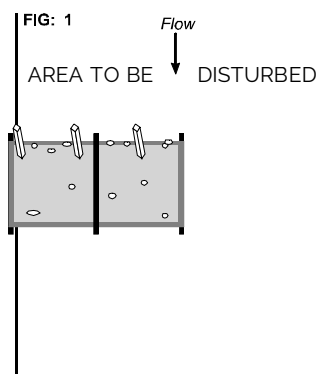
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Sedimat™ Coverage Guidelines (1.20m x 3.00m)

Sedimats™ are easy to apply in a variety of situations in both natural & artificial channels once the guidelines are understood.

Minimum Length of Down Stream Coverage Suggested

Water Velocity	0-0.3m/s	0.3-0.6m/s	0.6-0.9m/s	>0.9m/s
Fines mostly sand	1.20m	2.40m	3.60m	>5.00m
Fines mostly silt and clay	2.40m	4.80m	7.20m	>10.00m



	Guidelines	Comments
LOCATION	a). The mats must be installed downstream of the area to be disturbed, and should be placed as close as possible to the works area without causing disruption.	<i>The mats are at their most effective when encountering sediment directly after it is disturbed - as the sediment travels downstream it becomes more dispersed in the water. However, if the current immediately below the work area is so fast and turbulent that sediment may be transported right over the mats then they can be positioned downstream at the first slow spot.</i>
INSTALLATION	a). Before works begin, and starting at the position furthest up-stream, unroll and stretch out the mats then submerge them in the water at right angles to the flow.	<i>The mats can be unrolled across or down the channel to provide any length/width of coverage.</i>
	b). Secure up-stream edges with sufficient stones/stakes to prevent lift by the current. If required, add further stones/stakes to ensure the mats lay flat on the stream bed and will not be displaced (Fig: 1)	<i>Where currents are/may be strong, or if the mats will be installed for a long time, it is advisable to use stakes. It is important the current is not allowed to flow under the mats. Avoid covering too much of the mat with stones (accumulating silt will act as an anchor).</i>
	c). Where several mats are required to cover the channel width, lap the sides (Fig: 2)	<i>The full width of the channel should be protected unless there is a specific reason.</i>
	d). Where more than one row is required, tuck the up-stream edges under the preceding mats (Fig:3)	<i>Refer to coverage guidelines</i>
REMOVAL	a). It is important to regularly check if the mats are full. Feel/Look for the presence of sediment lying on top of the downstream edge of the mat.	<i>When the mats are full they must be replaced or more added to the downstream end of the existing mats.</i>
	b). When construction activities are complete, or the mats full, they can easily be removed either by rolling them into a machinery bucket or dragging them onto the bank.	<i>The mats are capable of trapping in excess of 250kg of sediment so will require machinery removal when heavily laden. When being removed there is often slight leakage, if this is not acceptable then mats should be temporarily installed downstream to trap this.</i>
	c). If required, the mats can then be unrolled, secured to the bank (with fixing	<i>The sediment laden biodegradable mats provide instant surface stabilisation and a rich seedbed for vegetation restoration, thereby avoiding disposal problems. If desired the support stays can easily be cut free for re-use or disposal.</i>

WARNING - ENSURE YOU PLAN AHEAD FOR REMOVAL OF MATS AS THEY WILL BE HEAVILY LADEN WITH SILT

Application Categories: Sediment Pollution Control

Hy-Tex Terrastop™ Silt Fences for Stormwater Run-Off Control

Hy-Tex Terrastop silt fence in use on National Grid's Milford Haven to Aberdulais gas pipeline project



Hy-Tex Terrastop silt fence in use on National Grid's Felindre to Brecon gas pipeline project



News: Terrastop HighFlow trapped approx. 5 tonnes of silt per 10m fence run over 1 month on potato field trials in Scotland

Terrastop™ Premium (GR180)



1137-CPR-0613/29

Sand bags in both grades also available for no-dig solutions. Call for further details

Many construction, forestry and farming activities result in disturbed or bare ground that is vulnerable to weather erosion. The silt laden run-off, plus site debris and other pollutants, often contaminates surrounding land, watercourses, lakes and drains - resulting in significant environmental diffuse pollution and potentially costly fines.

However, due to the on-going nature of such work, it is generally not possible to protect exposed surfaces until the project is complete. So stormwater from such sites represents a major non-point source of diffuse water pollution in the UK.

Solution: Hy-Tex *Terrastop™ Premium*, and *HighFlow* silt fences, offer a proven, practical, economic and effective method to reduce stormwater run-off pollution from such locations. They are special, high quality, permeable, technical filter fabrics, that can be installed as an entrenched vertical barrier fence, and are designed to intercept and detain run-off - trapping harmful silt through settlement and filtration before it leaves the site.

Performance: The benefits of silt fences are increasingly becoming recognised in Britain: The Environment Agency/SEPA Pollution Prevention Guidelines (PPG5) now recommend the use of silt fences to reduce silt transport from exposed ground and stock piles; and research at The James Hutton Institute, with Terrastop Mono 60 silt fencing, showed that even after post-harvest contour grubbing of potato fields roughly 80 tonnes of soil containing 60-70 kg phosphate-P contaminants was trapped from a 17ha field [Dr Andy Vinten].

