

Saint Hill – Site 2,
Marquee area
Saint Hill Road,
East Grinstead, West Sussex, RH19 4JY
Flood Risk Assessment & Surface Water Drainage
Strategy

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1 Introduction

QED Structures has been instructed to prepare a site-specific Flood Risk Assessment (FRA) and Surface Water Drainage Strategy (SWDS) for the development at Saint Hill, Saint Hill Road, East Grinstead, West Sussex, RH19 4JY.

The site is located on the south-western side of Saint Hill Road and consists of a field to the west of a group of buildings centered around The Castle and Saint Hill Manor that comprise the UK headquarters of the International Association of Scientologists.

The proposed development relates to Site 2 and comprises infrastructure to facilitate annual events, including a Marquee events area, a permanent wash block / toilet block, crane pads, associated ground level alterations, permeable access areas and sustainable surface water and foul drainage provision. The site will be used on an occasional basis in connection with events held at Saint Hill, with the erection and dismantling of temporary marquee structures for a total maximum period of 84 days per year. Land immediately to the west is proposed to be rewired following construction.

The British Geological Survey (BGS) Geology of Britain Viewer indicates that the bedrock underlying the majority of the site is Ardingly Sandstone Member – Sandstone. The northern boundary of the site contains bedrock geology consisting of Lower Grinstead Clay-Mudstone (Source: BGS). There are no superficial deposits underlying the site.

The Environment Agency (EA) mapping for Flood Risk, shows the site located within Flood Zone 1 (Low risk of fluvial or tidal flooding). Locations in flood zone 1 have a low probability of flooding. This means that in any year land has a less than 0.1% chance of flooding from rivers or the sea.

Due to the limited flood risk to the site, residual risks are limited to overland flow from an exceedance event and potential surface water risk. In the event of heavy rainfall the low permeability of the sub soil would limit infiltration, and overland flow could occur.

External surfaces are proposed to be permeable, where feasible, to promote infiltration and mitigate the potential to generate additional surface water runoff.

The drainage strategy proposes that runoff from the turning area, marquee pad and toilet block (22930m²) will discharge to a watercourse west of the site via an unlined permeable surface (Type B), with storage in the sub-base of the marquee pad, and supplemental Geocellular storage in the turning area.

Infiltration testing has been undertaken and results indicate impeded infiltration and therefore full infiltration may not be a feasible method of discharge for all surface water; however, the sub-base attenuation is to be unlined (Type B) to promote infiltration as much as possible.

Discharge rates for the marquee pad storage are restricted to a maximum of 9.4l/s for the marquee pad area via an orifice plate at invert level, which is less than the Qbar (10.5/s) for this area. The Marquee pad is to have a storage area of a minimum 10000sqm and 0.65m deep sub base with 30% void ratio offering 1950m³ storage.

This flows downstream to additional storage for the access track and turning area where a secondary orifice plates complex flow control limits flow to a maximum of 30.8l/s in the 1in100yr+CC rainfall event.

The turning area will be attenuated with an Aco HD geocellular crate. It has a contributing attenuation area of 5513m², with the tank plan area being 400m², 910mm deep and 97% porosity. The storage volume needed is 345.6m³.

It can be seen proposed outflow rates are no greater than the pre-development greenfield runoff rates for the Marquee pad and access track drained areas.

It can be seen from the calculations that all half drains times are less than 1440mins so are acceptable offering greater than 50% storage after 24hrs.

Foul drainage arising from the proposed wash block and WC facilities will discharge to the existing on-site foul water system serving Saint Hill. Review of the specification of the existing on-site foul water system confirms that sufficient excess capacity is available to accommodate the proposed development.

This report has been produced broadly in accordance with the National Planning Policy Framework (December 2024, as amended February 2025), the Flood Risk and Coastal Change Planning Practice Guidance, the National standards for sustainable drainage systems (SuDS) (2025), West Sussex County Council relevant guidance, and the Mid Sussex District Council Level 1 Strategic Flood Risk Assessment (2024 or as updated).

2 Policy Compliance

The purpose of this assessment is to demonstrate that the proposals outlined above can be satisfactorily accommodated without increasing flood risk elsewhere or placing the development itself at unacceptable risk of flooding, having regard to the following current policy and guidance:

- National Planning Policy Framework (December 2024, as amended February 2025)
- Flood Risk and Coastal Change Planning Practice Guidance, National standards for sustainable drainage systems (SuDS) (2025), and West Sussex County Council relevant guidance
- Mid Sussex District Council Level 1 Strategic Flood Risk Assessment (2024 or as updated)

3 Site Location

The site is located at Saint Hill Manor, Saint Hill Road, East Grinstead, West Sussex, RH19 4JY. The site is currently a field used as an event space.



Figure 1: Site location plan

The proposed development is for a change of use of vacant land to event area for occasional use, with installation of permanent infrastructure and reinforced ground surfacing (cellular paving grid) to facilitate the erection of annual marquee structures including ground level alterations, wash block and toilets, generator enclosure and concrete ring, together with the erection and dismantling of the temporary marquee structure themselves (for a total maximum period of 84 days per year) and overflow car parking for the Church and neighbouring sports clubs consisting of reinforced ground surfacing (cellular paving grid) for up to 683 car spaces (comprising up to 113 cars (Area A) for no more than 30 days per annum, 313 cars (Areas A & B) for no more than 13 days per year and up to 683 cars (Areas A, B & C) for no more than 7 days per year), construction of a new access and internal road, sustainable surface water and foul drainage provision, associated landscaping and ecological enhancements.

Architectural site plans detailing the proposed development are included Appendix I and are extracted below for reference.



Figure 2: Proposed Site Plan

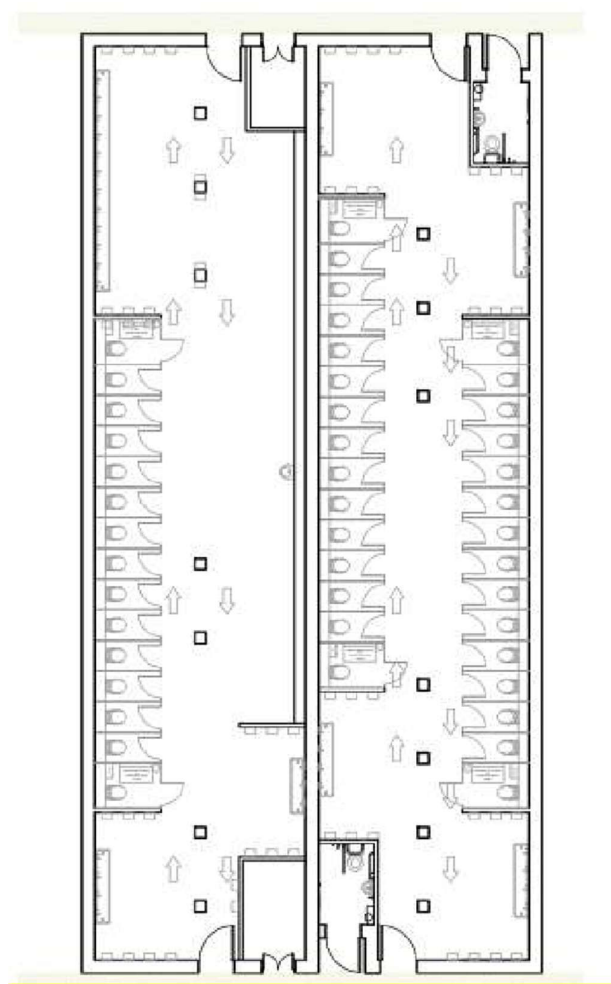


Figure 3: Proposed Toilet Block Plan

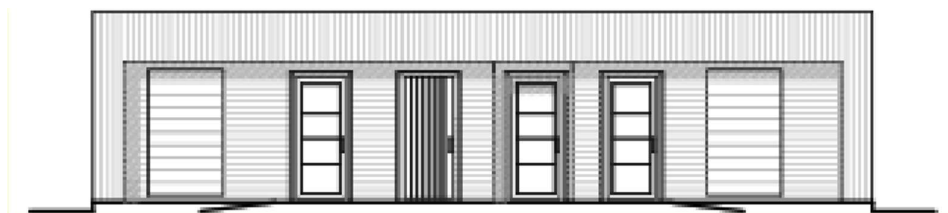


Figure 4: Proposed Toilet Block Elevation

4 Geology and Infiltration Potential

The British Geological Survey (BGS) Geology of Britain Viewer indicates that the bedrock underlying the majority of the site is Ardingly Sandstone Member – Sandstone. The northern boundary of the site contains bedrock geology consisting of Lower Grinstead Clay - Mudstone (Source: BGS). There are no superficial deposits underlying the site. Initial infiltration testing has been undertaken and is shown not to be a feasible method of discharge for all surface water; however, the sub-base attenuation is to be unlined (Type B) to promote infiltration as much as possible.

