

Appendix C Reservoir Appraisal Note

TECHNICAL NOTE

Job Name: Hadleigh site, Castle Point
Job No: 47268
Note No: 01
Date: 24 February 2021
Prepared By: Daniel Sharp
Subject: Initial appraisal of existing reservoir

Item	Subject
1.	<p>Introduction</p> <p>Stantec were appointed to undertake a review of information available on the existing reservoir and to provide a high-level appraisal of the potential for including this feature as part of the development proposals. The review was also to assess if the reservoir was registered under the Reservoir Act 1975, or if it should be due to its volume of water impounded above surrounding ground levels.</p> <p>The reservoir was inspected by Stantec at a visit on 18 February 2021, attended by Daniel Sharp, Senior Associate Civil Engineer and member of the Panel of Supervising Engineers (Reservoirs Act 1975). Daniel was accompanied for part of his visit by the landowner's son, who provided some information on the reservoir construction and operation.</p>
2.	<p>Information provided</p> <p>Stantec were provided with the following information relevant to the reservoir:</p> <ul style="list-style-type: none"> • Specifications, bill of quantities and 2No drawings dated 9 May 1975, prepared by Anglia Consultants (agricultural consultants). The information is useful but was prepared for construction tender purposes, is brief in detail, and may not be a reliable record of the as-constructed reservoir. • Topographical survey of the reservoir (and wider site) undertaken by Survey Solutions and dated 28 July 2020. The survey includes spot levels, features, trees on the reservoir, and bed levels measured below water.
3.	<p>Reservoir description</p> <p>The reservoir purpose was originally agricultural irrigation storage but has not been used for this reason for many years. It is currently leased to a fishing club (Cook Farm Fishery) and stocked with various species of fish. Fishing is by membership or day ticket only.</p> <p>The particulars of the reservoir are as follows:</p> <ul style="list-style-type: none"> • The reservoir is rectangular in shape, orientated southwest to northeast. • The water body measures approximately 140m long by 40m wide. • The surface area of water at normal water level is approximately 7,800m². • Normal water level is approximately 61.83m AoD. • The depth of water at normal (design) water level varies from a maximum of almost 4m at the northeast end and reduces to around 2m at the south west end.

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	<ul style="list-style-type: none"> Estimated from a simple 3D ground model generated from surveyed bed levels, the volume of water impounded in the reservoir at normal water level is approximately 17,000m³. This does not allow for any estimation of mobile silt that may be present on the bed and assumes that the survey simply probed to detect bed levels.
4.	<p>Construction</p> <p>The reservoir is understood to have been constructed in 1975 or 1976 and was formed by impounding water within a raised embankment dam around the entire perimeter. According to the tender specifications, the basin of the reservoir was excavated in sandy clay to a maximum depth of 2m, avoiding excavating into underlying 'unsuitable silty material'. The excavated arisings were compacted in layers to construct the embankment dam. The specifications do not mention any impermeable reservoir liner or puddle clay layer.</p> <p>The dam is very low at the southwest end but is approximately 4m high above the lowest surrounding ground level at the northeast end.</p> <p>The crest of the dam varies slightly in height but is formed at a lowest level of 62.15m AoD. The crest width varies around the perimeter but is typically 2.5m to 3.5m wide.</p> <p>The downstream (outer) face of the dam typically has a gradient of between 1:2.5 and 1:3. The upstream (inner) slopes appear to be similar from the surveyed bed levels. Stantec have not undertaken any geotechnical slope stability analysis for the embankment dam, which would require detailed investigations, soil sampling and testing. No signs of slope instability were observed on the visible parts of the dam, although much of the downstream face was obscured by vegetation.</p>
5.	<p>The Reservoirs Act</p> <p>Large, raised reservoirs in England capable of impounding more than 25,000m³ of water above surrounding ground level are subject to registration and the safety provisions of the Reservoirs Act 1975. With an estimated volume of around 17,000m³, and insufficient freeboard for the impounded volume to exceed 25,000m³, the reservoir does not fall within the ambit of the Act, however it should be monitored and maintained in a safe condition as if it did. Regular reservoir inspection by a competent Engineer and an active regime of maintenance is good practice and can be a requirement on reservoir owners for insurance purposes.</p> <p>It is possible that the 25,000m³ threshold for registration could be reduced to 10,000m³ in the future, as it has been in Wales, although there are currently no imminent proposals to do so in England.</p>
6.	<p>Operation</p> <p>The reservoir is topped up from a 4" plastic pipe at the southwest corner. This inlet supplies water from a diversion structure in the watercourse approximately 90m to the south. The structure incorporates informal stop boards that can be removed or adjusted to control flows as required, although it does not appear that this is actively managed.</p> <p>It is not known if the watercourse at the diversion structure contains sufficient water to supply the reservoir all year round. The watercourse had relatively little flow at Stantec's February visit, so it is possible that it dries up completely in summer conditions. Stantec</p>

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	<p>were advised at their visit that the water level in the reservoir does not significantly drop during summer, although no records were available to confirm this.</p> <p>Due to the raised embankment around the reservoir perimeter, surrounding land cannot drain into the reservoir. Apart from the inlet pipe supply, the only other water that can enter the reservoir is direct rainfall.</p> <p>There is a single overflow from the reservoir in the form of a 4" plastic pipe at the south corner. This has an upstream invert level of 61.83m AoD, which determines the normal water level. The pipe runs approximately 15m south to discharge into the watercourse behind a timber fenced area adjoining a small building.</p> <p>At Stantec's visit the inlet and overflow were both flowing at approximately 1lt per second.</p>
7.	<p>Flood risk from reservoir</p> <p>The entire water volume in the reservoir is impounded above the lowest surrounding ground level and therefore could potentially escape if the dam were to fully breach. If such a dam breach were to occur, the uncontrolled release of water would enter the natural valley beside the reservoir and flow along the watercourse toward the northeast.</p> <p>If a breach were sudden and significant, the release of water could potentially cause flooding to existing development along the watercourse, especially if it occurred during storm conditions when the watercourse was already experiencing high flows and the catchment was saturated. The flooding could be similar or greater in extent to the areas indicted on the Environment Agency surface water flooding map. As the reservoir is not a 'large raised reservoir' registered under the Reservoirs Act, no breach flood mapping is available from the Environment Agency.</p>
8.	<p>Reservoir safety and maintenance</p> <p>There are numerous mature trees growing on the dam crest, upstream and downstream faces around the reservoir perimeter. These include willow, oak, birch and conifer. Trees are noted over 10m high on the topographical survey. The location, number and height of trees on the dam presents a significant risk of damage. Leakage could occur through the dam due to desiccation and cracking of the embankment in root zones. Trees falling due to high winds or disease could remove large plugs of soil from the dam crest, causing a breach and uncontrolled release of water.</p> <p>The trees around the reservoir perimeter should be assessed, reduced or removed to reduce risk of damage to the dam. Where trees are removed they should be cut down to low stumps, avoiding disturbing the dam by removal of root balls.</p> <p>The downstream faces of the dam are covered with a variety of ruderal vegetation including dense areas of bramble. As a result, it was not possible to inspect all parts of the dam to determine if seepages are occurring, although none were observed in areas that could be accessed. The vegetation is also preventing grass cover from establishing, which is important for embankment erosion protection and stability, especially in the event of overtopping in flood conditions. The ruderal vegetation on the dam should be cut and controlled to help establish better grass cover.</p> <p>The freeboard provided above normal water level to the dam crest is approximately 0.3m. This limited freeboard may not be adequate to contain a flood rise associated with an extreme storm plus wave action and is unlikely to meet current design standards for a new reservoir. If the dam crest were to overtop, flows would be concentrated over the lowest parts of the crest and could potentially cause erosion and a breach. A hydraulic</p>

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	<p>assessment should be undertaken for the reservoir to determine whether the freeboard is adequate. If it is not, options may include lowering the overflow level, increasing overflow capacity, or raising the dam crest.</p> <p>The water diversion structure supplying the reservoir was heavily silted, restricting flows to the inlet pipe. It is likely that the pipe is also heavily silted. The stop boards and trash screens at the structure were in disrepair. The water diversion structure should be cleaned out and repaired. The inlet pipe should also be cleared of silt.</p>

DOCUMENT ISSUE RECORD

Technical Note No	Rev	Date	Prepared	Checked	Reviewed (Discipline Lead)	Approved (Project Director)
47268/001	-	24/2/2021	D Sharp	1/3/21	S Knowles	S Darch

This report has been prepared by Stantec UK Limited ('Stantec') on behalf of its client to whom this report is addressed ('Client') in connection with the project described in this report and takes into account the Client's particular instructions and requirements. This report was prepared in accordance with the professional services appointment under which Stantec was appointed by its Client. This report is not intended for and should not be relied on by any third party (i.e. parties other than the Client). Stantec accepts no duty or responsibility (including in negligence) to any party other than the Client and disclaims all liability of any nature whatsoever to any such party in respect of this report.

Appendix D Catchment Plan

Appendix E Anglian Water Records and Correspondence

Davison, Max

From: Planning Liaison <planningliaison@anglianwater.co.uk>
Sent: 05 February 2021 14:36
To: Davison, Max
Cc: Knowles, Stephanie
Subject: RE: Hadleigh Flood Risk Enquiry

Good afternoon Max

Thank you for your email regarding flood query in Hadleigh, Essex, SS7 3NZ

I have checked the above address for you and Anglian Water is able to confirm that we have no records of flooding in the vicinity that can be attributed to capacity limitations in the public sewerage system. It is possible that other flooding may have occurred that we do not have records of, other organisations such as the Local Authority, Internal Drainage Board or the Environment Agency may have records.

Please do not hesitate to contact me if you require further assistance

Kind regards

Sandra



Sandra De Olim

Planning & Capacity - Development Services

Mobile: 07929804300

Telephone: 07929786955

Anglian Water Services Limited

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

From: Davison, Max <Max.Davison@stantec.com>
Sent: 05 February 2021 12:35
To: Planning Liaison <planningliaison@anglianwater.co.uk>
Cc: Knowles, Stephanie <stephanie.knowles@stantec.com>
Subject: Hadleigh Flood Risk Enquiry

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

Dear Sir/Madam,

Stantec has been commissioned to undertake a Flood Risk Assessment and Drainage Strategy (both surface water and foul) to support an outline planning application for Land at Hadleigh, Essex, SS7 3NZ (National Grid

MINUTES

Meeting Title: Land East of Rayleigh Road (Hadleigh)
Meeting with Anglian Water on Surface Water and Foul Drainage

Attendees: Richard Lyon (RL) – Anglian Water (AW)
Douglas Mlambo (DM) – Anglian Water (AW)
Haider Ali (HA) – Stantec UK Ltd (ST)
Asa Soderberg (AS) – Stantec UK Ltd (ST)
Yvonne Riley (YR) – Stantec UK Ltd (ST)

Date of Meeting: Tuesday 25 January 2022

Job Number: 332210105

Item	Subject	Actions
1.	<p><u>Introduction:</u></p> <p>HA discussed the proposals and updates since the pre-application discussions with AW. In brief as follows:</p> <ul style="list-style-type: none"> The site is allocated in the emerging local plan, with current proposals for approximately 450 units, nursery, community centre and health centre. The previously issued catchment plan accompanying a pre-development enquiry in 2018 is now superseded due to an assessment of the topography and spatial masterplan updates. <p>There are no significant updates to the outfalls, with discharge rates altered but overall, no change.</p> <ul style="list-style-type: none"> It was proposed that the features would be offered for adoption by AW. 	
2.	<p><u>Proposed SW Drainage Strategy – Discussion Points:</u></p> <ul style="list-style-type: none"> HA confirmed that the surface water drainage has been designed to hold the 1 in 100 plus 40% allowance for climate change event. The basins are 1.2 m to 1.3 m in depth with 300mm freeboard above the 1:100+20% event, with outflow controls. They are designed as dry basins. HA highlighted that some basins are proposed as having dual benefit, also providing some public amenity space in which is utilised as storage in the higher rainfall events only. DM confirmed this was acceptable, querying if 1.2m would be the maximum water depth, allowing for freeboard. DM raised the query to check with ECC regarding how the green open space area would be calculated, and if the dual basins are included in this. DM stated the implementation of an upstream treatment train as critical and to ensure space is available. HA confirmed there is suitable open green space available for 	<p>Stantec to confirm with client if the dual use basins are to be included in public open space allocations. We are awaiting confirmation on this</p>

MINUTES

Item	Subject	Actions
	<p>treatment and conveyance, and this was agreed in principle by DM.</p> <ul style="list-style-type: none"> • HA discussed the outfalls per catchment, confirming that catchment 1, 2 and 3 will outfall to the public sewer. DM queried the constraints to discharge to watercourse, and requested tabulated areas with outfall locations. HA was in agreeance and confirmed that due to the topographic constraints a connection to the watercourse for catchments 1-3 would not be possible, which was agreed by DM. • HA confirmed that catchment 1 positively drains to the north-west, catchment 2 to the north and catchment 3 to the south. HA highlighted the lack of IL data available for public sewers in this area. • RL and DM agreed with the proposals for separate outfalls for catchment 1 and 2, and mentioned there should be capacity. RL had concern for the capacity of the outfall for catchment 3 to the south as AW plans show this is likely culverted with no clear run. HA and AS confirmed the catchment size is small and that pumping would be required if the outfall was unsuitable. RL agreed pumping is unsuitable, offering advice that modelling and/or a survey may be required for this outfall location to the south (AW Ref: 0853). • It was agreed that all basins and SuDS features would be offered to AW for adoption, which DM confirmed he could see no issue with. • HA discussed that proposed discharge rates are limited to the 1 in 1 year. HA discussed that to avoid blockages, it would be practical for the control for catchment 2 and 3 to be at 2.0 l/s. RL in agreeance in principle and find 2.0l/s acceptable and realistic. 	<p>RL to identify if modelling data and/or survey is available</p>
3.	<p><u>Proposed Foul Drainage Strategy – Discussion points:</u></p> <ul style="list-style-type: none"> • HA confirmed that the foul drainage strategy generally follows the surface water catchments. Catchment 1 to 4 drain via gravity, utilising proposed main highway corridors for conveyance. HA highlighted issues with levels for chamber 0300 on the AW plans. RL agreed this could be incorrect and likely an error. • RL confirmed that a distinction of areas should be used on the planning submission, rather than phases as presented in the meeting. HA was in agreeance. • HA confirmed the previous proposals for catchment 4 include a connection point which appears to be an area of hardstanding owned by a third party (AW Ref 7300), which was not shown on the AW sewer maps. HA mentioned that due to this, the connection will need to be moved to the west utilising an existing green corridor (AW Ref: 7300). RL 	<p>ST to advise on third party landownership for green corridor</p>

MINUTES

Item	Subject	Actions
	<p>confirmed this is unlikely to be an issue, highlighting the need to establish third party landownership.</p> <ul style="list-style-type: none"> AS mentioned that pumping would be required if there is issues with moving the connection through the aforementioned green corridor. RL was in agreeance and confirmed that AW would support a gravity connection through this third-party land under AW powers assuming the land as shown can be accessed. HA discussed the constraints for catchment 5, showing that the topography of catchment 5 falls north towards the watercourse situated along the northern boundary of catchment 5. Due to this, it is anticipated pumping to the public sewer to the south would be required (AW Ref: 6801). HA confirmed details of units and the estimated size of the pump chamber (6000l/s approx. capacity) in which would be offered for adoption. RL discussed the possibility of reducing the pumping station size by utilising gravity connections to some parts of catchment 5 (i.e frontages along the southern boundary, connecting to proposed drainage in other catchments where applicable etc.) HA identified various issues with these scenarios such as crossing an existing watercourse and deeper drainage infrastructure increasing the risk of not achieving a positive connection into the public sewer for other catchments. HA also confirmed catchment 5 is less dense which would result in little change to storage requirements, pump rate etc. should draining some sections of catchment 5 elsewhere were achievable. HA also confirmed the presence of trees along the southern boundary which could constrain the design. RL was in agreeance with HA. RL raised the possibility of catchment 5 connecting to an existing pumping station further west as a potential discharge point (AW Ref: THNDSP downstream of Chamber Ref: 4800), however, lack of data maybe a risk if included within the strategy. RL to investigate. RL confirmed he would check for surveys in the area to confirm existing manhole details. HA discussed the possibility of incorporating a smaller typical pumping station layout within the masterplan than specified in Figure D3 in the DCG. RL confirmed he shall enquire about a smaller sized pumping station layout that would be acceptable to AW to adopt and advise. HA also confirmed he is liaising with Xylem on the adoptable pump station. RL confirmed there was no issues with this. 	<p>RL to check for service work in the area, and to enquire about smaller sized pump station layout.</p>

MINUTES

Item	Subject	Actions
4.	<ul style="list-style-type: none"> • YR agreed to issue meeting minutes for AW to review. • RL queried delivery dates and when capacity is required, ST to confirm. • AW to advise on any information held on outfall connection points, capacity and details of smaller adoptable pumping station layouts to be incorporated within the masterplan . • HA to issue revised information for pre-development enquiry to be updated 	<p>ST</p> <p>ST</p> <p>AW</p> <p>ST</p>



Pre-Planning Assessment Report

Castle Point Hadleigh

InFlow Reference: PPE-0117076

Assessment Type: Used Water

Report published: 29/03/2021



Thank you for submitting a pre-planning enquiry.