While in other countries where silt fences have been used extensively for many years, their proven performance (Intercepting up to 86% of suspended solids [Horner et al. 1990]) has made them a standard *Best Management Practice* on a diverse range of projects. From this in-depth research, and practical experience, Hy-Tex *Terrastop™ Premium* and *HighFlow* were developed to exceed the highest standards, with many unique features for ease of use, reliability and effective results.

Key Features: General purpose non-woven and woven geotextiles are unsuitable for silt fence use as they clog, overtop and inadequately filter sediment due to poor hydraulic properties (typically less than 10 l/m²/sec) and often fail: tearing and fraying (as they are too weak to withstand the forces of stormwater/silt build-up without costly additional wire support fences) or becoming brittle quickly (due to lack of UV protection). *Terrastop™ Premium* and *HighFlow* are manufactured specifically as silt fences so have high tensile and burst strengths, premium UV stabilisation, woven structures with tear resistant non-fraying reinforced edges, that are durable and self supporting between fixing posts for reliability, as well as having a visually pleasing subtle green colour.

The CE Mark certified *Terrastop Premium* also has an special fibrous weft yarn, combined with a high quality weave, to enhance filtration, maintain flow and minimise clogging.

Installation Aids: Silt fences also often fail through poor installation or aftercare, therefore *Terrastop™ Premium* incorporates pre-marked lines for burial depth and maximum silt accumulation level to ensure correct set-up and maintenance; as well as a top ribbon strip to simplify post attachment and tensioning.

Kirsty Liddon's Edinburgh University Dissertation "Prevention of Diffuse Pollution from Active Forestry Harvesting Sites:" concluded "the Hy-Tex [Terrastop Premium] material appears to be the most suitable material for use as sediment retention as it has the most consistent performance between differing soil types retaining the highest volumes of sediment for both gley and peat solutions."

Hy-Tex Terrastop™ Silt Fences for Stormwater Run-Off Control

Typical erosion rates for land-based activities

(soil loss from various land areas, in tons per acre per year)



(Dunne, T. and L. Leopold, 1978; NRCS, 2000; NRCS, 2006; ASCE and WEF, 1992)



The Problem

- Construction activities disturb or expose vulnerable soil
- Erosion up to 150 times greater than before works
- Sediment run-off typically 10 times greater than agricultural lands
- 2.5 cm of rainfall per hour produces 25,000 litres of water for every 1,000m² of land
- Silt laden storm water run-off contaminates surrounding land, roadways, watercourses, lakes and drainage systems
- In a short period more sediment may be deposited in waterways than would normally accumulate over several decades
- Increased public spending on maintenance of drainage systems, waterways and reservoirs
- Serious environmental harm to aquatic habitats

The Solution

Purpose made, properly installed and well maintained silt fences can remove*:

70% of average total suspended solids

80 to 90% of sand

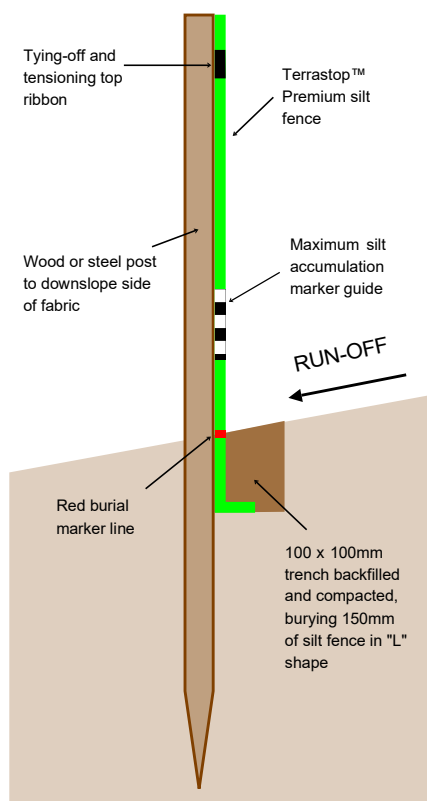
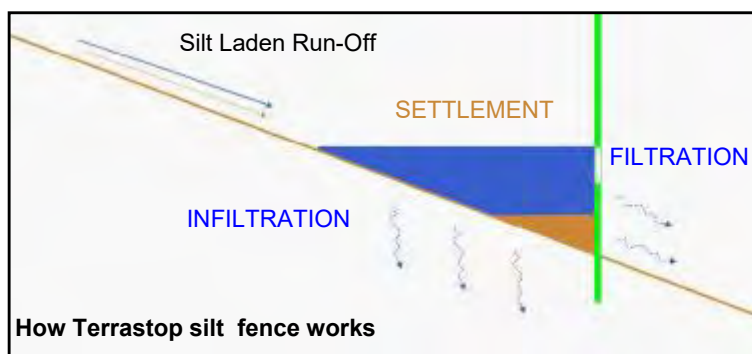
50 to 80% of silt-loam