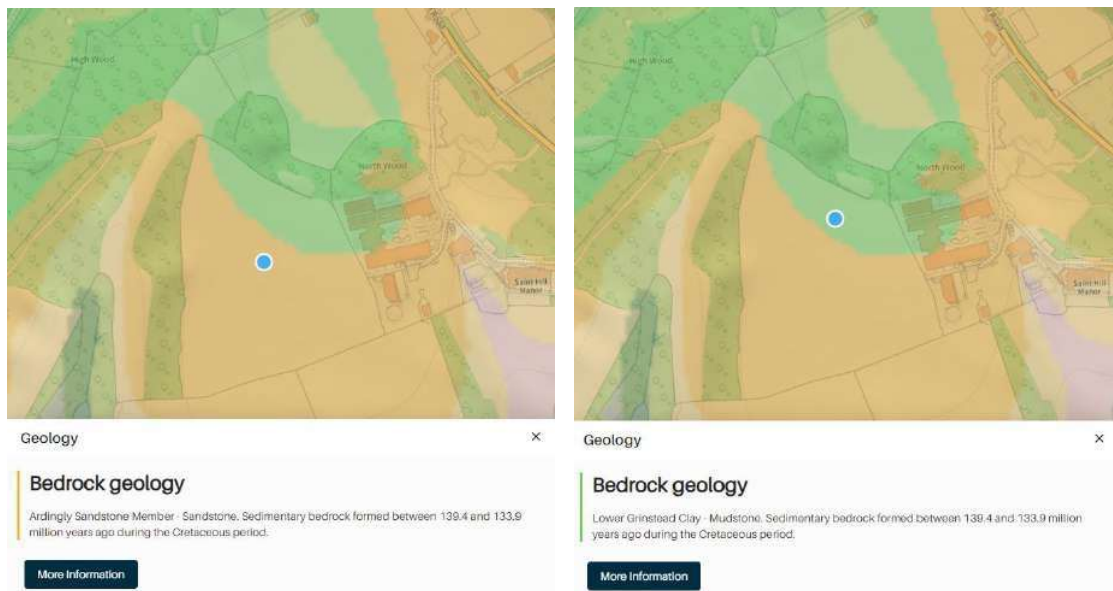


Figure 5: BGS geology map extracts

5 Sequential Test/Exception Test

Under the NPPF, all new planning applications should undergo a Sequential Test. This test should be implemented by local planning authorities with a view to locating vulnerable new developments outside of the floodplain.

No sequential test is deemed necessary as proposed development can be located outside of risk areas and safe access/egress can be provided, as outlined by guidance published in the NPPF.

The NPPF Sequential Test: Flood Risk Vulnerability and Flood Zone 'Compatibility' Table is reproduced below;

Flood Zones	Flood Risk Vulnerability Classification				
	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a †	Exception Test required †	X	Exception Test required	✓	✓
Zone 3b *	Exception Test required *	X	X	X	✓ *

Key:

- ✓ Exception test is not required
- X Development should not be permitted

Table 1: NPPF Sequential Test: Flood Risk Vulnerability and Flood Zone 'Compatibility' Table

Using the principles of the Sequential Test outlined above, the proposed development is classed as 'less Vulnerable' under the NPPF. Therefore, in accordance with the Flood Risk and Coastal Change Planning Policy Guidance (PPG), the proposed development does not require the application of the Exception Test as is appropriate in Flood Zone 1.

The development would still need to apply the principles of flood risk assessment to the development and the standing advice published by the Environment Agency as part of the NPPF for Flood Risk assessment for Minor Development is applicable to this proposed development.

6 Climate Change Allowances

Making an allowance for climate change in the design of surface water drainage systems will help to minimise vulnerability and provide resilience to flooding and coastal change in the future. Climate Change allowances vary across the UK subject to catchment conditions and are based on climate change projections and different scenarios of carbon dioxide (CO₂) emissions to the atmosphere.

Climate change allowances were recently updated by the EA and the climate change allowances are now defined by River Catchment peak rainfall allowances. The data published on the DEFRA database shows the site located within the Medway Management Catchment and for residential development (lifespan 100yrs), in accordance with NPPF guidance, the upper end allowance of 40% should be applied to rainfall events as the climate change allowance within this region.

1% annual exceedance rainfall event

Epoch	Central allowance	Upper end allowance
2050s	20%	45%
2070s	20%	40%

Figure 6: Peak Rainfall allowances

The EA have updated the River Flow climate change allowances in July 21. Where previously England had been split into ten River Basin Districts, the new approach divides these ten River Basin Districts into 92 smaller Catchment Management areas, each of which has its own climate change allowance value. The proposed development is located in the Medway Management Catchment and the new river flow allowances for the Medway Management Catchment as extracted below.

Medway Management Catchment peak river flow allowances

	Central	Higher	Upper
2020s	14%	19%	29%
2050s	15%	21%	37%
2080s	27%	37%	62%

Figure 7: River Flow Catchment allowances

The guidance published within the NPPF for using peak river flow allowances for flood risk assessments is extracted below:

In flood zones 2 or 3a for:

- essential infrastructure – use the higher central allowance
- highly vulnerable – use central allowance (development should not be permitted in flood zone 3a)
- more vulnerable – use the central allowance
- less vulnerable – use the central allowance
- water compatible – use the central allowance

As the proposals are within flood zone 1, the peak river flow allowances do not apply to the site.

7 Sources of Flooding

7.1 Tidal and Fluvial

The Environment Agency (EA) mapping for Flood Risk, shows the site located within Flood Zone 1 (Low risk of fluvial or tidal flooding). Locations in flood zone 1 have a low probability of flooding. This means that in any year land has a less than 0.1% chance of flooding from rivers or the sea.



Figure 8: Flood map for planning extract with site boundary shown in red

7.2 EA Long Term Flood Risk map

According to the EA Long Term Flood Risk map, the site is at a very low risk of tidal and fluvial flooding. Very low risk means that each year this area has a chance of flooding less than 0.1%. It is understood that the EA Long Term Flood Risk map uses a 15m boundary to determine the flood risk to a development.

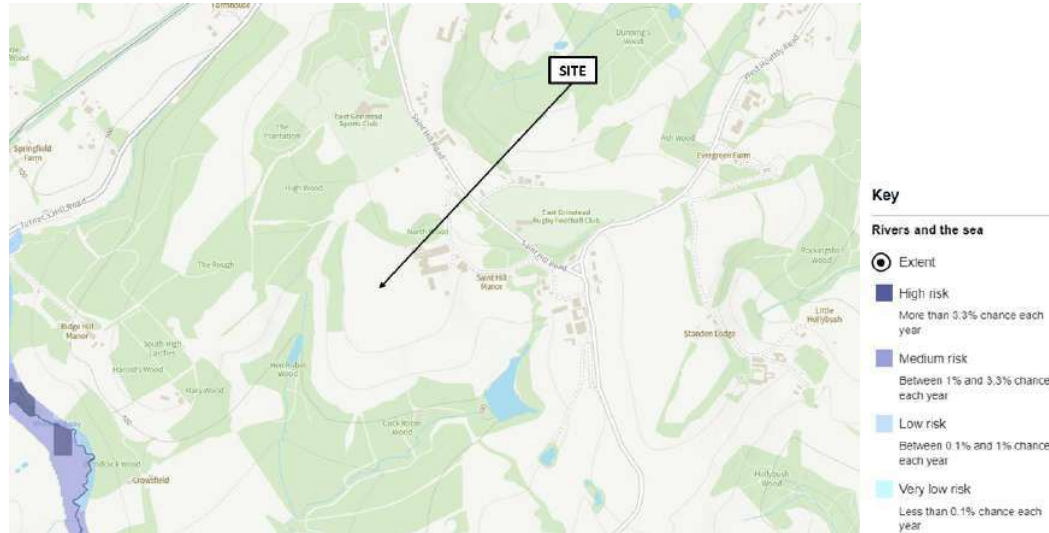


Figure 9: EA Long term risk of flooding map extract - Rivers and the Sea

According to the EA Long Term Flood Risk map for planning the site is largely at a very low chance of surface water flooding. Very low risk means that each year this area has a chance of flooding less than 0.1%.

It can be seen a potential flow path is shown across the car park area but it is not clear from the topographic survey where this would be located.

Proposals are to limit level changes/earthworks as much as feasible so any flow path can be maintained as part of the proposed work.

The introduction of sustainable drainage features in the car park areas and additional surface water storage would lessen the impact of any overland flow.



Figure 10: EA Long term risk of flooding map extract – Surface Water

7.3 Surface Water

Due to the presence of risk nearby to the proposed developments, QED Structures have obtained RoFSW data to better understand the risk of flooding from surface water.

The figure below shows the site to experience less than 200mm flooding for the most part for the 2040 to 2060 event. Local areas are shown at 200mm.