This has been produced for Stantec UK.

Your reference number is **PPE-0117076**.

This report can be submitted as a drainage strategy for the development should it seek planning permission.

If you have any questions upon receipt of this report, you can submit a further question via InFlow. Alternatively, please contact the Planning & Capacity team on **07929 786 955** or email planningliaison@anglianwater.co.uk

Section 1 - Proposed development

The response within this report has been based on the following information which was submitted as part of your application:

List of planned developments	
Type of development	No. Of units
Dwellings	500

The anticipated residential build rate is:

Year	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10
Build rate	50	50	50	50	50	50	50	50	50	50

Development type: Greenfield

Planning application status: Pending Consideration

Site grid reference number: TQ8036789105

The comments contained within this report relate to the public water mains and sewers indicated on our records.

Your attention is drawn to the disclaimer in the useful information section of this report.

Section 2 - Assets affected

Our records indicate that we have the following types of assets within or overlapping the boundary of your development site as listed in the table below.

Additionally, it is highly recommended that you carry out a thorough investigation of your proposed working area to establish whether any unmapped public or private sewers and lateral drains are in existence. We are unable to permit development either over or within the easement strip without our prior consent. The extent of the easement is provided in the table below. Please be aware that the existing water mains/public sewers should be located in highway or open space and not in private gardens. This is to ensure available access for any future maintenance and repair and this should be taken into consideration when planning your site layout.

Water and Used water easement information		
Asset type	Pipe size (mm)	Total easement required (m)
Sewer mains	375	3.00 m either side of the centre line
Sewer mains	Unknown	3.00 m either side of the centre line
Sewer mains	9	3.00 m either side of the centre line
Sewer mains	Unknown	3.00 m either side of the centre line
Sewer mains	375	3.00 m either side of the centre line
Sewer mains	9	3.00 m either side of the centre line
Sewer mains	375	3.00 m either side of the centre line
Sewer mains	225	3.00 m either side of the centre line
Sewer mains	Unknown	3.00 m either side of the centre line
Sewer mains	9	3.00 m either side of the centre line

If it is not possible to avoid our assets then these may need to be diverted in accordance with Section 185 of the Water Industry Act (1991). You will need to make a formal application if you would like a diversion to be considered.

Due to the private sewer transfer in October 2011 many newly adopted public used water assets and their history are not indicated on our records. You also need to be aware that your development site may contain private water mains, drains or other assets not shown on our records. These are private assets and not the responsibility of Anglian Water but that of the landowner.

Section 3 - Water recycling services

In examining the used water system we assess the ability for your site to connect to the public sewerage network without causing a detriment to the operation of the system. We also assess the receiving water recycling centre and determine whether the water recycling centre can cope with the increased flow and effluent quality arising from your development.

Water recycling centre

The foul drainage from this development is in the catchment of Rayleigh-East Water Recycling Centre, which currently does not have capacity to treat the flows from your development site. Anglian Water are obligated to accept the foul flows from your development with the benefit of planning consent and would therefore take the necessary steps to ensure that there is sufficient treatment capacity should the planning authority grant planning permission.

Used water network

Our assessment has been based on development flows connecting to the nearest foul water sewer of the same size or greater pipe diameter to that required to drain the site. The infrastructure to convey foul water flows to the receiving sewerage network is assumed to be the responsibility of the developer. Conveyance to the connection point is considered as Onsite Work and includes all work carried out upstream from of the point of connection, including making the connection to our existing network. The connection points has been determined in reference to the calculated discharge flow and on this basis, a 225mm internal diameter pipe is required to drain the development site as a whole. You have had a meeting with our Senior Engineer Richard Lyon and the connection points have been determined as thus; Phase 1, a 150mm diameter sewer at manhole 0300 in Rayleigh Road at National Grid Reference NGR TQ8003089366. The cover level is 49.86 and the invert level is 48.25. Phase 2, a 225mm diameter sewer at manhole 3301 in Stadium Way at National Grid Reference NGR TQ8033789390. The cover level is 63.85 and the invert level is 61.47. Phase 3, a 150mm diameter sewer at manhole 0800 in Daws Heath Road at National Grid Reference NGR TQ8003488823. There are no cover level and invert level details. Phase 4, a 300mm diameter sewer at manhole 7300 off Stadium Way at National Grid Reference NGR TQ8073689323. The cover level is 60.21 and the invert level is 56.88. Anglian Water has assessed the impact of gravity flows from the planned development to the public foul sewerage network for Phases 1-4. We can confirm that this is acceptable as the foul sewerage system, at present, has available capacity for your site. Phase 5, a 300mm diameter sewer at manhole 7300 off Stadium Way at National Grid Reference NGR TQ8073689323. The cover level is 60.21 and the invert level is 56.88. Phase 6, a 150mm diameter sewer at manhole 6800 in Daws Heath Road at National Grid Reference NGR TQ8068988848. There are no cover level and invert level details. Anglian Water has assessed the impact of a pumped conveyance from the planned development of Phases 5 and 6 to the public foul sewerage network and we can confirm that this connection is acceptable as the foul sewerage system, at present, has available capacity for your site. In line with Sewers for Adoption, the pumped discharge will need to connect via an intermediate manhole and at least 5 metres of an appropriately sized gravity sewer. The pump rate and configuration of the connection will be determined with your detailed design. You should submit this detail with your Section 106 new connection application. Please note that Anglian Water will request a suitably worded condition at planning application stage to ensure this strategy is implemented to mitigate the risk of flooding.

It is assumed that the developer will provide the necessary infrastructure to convey flows from the site to the network. Consequently, this report does not include any costs for the conveyance of flows.

Surface water disposal

In principle, your proposed method of surface water disposal is acceptable to Anglian Water. It is our understanding that the evidence to confirm compliance with the surface water hierarchy is not available. Once the evidence has been confirmed, then the connection points may be made to as follows; Phase 1 to manhole 0354 off Rayleigh Road at NGR TQ8003989350 at a rate of 1.7l/s. There are no cover level and invert level details. Phase 2 to manhole 2351 in Stadium Way at NGR TQ8027989385 at a rate of 3.1l/s. There are no cover level and invert level details. Phase 3 to manhole 0851 in Firfield Road at NGR TQ8004488898 at a rate of 1.4l/s. There are no cover level and invert level details. Phases 4-6 to discharge via watercourse. Anglian Water cannot confirm suitability of these proposals/rates. Our assessment has been based on development flows connecting to the nearest surface water sewer of the same size or greater pipe diameter. It is your responsibility to provide the evidence to confirm that all alternative methods of surface water disposal have been explored and these will be required before your connection can be agreed. This is subject to satisfactory evidence which shows the surface water management hierarchy as outlined in Building Regulations Part H has been explored. This would encompass the results from the site specific infiltration testing and/or confirmation that the flows cannot be discharged to a watercourse. Anglian Water's surface water policy follows the Surface Water hierarchy, outlined in Part H of the Building Regulations. Should your assumptions or evidence change then an alternative solution, connection point or flow rate may be required. You are therefore advised to update Anglian Water with the key supporting evidence at your earliest convenience.

As you may be aware, Anglian Water will consider the adoption of SuDs provided that they meet the criteria outline in our SuDs adoption manual. This can be found on our [website](#). We will adopt features located in public open space that are designed and constructed, in conjunction with the Local Authority and Lead Local Flood Authority (LLFA), to the criteria within our SuDs adoption manual. Specifically, developers must be able to demonstrate:

1. Effective upstream source control,

2. Effective exceedance design, and
3. Effective maintenance schedule demonstrating that the assets can be maintained both now and in the future with adequate access.

If you wish to look at the adoption of any SuDs then an expression of interest form can be found on our [website](#)

Trade Effluent

We note that you do not have any trade effluent requirements. Should this be required in the future you will need our written formal consent. This is in accordance with Section 118 of the Water Industry Act (1991).

Used Water Budget Costs

Your development site will be required to pay an infrastructure charge for each new property connecting to the public sewer that benefits from Full planning permission.

You will be required to pay an infrastructure charge upon connection for each new plot on your development site. The infrastructure charge are types of charges set out in Section 146(2) of the Water Industry Act 1991

The charge should be paid by anyone who wishes to build or develop a property and is payable upon request of connection.

Payment of the infrastructure charge must be made before premises are connected to the public sewer.

Infrastructure charge for water recycling:	£ 573.00
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The Water Recycling Infrastructure charge for your dwellings is:

Infrastructure charge	Number of units	Total
£ 573.00	500	£ 286500

Infrastructure charges are raised on a standard basis of one charge per new connection (one for water and one for sewerage). However, if the new connection is to non- household premises, the fixed element is calculated according to the number and type of water fittings in the premises. This is called the "relevant multiplier" method of calculating the charge.

Details of the relevant multiplier for each fitting can be found at our [website](#).

It has been assumed that the onsite used water network will be provided under Section 104 of the Water Industry Act

It is recommended that you also budget for connection costs.

Please note that we offer alternative types of connections depending on your needs and these costs are available at our [website](#).

Section 4 - Map of Proposed Connection Points



Figure 1: Showing your used water point of connection

Section 5 - Useful information

Water Industry Act – Key used water sections

Section 98:

This provides you with the right to requisition a new public sewer. The new public sewer can be constructed by Anglian Water on your behalf. Alternatively, you can construct the sewer yourself under section 30 of the Anglian Water Authority Act 1977.

Section 102:

This provides you with the right to have an existing sewerage asset vested by us. It is your responsibility to bring the infrastructure to an adoptable condition ahead of the asset being vested.

Section 104:

This provides you with the right to have a design technically vetted and an agreement reached that will see us adopt your assets following their satisfactory construction and connection to the public sewer.

Section 106:

This provides you with the right to have your constructed sewer connected to the public sewer.

Section 185

This provides you with the right to have a public sewerage asset diverted.

Details on how to make a formal application for a new sewer, new connection or diversion are available on our [website](#) or via our Development Services team on **0345 60 66 087**.

Sustainable drainage systems

Many existing urban drainage systems can cause problems of flooding, pollution or damage to the environment and are not resilient to climate change in the long term. .

Our preferred method of surface water disposal is through the use of Sustainable Drainage Systems or SuDS.

SuDS are a range of techniques that aim to mimic the way surface water drains in natural systems within urban areas. For more information on SuDS, please visit our [website](#)

We recommend that you contact the Local Authority and Lead Local Flood Authority (LLFA) for your site to discuss your application.

Private sewer transfers

Sewers and lateral drains connected to the public sewer on the 1 July 2011 transferred into Water Company ownership on the 1 October 2011. This follows the implementation of the Floods and Water Management Act (FWMA). This included sewers and lateral drains that were subject to an existing Section 104 Adoption Agreement and those that were not. There were exemptions and the main non-transferable assets were as follows:

Surface water sewers and lateral drains that do not discharge to the public sewer, e.g. those that discharged to a watercourse.

Foul sewers and lateral drains that discharged to a privately owned sewage treatment/collection facility.

Pumping stations and rising mains will transfer between 1 October 2011 and 1 October 2016.

The implementation of Section 42 of the FWMA will ensure that future private sewers will not be created. It is anticipated that all new sewer applications will need to have an approved section 104 application ahead of a section 106 connection.

It is anticipated that all new sewer applications will need to have an approved Section 104 application ahead of a Section 106 connection

Encroachment

Anglian Water operates a risk based approach to development encroaching close to our used water infrastructure. We assess the issue of encroachment if you are planning to build within 400 metres of a water recycling centre or, within 15 metres to 100 metres of a pumping station. We have more information available on our [website](#)

Locating our assets

Maps detailing the location of our water and used water infrastructure including both underground assets and above ground assets such as pumping stations and recycling centres are available from [digdat](#)

All requests from members of the public or non-statutory bodies for maps showing the location of our assets will be subject to an appropriate administrative charge.

We have more information on our [website](#)

Charging arrangements

Our charging arrangements and summary for this year's water and used water connection and infrastructure charges can be found on our [website](#)

Section 6 - Disclaimer

The information provided in this report is based on data currently held by Anglian Water Services Limited ('Anglian Water') or provided by a third party. Accordingly, the information in this report is provided with no guarantee of accuracy, timeliness, completeness and is without indemnity or warranty of any kind (express or implied).

This report should not be considered in isolation and does not nullify the need for the enquirer to make additional appropriate searches, inspections and enquiries. Anglian Water supports the plan led approach to sustainable development that is set out in the National Planning Policy Framework ('NPPF') and any infrastructure needs identified in this report must be considered in the context of current, adopted and/or emerging local plans. Where local plans are absent, silent or have expired these needs should be considered against the definition of sustainability holistically as set out in the NPPF.

Whilst the information in this report is based on the presumption that proposed development obtains planning permission, nothing in this report confirms that planning permission will be granted or that Anglian Water will be bound to carry out the works/proposals contained within this report.

No liability whatsoever, including liability for negligence is accepted by Anglian Water or its partners, employees or agents, for any error or omission, or for the results obtained from the use of this report and/or its content. Furthermore, in no event will any of those parties be liable to the applicant or any third party for any decision made or action taken as a result of reliance on this report.

This report is valid for the date printed and the enquirer is advised to resubmit their request for an up to date report should there be a delay in submitting any subsequent application for water supply/sewer connection(s).

InFlow Ref: PPE-0117076

Used Water Connection Point for Phase 1: 150mm diameter sewer at manhole 0300 in Rayleigh Road (NGR: TQ 80030 89366)



Potable Water		Fitting	
Raw Water		Hydrant	
Decommissioned Water			

Please note: Not all fittings are shown on the map

Final Sewer		Outlet*	
Surface Sewer		Inlet*	
Combined Sewer		Manhole*	
Final Effluent		Sewage Treatment Works	
Rising Main*		Public Pumping Station	
Private Sewer*		Decommissioned Pumping Station	
Decommissioned Sewer*			

*Colour denotes effluent type

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InFlow Ref: PPE-0117076

Used Water Connection Point for Phase 2: 225mm diameter sewer at manhole 3301 in Stadium Way (NGR: TQ 80337 89390)



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InFlow Ref: PPE-0117076

Used Water Connection Point for Phase 3: 150mm diameter sewer at manhole 0800 in Daws Heath Road (NGR: TQ 80034 88823)



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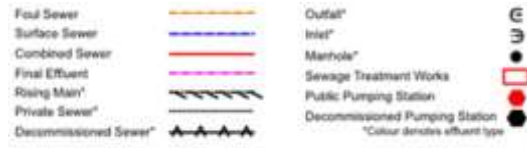
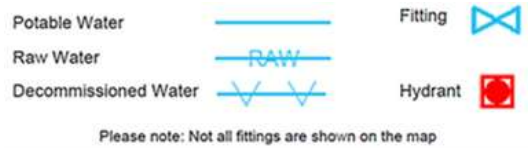


InFlow Ref: PPE-0117076

Used Water Connection Point for Phase 5: 300mm diameter sewer at manhole 7300 off Stadium Way (NGR: TQ 80736 89323)



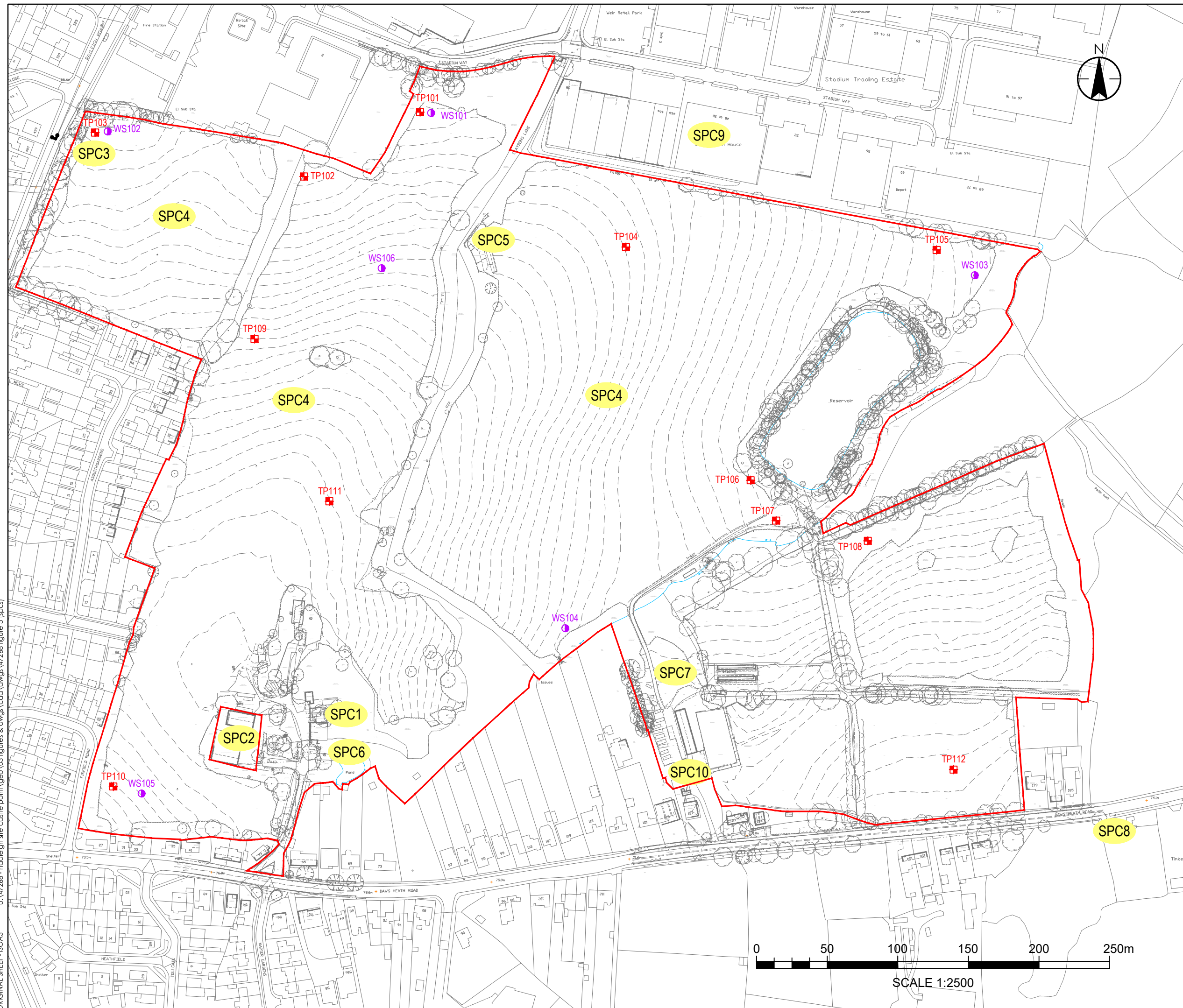
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Appendix F Geotechnical Investigations and Infiltration Results

Key

- SPC Sources of Potential Contamination (SPC)
- Proposed Trial Pit Locations
- Proposed Window Sample Locations



Plotted: 07.07.2021 10:07:07 3:53:27 PM By: Cotton, David
 ORIGINAL SHEET - ISCA3
 u:\47268 - hadleigh site castle point\geo\03 figures & dwgs\cadd\dwgs\47268 figure 5 (spcs)

Client/Project:

this Land.