0 to 20% of silt-clay-loam

*United States Environmental Protection Agency

Key Requirements

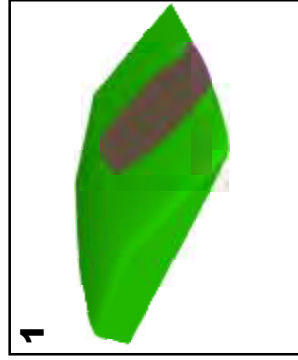
- High tensile strength (Minimum 20kN/m), UV stabilised, woven structure
- Tear resistant non-fraying reinforced edges
- Self supporting between fixing posts
- Special weave to enhance filtration, maintain high flow rates (Minimum 20 l/m².sec) and be less prone to clogging
- Ideal exposed fence height of 0.60m (Higher fences often fail due to excess wind and run-off loading) or 1.00m for high flow fences (Greater than 100 l/m².sec)
- Visually pleasing subtle green colour



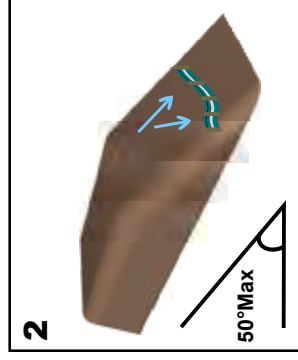
Specification	Terrastop™ Premium (Terrasilt GR180)	Terrastop™ HighFlow
Tensile Strength	22kN/m	32kN/m
Puncture Resistance (CBR)	3,500N	3,700N
Permeability (ISO 11058)	21 l/m ² .s (45 l/m ² .s to AS 3706.9)	190 l/m ² .s
Opening Size (ISO 11058)	180µm	320µm
Weight	200g/m ²	145g/m ²
Material	1000µ thick, green/black, 400kLy UV stabilised, polypropylene, tear resistant non-fraying edges.	500µ thick, green/black, 450kLy UV stabilised, polyethylene, tear resistant non-fraying edges.
Roll Size	0.75 x 100m	1.00 x 100m
Other Key Features:	Fibrous weft yarn, burial depth and max silt height marker lines, top tying-off + tensioning ribbon.	

"Basic" grade also available for less stringent applications

Hy-Tex Terrastop™ - Silt Fences for Stormwater Run-Off Control

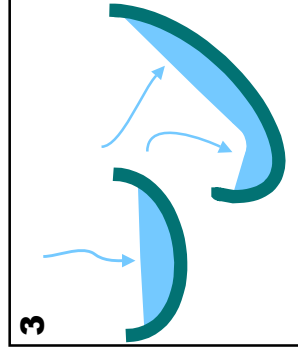


- Find where erosion may occur.
- Look for areas where soil has been disturbed or vegetation removed.

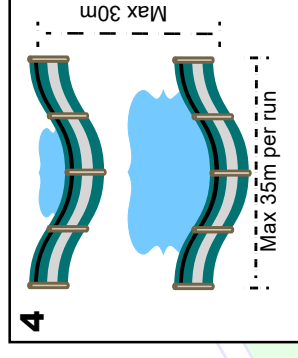


- Maximum 50° slope angle
- Not suitable for channels or ditches

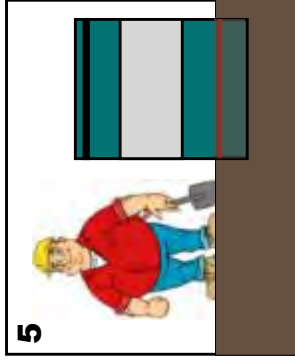
Use Ultra Erosion Guards for steeper slopes



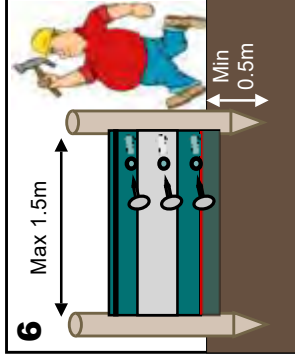
- Check where water is running
- Position fence central and at right angles to flow
- Curve fence ends up slope to form 'smiles' or 'J' shapes so water ponds behind fence



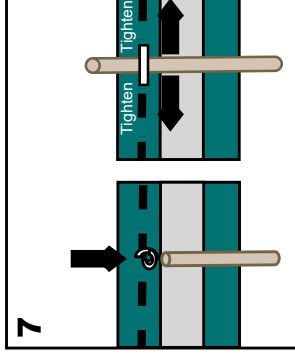
- Maximum 35m fence runs
- Maximum 30m between fence rows
- Add extra fences above and to the side for larger areas



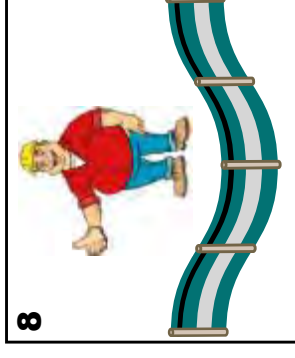
- Dig 100mm trench or use a trenching machine.
- Bury fence up to the red line.
- Make sure backfill is on upslope side of fence.
- Firmly compact.