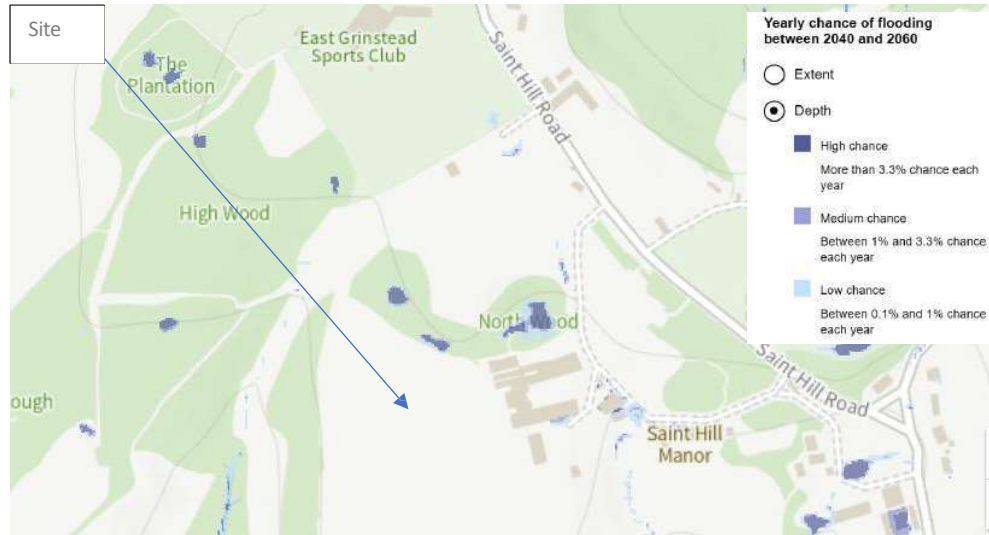


Figure 11: EA RoFSW data showing chance of 200mm water depth during the 2040-2060 surface water event

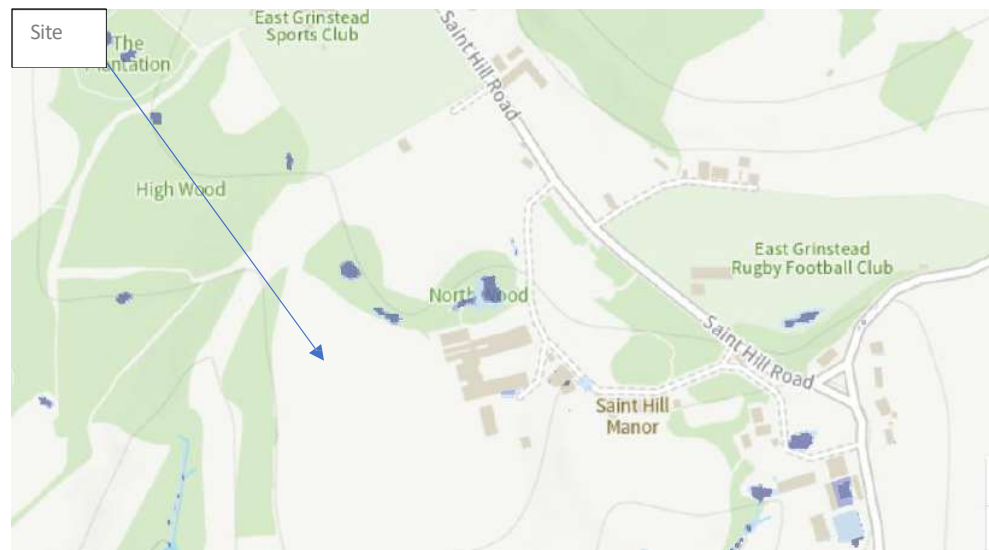


Figure 12: EA RoFSW data showing chance of 300mm water depth during the 2040-2060 surface water event

Figure 10 above shows only very localised flooding risk to a 300mm depth. Figure 11 below shown no water depths up to 600mm are expected on the site.

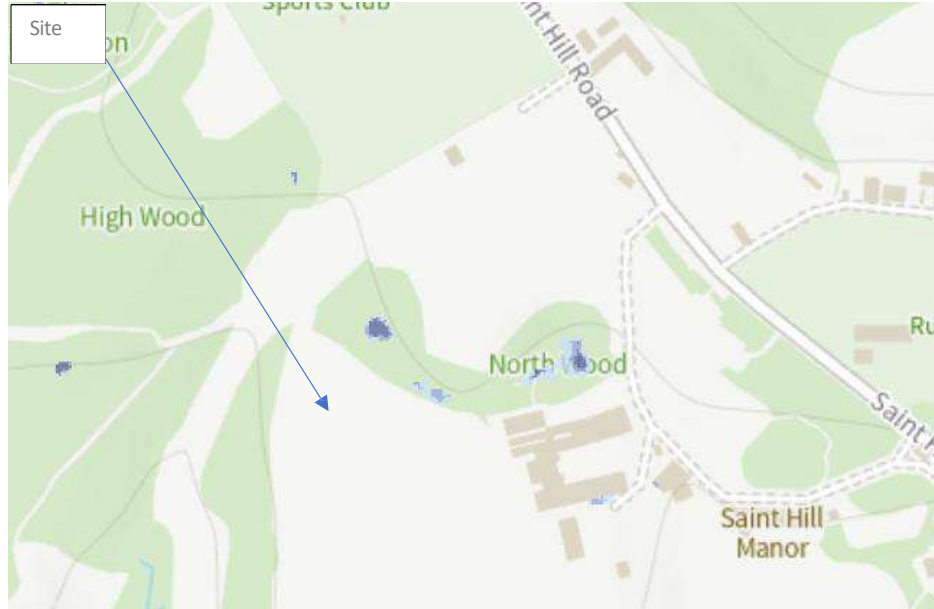


Figure 13: EA RoFSW data showing chance of 600mm water depth during the 2040-2060 surface water event

Following a detailed review of the GIS data, it is understood the risk to the proposed development from surface water flooding is generally very low. The introduction of sustainable drainage features in the car park areas and additional surface water storage would lessen the impact of any overland flow and reduce potential water depths.

7.4 Catchment Flood Management Plan

Mapping published within the West Sussex County Council SFRA shows the site to be located in the Medway CFMP (Catchment Flood Management Plan). A CFMP is a strategic planning document developed by the Environment Agency within a river catchment to set policies for managing flood risk.

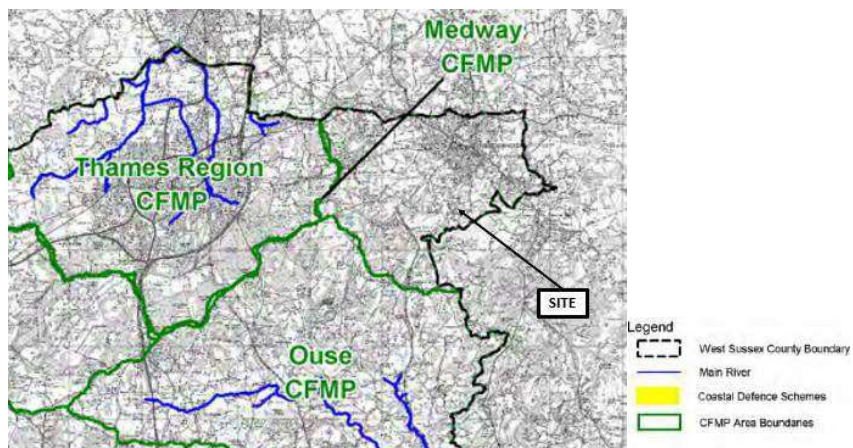


Figure 14: West Sussex County Council SFRA – Flood Management Plans and Strategies map extract

Mapping published within the River Medway Catchment Flood Management Plan shows the site to be located in the Upper Catchment, for which Policy 3 applies.

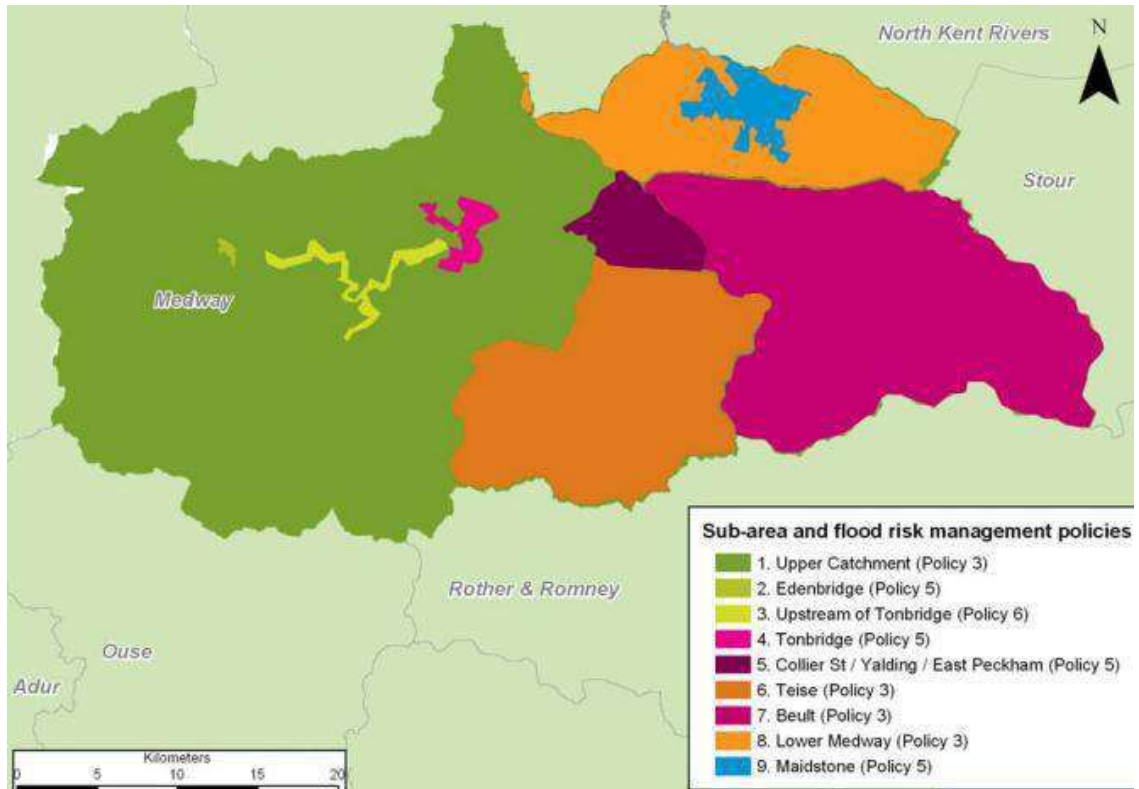


Figure 15: River Medway Catchment Flood Management Plan – Sub-areas and Flood Risk Management Policies map extract