Land East of Rayleigh Road, Hadleigh




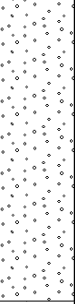

Prepared: davco	Checked: JC	Date: 2021.06.30
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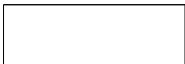
Title


Sources of Potential Contamination (SPC) and Ground Investigation Locations for Drainage Assessment



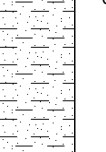
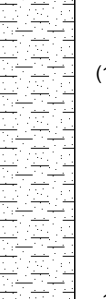

Revision: 0	Figure 5
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Project Name Hadleigh	Project No: 332210105		TRIAL PIT TP101
Client This Land	Start Date 10/05/2021		
Contractor A F Howlands	Ground Level 65.76m OD	Logged By: JC	Sheet 1 of 1
Method/Plant JCB 3CX	Coordinates 580270 E 189338 N	Checked By: JEC	Scale 1:25

(m)	Samples and Insitu Tests			Water	Legend	Depth (Thickness)	Level (m OD)	Stratum Description	Instrumentation /Backfill
	Depth	Type	Results						
	0.10 - 1.00	D1				(0.20) 0.20	65.56	TOPSOIL (Brown friable silty sandy slightly gravelly clay. Gravel is angular to subrounded fine to coarse flint. Occasional rootlets) [TOPSOIL] Firm orange brown sandy CLAY. Sand is fine to medium grained. [HEAD DEPOSITS]	
1	1.00 - 1.90	D2				(1.70)			
2	1.90 - 2.00	D3				1.90 (0.10) 2.00	63.86 63.76	Soft red orange brown sandy SILT. Sand is fine to medium grained. [CLAYGATE MEMBER] End of Trial Pit at 2.00m	
3									
4									
5									


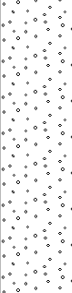
General Remarks 1. Location CAT scanned prior to excavation 2. No groundwater encountered. 3. Trial pit remained open and sidewalls stable during excavation, 4. Pit backfilled with gravel to 1.0m and then arisings to the surface. 5. Soakage test performed between 1.0m and 2.0m	Water Strike Standing Flow	Stability: Stable
		Pit Dimensions 0.45 m 


Project Name Hadleigh		Project No: 332210105			TRIAL PIT	
Client This Land		Start Date 10/05/2021	End Date 14/05/2021		TP102	
Contractor A F Howlands		Ground Level 66.72m OD			Logged By: JC	
Method/Plant JCB 3CX		Coordinates 580198 E 189305 N		Checked By: JEC		Sheet 1 of 1 Scale 1:25

(m)	Samples and Insitu Tests			Water	Legend	Depth (Thickness)	Level (m OD)	Stratum Description	Instrum entation /Backfill
	Depth	Type	Results						
	0.00 - 0.30	D1				(0.40)		TOPSOIL (Brown friable silty sandy slightly gravelly clay. Gravel is angular to subrounded fine to coarse flint. Occasional rootlets) [TOPSOIL]	
	0.30 - 1.00	D2				0.40	66.32		
1	1.00 - 1.90	D3				(1.50)			
2						1.90	64.82	End of Trial Pit at 1.90m	
3									
4									
5									

General Remarks 1. Location CAT scanned prior to excavation 2. No groundwater encountered. 3. Trial pit remained open and sidewalls stable during excavation, 4. Pit backfilled with gravel to 0.9m and then arisings to the surface. 5. Soakage test performed between 0.9m and 1.9m	Water Strike Standing Flow	Stability: Stable
		Pit Dimensions <div style="display: flex; align-items: center; justify-content: center;"> 0.45 m <div style="border: 1px solid black; width: 100px; height: 20px; margin-left: 10px;"></div> </div>


Project Name Hadleigh	Project No: 332210105		TRIAL PIT TP103
Client This Land	Start Date 10/05/2021		
Contractor A F Howlands	Ground Level 66.40m OD		Sheet 1 of 1 Scale 1:25
Method/Plant JCB 3CX	Coordinates 580048 E 189328 N	Logged By: JC Checked By: JEC	

(m)	Samples and Insitu Tests			Water	Legend	Depth (Thickness)	Level (m OD)	Stratum Description	Instrumentation / Backfill
	Depth	Type	Results						
0.00 - 0.35	D1				(0.10)	66.30	TOPSOIL (Brown friable silty sandy slightly gravelly clay. Gravel is angular to subrounded fine to coarse flint. Occasional rootlets) [TOPSOIL] Soft orange brown very gravelly sandy CLAY. Sand is medium to coarse grained. Gravel is medium to coarse angular brick, sandstone. ... fragments of glass and tile [MADE GROUND] Firm orange brown mottled light grey sandy CLAY. Sand is fine to medium grained. ... becoming stiff with depth [HEAD DEPOSITS]		
0.30 0.35 - 1.10	ES1 D2				(0.40)	65.90			
1.10 - 2.00	D3				(1.50)				
					2.00	64.40	End of Trial Pit at 2.00m		


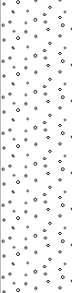
General Remarks 1. Location CAT scanned prior to excavation 2. No groundwater encountered. 3. Trial pit remained open and sidewalls stable during excavation, 4. Pit backfilled with gravel to 1.0m and then arisings to the surface. 5. Soakage test performed between 1.0m and 2.0m	Water Strike Standing Flow	Stability: Stable
		Pit Dimensions 0.45 m  2.00 m

Project Name Hadleigh	Project No: 332210105		TRIAL PIT TP104
Client This Land	Start Date 10/05/2021		
Contractor A F Howlands	Ground Level 67.26m OD		Sheet 1 of 1 Scale 1:25
Method/Plant JCB 3CX	Coordinates 580434 E 189257 N	Logged By: JC Checked By: JEC	

(m)	Samples and Insitu Tests			Water	Legend	Depth (Thickness)	Level (m OD)	Stratum Description	Instrumentation / Backfill
	Depth	Type	Results						
0.00 - 0.30	D1					(0.35)	66.91	TOPSOIL (Brown friable silty sandy slightly gravelly clay. Gravel is angular to subrounded fine to coarse flint. Occasional rootlets) [TOPSOIL]	
0.30 - 1.10	D2					0.35 (0.75)	66.16	Firm to stiff orange brown sandy CLAY. Sand is fine to medium grained. ... increasing in sand content with depth at 1.10m [HEAD DEPOSITS]	
1.10 - 1.90	D3					1.10 (1.10)	65.06	Orange brown very silty fine to medium SAND [CLAYGATE MEMBER]	
1.90 - 2.20	D4					2.20		End of Trial Pit at 2.20m	

General Remarks 1. Location CAT scanned prior to excavation 2. No groundwater encountered. 3. Trial pit remained open and sidewalls stable during excavation, 4. Pit backfilled with gravel to 1.2m and then arisings to the surface. 5. Soakage test performed between 1.2m and 2.2m	Water Strike Standing Flow	Stability: Stable
		Pit Dimensions 0.45 m  2.00 m

Project Name Hadleigh		Project No: 332210105			TRIAL PIT TP105
Client This Land		Start Date End Date 10/05/2021 14/05/2021			
Contractor A F Howlands		Ground Level 58.64m OD		Logged By: JC	
Method/Plant JCB 3CX		Coordinates 580642 E 189249 N		Checked By: JEC	
				Sheet 1 of 1	
				Scale 1:25	

(m)	Samples and Insitu Tests			Water	Legend	Depth (Thickness)	Level (m OD)	Stratum Description	Instrum entation /Backfill
	Depth	Type	Results						
0.00 - 0.20	D1							TOPSOIL (Brown friable silty sandy slightly gravelly clay. Gravel is angular to subrounded fine to coarse flint. Occasional rootlets) [TOPSOIL]	
0.20 - 0.80	D2				(0.40)	58.24	Firm orange brown mottled light grey sandy CLAY. Sand is fine to medium grained. ... becoming slightly gravelly with depth [HEAD DEPOSITS]		
0.80 - 1.50	D3				(1.60)				
1.50 - 2.00	D4				2.00	56.64			
End of Trial Pit at 2.00m									


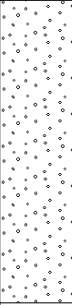
General Remarks 1. Location CAT scanned prior to excavation 2. No groundwater encountered. 3. Trial pit remained open and sidewalls stable during excavation, 4. Pit backfilled with gravel to 1.0m and then arisings to the surface. 5. Soakage test performed between 1.0m and 2.0m	Water Strike Standing Flow	Stability: Stable
		Pit Dimensions <div style="display: flex; align-items: center; justify-content: center;"> 0.45 m <div style="border: 1px solid black; width: 100px; height: 30px; position: relative;"> 1.90 m </div> </div>


Project Name Hadleigh	Project No: 332210105		TRIAL PIT
Client This Land	Start Date 10/05/2021		End Date 14/05/2021
Contractor A F Howlands	Ground Level 62.42m OD		
Method/Plant JCB 3CX	Coordinates 580511 E 189085 N	Logged By: JC	Sheet 1 of 1
		Checked By: JEC	Scale 1:25

(m)	Samples and Insitu Tests			Water	Legend	Depth (Thickness)	Level (m OD)	Stratum Description	Instrumentation /Backfill
	Depth	Type	Results						
0.00 - 0.20	D1					(0.20)		TOPSOIL (Brown friable silty sandy slightly gravelly clay. Gravel is angular to subrounded fine to coarse flint. Occasional rootlets) [TOPSOIL] Firm orange brown mottled light grey very sandy CLAY. Sand is fine to medium grained. ... becoming soft with depth ... becoming damp with depth [HEAD DEPOSITS]	
0.20 - 0.80	D2					0.20	62.22		
0.80 - 1.80	D3					(1.60)			
1.80 - 2.00	D4					1.80 (0.20) 2.00	60.62 60.42	Soft orange brown and grey mottled very silty CLAY [CLAYGATE MEMBER]	
End of Trial Pit at 2.00m									

General Remarks 1. Location CAT scanned prior to excavation 2. Groundwater encountered as a minor seepage at 2m depth. 3. Trial pit remained open and sidewalls stable during excavation, 4. Pit backfilled with gravel to 1.0m and then arisings to the surface. 5. Soakage test performed between 1.0m and 2.0m	Water	Stability: Stable
	Strike 2.00 m Standing Flow Minor seepage	Pit Dimensions 0.45 m 2.00 m

Project Name Hadleigh	Project No: 332210105		TRIAL PIT
Client This Land	Start Date 10/05/2021		End Date 14/05/2021
Contractor A F Howlands	Ground Level 61.93m OD		
Method/Plant JCB 3CX	Coordinates 580529 E 189058 N	Logged By: JC	Sheet 1 of 1
		Checked By: JEC	Scale 1:25

(m)	Samples and Insitu Tests			Water	Legend	Depth (Thickness)	Level (m OD)	Stratum Description	Instrumentation / Backfill
	Depth	Type	Results						
0.00 - 0.30	D1					(0.30)		Macadam surfacing over soft black brown very gravelly sandy CLAY. Gravel is clinker, brick and glass. Occasional cobbles of angular brick. Sand is medium to coarse grained. [MADE GROUND]	
0.20	ES1					0.30	61.63		
0.30 - 0.80	D2								
0.80 - 1.50	D3					(1.20)		Firm orange brown mottled light grey sandy CLAY. Sand is fine to medium grained. [HEAD DEPOSITS]	
						1.50	60.43	End of Trial Pit at 1.50m	

General Remarks 1. Location CAT scanned prior to excavation 2. Groundwater encountered as a moderate seepage at 1.5m depth 3. Trial pit remained open and sidewalls stable during excavation, 4. Pit backfilled with gravel to 0.5m and then arisings to the surface. 5. Soakage test performed between 0.5m and 1.5m	Water Strike 1.50 m Standing Flow Moderate seepage	Stability: Stable Pit Dimensions 0.45 m  2.00 m
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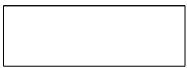
Project Name Hadleigh	Project No: 332210105		TRIAL PIT
Client This Land	Start Date 10/05/2021		End Date 14/05/2021
Contractor A F Howlands	Ground Level 63.69m OD		
Method/Plant JCB 3CX	Coordinates 580592 E 189039 N	Logged By: JC	Sheet 1 of 1
		Checked By: JEC	Scale 1:25

(m)	Samples and Insitu Tests			Water	Legend	Depth (Thickness)	Level (m OD)	Stratum Description	Instrumentation / Backfill
	Depth	Type	Results						
0.00 - 0.30	D1					(0.30)	63.39	TOPSOIL (Brown friable silty sandy slightly gravelly clay. Gravel is angular to subrounded fine to coarse flint. Occasional rootlets) [TOPSOIL]	
0.30 - 1.00	D2					0.30		Firm red orange brown mottled light grey sandy CLAY. Sand is fine to medium grained. becoming clayey fine SAND with depth ... arisings recorded as damp from 1.0m depth [HEAD DEPOSITS]	
1.00 - 1.50	D3					(1.70)			
1.50 - 2.00	D4			▼					
2.00						2.00	61.69	End of Trial Pit at 2.00m	
3.00									
4.00									
5.00									



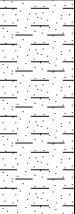
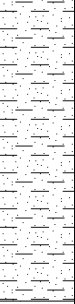
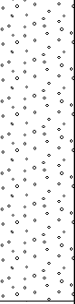
General Remarks 1. Location CAT scanned prior to excavation 2. Groundwater encountered at 1.5m as a minor seepage 3. Trial pit remained open and sidewalls stable during excavation, 4. Pit backfilled with gravel to 1.0m and then arisings to the surface. 5. Soakage test performed between 1.0m and 2.0m	Water Strike 1.50 m Standing Flow Minor seepage	Stability: Stable Pit Dimensions 0.45 m 2.00 m
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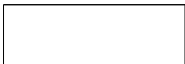
Project Name Hadleigh	Project No: 332210105		TRIAL PIT
Client This Land	Start Date 10/05/2021		End Date 14/05/2021
Contractor A F Howlands	Ground Level 72.78m OD		
Method/Plant JCB 3CX	Coordinates 580151 E 189192 N	Logged By: JC	Sheet 1 of 1
		Checked By: JEC	Scale 1:25

(m)	Samples and Insitu Tests			Water	Legend	Depth (Thickness)	Level (m OD)	Stratum Description	Instrumentation / Backfill
	Depth	Type	Results						
0.00 - 0.40	D1					(0.50)	72.28	TOPSOIL (Brown friable silty sandy slightly gravelly clay. Gravel is angular to subrounded fine to coarse flint. Occasional rootlets) [TOPSOIL]	
0.40 - 1.00	D2					0.50	72.28	Firm to stiff orange brown sandy CLAY. Sand is fine to medium grained. [HEAD DEPOSITS]	
1.00 - 1.50	D3					(1.00)	71.28		
						1.50	71.28	End of Trial Pit at 1.50m	



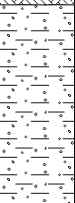

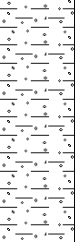
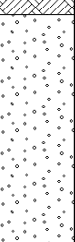


General Remarks 1. Location CAT scanned prior to excavation 2. No groundwater encountered. 3. Trial pit remained open and sidewalls stable during excavation, 4. Pit backfilled with gravel to 0.5m and then arisings to the surface. 5. Soakage test performed between 0.5m and 1.5m	Water	Stability: Stable
	Strike 1.30 m Standing Flow Slow inflow	Pit Dimensions 0.45 m 