- Position posts on downslope side of fence
- Max 1.50m post spacing
- Min 0.50m in ground.
- Secure with 3 nails and washers per post or use cable ties
- Post size minimum 1.20m long and 50mm diameter

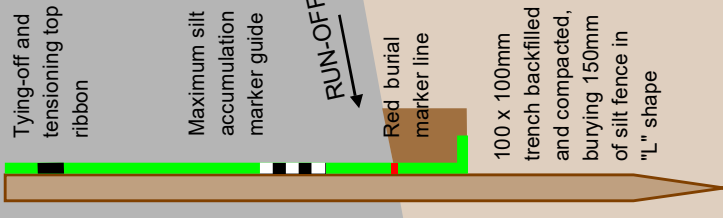


- Tension top edge by looping ribbon band over post.
- Add additional bracing posts for poor ground conditions



- Regularly check site
- Reassess for new areas of erosion and add extra fences as needed
- Repair any damage.
- Remove trapped silt when reaches top of white band or install additional fences.

Terrastop Silt Fence Installation Guidelines



Hy-Tex Terrastop™ - Silt Fences for Stormwater Run-Off Control

Position Fence

Fence is centred and at right angles to flow.

Orange lines highlight the slope direction.



Runoff follows the fence line making erosion worse.

Yellow line depicts the correct positioning.

Blue line is the water runoff direction.

Join Fences

Fold edges on one another several times & then fixed.



Gaps allow sediment to pass through.

Trench In

Bottom buried up to red line & backfill firmly compacted.

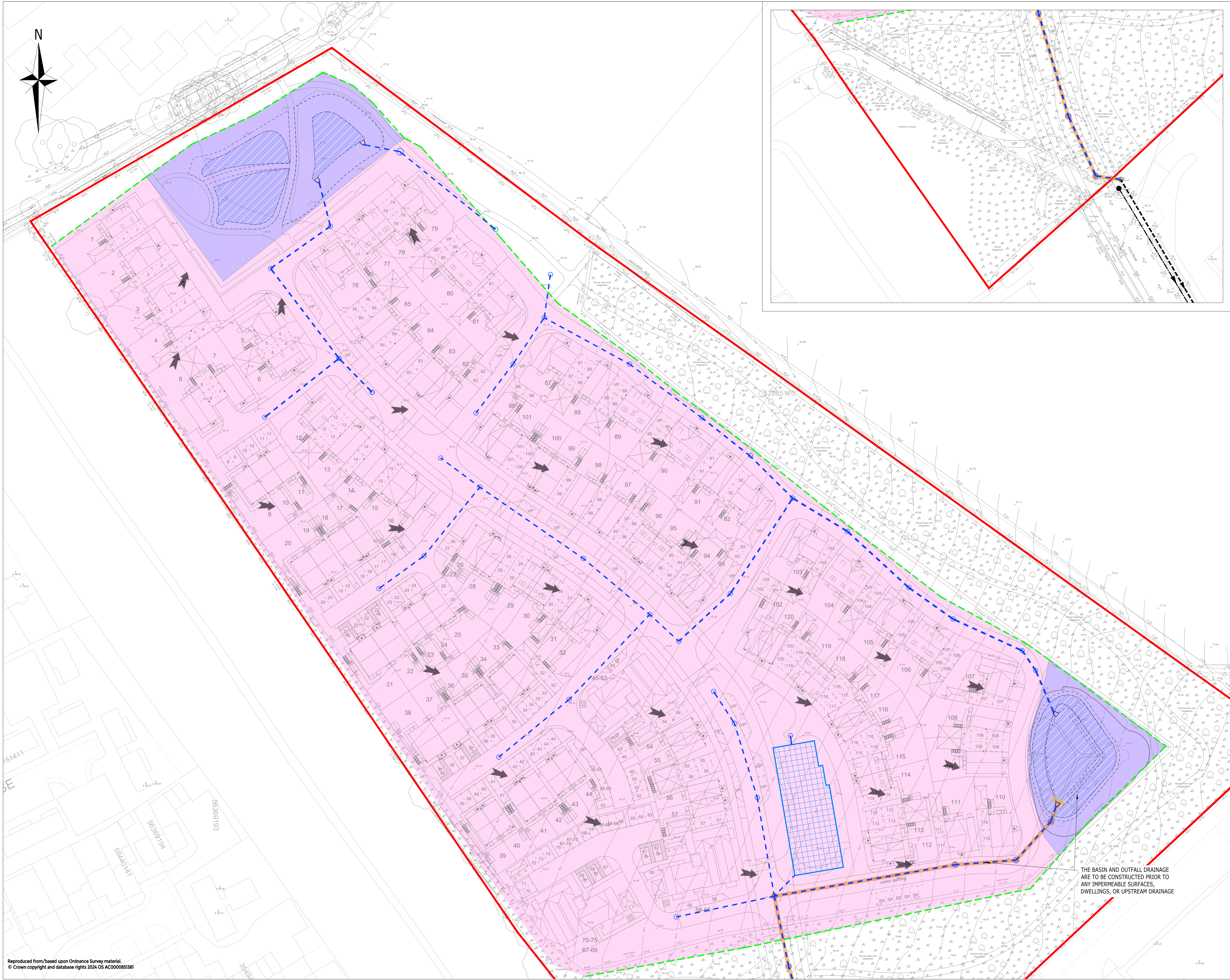


Not buried deep enough & ground poorly compacted.