Policy 3 for the River Medway CFMP is as follows:

Areas of low to moderate flood risk where we are generally managing existing flood risk effectively

This policy will tend to be applied where the risks are currently appropriately managed and where the risk of flooding is not expected to increase significantly in the future. However, we keep our approach under review, looking for improvements and responding to new challenges or information as they emerge. We may review our approach to managing flood defences and other flood risk management actions, to ensure that we are managing efficiently and taking the best approach to managing flood risk in the longer term.

7.5 Groundwater

Mapping published within the West Sussex County Council SFRA shows the site to be located in an area with medium potential for groundwater flooding and no recorded groundwater flooding events.

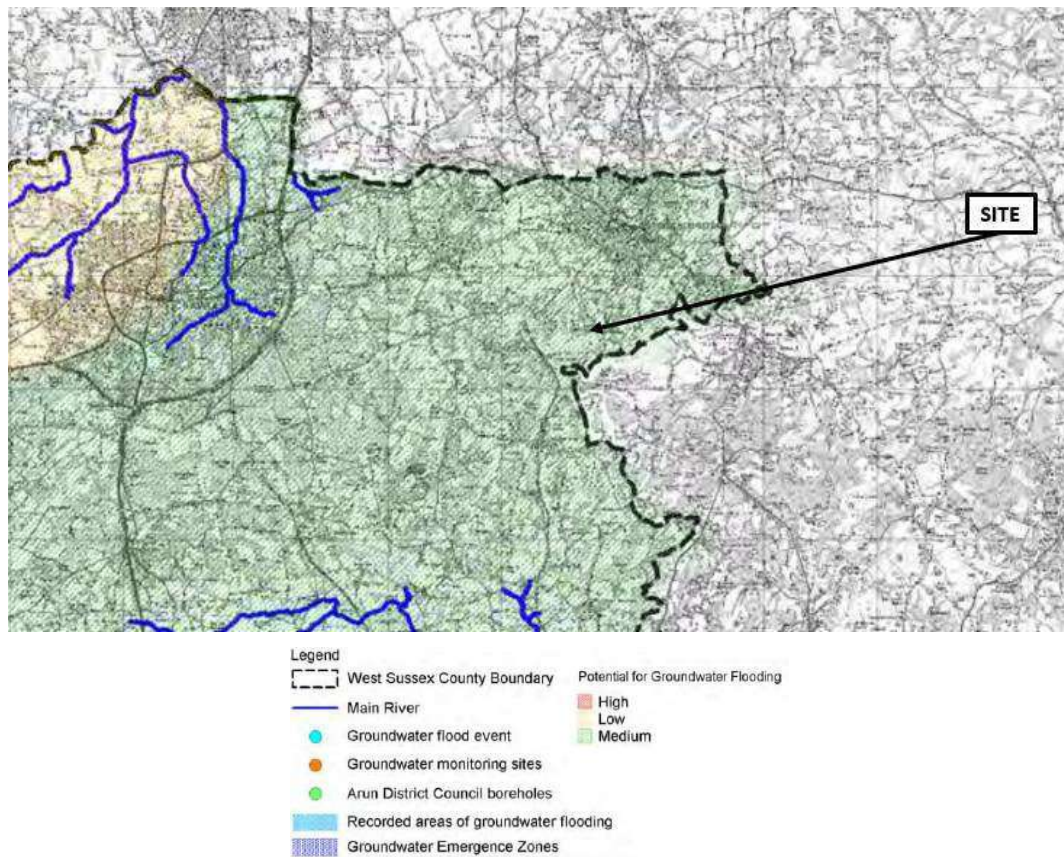


Figure 16: West Sussex County Council SFRA – Areas Prone to Groundwater Flooding map extract

7.6 Historic flood

Mapping published within the West Sussex County Council SFRA shows the site to be located in an area with low to medium proneness to flooding from the land. There are no recorded surface water flooding events recorded on or near to the development site.

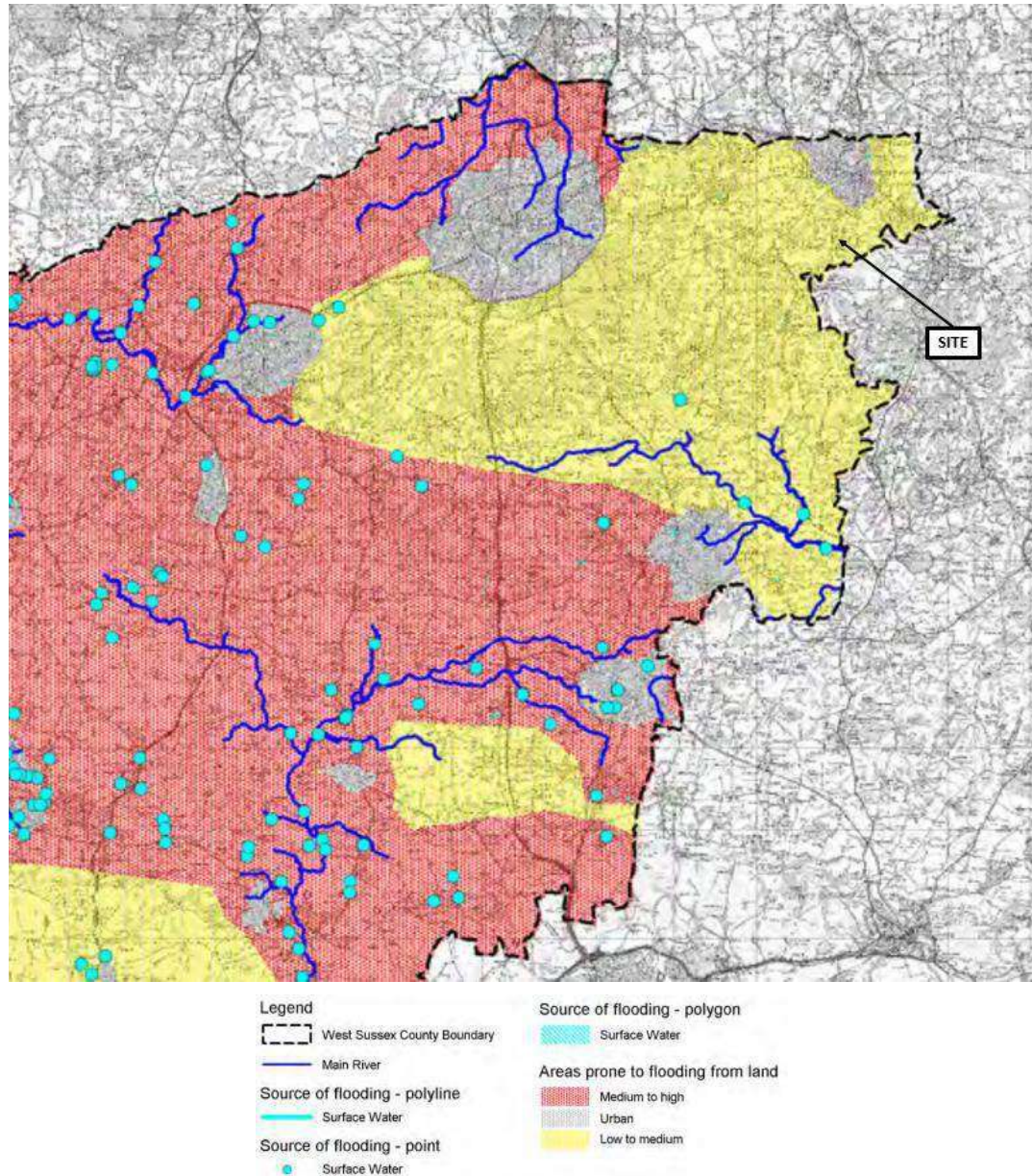


Figure 17: West Sussex County Council SFRA – Areas Prone to Flooding from the Land map extract

7.7 Sewer

Mapping published within the West Sussex County Council SFRA shows the site to be located in an area in close proximity to a number of recorded sewer-based flooding events. However, these occurred in the urban area of East Grinstead, and the proposed development is on unaffected rural land.