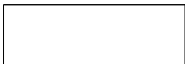
Project Name Hadleigh	Project No: 332210105		TRIAL PIT
Client This Land	Start Date 10/05/2021		End Date 14/05/2021
Contractor A F Howlands	Ground Level 77.56m OD		
Method/Plant JCB 3CX	Coordinates 580072 E 188890 N	Logged By: JC	Sheet 1 of 1
		Checked By: JEC	Scale 1:25

(m)	Samples and Insitu Tests			Water	Legend	Depth (Thickness)	Level (m OD)	Stratum Description	Instrum entation /Backfill
	Depth	Type	Results						
	0.00 - 0.30	D1				(0.30)		TOPSOIL (Brown friable silty sandy slightly gravelly clay. Gravel is angular to subrounded fine to coarse flint. Occasional rootlets) [TOPSOIL] Firm orange brown mottled light grey sandy CLAY. Sand is fine to medium grained. ... increasing in sand content with depth [HEAD DEPOSITS]	
	0.30 - 1.00	D2				0.30	77.26		
1	1.00 - 2.00	D3				(1.70)			
2				▼		2.00	75.56	End of Trial Pit at 2.00m	
3									
4									
5									

General Remarks 1. Location CAT scanned prior to excavation 2. Groundwater encountered at 2m. 3. Trial pit remained open and sidewalls stable during excavation, 4. Pit backfilled with gravel to 1.0m and then arisings to the surface. 5. Soakage test performed between 1.0m and 2.0m	Water	Stability: Stable
	Strike 2.00 m Standing Flow Minor seepage	Pit Dimensions 0.45 m 

Project Name Hadleigh		Project No: 332210105			TRIAL PIT TP111
Client This Land		Start Date 10/05/2021	End Date 14/05/2021		
Contractor A F Howlands		Ground Level 77.62m OD		Logged By: JC	Sheet 1 of 1
Method/Plant JCB 3CX		Coordinates 580208 E 189073 N		Checked By: JEC	Scale 1:25

(m)	Samples and Insitu Tests			Water	Legend	Depth (Thickness)	Level (m OD)	Stratum Description	Instrumentation / Backfill
	Depth	Type	Results						
	0.00 - 0.30	D1				(0.30)		Dark brown very silty fine to coarse SAND with frequent rootlets [TOPSOIL]	
	0.30 - 1.00	D2				0.30	77.32	Firm orange brown and grey mottled slightly gravelly CLAY. Gravel is rounded fine to coarse flint. [HEAD DEPOSITS]	
1	1.00 - 1.80	D3				(1.50)			
	1.80 - 2.00	D4				1.80 (0.20)	75.82	Orange brown very silty slightly gravelly fine to coarse SAND. Gravel is rounded fine to coarse flint. [CLAYGATE MEMBER]	
2						2.00	75.62	End of Trial Pit at 2.00m	
3									
4									
5									

General Remarks 1. Location CAT scanned prior to excavation 2. No groundwater encountered. 3. Trial pit remained open and sidewalls stable during excavation, 4. Pit backfilled with gravel to 1.0m and then arisings to the surface. 5. Soakage test performed between 1.0m and 2.0m	Water Strike Standing Flow	Stability: Stable
		Pit Dimensions 0.45 m  2.00 m

Project Name Hadleigh	Project No: 332210105		TRIAL PIT
Client This Land	Start Date 10/05/2021		End Date 14/05/2021
Contractor A F Howlands	Ground Level 72.83m OD		Sheet 1 of 1 Scale 1:25
Method/Plant JCB 3CX	Coordinates 580652 E 188879 N	Logged By: JC Checked By: JEC	

(m)	Samples and Insitu Tests			Water	Legend	Depth (Thickness)	Level (m OD)	Stratum Description	Instrumentation / Backfill
	Depth	Type	Results						
0.00 - 0.35	D1					(0.35)	72.48	TOPSOIL (Brown friable silty sandy slightly gravelly clay. Gravel is angular to subrounded fine to coarse flint. Occasional rootlets) [TOPSOIL]	
0.35 - 0.80	D2					0.35		Firm orange brown mottled light grey very sandy CLAY. Sand is fine to medium grained. [HEAD DEPOSITS]	
0.80 - 1.40	D3					(1.75)			
1.40 - 2.00	D4					2.10	70.73	End of Trial Pit at 2.10m	

General Remarks 1. Location CAT scanned prior to excavation 2. Groundwater encountered from 1.2m 3. Trial pit remained open and sidewalls unstable during excavation, 4. Pit backfilled with gravel to 1.1m and then arisings to the surface. 5. Soakage test performed between 1.1m and 2.1m	Water Strike 1.20 m Standing Flow Moderate inflow	Stability: Unstable beyond 2m Pit Dimensions 0.45 m 1.90 m
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Project Name Hadleigh	Project No: 332210105		WINDOW SAMPLE
Client This Land	Start Date 14/05/2021		End Date 14/05/2021
Contractor A F Howlands	Ground Level 66.09m OD (OSGB)	Logged By: SW	Sheet 1 of 1
Method/Plant Dando Terrier 2002	Coordinates (OSGB) 580276 E 189335 N	Checked By: JC	Scale 1:40


(m)	Samples and Insitu Tests			Water	Legend	Depth (Thickness)	Level (m OD)	Stratum Description	Instrumentation /backfill
	Depth	Type	Results						
0.00 - 0.30	D1					(0.30)	65.79	TOPSOIL (Brown friable silty sandy slightly gravelly clay. Gravel is angular to subrounded fine to coarse flint. Occasional rootlets) [TOPSOIL]	
0.60 - 0.80	D2							Soft becoming firm grey orange mottled silty sandy CLAY. Occasional relic rootlets [HEAD DEPOSITS]	
1.20 1.20 - 1.65	S D3	N=13				(2.50)			
1.70 - 1.90	D4								
2.00 2.00 - 2.45	S D5	N=14							
2.80 - 3.00	D6					2.80	63.29	Medium dense brown very clayey silty fine SAND [CLAYGATE MEMBER]	
3.00 3.00 - 3.45	S D7	N=16							
3.60 - 3.90	D8								
4.00 4.00 - 4.45	S D9	N=14				(3.00)			
4.80 - 5.00	D10								
5.00 5.00 - 5.45	S D11	N=14						Medium dense brown very clayey silty fine SAND	
5.60 - 6.00	D12								
5.80 (0.20) 6.00						5.80 (0.20) 6.00	60.29 60.09	Stiff grey silty sandy CLAY [LONDON CLAY FORMATION?]	
								End of Window Sample at 6.00m	

General Remarks 1. Location CAT scanned prior to excavation 2. Hand dug inspection pit to 1.20 m3. No groundwater encountered 4. Slotted Standpipe installed to 5.00 m5. SPT Hammer Energy Ratio = 68%	Water Strike			Window Sample Run			
	Strike	Time (mins)	Rose to	Start	End	Dia. (mm)	Rec. %

Project Name Hadleigh	Project No: 332210105		WINDOW SAMPLE WS102
Client This Land	Start Date 13/05/2021		
Contractor A F Howlands	Ground Level 66.21m OD (OSGB)	Logged By: SW	Sheet 1 of 1
Method/Plant Dando Terrier 2002	Coordinates (OSGB) 580052 E 189333 N	Checked By: JC	Scale 1:40

(m)	Samples and Insitu Tests			Water	Legend	Depth (Thickness)	Level (m OD)	Stratum Description	Instrumentation / Backfill
	Depth	Type	Results						
0.00 - 0.20	D1					(0.20)	66.01	TOPSOIL (Brown friable silty sandy slightly gravelly clay. Gravel is angular to subrounded fine to coarse flint. Occasional rootlets)	
0.30 - 0.50	D2					0.20		[TOPSOIL] Soft becoming firm light greyish brown orange mottled silty sandy CLAY. Occasional relic rootlets [HEAD DEPOSITS]	
1.20	S	N=9							
1.20 - 1.65	D3								
1.80 - 2.00	D4								
2.00	S	N=7				(3.60)			
2.00 - 2.45	D5								
2.80 - 3.00	D6								
3.00	S	N=15							
3.00 - 3.45	D7								
3.70 - 3.80	D8					3.80	62.41 Band of light brown very clayey silty fine sand from 3.70 m to 3.80 m	
3.80 - 4.00	D9							Stiff dark grey silty slightly sandy CLAY [CLAYGATE MEMBER]	
4.00	S	N=10							
4.00 - 4.45	D10								
5.00	S	N=11				(2.20)		Stiff dark grey silty slightly sandy CLAY	
5.00 - 5.45	D11								
6.00						6.00	60.21	End of Window Sample at 6.00m	

General Remarks 1. Location CAT scanned prior to excavation2. Hand dug inspection pit to 1.20 m3. Groundwater struck at 4.00 m and rose to 3.95 m in 5 mins, 3.77 m in 10 mins, 3.70 m in 15 mins and 3.68 m in 20 mins4. Slotted Standpipe installed to 5.00 m5. SPT Hammer Energy Ratio = 68%	Water Strike			Window Sample Run			
	Strike	Time (mins)	Rose to	Start	End	Dia. (mm)	Rec. %

Project Name Hadleigh	Project No: 332210105		WINDOW SAMPLE WS103
Client This Land	Start Date 14/05/2021		
Contractor A F Howlands	Ground Level 58.11m OD (OSGB)	Logged By: SW	Sheet 1 of 1
Method/Plant Dando Terrier 2002	Coordinates (OSGB) 580658 E 189249 N	Checked By: JC	Scale 1:40

(m)	Samples and Insitu Tests			Water	Legend	Depth (Thickness)	Level (m OD)	Stratum Description	Instrumentation / Backfill
	Depth	Type	Results						
0.00 - 0.30	D1					(0.30)	57.81	TOPSOIL (Brown friable silty sandy slightly gravelly clay. Gravel is angular to subrounded fine to coarse flint. Occasional rootlets)	
0.50 - 0.70	D2					0.30		[TOPSOIL] Soft becoming firm light greyish brown orange mottled silty sandy CLAY. Occasional angular to subrounded fine to medium flint gravel. Some relic rootlets [HEAD DEPOSITS]	
1.20	S	N=6							
1.20 - 1.65	D3								
1.70 - 1.90	D4								
2.00	S	N=8							
2.00 - 2.45	D5					(3.50)			
2.80 - 3.00	D6								
3.00	S	N=12							
3.00 - 3.45	D7								
3.80 - 4.00	D8					3.80	54.31	Stiff dark grey silty CLAY [CLAYGATE MEMBER]	
4.00	S	N=12							
4.00 - 4.45	D9								
4.80 - 5.00	D10								
5.00	S	N=17				(2.20)		Stiff dark grey silty CLAY	
5.00 - 5.45	D11								
5.70 - 6.00	D12					6.00	52.11	End of Window Sample at 6.00m	

General Remarks 1. Location CAT scanned prior to excavation2. Hand dug inspection pit to 1.20 m3. Groundwater struck at 2.00 m and rose to 2.19 m in 5 mins, 2.15 m in 10 mins, 2.12 m in 15 mins and 2.10 m in 20 mins4. Slotted Standpipe installed to 6.00 m5. SPT Hammer Energy Ratio = 68%	Water Strike			Window Sample Run			
	Strike	Time (mins)	Rose to	Start	End	Dia. (mm)	Rec. %

Project Name Hadleigh	Project No: 332210105		WINDOW SAMPLE WS104
Client This Land	Start Date 14/05/2021		
Contractor A F Howlands	Ground Level 66.80m OD (OSGB)	Logged By: SW	Sheet 1 of 1
Method/Plant Dando Terrier 2002	Coordinates (OSGB) 580373 E 188983 N	Checked By: JC	Scale 1:40

(m)	Samples and Insitu Tests			Water	Legend	Depth (Thickness)	Level (m OD)	Stratum Description	Instrumentation/Backfill
	Depth	Type	Results						
0.00 - 0.40	D1					(0.40)	66.40	TOPSOIL (Brown friable silty sandy slightly gravelly clay. Gravel is angular to subrounded fine to coarse flint. Occasional rootlets) [TOPSOIL]	
0.70 - 0.90	D2							Soft becoming firm light greyish brown orange mottled silty sandy CLAY. Occasional relic rootlets [HEAD DEPOSITS]	
1.20 1.20 - 1.65	S D3	N=29				(1.30)			
1.70 - 1.90	D4					1.70	65.10	Medium dense brown very clayey silty fine SAND [CLAYGATE MEMBER]	
2.00 2.00 - 2.45	S D5	N=21							
2.80 - 3.00	D6					(2.30)			
3.60 - 3.80	D7								
4.00						4.00	62.80	End of Window Sample at 4.00m	

General Remarks 1. Location CAT scanned prior to excavation2. Hand dug inspection pit to 1.20 m3. Groundwater struck at 2.00 m and rose to 1.62 m in 5 mins, 1.46 m in 10 mins, 1.40 m in 15 mins and 1.38 m in 20 mins4. Slotted Standpipe installed to 3.00 m5. SPT Hammer Energy Ratio = 68%	Water Strike			Window Sample Run			
	Strike	Time (mins)	Rose to	Start	End	Dia. (mm)	Rec. %

Project Name Hadleigh	Project No: 332210105		WINDOW SAMPLE
Client This Land	Start Date 13/05/2021		End Date 13/05/2021
Contractor A F Howlands	Ground Level 78.04m OD (OSGB)		
Method/Plant Dando Terrier 2002	Coordinates (OSGB) 580082 E 188888 N		Logged By: SW Checked By: JC
			Sheet 1 of 1 Scale 1:40

(m)	Samples and Insitu Tests			Water	Legend	Depth (Thickness)	Level (m OD)	Stratum Description	Instrumentation / Backfill
	Depth	Type	Results						
0.00 - 0.20	D1					(0.30)		TOPSOIL (Brown friable silty sandy slightly gravelly clay. Gravel is angular to subrounded fine to coarse flint. Occasional rootlets) [TOPSOIL] Soft becoming firm light greyish brown orange mottled silty sandy CLAY. Occasional relic rootlets [HEAD DEPOSITS]	
0.30 - 0.50	D2					0.30	77.74		
1.20 1.20 - 1.65	S D3	N=12							
1.80 - 2.00	D4								
2.00 2.00 - 2.45	S D5	N=11				(3.40)			
2.80 - 3.00	D6							<i>.... Becoming firm orange silty fine to medium sandy clay</i>	
3.00 3.00 - 3.45	S D7	N=15							
3.70 - 3.80 3.80 - 4.00	D8 D9					3.70	74.34	Firm becoming stiff brown silty sandy CLAY [CLAYGATE MEMBER]	
4.00 4.00 - 4.45	S D10	N=17						<i>.... Small pockets of fine to medium orange sand from 4.20 m to 6.00 m in firm to stiff clay</i>	
5.00 5.00 - 5.45	S D11	N=17				(2.30)		<i>Firm becoming stiff brown silty sandy CLAY</i>	
6.00						6.00	72.04	End of Window Sample at 6.00m	

General Remarks 1. Location CAT scanned prior to excavation 2. Hand dug inspection pit to 1.20 m3. Groundwater seepage at 4.00 m4. Slotted Standpipe installed to 6.00 m5. SPT Hammer Energy Ratio = 68%	Water Strike			Window Sample Run			
	Strike	Time (mins)	Rose to	Start	End	Dia. (mm)	Rec. %

Project Name Hadleigh	Project No: 332210105		WINDOW SAMPLE WS106
Client This Land	Start Date 13/05/2021		
Contractor A F Howlands	Ground Level 70.13m OD (OSGB)	Logged By: SW	Sheet 1 of 1
Method/Plant Dando Terrier 2002	Coordinates (OSGB) 580242 E 189259 N	Checked By: JC	Scale 1:40

(m)	Samples and Insitu Tests			Water	Legend	Depth (Thickness)	Level (m OD)	Stratum Description	Instrumentation /Backfill
	Depth	Type	Results						
0.00 - 0.30	D1					(0.30)	69.83	TOPSOIL (Brown friable silty sandy slightly gravelly clay. Gravel is angular to subrounded fine to coarse flint. Occasional rootlets) [TOPSOIL]	
0.60 - 0.80	D2					0.30		Soft becoming firm light greyish brown orange mottled silty sandy CLAY. Occasional relic rootlets [HEAD DEPOSITS]	
1.20 - 1.65	S D3	N=7							
1.80 - 2.00	D4								
2.00 - 2.45	S D5	N=7							
2.80 - 3.00	D6								
3.00 - 3.45	S D7	N=12				(5.30)			
3.80 - 4.00	D8								
4.00 - 4.45	S D9	N=12							
4.80 - 5.00	D10								
5.00 - 5.45	S D11	N=17						<i>Stiff dark grey silty slightly sandy CLAY</i>	
5.60 - 6.00	D12					5.60 (0.40)	64.53	Stiff dark grey silty slightly sandy CLAY [CLAYGATE MEMBER]	
						6.00	64.13	End of Window Sample at 6.00m	

General Remarks 1. Location CAT scanned prior to excavation2. Hand dug inspection pit to 1.20 m3. Groundwater struck at 2.00 m and rose to 2.10 m in 5 mins, 1.97 m in 10 mins, 1.95 m in 15 mins and 20 mins4. Slotted Standpipe installed to 4.00 m5. SPT Hammer Energy Ratio = 68%	Water Strike			Window Sample Run			
	Strike	Time (mins)	Rose to	Start	End	Dia. (mm)	Rec. %