Appendix F

2502330-ACE-XX-00-DR-C-0171

Temporary Measures During Construction



- NOTES:
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE RELEVANT SPECIFICATION, INC. RISK ASSESSMENTS AND ALL OTHER RELATED DRAWINGS ISSUED BY THE ENGINEER.
 - DO NOT SCALE FROM THIS DRAWING. WORK FROM FIGURED DIMENSIONS ONLY.
 - ALL DIMENSIONS SHOWN ON THIS DRAWING ARE IN METRES UNLESS OTHERWISE STATED.
 - ALL DIMENSIONS, LEVELS AND SURVEY GRID CO-ORDINATES ARE TO BE CHECKED ON SITE AND THE ENGINEER NOTIFIED IMMEDIATELY OF ANY DISCREPANCIES PRIOR TO THE COMMENCEMENT OF THE WORKS.
 - NO DEVIATION FROM THE DETAILS SHOWN ON THIS DRAWING IS PERMITTED WITHOUT PRIOR PERMISSION FROM THE ENGINEER.
 - ANY WORKS OUTSIDE RED SITE BOUNDARY ARE FOR INFORMATION PURPOSES ONLY. UNLESS SPECIFICALLY NOTED, ALL WORKS OUTSIDE THE SITE BOUNDARY WILL BE UNDERTAKEN BY OTHERS UNDER A SEPARATE CONTRACT.

- KEY
- SITE BOUNDARY
 - PERMANENT PROPOSED ADOPTABLE SURFACE WATER SEWER & MANHOLE
 - EXISTING ANGLIAN WATER SURFACE WATER SEWER & MANHOLE
 - EXISTING ANGLIAN WATER FOUL WATER SEWER & MANHOLE
 - PROPOSED PERMANENT INFILTRATION BASIN
 - PROPOSED PERMANENT HEADWALL
 - PROPOSED ATTENUATION TANK
 - HAYBALES
 - NATURAL FALL DIRECTION OF EXISTING TOPOGRAPHY
 - DEVELOPMENT SILT CONTAINMENT AREA
 - SANG SILT CONTAINMENT AREA
 - OUTFALL DRAINAGE TO BE CONSTRUCTED
 - SILT FENCING

0m 5m 25m
Scale: 1:500 @ A1

Rev	Description	WA	EF	BB	18.02.26
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AN EMPLOYEE OWNED COMPANY

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E-mail: enquiries@ardent-ce.co.uk

Client
**BARRATT DAVID WILSON HOMES
NORTH THAMES**

Project Title:
LAND AT TALBOT WAY, LETCHFORD

Drawing Title:
**TEMPORARY MEASURES
DURING CONSTRUCTION**

Drawn by	Checked by	Approved by	Revision
WA	EF	BB	-
A1 Scale	Date		
1:500@A1	FEB 2026		
Drawing Number			
2502330-ACE-XX-00-DR-C-0171			

Appendix G

SuDS Operation and Maintenance Schedules

OPERATION AND MAINTENANCE REQUIREMENTS BASED ON C753 THE SuDS
MANUAL 2015

Inlets, Outlets, Controls and Inspection Chambers	
Regular Maintenance	Typical Frequency
Inlets, outlets and surface control structures Inspect surface structures, removing obstructions and silt as necessary. Check there is no physical damage.	Monthly
Inspection chambers and below-ground control chambers Remove cover and inspect, ensuring that water is flowing freely and that the exit route for water is unobstructed. Remove debris and silt. Undertake inspection after leaf fall in autumn.	Annually
Occasional Maintenance	
Check topsoil levels are 20mm above edges of baskets and chambers to avoid mower damage.	As necessary
Remedial Work	Frequency
Repair physical damage if necessary	As Required

Operation and Maintenance Requirements for Filter Drains		
Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Remove litter (including leaf litter) and debris from filter drain surface, access chambers and pre-treatment devices.	Monthly or as required.
	Inspect filter drain surface, inlet/outlet pipework and control system for blockages, clogging, standing water and structural damage.	Monthly.
	Inspect pre-treatment systems, inlets and perforated pipework for silt accumulation, and establish appropriate silt removal frequencies.	Six monthly.
	Remove sediment from pre-treatment devices.	Six monthly, or as required.
Occasional Maintenance	Remove or control tree roots where they are encroaching the sides of the filter drain, using recommended methods (e.g. NJUG, 2007 or BS 3998:2010).	As required.
	At locations with high pollution loads, remove surface geotextile and replace, and wash or replace overlying filter medium.	Five yearly, or as required.
	Clear perforated pipework of blockages.	As required.