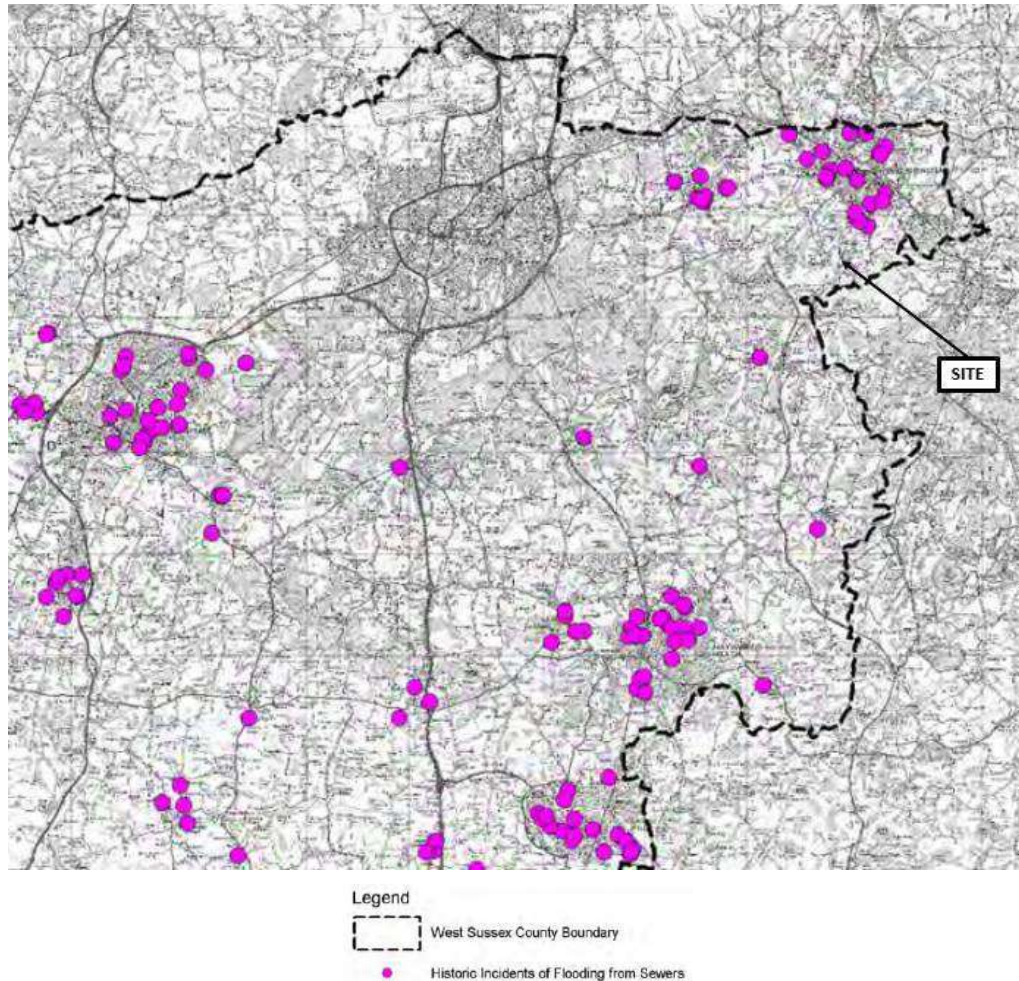


Figure 18: West Sussex County Council SFRA – Areas Prone to Flooding from Sewers map extract

7.8 Reservoir

The EA Long Term Flood Risk map shows that the development is located within an area where flooding from reservoirs is unlikely.

In the unlikely event that a reservoir dam fails, a large volume of water would escape at once, with little or no warning. According to the EA, there has been no loss of life in the UK from reservoir flooding since 1925. All large reservoirs must be inspected and supervised by reservoir panel engineers as detailed by the enforcement authority for the Reservoirs Act 1975 in England. The EA are responsible to ensure that reservoirs are inspected regularly, and essential safety work carried out.

8 Residual Risks

Due to the limited flood risk to the site, residual risks are limited to overland flow from an exceedance event and potential surface water risk. In the event of heavy rainfall the low permeability of the sub soil would limit infiltration, and overland flow could occur.

Proposed ground levels should be designed to contain surface water runoff within the marquee pad extents to direct surface runoff away from existing adjacent development.

Permeable surfacing is proposed to allow infiltration, as existing, where feasible. A filter trench with a perforated pipe has been proposed to capture runoff and direct excess flow to areas for attenuation and storage prior to controlled release.

Consideration is also needed of the proposed development site being located within an area adhering to Policy 3 of the River Medway CFMP. This policy is applied to areas of low to moderate flood risk where there is a general management of existing flood risk effectively. Developments within this area could have an influence upon the risk of flooding, and so mitigating sustainable drainage measures should be considered by the developer to limit runoff from the site, to ensure that risk to others does not increase when this proposal is complete.

9 Flood Risk Management Measures

It should be ensured the grading of the site in preparation for temporary structures is undertaken in a flood resilient manner in case of exceedance events.

The proposed ground levels for the Marquee pad and access road should be directed to fall towards the south and west to direct overland flow towards the existing water course rather than cause on site flooding or direct water to existing infrastructure.

All new external surfaces should be permeable in nature, where feasible, to promote infiltration and mitigate the potential to generate additional surface water runoff.

Provision of sustainable storm water drainage measures should be considered by the developer and are outlined within these proposals in order to limit runoff from the site, to greenfield runoff rates, or as close to as practical, to ensure that risk to others does not increase when this proposal is complete.

10 Sustainable Urban Drainage (SuDS) Assessment

In accordance with the SuDS management train approach, the use of various SuDS measures to reduce and control surface water flows have been considered in detail for the development.

The management of surface water has been considered in respect to the SuDS hierarchy below as detailed in the CIRIA 753 'The SUDS Manual', Section 3.2.3:

SUDS DRAINAGE HIERARCHY				
			Suitability	Comment
	1.	Store rainwater for later use	✓	Rainwater harvesting should be considered by the developer.
	2.	Use infiltration techniques, such as porous surfaces in non-clay areas	✓	Infiltration testing has revealed that only partial infiltration is feasible.
	3.	Attenuate rainwater in ponds or open water features for gradual release	x	Not proposed due to gradient of land.
	4.	Attenuate rainwater or sealed water features for gradual release	✓	It is necessary to provide attenuation in order to keep runoff rates from the proposed development as close as feasible to greenfield runoff rates.
	5.	Discharge rainwater direct to a watercourse	✓	There is an existing watercourse in close proximity to the site
	6.	Discharge rainwater to a surface water sewer/drain	x	
	7.	Discharge rainwater to Combined Sewer	-	

Table 2: SuDS Drainage Hierarchy

Following the SuDS drainage hierarchy, full infiltration was initially considered for the site. However, infiltration testing has demonstrated that infiltration is not feasible as the sole means of surface water disposal. The adopted drainage strategy therefore utilises unlined permeable construction (Type B) to promote partial infiltration where ground conditions permit, together with attenuation storage within the marquee pad sub-base and the turning area / access track drainage infrastructure. Surface water runoff from the site will then discharge in a controlled manner to the existing watercourse to the west of the site at rates no greater than the corresponding pre-development greenfield runoff rates..

The suitability of SuDS components has been assessed in order to provide a sustainable means of providing the required attenuation volumes. The following components have been assessed as follows in Table 3, below.

SUITABILITY OF SUDS COMPONENTS		
SuDS Component	Comment	Suitability
Infiltrating SuDS	Infiltration testing shows infiltration as a sole means of discharge not to be feasible. However partial infiltration via type B permeable paving could be utilised to promote infiltration where possible.	✓
Permeable Pavement	Permeable pavement is deemed suitable for this site.	✓
Green / Blue Roofs	May be possible to include on the proposed toilet block as proposals show it to have a flat roof.	✓
Rainwater Harvesting	It is recommended that a rainwater harvesting tank is considered in order to reduce the clean water usage of the site.	✓
Swales	Slopes and space limit potential for open features.	x
Rills and Channels	Filter drains are used instead of rill and channels	x
Bioretention Systems	Provide little additional storage and not needed as all external surfaces are permeable and the majority are grassed.	x
Retention Ponds and Wetlands	Slopes and space limit potential for open features.	x
Detention Basins	Slopes and space limit potential for open features.	x
Geocellular Systems	Proposed to offer additional storage where needed	x
Proprietary Treatment Systems	Not needed as proposed permeable surfacing can treat car park areas.	x
Filter Drains and Filter Strips	Included on the car park extent to capture, treat and manage runoff in the permeable paving sub base	✓

Table 3: Suitability of SuDS Components

Permeable Pavement

Permeable pavements are efficient in treating oils and metals but also in intercepting debris and silt. Type B (partial infiltration) permeable paving is proposed in order to promote infiltration where possible.

Filter Drain

A filter drain is a trench filled with permeable material, such as gravel and a perforated pipe at the base. They can be used to filter and convey stormwater to downstream SUDS components.