WINDOWLESS DYNAMIC SAMPLE RECORDS

L	Liner sample
D	Small disturbed sample
SPT	Standard penetration test using a split spoon sampler N Value is uncorrected, but the hammer energy ratio is provided (in remarks)
IP xx	Initial penetration during the SPT recorded in millimetres. If initial penetration equals or exceeds 450 mm the test is aborted.
S x,x	SPT seating drive blow count given by the summation of the blows 'X' required to drive the seating length
T x,x,x,x	SPT test drive blow count 'N' given by the summation of the blows 'X' required to drive the seating length (300 mm)
X*Y	Incomplete standard penetration test where the seating/test drive could not be completed. The blows 'X' represent the total blows for the given length of seating drive 'Y' (mm)
<u>dd/mm/yy: 1.0</u>	Date, water level at the borehole depth at the end of shift
dd/mm/yy: dry	and the start of the following shift

Each sample type is numbered sequentially with depth and relates to the depth range quoted

All depths and measurements are given in metres, except as noted

Strata descriptions compiled by visual examination of samples obtained during boring, after BS 5930:2015+A1:2020 and modified in accordance with laboratory test results where applicable



A F Howland Associates Geotechnical Engineers

Site
Castle Point, Hadleigh

Number
WS101

Machine : Dando Terrier 2002
Method : Windowless Dynamic Sampling

Dimensions
102mm to 2.00m
87mm to 4.00m
75mm to 6.00m

Ground Level (mOD)
66.09

Client
Stantec

Job Number
21.133

Location
580276 E 189335 N

Dates
14/05/2021

Engineer

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.30	D1			65.79	(0.30) 0.30	TOPSOIL (Brown friable silty sandy slightly gravelly clay. Gravel is angular to subrounded fine to coarse flint. Occasional rootlets)		
0.60-0.80	D2					Soft becoming firm grey orange mottled silty sandy CLAY. Occasional relic rootlets		
1.20-1.65	SPT N=13 D3	DRY	IP 0/S 1,2 T 2,4,3,4		(2.50)			
1.70-1.90	D4							
2.00-2.45	SPT N=14 D5	DRY	IP 0/S 2,2 T 3,3,4,4					
2.80-3.00	D6			63.29	2.80	Medium dense brown very clayey silty fine SAND		
3.00-3.45	SPT N=16 D7	DRY	IP 0/S 1,1 T 3,3,4,6					
3.60-3.90	D8							
4.00-4.45	SPT N=14 D9	DRY	IP 0/S 1,2 T 3,3,3,5		(3.00)			
4.80-5.00	D10							
5.00-5.45	SPT N=14 D11	DRY	IP 0/S 3,3 T 2,2,5,5					
5.60-6.00	D12			60.29 60.09	5.80 (0.20) 6.00	Stiff grey silty sandy CLAY		
			14/05/2021:DRY			Complete at 6.00m		

Remarks

1. Location CAT scanned prior to excavation
2. Hand dug inspection pit to 1.20 m
3. No groundwater encountered
4. Slotted Standpipe installed to 5.00 m
5. SPT Hammer Energy Ratio = 68%

Scale (approx)
1:40

Logged By
SW

Figure No.
21.133.WS101



A F Howland Associates Geotechnical Engineers

Site
Castle Point, Hadleigh

Borehole
Number
WS101

Installation Type
Single Installation

Dimensions
Internal Diameter of Tube [A] = 50 mm

Client
Stantec

Job
Number
21.133

Location
580276 E 189335 N

Ground Level (mOD)
66.09

Engineer

Sheet
1/1

Legend	Water	Instr (A)	Level (mOD)	Depth (m)	Description	Groundwater Strikes During Drilling														
						Date	Time	Depth Struck (m)	Casing Depth (m)	Inflow Rate	Readings				Depth Sealed (m)					
			65.89	0.20	Concrete															
			65.09	1.00	Bentonite Seal															
						Groundwater Observations During Drilling														
						Date	Start of Shift					End of Shift								
							Time	Depth Hole (m)	Casing Depth (m)	Water Depth (m)	Water Level (mOD)	Time	Depth Hole (m)	Casing Depth (m)	Water Depth (m)	Water Level (mOD)				
						14/05/21						6.00			DRY					
						Instrument Groundwater Observations														
						Inst. [A] Type : Slotted Standpipe														
						Date	Instrument [A]			Remarks										
							Time	Depth (m)	Level (mOD)											
			61.09	5.00																
			60.09	6.00	General Backfill															

Remarks



A F Howland Associates Geotechnical Engineers

Site
Castle Point, Hadleigh

Number
WS102

Machine : Dando Terrier 2002
Method : Windowless Dynamic Sampling

Dimensions
102mm to 2.00m
87mm to 4.00m
75mm to 6.00m

Ground Level (mOD)
66.21

Client
Stantec

Job Number
21.133

Location
580052 E 189333 N

Dates
13/05/2021

Engineer

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.20	D1			66.01	(0.20)	TOPSOIL (Brown friable silty sandy slightly gravelly clay. Gravel is angular to subrounded fine to coarse flint. Occasional rootlets)		
0.30-0.50	D2				0.20	Soft becoming firm light greyish brown orange mottled silty sandy CLAY. Occasional relic rootlets		
1.20-1.70 1.20-1.65	SPT D3 N=9	DRY	IP 50/S 1,1 T 2,2,3,2					
1.80-2.00	D4				(3.60)			
2.00-2.48 2.00-2.45	SPT D5 N=7	DRY	IP 30/S 2,1 T 1,2,2,2					
2.80-3.00	D6							
3.00-3.45 3.00-3.45	SPT N=15 D7	DRY	IP 0/S 1,2 T 4,3,4,4					
3.70-3.80 3.80-4.00	D8 D9			62.41	3.80 band of light brown very clayey silty fine sand from 3.70 m to 3.80 m		▼1
4.00-4.45	D10					Stiff dark grey silty slightly sandy CLAY		▼1
4.00-4.45	SPT N=10	3.95	Moderate(1) at 4.00m, rose to 3.68m in 20 mins, not sealed. IP 0/S 2,2 T 2,2,3,3					
5.00-5.45 5.00-5.45	SPT N=11 D11	4.50	IP 0/S 2,2 T 2,3,3,3		(2.20)			
			13/05/2021:4.47m	60.21	6.00	Complete at 6.00m		

Remarks

1. Location CAT scanned prior to excavation
2. Hand dug inspection pit to 1.20 m
3. Groundwater struck at 4.00 m and rose to 3.95 m in 5 mins, 3.77 m in 10 mins, 3.70 m in 15 mins and 3.68 m in 20 mins
4. Slotted Standpipe installed to 5.00 m
5. SPT Hammer Energy Ratio = 68%

Scale (approx)
1:40

Logged By
SW

Figure No.
21.133.WS102



A F Howland Associates Geotechnical Engineers

Site
Castle Point, Hadleigh

Borehole
Number
WS102

Installation Type
Single Installation

Dimensions
Internal Diameter of Tube [A] = 50 mm

Client
Stantec

Job Number
21.133

Location
580052 E 189333 N

Ground Level (mOD)
66.21

Engineer

Sheet
1/1

Legend	Water	Instr (A)	Level (mOD)	Depth (m)	Description	Groundwater Strikes During Drilling															
						Date	Time	Depth Struck (m)	Casing Depth (m)	Inflow Rate	Readings				Depth Sealed (m)						
			66.01	0.20	Concrete																
					Bentonite Seal	13/05/21		4.00		Moderate	3.95	3.77	3.70	3.68						NOT	
			65.21	1.00		Groundwater Observations During Drilling															
						Start of Shift					End of Shift										
						Date	Time	Depth Hole (m)	Casing Depth (m)	Water Depth (m)	Water Level (mOD)	Time	Depth Hole (m)	Casing Depth (m)	Water Depth (m)	Water Level (mOD)					
						13/05/21							6.00		4.47	61.74					
					Slotted Standpipe	Instrument Groundwater Observations															
						Inst. [A] Type : Slotted Standpipe															
						Instrument [A]			Remarks												
					Date	Time	Depth (m)	Level (mOD)													
			61.21	5.00																	
					General Backfill																
			60.21	6.00																	

Remarks



A F Howland Associates Geotechnical Engineers

Site
Castle Point, Hadleigh

Number
WS103

Machine : Dando Terrier 2002
Method : Windowless Dynamic Sampling

Dimensions
102mm to 2.00m
87mm to 4.00m
75mm to 6.00m

Ground Level (mOD)
58.11

Client
Stantec

Job Number
21.133

Location
580658 E 189249 N

Dates
14/05/2021

Engineer

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.30	D1			57.81	(0.30) 0.30	TOPSOIL (Brown friable silty sandy slightly gravelly clay. Gravel is angular to subrounded fine to coarse flint. Occasional rootlets)		
0.50-0.70	D2					Soft becoming firm light greyish brown orange mottled silty sandy CLAY. Occasional angular to subrounded fine to medium flint gravel. Some relic rootlets		
1.20-1.73 1.20-1.65	SPT D3 N=6	DRY	IP 80/S 1,2 T 1,1,2,2					
1.70-1.90	D4							
2.00-2.45	D5		Slow(1) at 2.00m, fell to 2.10m in 20 mins, not sealed.		(3.50)			
2.00-2.50	SPT N=8	2.19	IP 50/S 2,1 T 2,2,2,2					
2.80-3.00	D6							
3.00-3.46 3.00-3.45	SPT D7 N=12	2.90	IP 10/S 2,2 T 3,3,3,3					
3.80-4.00	D8			54.31	3.80	Stiff dark grey silty CLAY		
4.00-4.45 4.00-4.45	SPT N=12 D9	3.12	IP 0/S 2,2 T 3,2,4,3					
4.80-5.00	D10				(2.20)			
5.00-5.45 5.00-5.45	SPT N=17 D11	4.05	IP 0/S 3,4 T 4,3,5,5					
5.70-6.00	D12			52.11	6.00	Complete at 6.00m		
			14/05/2021:DRY					

Remarks

1. Location CAT scanned prior to excavation
2. Hand dug inspection pit to 1.20 m
3. Groundwater struck at 2.00 m and rose to 2.19 m in 5 mins, 2.15 m in 10 mins, 2.12 m in 15 mins and 2.10 m in 20 mins
4. Slotted Standpipe installed to 6.00 m
5. SPT Hammer Energy Ratio = 68%

Scale (approx)
1:40

Logged By
SW

Figure No.
21.133.WS102



A F Howland Associates Geotechnical Engineers

Site
Castle Point, Hadleigh

Borehole
Number
WS103

Installation Type
Single Installation

Dimensions
Internal Diameter of Tube [A] = 50 mm

Client
Stantec

Job Number
21.133

Location
580658 E 189249 N

Ground Level (mOD)
58.11

Engineer

Sheet
1/1

Legend	Water	Instr (A)	Level (mOD)	Depth (m)	Description	Groundwater Strikes During Drilling															
						Date	Time	Depth Struck (m)	Casing Depth (m)	Inflow Rate	Readings				Depth Sealed (m)						
			57.91	0.20	Concrete																
					Bentonite Seal	14/05/21		2.00		Slow	2.19	2.15	2.12	2.10							NOT
			57.11	1.00		Groundwater Observations During Drilling															
						Start of Shift					End of Shift										
						Date	Time	Depth Hole (m)	Casing Depth (m)	Water Depth (m)	Water Level (mOD)	Time	Depth Hole (m)	Casing Depth (m)	Water Depth (m)	Water Level (mOD)					
						14/05/21							6.00								DRY
						Instrument Groundwater Observations															
						Inst. [A] Type : Slotted Standpipe															
					Slotted Standpipe	Instrument [A]			Remarks												
						Date	Time	Depth (m)	Level (mOD)												
			52.11	6.00																	

Remarks



A F Howland Associates Geotechnical Engineers

Site
Castle Point, Hadleigh

Number
WS104

Machine : Dando Terrier 2002
Method : Windowless Dynamic Sampling

Dimensions
102mm to 2.00m
87mm to 3.00m
63mm to 4.00m

Ground Level (mOD)
66.80

Client
Stantec

Job Number
21.133

Location
580373 E 188983 N

Dates
14/05/2021

Engineer

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water			
0.00-0.40	D1	DRY	IP 60/S 3,4 T 6,6,8,9 Moderate(1) at 2.00m, rose to 1.38m in 20 mins, not sealed. IP 0/S 1,3 T 3,5,5,8	66.40	(0.40)	TOPSOIL (Brown friable silty sandy slightly gravelly clay. Gravel is angular to subrounded fine to coarse flint. Occasional rootlets)		▽1			
0.70-0.90	D2				(1.30)	Soft becoming firm light greyish brown orange mottled silty sandy CLAY. Occasional relic rootlets					
1.20-1.71 1.20-1.65	SPT D3 N=29				65.10	1.70	Medium dense brown very clayey silty fine SAND				
1.70-1.90	D4				1.62	14/05/2021:1.40m	62.80		4.00	Complete at 4.00m	
2.00-2.45	D5										
2.00-2.45	SPT N=21										
2.80-3.00	D6										
3.60-3.80	D7										

Remarks

1. Location CAT scanned prior to excavation
2. Hand dug inspection pit to 1.20 m
3. Groundwater struck at 2.00 m and rose to 1.62 m in 5 mins, 1.46 m in 10 mins, 1.40 m in 15 mins and 1.38 m in 20 mins
4. Slotted Standpipe installed to 3.00 m
5. SPT Hammer Energy Ratio = 68%

Scale (approx)
1:40

Logged By
SW

Figure No.
21.133.WS104



A F Howland Associates Geotechnical Engineers

Site
Castle Point, Hadleigh

Number
WS105

Machine : Dando Terrier 2002
Method : Windowless Dynamic Sampling

Dimensions
102mm to 2.00m
87mm to 4.00m
75mm to 6.00m

Ground Level (mOD)
78.04

Client
Stantec

Job Number
21.133

Location
580082 E 188888 N

Dates
13/05/2021

Engineer

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.20	D1				(0.30)	TOPSOIL (Brown friable silty sandy slightly gravelly clay. Gravel is angular to subrounded fine to coarse flint. Occasional rootlets)		
0.30-0.50	D2			77.74	0.30			
1.20-1.65	SPT N=12	DRY	IP 0/S 2,3 T 3,3,3,3			Soft becoming firm light greyish brown orange mottled silty sandy CLAY. Occasional relic rootlets		
1.20-1.65	D3							
1.80-2.00	D4	DRY	IP 0/S 1,1 T 2,3,3,3		(3.40) Becoming firm orange silty fine to medium sandy clay		
2.00-2.45	SPT N=11 D5							
2.80-3.00	D6	DRY	IP 10/S 2,2 T 3,4,4,4			Firm becoming stiff brown silty sandy CLAY		
3.00-3.46	SPT D7 N=15							
3.70-3.80	D8	DRY	Seepage(1) at 4.00m. IP 0/S 2,3 T 4,4,4,5	74.34	3.70 Small pockets of fine to medium orange sand from 4.20 m to 6.00 m in firm to stiff clay		▽1
3.80-4.00	D9							
4.00-4.45	D10	DRY	IP 0/S 2,3 T 3,4,5,5		(2.30)	Complete at 6.00m		
4.00-4.45	SPT N=17 D11							
5.00-5.45	SPT N=17 D11	DRY						
5.00-5.45			13/05/2021:DRY	72.04	6.00			

Remarks

1. Location CAT scanned prior to excavation
2. Hand dug inspection pit to 1.20 m
3. Groundwater seepage at 4.00 m
4. Slotted Standpipe installed to 6.00 m
5. SPT Hammer Energy Ratio = 68%

Scale (approx)	Logged By
1:40	SW

Figure No.
21.133.WS105



A F Howland Associates Geotechnical Engineers

Site
Castle Point, Hadleigh

Borehole
Number
WS105

Installation Type
Single Installation

Dimensions
Internal Diameter of Tube [A] = 50 mm

Client
Stantec

Job Number
21.133

Location
580082 E 188888 N

Ground Level (mOD)
78.04

Engineer

Sheet
1/1

Legend	Water	Instr (A)	Level (mOD)	Depth (m)	Description	Groundwater Strikes During Drilling										
						Date	Time	Depth Struck (m)	Casing Depth (m)	Inflow Rate	Readings				Depth Sealed (m)	
			77.84	0.20	Concrete	13/05/21		4.00		Seepage						
			77.04	1.00	Bentonite Seal	Groundwater Observations During Drilling										
						Start of Shift					End of Shift					
						Date	Time	Depth Hole (m)	Casing Depth (m)	Water Depth (m)	Water Level (mOD)	Time	Depth Hole (m)	Casing Depth (m)	Water Depth (m)	Water Level (mOD)
						13/05/21							6.00			DRY
						Instrument Groundwater Observations										
						Inst. [A] Type : Slotted Standpipe										
						Instrument [A]			Remarks							
					Date	Time	Depth (m)	Level (mOD)								
			72.04	6.00	Slotted Standpipe											