Operation and Maintenance Requirements for Swales

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Remove litter (including leaf litter) and debris.	Monthly or as required.
	Cut grass – to retain grass height within specified design range.	Monthly (during growing season) or as required.
	Manage other vegetation and remove nuisance plants.	Monthly at start, then as required.
	Inspect inlets, outlets and overflows for blockages, and clear if required.	Monthly.
	Inspect infiltration surfaces for ponding, compaction, silt accumulation, record areas where water is ponding for > 48 hours.	Monthly or as required.
	Inspect vegetation coverage.	Monthly for six months, quarterly for two years, then half yearly.
	Inspect inlets and facility surface for silt accumulation, establish appropriate silt removal frequencies.	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 swale treatment area.
Remedial Actions	Repair erosion or other damage by re-turfing or reseeded.	As required.
	Relevel uneven surfaces and reinstate design levels.	As required.
	Scarify and spike topsoil layer to improve infiltration performance, break-up silt deposits and prevent compaction of the soil surface.	As required.
	Remove build-up of sediment on upstream gravel trench, flow spreader or top of soil surface.	As required.

Operation and Maintenance Requirements for Swales		
Maintenance Schedule	Required Action	Typical Frequency
Remedial Actions	Remove and dispose of oil and fuel residues using safe standard practices.	As required.

Operation and Maintenance Requirements for Detention Basin		
Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Remove litter (including leaf litter) and debris.	Monthly or as required.
	Cut grass – for spillways and access routes.	Monthly (during growing season) or as required.
	Cut grass – meadow grass in and around basin.	Half yearly (spring – before nesting season, and autumn).
	Manage other vegetation and remove nuisance plants.	Monthly at start, then as required.
	Inspect inlets, outlets and overflows for blockages, and clear if required.	Monthly.
	Inspect bankside, structures, pipework etc. for evidence of physical damage.	Monthly.
	Inspect inlets and facility surface for silt accumulation and establish appropriate silt removal frequencies.	Monthly (for first year), then annually or as required.
	Check any penstocks and other mechanical devices.	Annually.
	Tidy all dead growth before start of growing season.	Annually.
	Remove sediment from inlets, outlets and forebay.	Annually (or as required).
	Manage wetland plants in outlet pool – where provided.	Annually.
Occasional Maintenance	Reseed areas of poor vegetation growth.	As required.
	Prune and trim any trees, remove cuttings.	Every two years, or as required.
	Remove sediment from inlets, outlets, forebay and main basin when required.	Every five years, or as required.
Remedial Actions	Repair erosion or other damage by reseeding or re-turfing.	As required.
	Realignment of rip-rap.	As required.

Operation and Maintenance Requirements for Detention Basin		
Maintenance Schedule	Required Action	Typical Frequency
Remedial Actions	Repair/rehabilitation of inlets, outlets and overflows.	As required.
	Relevel uneven surfaces and reinstate design levels.	As required.

Appendix H

Anglian Water Discharge Agreement

Thomas Rayment

From: Planning Liaison <planningliaison@anglianwater.co.uk>
Sent: 07 July 2025 15:04
To: Thomas Rayment
Subject: RE: Existing Planning Pre-Dev Enquiry (Talbot Way, Letchford)
Attachments: image014.emz

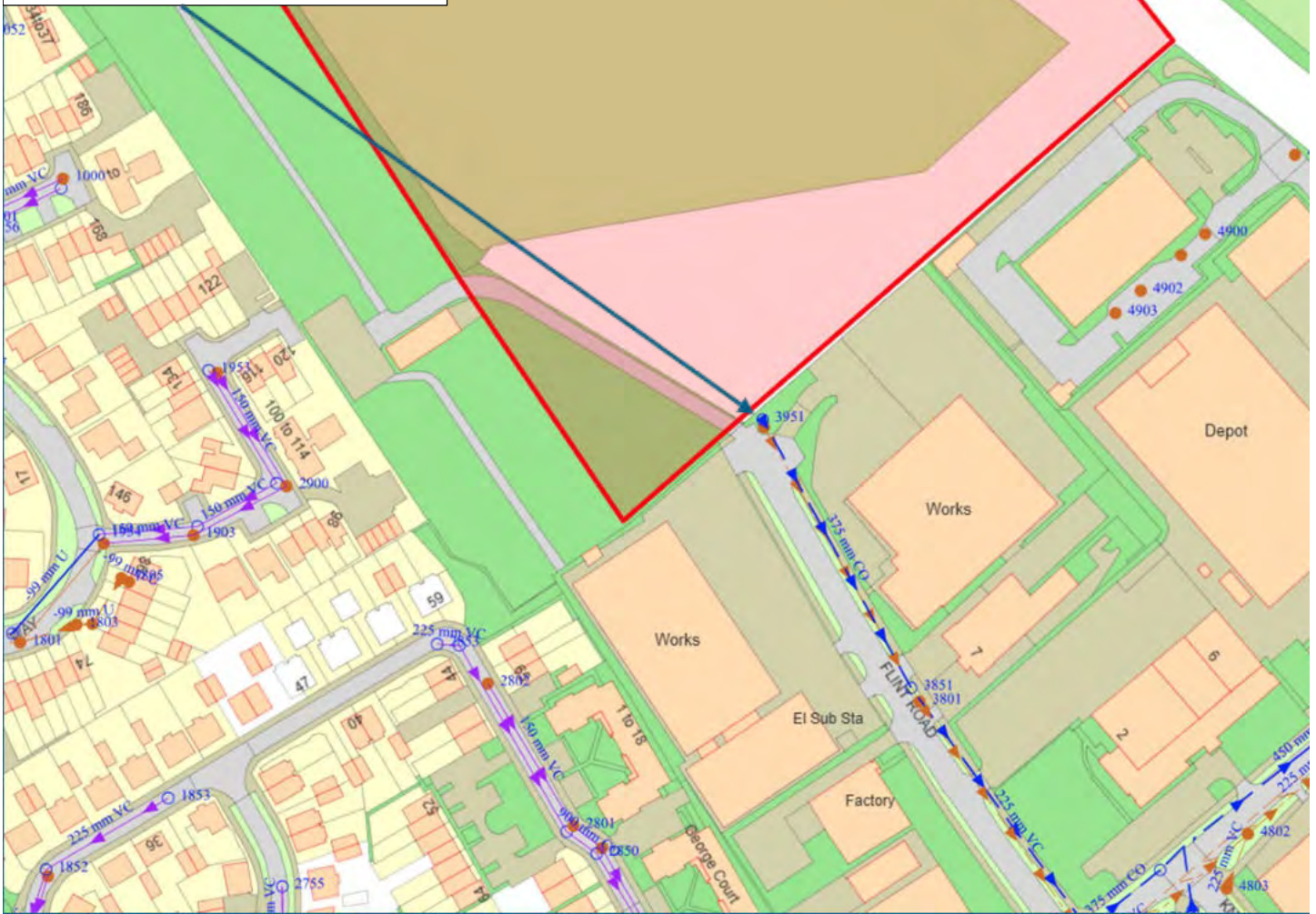
EXTERNAL EMAIL: Do not click any links or open any attachments unless you trust the sender and know the content is safe.