11 Surface Water Drainage Strategy

In accordance with West Sussex County Council and local sustainable drainage and flood risk policies, the development is required to incorporate SuDS measures to reduce both runoff volumes and runoff rates from the site. Current local drainage guidance seeks to achieve runoff rates as close as reasonably practicable to the equivalent greenfield condition for new development.

The surface water drainage strategy for Site 2 provides for runoff from the marquee pad, turning area, wash block / toilet block and associated external areas, with a total contributing area of approximately 22,900m² including an allowance for potential future development, to be managed through unlined permeable construction (Type B) and discharged in a controlled manner to the existing watercourse to the west of the site. Attenuation storage is provided within the permeable sub-base of the marquee pad and within the turning area / access track drainage infrastructure.

The marquee pad provides the upstream attenuation and initial flow control within the drainage system, with runoff then draining downstream towards the turning area at the lower part of the site. Additional attenuation and flow control are provided at this lower point to restrict discharge from the combined marquee pad and turning area catchment to rates no greater than the equivalent pre-development greenfield runoff rates.

Infiltration testing has been undertaken, and the results indicate that infiltration is not feasible as the sole means of surface water disposal. However, the proposed permeable construction is to remain unlined (Type B) in order to promote infiltration where ground conditions permit and to reduce runoff as far as practicable. For the purposes of the hydraulic calculations included in Appendix III, the sub-base attenuation has conservatively been assumed to provide 0% permeability, thereby excluding any infiltration benefit from the design calculations.

SURFACE WATER DISCHARGE RATES SUMMARY					
	Area (ha)	Discharge Rates (l/s)			
		2 year	QBar	30 year	100 year
Greenfield Rates Marquee pad	1.739	9.3	10.5	24.2	33.6
Proposed Runoff Rates Marquee pad+ 40% CC	1.739	7.2		8.5	9.4
Greenfield Rates access track & turning area	0.55	2.7	3.0	7.0	9.7
Combined Greenfield Rates	1.559	12.0		31.2	43.3
Proposed Combined Runoff Rates + 40% CC	2.29	11.6		23.7	30.8

Access roads and walkways are also proposed to be of permeable construction, contributing to source control and attenuation storage within the wider drainage system.

Discharge rates from the marquee pad storage are restricted to a maximum of 9.4 l/s via an orifice plate at invert level, which is lower than the equivalent QBAR rate of 10.5 l/s for that drainage area. The marquee pad is proposed to provide a minimum storage area of 10,000m² with a 0.65m deep sub-base and 30% void ratio, giving a total attenuation volume of approximately 1,950m³ within the permeable sub-base construction.

Runoff then passes downstream to the access track and turning area, where a secondary complex flow control arrangement comprising orifice plates limits discharge to a maximum of 30.8 l/s during the 1 in 100-year rainfall event plus 40% climate change allowance. The proposed outflow rates are therefore no greater than the corresponding pre-development greenfield runoff rates for the relevant drained areas.

Additional attenuation storage is provided within the permeable construction serving the turning area and access track. This drainage element serves a contributing area of 5,513m² and provides approximately 345.6m³ of attenuation storage within the sub-base and associated permeable drainage construction.

A proposed storm drainage strategy plan layout is included in Appendix II. Greenfield runoff calculations and hydraulic design calculations are included in Appendix III.

12 Foul Water Drainage Strategy

The proposed development involves the change of use of vacant land to an events area for occasional use, including the installation of a permanent wash block and WC facilities to serve the erected marquee structures and associated car parking. The use of the site is limited to a maximum of 84 days per year in total.

Car parking is provided across three areas (Areas A, B and C), with a maximum combined capacity of 683 spaces. In the absence of fixed attendance figures, the design occupancy has been derived from the maximum car park capacity using a rate of 2.0 persons per vehicle, giving a design occupancy of 1,366 persons, rounded up to 1,400 persons for the purposes of a conservative design assessment.

Foul drainage will be generated from the permanent wash block and WC facilities only and will discharge to the existing on-site foul water system serving Saint Hill.

Drainage calculations have been carried out in accordance with BS EN 12056-2 and British Water Flows and Loads 4. Based on the adopted design occupancy and unit flow rates of 30 litres per person per event for WC use and 5 litres per person per event for wash hand basin use, the peak daily hydraulic load is calculated at 49 m³/day. The peak instantaneous foul flow has been calculated at 3.91 l/s using the Discharge Unit method in accordance with BS EN 12056-2. Foul drainage pipework will be sized at a minimum of 150mm diameter and laid at gradients sufficient to maintain self-cleansing velocities in accordance with Approved Document H.

Review of the specification of the existing on-site foul water system confirms that sufficient excess capacity is available to accommodate the proposed development.

The proposed foul drainage strategy is considered appropriate for the scale, nature and frequency of the development.

13 Water Quality

The primary risk to water quality is from the trafficked areas (i.e. access road). This can be treated through the implementation of permeable paving across trafficked areas.

The plans included in Appendix shows permeable pavement is proposed to be provided for the external trafficked areas to treat the runoff from the surrounding catchments.

The Pollution Hazard Indices are summarised in Table 4 – Summary of Pollution Hazard Indices for different Land Use below (based on Table 26.2 of The SuDS Manual):

POLLUTION HAZARD INDICES FOR DIFFERENT LAND USE CLASSIFICATIONS				
LAND USE	Pollution Hazard Level	Total Suspended Solids	Metals	Hydrocarbons
Low Traffic Roads	Low	0.5	0.4	0.4
TOTAL POLLUTION HAZARD INDEX		0.8	0.6	0.45

Table 5: Summary of Pollution hazard Indices for different Land Use

When designing suitable treatment trains to deliver adequate treatment prior to discharging to sewers, watercourse or groundwater, consideration of the treatment properties of each SuDS component specified should be reviewed. With the total mitigation potential of a SuDS treatment train determined by:

$$SuDS_1 + 0.5 * SuDS_2 + 0.5 * SuDS_3 \dots = Total\ SuDS\ Mitigation\ Index$$

The Mitigation Indices of the proposed SuDS techniques are summarised in Table 6 below.

INDICATIVE SuDS MITIGATION INDICES FOR DISCHARGES TO SURFACE WATER

■ Hove ■ London ■ Manchester ■ Leeds ■ Barcelona

QED Structures Limited. Reg. address: 7 Hove Manor Parade, Hove Street, Hove, East Sussex, BN3 2DF. No: 5559060 England and Wales.

SuDS Component	Total Suspended Solids	Metals	Hydrocarbons
Permeable Paving	0.7	0.6	0.7
TOTAL SUDS MITIGATION INDEX	0.7	0.6	0.7

Table 6: Indicative SuDS Mitigation Indices.

It can be seen that the Total SuDS Mitigation Index $\geq$ Pollution Hazard Index therefore the water treatment provided by this SuDS train is enough to remove the potential pollutants.

14 Schedule of Maintenance

All onsite SuDS and drainage systems will be privately maintained. A long-term maintenance regime should be agreed with the site owners before adoption.

In addition to a long-term maintenance regime, it is recommended that all drainage elements implemented on site should be inspected following the first rainfall event post-construction and monthly for the first quarter following construction.

The property owner will be responsible for the management and maintenance of SuDS devices. Typical key suds components operation and maintenance activities are provided below.

TYPICAL KEY SUDS COMPONENTS OPERATION AND MAINTENANCE ACITIVIES													
Operation and Maintenance Activity	SuDS Component												
	Pond	Wetlands	Detention Basin	Infiltration Basin	Soakaway	Infiltration Trench	Filter Drain	Modular Storage	Pervious pavement	Swale/Bioretentio n	Filter Strip	Green Roofs	Proprietary Treatment
Regular Maintenance													
Inspection		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Litter/debris removal	✓	✓	✓	✓	-	✓	✓	-	✓	✓	✓	x	-
Grass cutting	✓	✓	✓	✓	-	✓	✓	-	-	✓	✓	x	x
Weed/invasive plant control	-	-	-	-	x	-	-	x	-	x	-	✓	x
Shrub management	-	-	-	-	x	x	x	x	-	-	-	x	x
Shoreline vegetation management	✓	✓	-	x	x	x	x	x	x	x	x	x	x
Aquatic vegetation management	✓	✓	-	x	x	x	x	x	x	x	x	x	x
Occasional Maintenance													
Sediment management	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Vegetation replacement	-	-	-	-	x	x	x	x	x	-	-	✓	x
Vacuum sweeping and brushing	x	x	x	x	x	x	x	x	✓	x	x	x	x
Remedial Maintenance													
Structure rehabilitation/repair	-	-	-	-	-	-	-	-	-	-	-	-	x
Infiltration surface reconditioning	x	x	x	-	-	-	-	x	-	-	-	x	x
Key:													
Will be Required		May be Required						Not Normally Required					

Table 7: General Maintenance Requirements (Source: CIRIA SuDS Manual C753)

General maintenance of key SuDS components are provided below.