Remarks



A F Howland Associates Geotechnical Engineers

Site
Castle Point, Hadleigh

Number
WS106

Machine : Dando Terrier 2002
Method : Windowless Dynamic Sampling

Dimensions
102mm to 3.00m
87mm to 5.00m
65mm to 6.00m

Ground Level (mOD)
70.13

Client
Stantec

Job Number
21.133

Location
580242 E 189259 N

Dates
13/05/2021

Engineer

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.30	D1			69.83	(0.30) 0.30	TOPSOIL (Brown friable silty sandy slightly gravelly clay. Gravel is angular to subrounded fine to coarse flint. Occasional rootlets)		
0.60-0.80	D2					Soft becoming firm light greyish brown orange mottled silty sandy CLAY. Occasional relic rootlets		
1.20-1.75 1.20-1.65	SPT D3 N=7	DRY	IP 100/S 1,2 T 1,2,2,2					
1.80-2.00 2.00-2.45	D4 D5							
2.00-2.50	SPT N=7	DRY	Moderate / Slow(1) at 2.00m, rose to 1.95m in 20 mins, not sealed. IP 50/S 2,1 T 1,2,2,2					
2.80-3.00 3.00-3.46 3.00-3.45	D6 SPT D7 N=12	2.10	IP 10/S 2,2 T 2,3,3,4		(5.30)			
3.80-4.00 4.00-4.47 4.00-4.45	D8 SPT D9 N=12	2.98	IP 20/S 2,1 T 3,2,4,3					
4.80-5.00 5.00-5.45 5.00-5.45	D10 SPT N=17 D11	3.30	IP 0/S 2,2 T 3,4,5,5					
5.60-6.00	D12			64.53	5.60	Stiff dark grey silty slightly sandy CLAY		
				64.13	(0.40) 6.00	Complete at 6.00m		
			13/05/2021:3.51m					

Remarks

1. Location CAT scanned prior to excavation
2. Hand dug inspection pit to 1.20 m
3. Groundwater struck at 2.00 m and rose to 2.10 m in 5 mins, 1.97 m in 10 mins, 1.95 m in 15 mins and 20 mins
4. Slotted Standpipe installed to 4.00 m
5. SPT Hammer Energy Ratio = 68%

Scale (approx)
1:40

Logged By
SW

Figure No.
21.133.WS106



A F Howland Associates Geotechnical Engineers

Site
Castle Point, Hadleigh

Borehole
Number
WS106

Installation Type
Single Installation

Dimensions
Internal Diameter of Tube [A] = 50 mm

Client
Stantec

Job
Number
21.133

Location
580242 E 189259 N

Ground Level (mOD)
70.13

Engineer

Sheet
1/1

Legend	Water	Instr (A)	Level (mOD)	Depth (m)	Description	Groundwater Strikes During Drilling										
						Date	Time	Depth Struck (m)	Casing Depth (m)	Inflow Rate	Readings				Depth Sealed (m)	
			69.93	0.20	Concrete	13/05/21		2.00		Moderate / Slow	2.10	1.97	1.95	1.95	NOT	
			69.13	1.00	Bentonite Seal	Groundwater Observations During Drilling										
						Start of Shift					End of Shift					
						Date	Time	Depth Hole (m)	Casing Depth (m)	Water Depth (m)	Water Level (mOD)	Time	Depth Hole (m)	Casing Depth (m)	Water Depth (m)	Water Level (mOD)
						13/05/21							6.00		3.51	66.62
					Slotted Standpipe	Instrument Groundwater Observations										
						Inst. [A] Type : Slotted Standpipe										
						Date	Instrument [A]			Remarks						
						Time	Depth (m)	Level (mOD)								
			66.13	4.00												
			64.13	6.00	General Backfill											

Remarks

APPENDIX B: CABLE PERCUSSIVE BOREHOLE RECORDS

B	Bulk disturbed sample
D	Small disturbed sample
ES	Environmental sample
U	100 mm diameter undisturbed open tube drive sample
X blows	The associated figure 'X' is the number of blows to drive the sample tube over the given depth range
SPT	Standard penetration test using a split spoon sampler
SPT(C)	Cone penetration test using a solid cone
X,X/X,X,X,X	Blows per increment during the standard penetration test. The initial value relates to the seating drive (150 mm) and the remaining four to the 75 mm increments of the test length
N=X	SPT blow count 'N' given by the summation of the blows 'X' required to drive the full test length (300 mm)
X*/Y	Incomplete standard penetration test where the seating drive could not be completed. The blows 'X' represent the total blows for the given length of seating drive 'Y' (mm)
X/Z	Incomplete standard penetration test where the seating drive was achieved but the full test length was not. The blows 'X' represent the total blows for the given test length 'Z' (mm)
dd/mm/yy: 1.0	Date, water level at the borehole depth at the end of shift
dd/mm/yy: dry	and the start of the following shift

Each sample type is numbered sequentially with depth and relates to the depth range quoted

All depths and measurements are given in metres, except as noted

Strata descriptions compiled by visual examination of samples obtained during boring, after BS 5930:2015 and modified in accordance with laboratory test results where applicable



A F Howland Associates
Geotechnical Engineers

Site
 Castle Point, Hadleigh

Trial Pit
 Number
TP101

Excavation Method JCB 3CX	Dimensions 2.00 m x 0.45 m x 2.00 m	Ground Level (mOD) 65.76	Client Stantec	Job Number 21.133
	Location 580270 E 189339 N	Dates 11/05/2021	Engineer	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10-1.00	D1			65.66	(0.10) 0.10	TOPSOIL(Dark brown clay with rootlets) Firm to stiff orange brown and grey mottled CLAY		
1.00-1.90	D2				(1.80)			
1.90-2.00	D3			63.86 63.76	1.90 (0.10) 2.00	Yellowish brown sandy SILT Complete at 2.00m		

Plan 	Remarks 1. Location CAT scanned prior to excavation 2. No groundwater encountered 3. Trial pit remained open and sidewalls stable during excavation. 4. Pit backfilled with gravel to 1.0 m and then arisings to surface 5. Soakage test performed between 1.0 m and 2.0 m	
		Scale (approx) 1:20



Site : Castle Point, Hadleigh

Client : Stantec

Engineer :

Job Number
21.133

Sheet
1 / 12

Location	Date	Level	Location
TP101	11/05/2021	65.76 mOD	E: 580270 N: 189339

Pit Width (m)	0.45
Pit Depth (m)	2.00
Pit Length (m)	2.00

Soil type at test level	Orange-brown mottled grey CLAY
Groundwater	None
Drain discharge depth	Not known
Sidewall stability	Stable
Stone filled or open pit	Stone filled

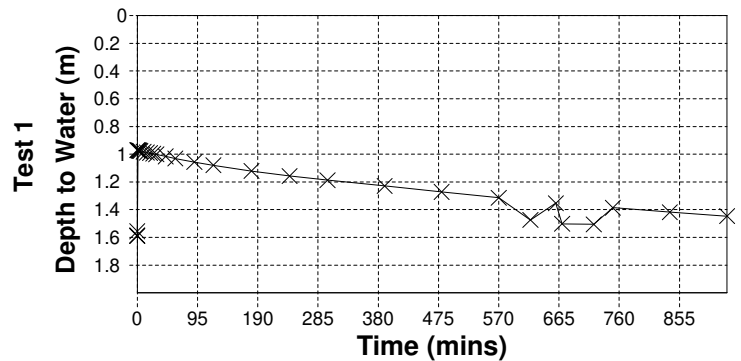
	1
Effective depth (m)	1.03
Volume outflowing between 75% & 25% (m3)*	
Mean surface area through which outflow occurs (m2)	
Time for outflow between 75% & 25% (min)	
SOIL INFILTRATION RATE (ms ⁻¹), f	Test Failed

Remarks

1. Soakage test undertaken between 1.0 m and 2.0 m
2. No groundwater encountered
3. Datalogger serial no. 10226020
4. Test 1 carried out on 11/05/21

* Volume outflowing reduced to account for granular backfill used during testing (30 % of free volume assumed).

Elapsed time (mins)	Depth to Water Test 1
0	1.556
1	0.971
2	0.973
3	0.974
4	0.976
5	0.977
10	0.983
15	0.988
20	0.992
25	0.997
30	1.001
45	1.016
60	1.031
90	1.057
120	1.08
180	1.121
240	1.157
300	1.187
390	1.229
480	1.272
570	1.314
620	1.475
660	1.354
670	1.502
720	1.506
750	1.386
840	1.418
930	1.447





A F Howland Associates
Geotechnical Engineers

Site
Castle Point, Hadleigh

Trial Pit
Number
TP102

Excavation Method JCB 3CX	Dimensions 1.90 m x 0.45 m x 190 m	Ground Level (mOD) 66.72	Client Stantec	Job Number 21.133
	Location 580198 E 189305 N	Dates 11/05/2021	Engineer	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.30	D1			66.62	(0.10) 0.10	TOPSOIL(Dark brown clay with rootlets) Firm to stiff orange brown and grey mottled CLAY		
0.30-1.00	D2							
1.00-1.90	D3			64.82	(1.80) 1.90	Complete at 1.90m		

Plan 	Remarks 1. Location CAT scanned prior to excavation 2. No groundwater encountered 3. Trial pit remained open and sidewalls stable during excavation. 4. Pit backfilled with gravel to 0.9 m and then arisings to surface 5. Soakage test performed between 0.9 m and 1.9 m	
		Scale (approx) 1:20



Site : Castle Point, Hadleigh

Client : Stantec

Engineer :

Job Number
21.133

Sheet
2 / 12

Location	Date	Level	Location
TP102	11/05/2021	66.72 mOD	E: 580198 N: 189305

Pit Width (m)	0.45
Pit Depth (m)	1.90
Pit Length (m)	1.90

Soil type at test level	Orange-brown mottled grey CLAY
Groundwater	None
Drain discharge depth	Not known
Sidewall stability	Stable
Stone filled or open pit	Stone filled

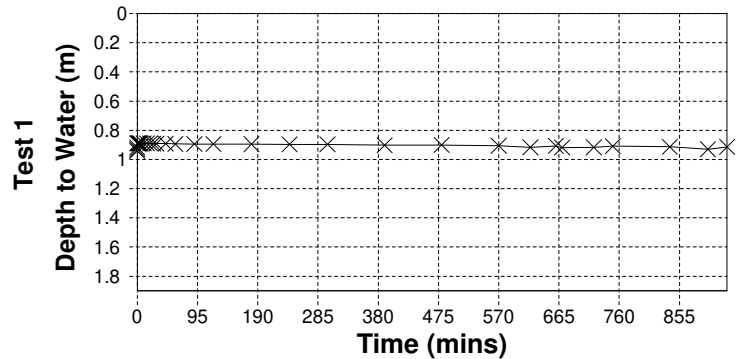
	1
Effective depth (m)	1.01
Volume outflowing between 75% & 25% (m3)*	
Mean surface area through which outflow occurs (m2)	
Time for outflow between 75% & 25% (min)	
SOIL INFILTRATION RATE (ms ⁻¹), f	Test Failed

Remarks

1. Soakage test undertaken between 0.9 m and 1.9 m
2. No groundwater encountered
3. Datalogger serial no. 11186040
4. Test 1 carried out on 11/05/21

* Volume outflowing reduced to account for granular backfill used during testing (30 % of free volume assumed).

Elapsed time (mins)	Depth to Water Test 1
0	0.931
1	0.89
2	0.89
3	0.89
4	0.89
5	0.89
10	0.89
15	0.89
20	0.89
25	0.891
30	0.891
45	0.891
60	0.893
90	0.894
120	0.894
180	0.895
240	0.896
300	0.896
390	0.902
480	0.901
570	0.906
620	0.917
660	0.907
670	0.918
720	0.917
750	0.909
840	0.913
900	0.93
930	0.914





A F Howland Associates

Geotechnical Engineers

Site
Castle Point, Hadleigh

Trial Pit Number
TP103

Excavation Method JCB 3CX	Dimensions 2.00 m x 0.45 m x 2.00 m	Ground Level (mOD) 66.40	Client Stantec	Job Number 21.133
	Location 580048 E 189328 N	Dates 11/05/2021	Engineer	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.35	D1			66.30	(0.10) 0.10	MADE GROUND (Dark brown gravelly fine to coarse sand. Gravel is angular to rounded fine to coarse concrete and brick) Soft to firm orange brown and grey mottled CLAY		
0.35-1.10	D2							
1.10-2.00	D3				(1.90)			
				64.40	2.00	Complete at 2.00m		

<p>Plan</p> <p style="text-align: center;">.</p> <p style="text-align: center;">.</p> <p style="text-align: center;">.</p> <p style="text-align: center;">.</p> <p style="text-align: center;">.</p> <p style="text-align: center;">.</p>	<p>Remarks</p> <ol style="list-style-type: none"> 1. Location CAT scanned prior to excavation 2. No groundwater encountered 3. Trial pit remained open and sidewalls stable during excavation. 4. Pit backfilled with gravel to 1.0 m and then arisings to surface 5. Soakage test performed between 1.0 m and 2.0 m 			
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">Scale (approx) 1:20</td> <td style="width: 33%;">Logged By CJL</td> <td style="width: 33%;">Figure No. 21.133.TP103</td> </tr> </table>	Scale (approx) 1:20	Logged By CJL	Figure No. 21.133.TP103
Scale (approx) 1:20	Logged By CJL	Figure No. 21.133.TP103		



Site : Castle Point, Hadleigh

Client : Stantec

Engineer :

Job Number
21.133

Sheet
3 / 12

Location	Date	Level	Location
TP103	11/05/2021	66.40 mOD	E: 580048 N: 189328

Pit Width (m)	0.45
Pit Depth (m)	2.00
Pit Length (m)	2.00

Soil type at test level	Orange-brown mottled grye CLAY
Groundwater	None
Drain discharge depth	Not known
Sidewall stability	Stable
Stone filled or open pit	Stone filled

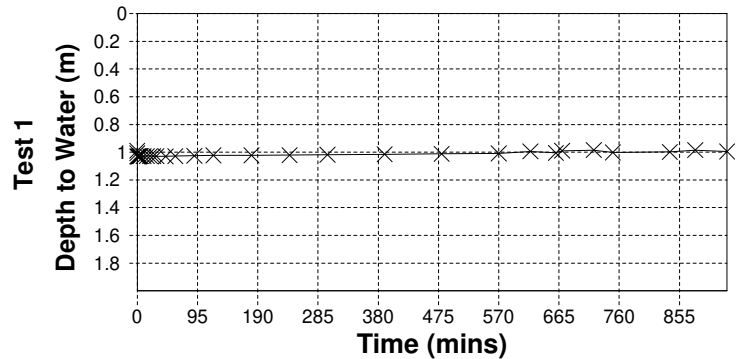
	1
Effective depth (m)	0.97
Volume outflowing between 75% & 25% (m3)*	
Mean surface area through which outflow occurs (m2)	
Time for outflow between 75% & 25% (min)	
SOIL INFILTRATION RATE (ms ⁻¹), f	Test Failed

Remarks

1. Soakage test undertaken between 1.0 m and 2.0 m
2. No groundwater encountered
3. Datalogger serial no. 12726020
4. Test 1 carried out on 11/05/21

* Volume outflowing reduced to account for granular backfill used during testing (30 % of free volume assumed).

Elapsed time (mins)	Depth to Water Test 1
0	0.989
1	1.03
2	1.03
3	1.03
4	1.029
5	1.029
10	1.029
15	1.028
20	1.028
25	1.029
30	1.029
45	1.03
60	1.028
90	1.026
120	1.023
180	1.023
240	1.021
300	1.018
390	1.015
480	1.012
570	1.009
620	0.994
660	1.005
670	0.99
720	0.985
750	1.002
840	0.998
880	0.985
930	0.995





Site : Castle Point, Hadleigh

Client : Stantec

Engineer :

Job Number
21.133

Sheet
4 / 12

Location	Date	Level	Location
TP104	10/05/2021	67.26 mOD	E: 580434 N: 189257

Pit Width (m)	0.40
Pit Depth (m)	2.20
Pit Length (m)	2.00

Soil type at test level	Orange-brown very silty SAND
Groundwater	None
Drain discharge depth	Not known
Sidewall stability	Stable
Stone filled or open pit	Stone filled

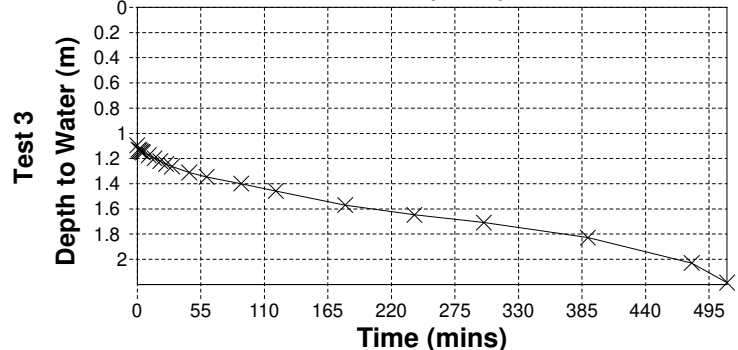
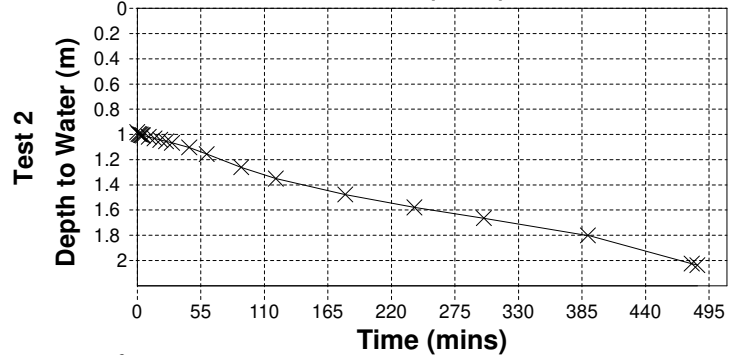
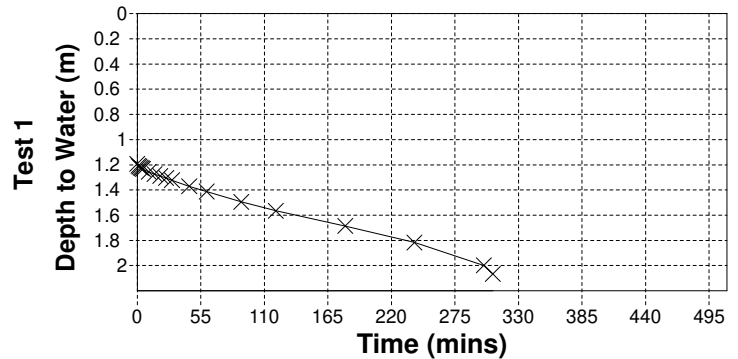
	1	2	3
Effective depth (m)	1.01	1.22	1.11
Volume outflowing between 75% & 25% (m ³)*	0.12	0.15	0.13
Mean surface area through which outflow occurs (m ²)	3.22	3.73	3.46
Time for outflow between 75% & 25% (min)	211.72	329.14	358.58
SOIL INFILTRATION RATE (ms ⁻¹), f	2.96E-6	1.99E-6	1.79E-6

Remarks

1. Soakage test undertaken between 1.2 m and 2.2 m
2. No groundwater encountered
3. Datalogger serial no. 10226030
4. Test 1 carried out on 10/05/21
5. Test 2 carried out on 11/05/21
6. Test 3 carried out on 12/05/21

* Volume outflowing reduced to account for granular backfill used during testing (30 % of free volume assumed).