Hi Tom,

Thank you for the correction.

Yes, that was a typo on my behalf, Anglian Water accept the connection to MH3951 at a rate of 8l/s.

Connection point to the 375mm surface water sewer at MH3951 at 8l/s



Please use this email trail as confirmation of your connection point.

Kind Regards,
Doug



anglianwater

Doug Mlambo

Senior Engineer (Flood Risk)

For details on how to submit a pre-planning enquiry to the Pre-Development Team, please visit the "how to apply" section on our website.

Growth Planning Team Telephone: **03450263912**

Anglian Water Services Limited

Growth, Planning & Capacity Team

Thorpe Wood House, Thorpe Wood, Peterborough,
Cambridgeshire, PE3 6WT



From: Thomas Rayment <trayment@ardent-ce.co.uk>

Sent: 04 July 2025 14:10

To: Planning Liaison <planningliaison@anglianwater.co.uk>; Ben Brooks <bbrooks@ardent-ce.co.uk>

Cc: Dear, Colin <colin.dear@barratthomes.co.uk>; Dominic Cronin <dcronin@Ardent-ce.co.uk>

Subject: RE: Existing Planning Pre-Dev Enquiry (Talbot Way, Letchford)

EXTERNAL MAIL - Please be aware this mail is from an external sender - THINK BEFORE YOU CLICK

Good afternoon Doug,

Thank you for getting back so quickly. I believe there is some confusion in the email below. Our preferred connection point is MH3951, but you state MH4752. Can you please clarify Anglian Water accept the connection to MH3951 at a rate of 8l/s?

Many Thanks,

Thomas Rayment

Principal Engineer

!!! I will be going on paternity leave at short notice. My colleagues are aware !!!

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T | 020 7680 4088 **M** | 07932 936 924 **E** | trayment@ardent-ce.co.uk

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From: Planning Liaison <planningliaison@anglianwater.co.uk>

Sent: 04 July 2025 14:00

To: Ben Brooks <bbrooks@ardent-ce.co.uk>; Planning Liaison <planningliaison@anglianwater.co.uk>

Cc: Dear, Colin <colin.dear@barratthomes.co.uk>; Dominic Cronin <dcronin@Ardent-ce.co.uk>; Thomas Rayment <trayment@ardent-ce.co.uk>

Subject: RE: Existing Planning Pre-Dev Enquiry (Talbot Way, Letchford)