PROPOSED SCHEDULE OF MAINTENANCE FOR BELOW GROUND DRAINAGE				
Item	Visual Inspection	Cleanse / De-sludge	CCTV Survey	Comments
Foul Drainage System (pipework, chambers etc.)	5 years	10 years	10 years	Cleansing to be carried as necessary
Surface Water Drainage System (pipework, chambers etc.)	5 years	10 years	10 years	Cleansing to be carried as necessary
Gullies/Channels	1 year	1 year	N/A	Cleansing to be carried as necessary
Catchpits	1 year	As required	N/A	Refer to manufacturers guidance for long term maintenance requirements.
Flow Controls	1 year	As required		Inspect after heavy rainfall and in autumn when leaf fall begins.
Permeable Paving	1 year	Clear debris every 2 years.	N/A	Refer to manufacturers guidance for long term maintenance requirements.

Table 8: Maintenance for Below Ground Drainage

15 Conclusion

QED Structures has prepared a site-specific Flood Risk Assessment (FRA) and Surface Water Drainage Strategy (SWDS) for the development at Saint Hill, Saint Hill Road, East Grinstead, West Sussex, RH19 4JY.

The proposed development relates to Site 2 and comprises infrastructure to facilitate annual events, including a marquee events area, a permanent wash block / toilet block, crane pads, associated ground level alterations, permeable access areas and sustainable surface water and foul drainage provision. The site will be used on an occasional basis in connection with events held at Saint Hill, with the erection and dismantling of temporary marquee structures for a total maximum period of 84 days per year. Land immediately to the west is proposed to be rewilded following construction.

The site is located on the south-western side of Saint Hill Road and comprises a field on a steep incline to the west of a group of buildings centred around The Castle and Saint Hill Manor, which together form the UK headquarters of the International Association of Scientologists.

The British Geological Survey (BGS) Geology of Britain Viewer indicates that the bedrock underlying the majority of the site comprises the Ardingly Sandstone Member – Sandstone, while the northern boundary of the site is underlain by Lower Grinstead Clay – Mudstone. No superficial deposits are recorded beneath the site.

Environment Agency flood mapping shows the site to be located within Flood Zone 1, which is land assessed as having a low probability of fluvial or tidal flooding. This means there is less than a 0.1% annual probability of flooding from rivers or the sea.

Due to the limited flood risk to the site, the residual flood risks are primarily associated with overland flow during exceedance events and localised surface water runoff. During periods of intense rainfall, the relatively low permeability of the sub-soil may restrict infiltration and result in temporary overland flow.

External surfaces are proposed to be permeable, where feasible, in order to promote infiltration and reduce the potential for additional surface water runoff. The surface water drainage strategy provides for runoff from the marquee pad, turning area, wash block / toilet block and associated external areas to discharge to the existing watercourse to the west of the site via unlined permeable construction (Type B), with attenuation and storage provided within the permeable sub-base construction and associated drainage infrastructure.

Infiltration testing has been undertaken and indicates that full infiltration is not feasible as the sole means of surface water disposal. However, the permeable sub-base construction is proposed to remain unlined (Type B) in order to promote infiltration where possible. For the purposes of the hydraulic design, infiltration has conservatively been excluded from the storage calculations.

Discharge rates from the marquee pad are restricted to a maximum of 9.4 l/s via an orifice plate at invert level, which is lower than the corresponding QBAR rate of 10.5 l/s for that catchment. The marquee pad is proposed to provide a minimum storage area of 10,000m² with a 0.65m deep sub-base and 30% void ratio, providing approximately 1,950m³ of attenuation storage within the permeable construction. Runoff then drains downstream towards the turning area and access track, where a secondary flow control arrangement limits discharge to a maximum of 30.8 l/s during the 1 in 100-year rainfall event plus 40% climate change allowance. The proposed outflow rates are no greater than the corresponding pre-development greenfield runoff rates for the relevant drained areas. Hydraulic calculations also demonstrate that all half-drain times are less than 1,440 minutes, meaning that more than 50% of the storage volume is available again within 24 hours.

Foul drainage will be generated from the permanent wash block and WC facilities only. The proposed development involves a change of use of vacant land to an events area for occasional use, limited to a maximum of 84 days per year. In the absence of fixed attendance figures, the design occupancy has been derived from the maximum site parking capacity using an allowance of 2.0 persons per vehicle, giving a design occupancy of 1,366 persons, rounded up to 1,400 persons for a conservative assessment.

Foul drainage arising from the proposed wash block and WC facilities will discharge to the existing on-site foul water system serving Saint Hill. Drainage calculations have been carried out in accordance with BS EN 12056-2 and British Water Flows and Loads 4. Based on the adopted design occupancy and unit flow rates of 30 litres per person per event for WC use and 5 litres per person per event for wash hand basin use, the peak daily hydraulic load is calculated at 49 m³/day. The peak instantaneous foul flow has been calculated at 3.91 l/s using the Discharge Unit method, and foul drainage pipework will be sized at a minimum of 150mm diameter, laid at gradients sufficient to maintain self-cleansing velocities in accordance with Approved Document H. Review of the specification of the existing on-site foul water system confirms that sufficient excess capacity is available to accommodate the proposed development.

This report has been prepared broadly in accordance with the National Planning Policy Framework (December 2024, as amended February 2025), the Flood Risk and Coastal Change Planning Practice Guidance, the National Standards for Sustainable Drainage Systems (SuDS) (2025), relevant West Sussex County Council guidance, and the Mid Sussex District Council Level 1 Strategic Flood Risk Assessment (2024 or as updated).



APPENDIX I – ARCHITECT PLANS



Notes

1. All dimensions in millimetres and all levels in metres AOD, unless stated otherwise.
2. All drawings to be read in conjunction with relevant details and specification.
3. Build up information show indicatively only. Construction details to be provided by Civil Engineer.
4. All railing and gate footings/fixings to be Contractor's Design in accordance with Product Supplier's standard and recommendation.
5. All works in proximity to existing trees to be carried out by hand.

LANDSCAPE KEY

- Red line boundary
- Site boundary ownership
- P1 - Asphalt
- P2 - Resin bound gravel to match existing
- P3a - Ground reinforcement grid system with gravel suitable for HGVs
- P3b - Ground reinforcement grid system with grass fill - suitable for HGVs
- P4 - Ground reinforcement grid system with grass planting
- Kerbs and edges
- Existing tree to be retained
- Root Protection Area
- Proposed tree planting
- Existing Tulip trees to be relocated or replanted with matching tree size
- Ancient Woodland
- Ancient Woodland - 15m buffer
- PL1 - Ornamental shrub and perennial planting
- PL2 - Swale planting
- PL3 - Low level shrub planting
- PL4 - Native shrub planting
- PL5 - Wildflower meadow planting
- PL6 - Large shrub planting
- PL7 - Wildflower meadow planting
- PL8 - Woodland copse
- PL9 - Green roof
- PL10 - Grass

P05 27.03.2026 Layout revision for planning MN
P04 21.11.2025 Blue line update MN
P03 14.10.2025 Issued for planning MN
P02 30.09.2025 Issued for coordination MN
P01 28.02.2025 Issued for planning MN
revision / date / description / issued by

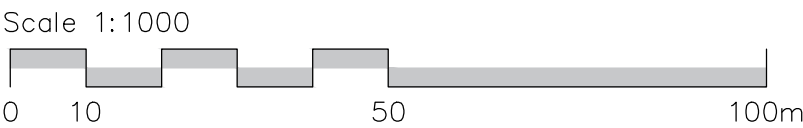
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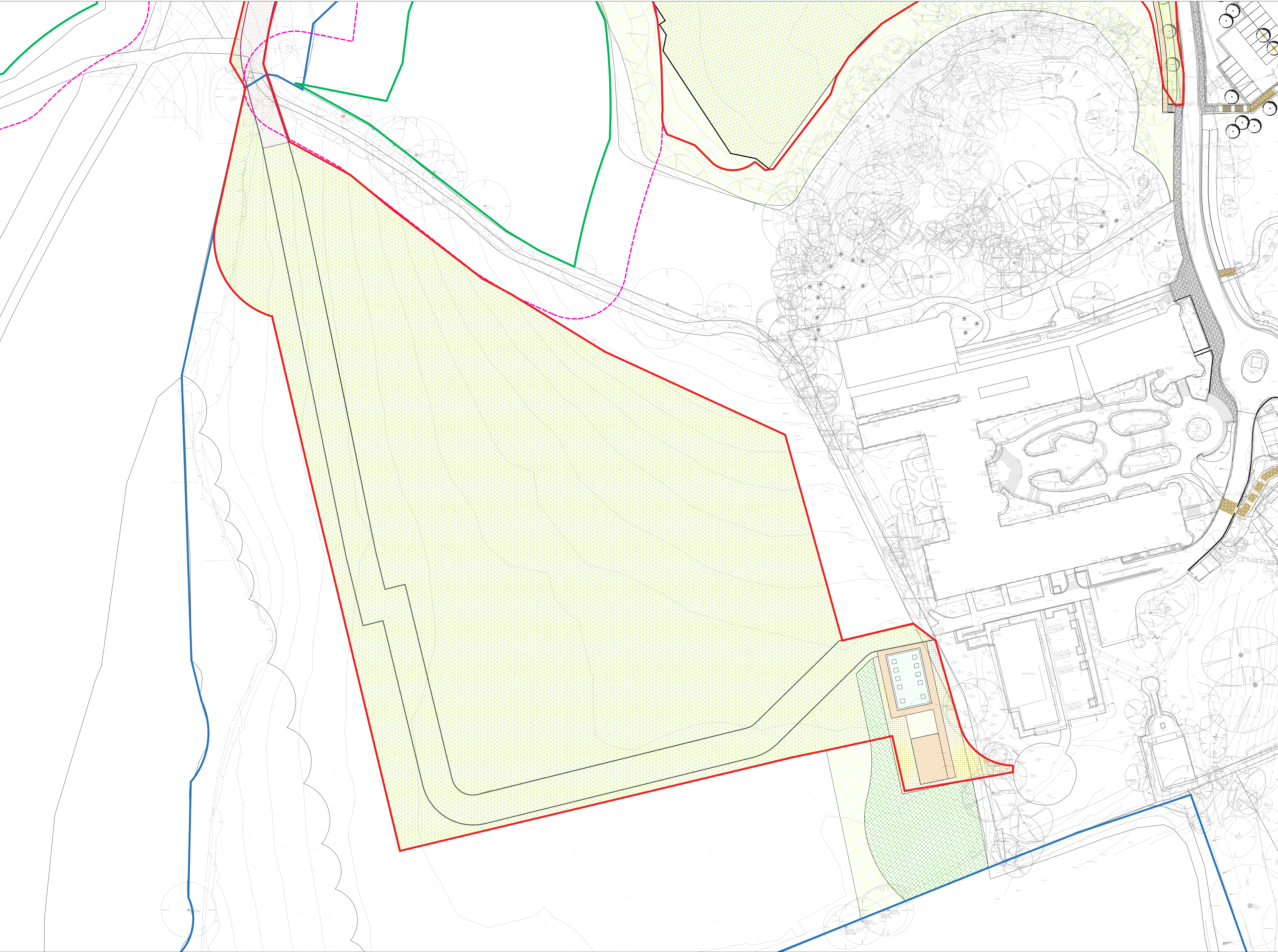