Elapsed time (mins)	Depth to Water Test 1	Depth to Water Test 2	Depth to Water Test 3
0	1.192	0.982	1.095
1	1.208	0.995	1.129
2	1.216	0.998	1.136
3	1.223	1.002	1.142
4	1.228	1.005	1.147
5	1.233	1.007	1.152
10	1.256	1.019	1.174
15	1.274	1.032	1.199
20	1.289	1.043	1.221
25	1.305	1.055	1.244
30	1.322	1.066	1.263
45	1.371	1.103	1.311
60	1.412	1.155	1.346
90	1.494	1.26	1.399
120	1.565	1.35	1.458
180	1.686	1.476	1.569
240	1.817	1.579	1.647
300	1.998	1.664	1.708
307.833	2.067		
390		1.801	1.828
480		2.025	2.029
484.833		2.037	
510.5			2.185





A F Howland Associates
Geotechnical Engineers

Site
Castle Point, Hadleigh

Trial Pit
Number
TP105

Excavation Method JCB 3CX	Dimensions 1.90 m x 0.45 m x 2.00 m	Ground Level (mOD) 58.64	Client Stantec	Job Number 21.133
	Location 580642 E 189249 N	Dates 10/05/2021	Engineer	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.20	D1				(0.20)	TOPSOIL (Dark brown sandy clay)		
0.20-0.80	D2			58.44	0.20	Firm orange brown and grey mottled CLAY		
0.80-1.50	D3				(1.80)			
1.50-2.00	D4			56.64	2.00	Complete at 2.00m		

Plan 	Remarks 1. Location CAT scanned prior to excavation 2. No groundwater encountered 3. Trial pit remained open and sidewalls stable during excavation. 4. Pit backfilled with gravel to 1.0 m and then arisings to surface 5. Soakage test performed between 1.0 m and 2.0 m	
		Scale (approx) 1:20



Site : Castle Point, Hadleigh

Client : Stantec

Engineer :

Job Number

21.133

Sheet

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Location	Date	Level	Location
TP105	12/05/2021	58.64 mOD	E: 580642 N: 189249

Pit Width (m)	0.45
Pit Depth (m)	2.00
Pit Length (m)	1.90

Soil type at test level	Orange-brown mottled grey CLAY
Groundwater	None
Drain discharge depth	Not known
Sidewall stability	Stable
Stone filled or open pit	Stone filled

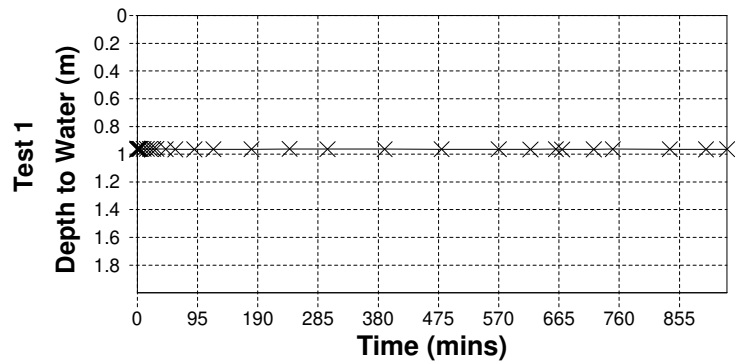
	1
Effective depth (m)	1.04
Volume outflowing between 75% & 25% (m3)*	
Mean surface area through which outflow occurs (m2)	
Time for outflow between 75% & 25% (min)	
SOIL INFILTRATION RATE (ms ⁻¹), f	Test Failed

Remarks

1. Soakage test undertaken between 1.0 m and 2.0 m
2. No groundwater encountered
3. Datalogger serial no. 12575011
4. Test 1 carried out on 12/05/21

* Volume outflowing reduced to account for granular backfill used during testing (30 % of free volume assumed).

Elapsed time (mins)	Depth to Water Test 1
0	0.966
1	0.961
2	0.961
3	0.961
4	0.961
5	0.961
10	0.962
15	0.962
20	0.962
25	0.962
30	0.962
45	0.963
60	0.965
90	0.965
120	0.964
180	0.964
240	0.962
300	0.963
390	0.963
480	0.964
570	0.964
620	0.966
660	0.963
670	0.966
720	0.965
750	0.963
840	0.964
897	0.965
930	0.964





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Site
Castle Point, Hadleigh

Trial Pit
Number
TP106

Excavation Method JCB 3CX	Dimensions 2.00 m x 0.45 m x 2.00 m	Ground Level (mOD) 62.42	Client Stantec	Job Number 21.133
	Location 580511 E 189085 N	Dates 10/05/2021	Engineer	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.20	D1				(0.20)	TOPSOIL (Brown very clayey very silty slightly gravelly fine to coarse sand. Gravel is angular fine to medium flint)		
0.20-0.80	D2			62.22	0.20	Soft orange brown and grey mottled CLAY becoming very soft and damp with depth		
0.80-1.80	D3				(1.60)			
1.80-2.00	D4			60.62	1.80	Very soft orange brown and grey mottled very silty CLAY (DAMP)		
				60.42	2.00	Complete at 2.00m		

Plan 	Remarks 1. Location CAT scanned prior to excavation 2. No groundwater encountered 3. Trial pit remained open and sidewalls stable during excavation. 4. Pit backfilled with gravel to 1.0 m and then arisings to surface 5. Soakage test performed between 1.0 m and 2.0 m	
		Scale (approx) 1:20



Site : Castle Point, Hadleigh

Client : Stantec

Engineer :

Job Number
21.133

Sheet
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Location	Date	Level	Location
TP106	10/05/2021	62.42 mOD	E: 580511 N: 189085

Pit Width (m)	0.40
Pit Depth (m)	2.00
Pit Length (m)	2.00

Soil type at test level	Oraneg-brown mottled grey CLAY
Groundwater	1.63 m (seepage)
Drain discharge depth	Not known
Sidewall stability	Stable
Stone filled or open pit	Stone filled

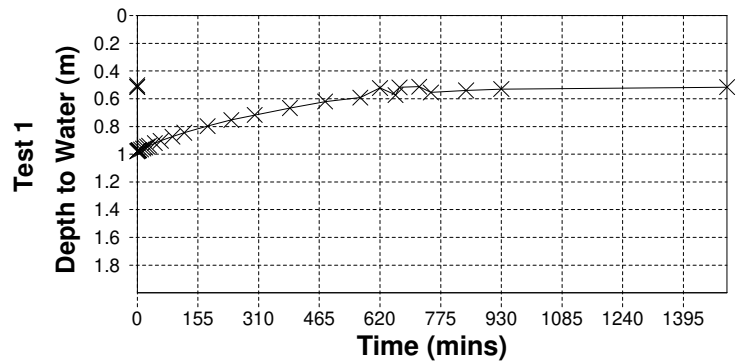
	1
Effective depth (m)	1.02
Volume outflowing between 75% & 25% (m3)*	
Mean surface area through which outflow occurs (m2)	
Time for outflow between 75% & 25% (min)	
SOIL INFILTRATION RATE (ms ⁻¹), f	Test Failed

Remarks

1. Soakage test undertaken between 1.0 m and 2.0 m
2. No groundwater encountered. Seepage at 1.63 m
3. Datalogger serial no. 106607020
4. Test 1 carried out on 10/05/21

* Volume outflowing reduced to account for granular backfill used during testing (30 % of free volume assumed).

Elapsed time (mins)	Depth to Water Test 1
0	0.503
1	0.978
2	0.975
3	0.973
4	0.971
5	0.97
10	0.966
15	0.959
20	0.952
25	0.945
30	0.939
45	0.92
60	0.903
90	0.873
120	0.845
180	0.797
240	0.753
300	0.717
390	0.667
480	0.62
570	0.592
620	0.522
660	0.573
670	0.518
720	0.513
750	0.555
840	0.54
930	0.53
1506.5	0.516





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Site
Castle Point, Hadleigh

Trial Pit
Number
TP107

Excavation Method JCB 3CX	Dimensions 2.00 m x 0.45 m x 1.50 m	Ground Level (mOD) 61.93	Client Stantec	Job Number 21.133
	Location 580529 E 189058 N	Dates 11/05/2021	Engineer	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.30	D1				(0.30)	MADE GROUND (Dark grey silty slightly gravelly clay. Gravel is angular fine to medium flint)		
0.30-0.80	D2			61.63	0.30	Very soft orange brown and grey mottled CLAY		
0.80-1.50	D3		SEEPAGE(1) at 1.50m.	60.43	(1.20) 1.50	Complete at 1.50m		▽1

Plan 	Remarks 1. Location CAT scanned prior to excavation 2. Groundwater seepage at 1.50 m 3. Trial pit remained open and sidewalls stable during excavation. 4. Pit backfilled with gravel to 0.5 m and then arisings to surface 5. Soakage test performed between 0.5 m and 1.5 m	
		Scale (approx) 1:20



Site : Castle Point, Hadleigh

Client : Stantec

Engineer :

Job Number
21.133

Sheet
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Location	Date	Level	Location
TP107	11/05/2021	61.93 mOD	E: 580529 N: 189058

Pit Width (m)	0.45
Pit Depth (m)	1.50
Pit Length (m)	2.00

Soil type at test level	Orange-brown mottled grey CLAY
Groundwater	None
Drain discharge depth	Not known
Sidewall stability	Stable
Stone filled or open pit	Stone filled

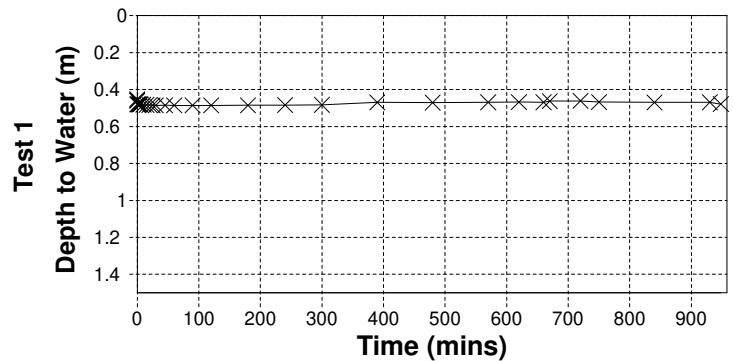
	1
Effective depth (m)	1.02
Volume outflowing between 75% & 25% (m3)*	
Mean surface area through which outflow occurs (m2)	
Time for outflow between 75% & 25% (min)	
SOIL INFILTRATION RATE (ms ⁻¹), f	Test Failed

Remarks

1. Soakage test undertaken between 0.5 m and 1.5 m
2. No groundwater encountered
3. Datalogger serial no. 10109050
4. Test 1 carried out on 11/05/21

* Volume outflowing reduced to account for granular backfill used during testing (30 % of free volume assumed).

Elapsed time (mins)	Depth to Water Test 1
0	0.461
1	0.48
2	0.481
3	0.481
4	0.481
5	0.481
10	0.482
15	0.483
20	0.484
25	0.485
30	0.486
45	0.485
60	0.486
90	0.486
120	0.486
180	0.485
240	0.484
300	0.483
390	0.47
480	0.471
570	0.469
620	0.468
660	0.469
670	0.463
720	0.462
750	0.468
840	0.47
930	0.469
948	0.479





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Site
Castle Point, Hadleigh

Trial Pit Number
TP108

Excavation Method JCB 3CX	Dimensions 2.00 m x 0.45 m x 2.00 m	Ground Level (mOD) 63.69	Client Stantec	Job Number 21.133
	Location 580592 E 189039 N	Dates 10/05/2021	Engineer	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.30	D1				(0.30)	TOPSOIL (Brown silty fine to coarse sand with rootlets)		
0.30-1.00	D2			63.39	0.30	Orange brown, grey, golden brown and brown mottled sandy CLAY inter-bedded with clayey sand		
1.00-1.50	D3				(1.70)			
1.50-2.00	D4		SEEPAGE(1) at 1.50m.			Complete at 2.00m		▽1
				61.69	2.00			

Plan 	Remarks 1. Location CAT scanned prior to excavation 2. Groundwater seepage at 1.50 m 3. Trial pit remained open and sidewalls stable during excavation. 4. Pit backfilled with gravel to 1.0 m and then arisings to surface 5. Soakage test performed between 1.0 m and 2.0 m	
		Scale (approx) 1:20



Site : Castle Point, Hadleigh

Client : Stantec

Engineer :

Job Number
21.133

Sheet
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Location	Date	Level	Location
TP108	10/05/2021	63.69 mOD	E: 580592 N: 189039

Pit Width (m)	0.40
Pit Depth (m)	2.00
Pit Length (m)	2.00

Soil type at test level	Multicoloured sandy CLAY/clayey SAND
Groundwater	1.50 m (seepage)
Drain discharge depth	Not known
Sidewall stability	Stable
Stone filled or open pit	Stone filled

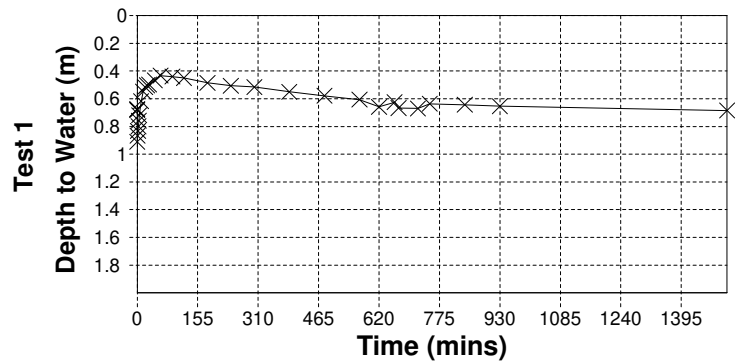
	1
Effective depth (m)	1.09
Volume outflowing between 75% & 25% (m3)*	
Mean surface area through which outflow occurs (m2)	
Time for outflow between 75% & 25% (min)	
SOIL INFILTRATION RATE (ms ⁻¹), f	Test Failed

Remarks

1. Soakage test undertaken between 1.0 m and 2.0 m
2. No groundwater encountered. Seepage at 1.50 m
3. Datalogger serial no. 10109020
4. Test 1 carried out on 10/05/21

* Volume outflowing reduced to account for granular backfill used during testing (30 % of free volume assumed).