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Hi Tom/Ben,

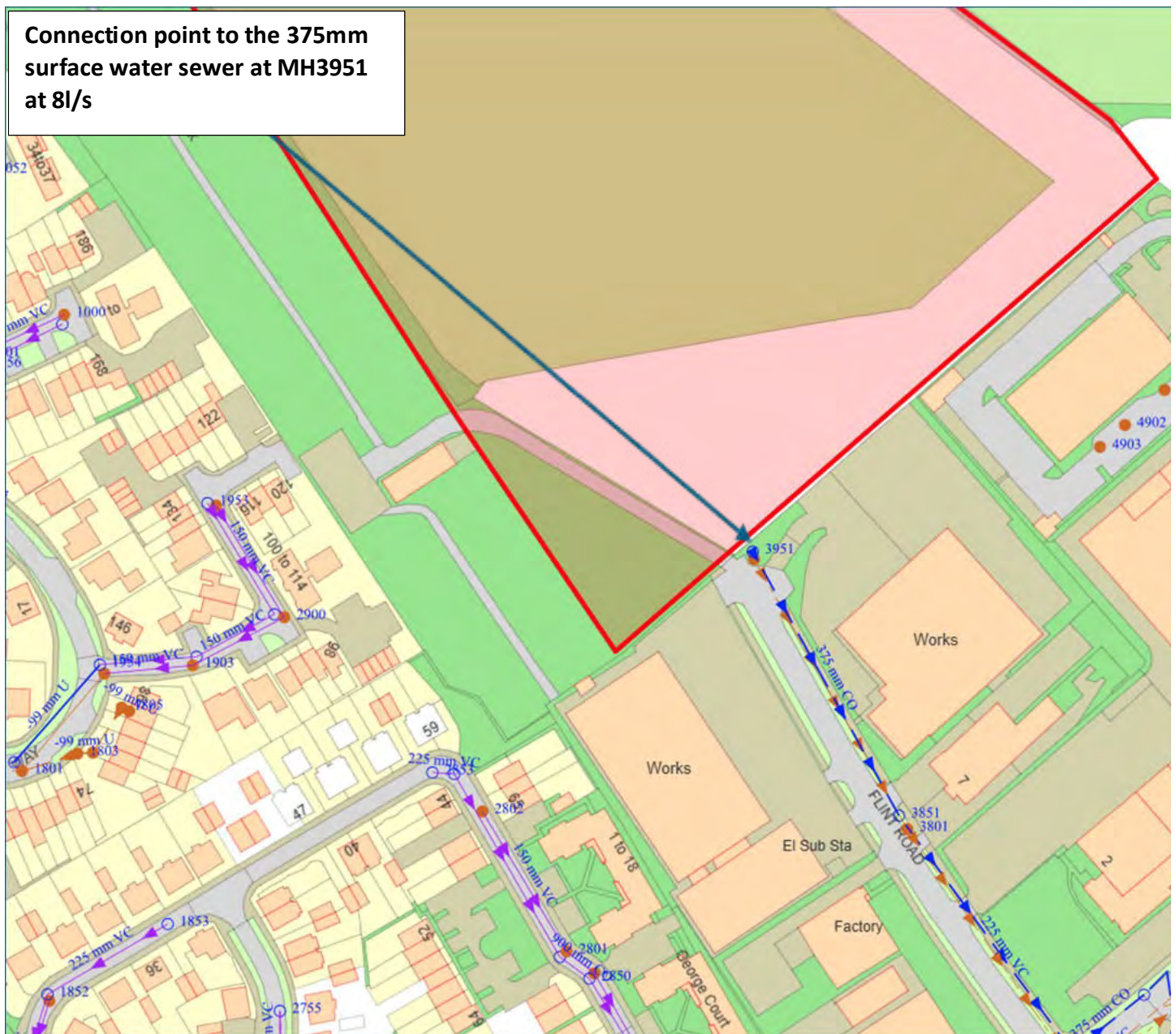
Thank you, Tom, for the quick Teams call that we had yesterday and the clarity you provided about your request for the above site.

We have also received GDPR approval from RSK and can formally respond to your request.

Having looked at the two PPE reports which you summarised your request as follows:

- “Planning Pre-Dev Report 01”, PPE-0111381 dated 22/01/2021, allowing a discharge rate at 8l/s to MH 3951
- “Planning Pre-Dev Report 02”; PPE-0216650 dated 29/10/2024, allowing a discharge rate at 7.58l/s to MH 4752.

The first PPE-0111381 dated 2021 is out of date and the second one is in date (PPE-0216650) and Anglian Water accept your preferred connection point to the surface water sewer south of your development at MH4752 at a maximum rate of 8l/s for all events. **Reasons:** The connection is to the same size sewer and at an easily accessible point from your development site.



Please take this email correspondence as confirmation for your connection point to supersede the one in our Pre-Planning report issued on 29/10/2024.

If you have any further questions, do not hesitate to get in touch with our team on the contacts below.

Kind Regards,
Doug

Doug Mlambo

Senior Engineer (Flood Risk)

For details on how to submit a pre-planning enquiry to the Pre-Development Team, please visit the "[how to apply](#)" section on our website.

Growth Planning Team Telephone: **03450263912**

Anglian Water Services Limited

Growth, Planning & Capacity Team

Thorpe Wood House, Thorpe Wood, Peterborough,
Cambridgeshire, PE3 6WT

From: Ben Brooks <bbrooks@ardent-ce.co.uk>

Sent: 02 July 2025 22:52

To: Planning Liaison <planningliaison@anglianwater.co.uk>

Cc: Dear, Colin <colin.dear@barratthomes.co.uk>; Dominic Cronin <dcronin@Ardent-ce.co.uk>; Thomas Rayment <trayment@ardent-ce.co.uk>

Subject: RE: Existing Planning Pre-Dev Enquiry (Talbot Way, Letchford)

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Charlotte,

We have requested RSK provide you with an email.

Let us know if there is anything else we can do to speed thing up.

Thanks,

Ben Brooks

Project Director

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