Elapsed time (mins)	Depth to Water (m) Test 1
0	0.675
1	0.867
2	0.833
3	0.799
4	0.759
5	0.719
10	0.618
15	0.549
20	0.515
25	0.503
30	0.498
45	0.468
60	0.433
90	0.44
120	0.45
180	0.485
240	0.506
300	0.515
390	0.55
480	0.579
570	0.606
620	0.659
660	0.625
670	0.667
720	0.67
750	0.636
840	0.643
930	0.654
1512.333	0.685





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Site
Castle Point, Hadleigh

Trial Pit
Number
TP109

Excavation Method JCB 3CX	Dimensions 1.90 m x 0.45 m x 1.50 m	Ground Level (mOD) 72.78	Client Stantec	Job Number 21.133
	Location 580151 E 189192 N	Dates 11/05/2021	Engineer	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.40	D1				(0.40)	TOPSOIL (Dark brown clay)		
0.40-1.00	D2			72.38	0.40	Soft orange brown and grey mottled CLAY		
1.00-1.50	D3		Water strike(1) at 1.30m.	71.28	(1.10) 1.50	Complete at 1.50m		∇ ₁

Plan 	Remarks 1. Location CAT scanned prior to excavation 2. Groundwater struck at 1.30 m 3. Trial pit remained open and sidewalls stable during excavation. 4. Pit backfilled with gravel to 0.5 m and then arisings to surface 5. Soakage test performed between 0.5 m and 1.5 m	
		Scale (approx) 1:20



Site : Castle Point, Hadleigh

Client : Stantec

Engineer :

Job Number
21.133

Sheet
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Location	Date	Level	Location
TP109	11/05/2021	72.78 mOD	E: 580151 N: 189192

Pit Width (m)	0.45
Pit Depth (m)	1.50
Pit Length (m)	1.90

Soil type at test level	Orange-brown mottled grey CLAY
Groundwater	1.30 m (seepage)
Drain discharge depth	Not known
Sidewall stability	Stable
Stone filled or open pit	Stone filled

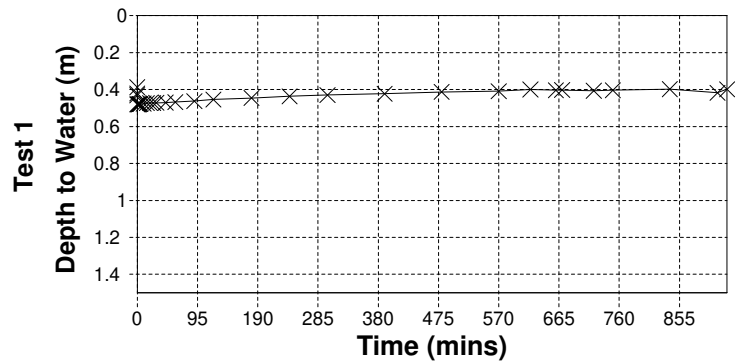
	1
Effective depth (m)	1.02
Volume outflowing between 75% & 25% (m3)*	
Mean surface area through which outflow occurs (m2)	
Time for outflow between 75% & 25% (min)	
SOIL INFILTRATION RATE (ms ⁻¹), f	Test Failed

Remarks

1. Soakage test undertaken between 0.5 m and 1.5 m
2. No groundwater encountered. Seepage at 1.30 m
3. Datalogger serial no. 10259010
4. Test 1 carried out on 11/05/21

* Volume outflowing reduced to account for granular backfill used during testing (30 % of free volume assumed).

Elapsed time (mins)	Depth to Water Test 1
0	0.481
1	0.481
2	0.48
3	0.48
4	0.479
5	0.479
10	0.476
15	0.474
20	0.473
25	0.473
30	0.472
45	0.471
60	0.468
90	0.463
120	0.454
180	0.446
240	0.437
300	0.43
390	0.423
480	0.413
570	0.409
620	0.40
660	0.404
670	0.403
720	0.407
750	0.404
840	0.398
915	0.418
930	0.399





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Site
 Castle Point, Hadleigh

Trial Pit
 Number
TP110

Excavation Method JCB 3CX	Dimensions 2.00 m x 0.45 m x 2.00 m	Ground Level (mOD) 77.56	Client Stantec	Job Number 21.133
	Location 580072 E 188890 N	Dates 11/05/2021	Engineer	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.30	D1				(0.30)	TOPSOIL (Dark brown very silty clay)		
0.30-1.00	D2			77.26	0.30	Soft to firm orange brown and grey mottled CLAY		
1.00-2.00	D3				(1.70)			
				75.56	2.00	Complete at 2.00m		

Plan 	Remarks 1. Location CAT scanned prior to excavation 2. No groundwater encountered 3. Trial pit remained open and sidewalls stable during excavation. 4. Pit backfilled with gravel to 1.0 m and then arisings to surface 5. Soakage test performed between 1.0 m and 2.0 m	
		Scale (approx) 1:20



Site : Castle Point, Hadleigh

Client : Stantec

Engineer :

Job Number
21.133

Sheet
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Location	Date	Level	Location
TP110	11/05/2021	77.56 mOD	E: 580072 N: 188890

Pit Width (m)	0.45
Pit Depth (m)	2.00
Pit Length (m)	2.00

Soil type at test level	Orange-brown mottled grey CLAY
Groundwater	None
Drain discharge depth	Not known
Sidewall stability	Stable
Stone filled or open pit	Stone filled

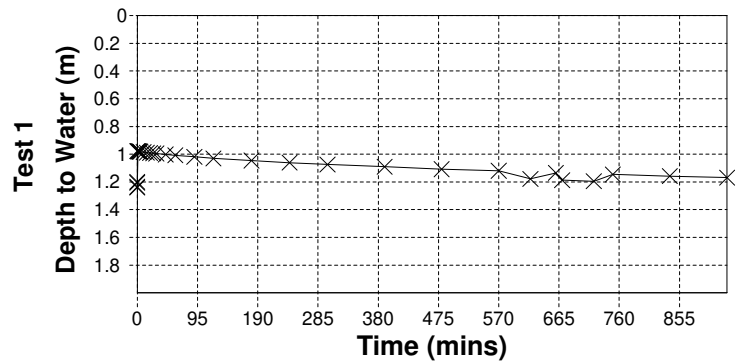
	1
Effective depth (m)	1.02
Volume outflowing between 75% & 25% (m3)*	
Mean surface area through which outflow occurs (m2)	
Time for outflow between 75% & 25% (min)	
SOIL INFILTRATION RATE (ms ⁻¹), f	Test Failed

Remarks

1. Soakage test undertaken between 1.0 m and 2.0 m
2. No groundwater encountered
3. Datalogger serial no. 13114031
4. Test 1 carried out on 11/05/21

* Volume outflowing reduced to account for granular backfill used during testing (30 % of free volume assumed).

Elapsed time (mins)	Depth to Water Test 1
0	1.199
1	0.979
2	0.979
3	0.98
4	0.981
5	0.982
10	0.985
15	0.989
20	0.991
25	0.993
30	0.995
45	1.002
60	1.008
90	1.019
120	1.03
180	1.046
240	1.061
300	1.074
390	1.09
480	1.108
570	1.12
620	1.178
660	1.135
670	1.187
720	1.195
750	1.146
840	1.158
930	1.169





A F Howland Associates Geotechnical Engineers

Site
Castle Point, Hadleigh

Trial Pit
Number
TP111

Excavation Method JCB 3CX	Dimensions 2.00 m x 0.45 m x 2.00 m	Ground Level (mOD) 77.62	Client Stantec	Job Number 21.133
	Location 580208 E 189073 N	Dates 11/05/2021	Engineer	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.30	D1				(0.30)	TOPSOIL (Dark brown very silty fine to coarse sand with rootlets)		
0.30-1.00	D2			77.32	0.30	Firm orange brown and grey mottled slightly gravelly CLAY. Gravel is rounded fine to coarse flint		
1.00-1.80	D3				(1.50)			
1.80-2.00	D4			75.82	1.80	Golden brown very silty slightly gravelly fine to coarse SAND. Gravel is rounded fine to coarse flint		
				75.62	2.00	Complete at 2.00m		

Plan 	Remarks 1. Location CAT scanned prior to excavation 2. No groundwater encountered 3. Trial pit remained open and sidewalls stable during excavation. 4. Pit backfilled with gravel to 1.0 m and then arisings to surface 5. Soakage test performed between 1.0 m and 2.0 m	
		Scale (approx) 1:20



Site : Castle Point, Hadleigh

Client : Stantec

Engineer :

Job Number
21.133

Sheet
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Location	Date	Level	Location
TP111	11/05/2021	77.62 mOD	E: 580208 N: 189073

Pit Width (m)	0.45
Pit Depth (m)	2.00
Pit Length (m)	1.90

Soil type at test level	Orange-brown slightly gravelly CLAY/clayey SAND
Groundwater	None
Drain discharge depth	Not known
Sidewall stability	Stable
Stone filled or open pit	Stone filled

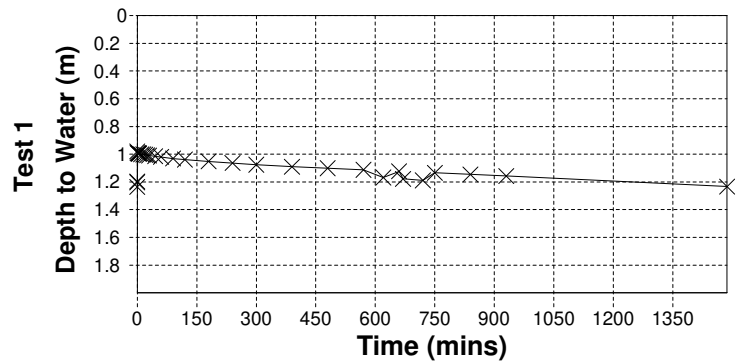
	1
Effective depth (m)	1.02
Volume outflowing between 75% & 25% (m3)*	
Mean surface area through which outflow occurs (m2)	
Time for outflow between 75% & 25% (min)	
SOIL INFILTRATION RATE (ms ⁻¹), f	Test Failed

Remarks

1. Soakage test undertaken between 1.0 m and 2.0 m
2. No groundwater encountered
3. Datalogger serial no. 10259030
4. Test 1 carried out on 11/05/21

* Volume outflowing reduced to account for granular backfill used during testing (30 % of free volume assumed).

Elapsed time (mins)	Depth to Water Test 1
0	1.197
1	0.992
2	0.993
3	0.994
4	0.995
5	0.996
10	1.00
15	1.002
20	1.004
25	1.007
30	1.01
45	1.015
60	1.02
90	1.031
120	1.039
180	1.052
240	1.064
300	1.076
390	1.09
480	1.101
570	1.113
620	1.168
660	1.124
670	1.178
720	1.189
750	1.134
840	1.146
930	1.157
1486.5	1.234





A F Howland Associates
Geotechnical Engineers

Site
 Castle Point, Hadleigh

Trial Pit
 Number
TP112

Excavation Method JCB 3CX	Dimensions 1.90 m x 0.45 m x 2.10 m	Ground Level (mOD) 72.83	Client Stantec	Job Number 21.133
	Location 580652 E 188879 N	Dates 10/05/2021	Engineer	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.35	D1				(0.35)	TOPSOIL (Dark brown silty fine to coarse sand with rootlets)		
0.35-0.80	D2			72.48	0.35 (0.45)	Soft orange brown and brown CLAY		
0.80-1.40	D3			72.03	0.80 (0.60)	Very soft orange brown and grey mottled CLAY		
1.40-2.00	D4		SEEPAGE(1) at 1.40m.	71.43	1.40 (0.70)	Soft orange brown and grey mottled CLAY		∇1
				70.73	2.10	Complete at 2.10m		

Plan 	Remarks 1. Location CAT scanned prior to excavation 2. Groundwater seepage at 1.40 m 3. Trial pit remained open and sidewalls stable during excavation. 4. Pit backfilled with gravel to 1.1 m and then arisings to surface 5. Soakage test performed between 1.1 m and 2.1 m	
		Scale (approx) 1:20



Site : Castle Point, Hadleigh

Client : Stantec

Engineer :

Job Number
21.133

Sheet
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Location	Date	Level	Location
TP112	11/05/2021	72.83 mOD	E: 580652 N: 188879

Pit Width (m)	0.40
Pit Depth (m)	2.10
Pit Length (m)	1.90

Soil type at test level	Orange-brown mottled grey CLAY
Groundwater	1.60 m (seepage)
Drain discharge depth	Not known
Sidewall stability	Stable
Stone filled or open pit	Stone filled

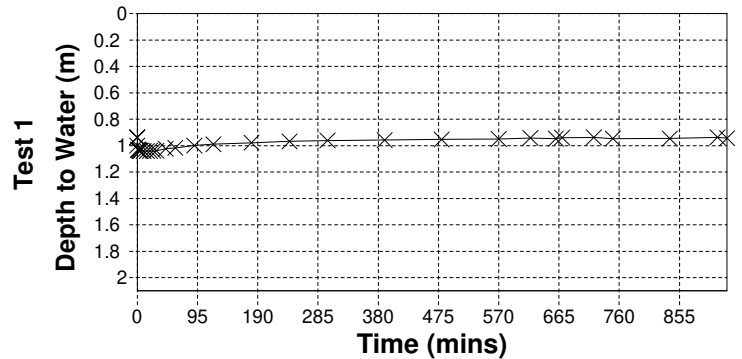
	1
Effective depth (m)	1.10
Volume outflowing between 75% & 25% (m3)*	
Mean surface area through which outflow occurs (m2)	
Time for outflow between 75% & 25% (min)	
SOIL INFILTRATION RATE (ms ⁻¹), f	Test Failed

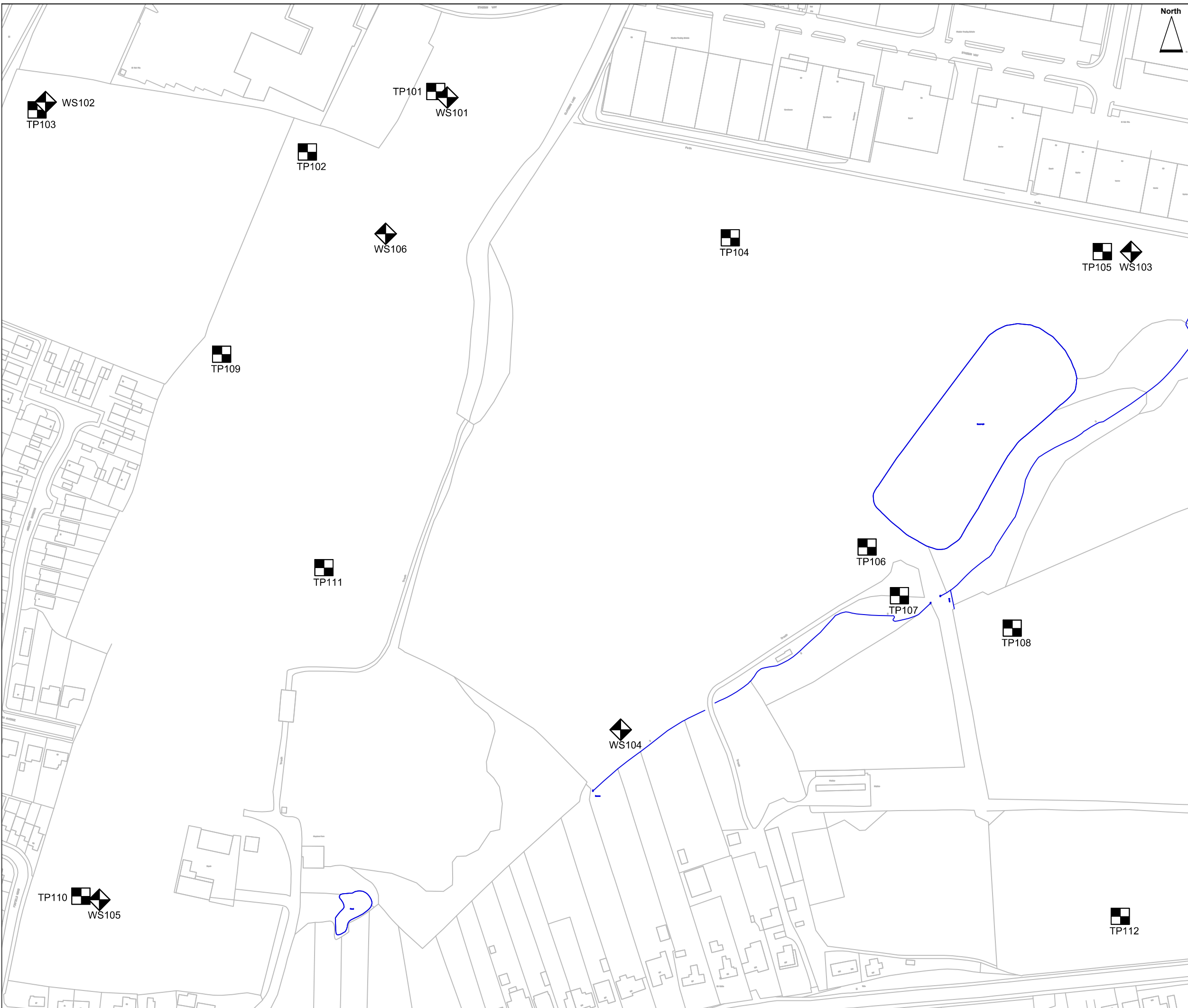
Remarks

1. Soakage test undertaken between 1.1 m and 2.1 m
2. No groundwater encountered. Seepage at 1.60 m
3. Datalogger serial no. 10089010
4. Test 1 carried out on 10/05/21



* Volume outflowing reduced to account for granular backfill used during testing (30 % of free volume assumed).

Elapsed time (mins)	Depth to Water Test 1
0	0.94
1	1.03
2	1.033
3	1.037
4	1.04
5	1.04
10	1.041
15	1.042
20	1.04
25	1.039
30	1.039
45	1.024
60	1.017
90	0.999
120	0.99
180	0.979
240	0.968
300	0.962
390	0.958
480	0.953
570	0.95
620	0.942
660	0.948
670	0.94
720	0.938
750	0.947
840	0.946
915	0.937
930	0.944





Key:

-  Windowless dynamic sampling location and reference
-  Trial pit location and reference

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Rev	Date	Revision Description	Drwn	Chkd



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Client: Stantec
Site: Castle Point, Hadleigh
Job No.: 21.133
Drawing Title: EXPLORATORY HOLE LOCATION PLAN
Date: May 2021
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