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-	date
	25.10.2024
title	drawn
Landscape GA Plan	JW
Juhring and Hobbs Fields	checked
	MN

drawing number	revision
1232-ENP-SI-00-DR-L-90105	P05

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P02 10.03.2025 issued for planning MN
P01 28.02.2025 issued for planning MN
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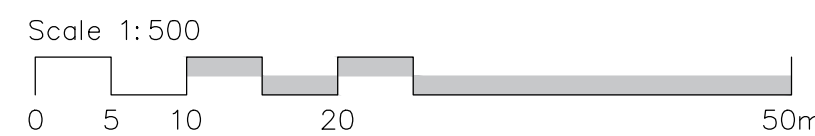
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Saint Hill Manor	1:500@A1
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-	25.10.2024
title	drawn
Landscape GA Plan	JW
Hobbs Field	checked
	MN

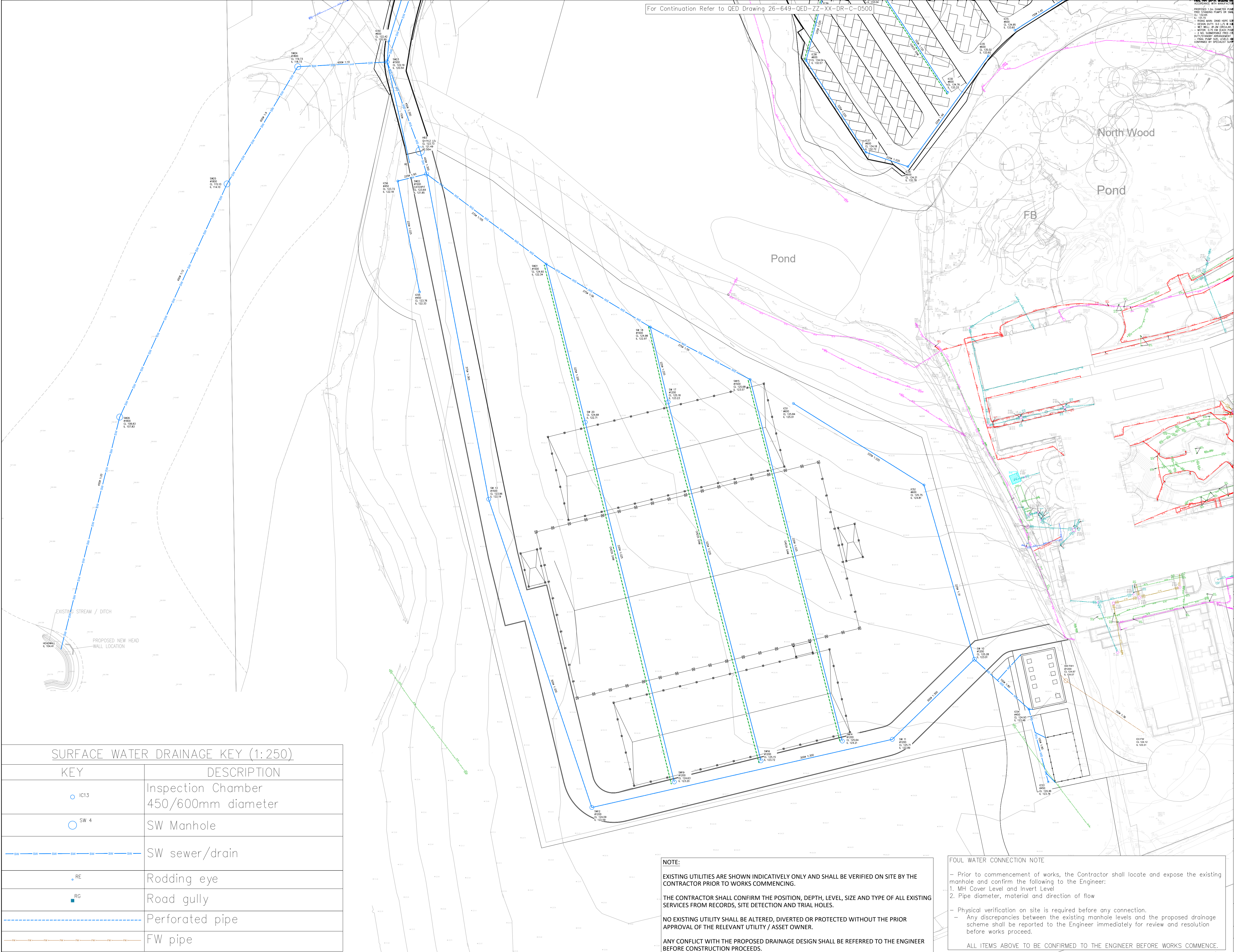
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APPENDIX II – PROPOSED DRAINAGE STRATEGY



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 13. Contractor to provide and have an approved method statement prior to works.
 14. All setting out to be in accordance with the Architects drawings. Any discrepancies between QED Structures and the Architects drawings to be referred to the Architect before proceeding. Dimensions must not be scaled.
 15. The Contractor is to comply full with CDM regulations in the course of constructing the works.
 16. At the commencement of the works, the Contractor is to carry out trial pits and liaise with utility companies in order to establish the exact position of all existing utility plant in the vicinity of the works and take adequate precautions for their protection.
 17. The Contractor is to refer to Health and Safety Executive 'Note 47 - Avoiding Danger from Underground Services' and Document G56 - Avoiding Danger from Overhead Electric Lines.'
 18. The Contractor will ascertain the CBR value of the subgrade in order to determine the required sub-base / capping thickness. Prior to laying any material, the subgrade must be inspected and any soft spots removed and filled with 6F2 capping material.
 19. Prior to the construction of any drainage works, the Contractor is to confirm the invert levels of existing manholes, drains and sewers. Any variations from the designed levels shown on the drawings must be reported to the Drainage Engineer in advance of construction works commencing. All new sewers and drains are to be laid in sequence starting from the outfall location.
 20. All drainage to be installed in accordance with relevant Building Regulation documents and current Sewage Sector Guidance. Connections to public sewers are to be agreed and inspected by the Water Authority.
 21. All drain and sewer pipes are Ø100mm and laid soffit to soffit, unless shown otherwise.
 22. Invert to base of soil stack bends to be 450mm below lowest branch connection for up to three storey buildings; for buildings up to five storeys, the invert to the base of soil stack bends should not be less than 750mm. All foul and surface water drainage stacks are to have above ground rodding access. Refer to above ground drainage layout(s) by others.
 23. All below ground connections are to match above ground outlet size, minimum Ø100mm. SVPs are to project 100mm above finished floor level.
 24. All internal manholes and inspection chambers to have double sealed recessed covers to suit floor finishes as defined by the Architect.
 25. All external covers in non-asphalt areas are to have recessed covers to suit the paving material.
 26. A CCTV survey and report in WINCAN format for all new drainage will be required prior to 'as built' drawing being issued.

P03	Drainage updated to suit the latest architect site layout	30/03/2026	RCC	MT
P02	FW sewer added	19/03/2026	RCC	MT
P01	Issued for information	16/03/2026	RCC	MT
REV	DESCRIPTION	DATE	BY	APP

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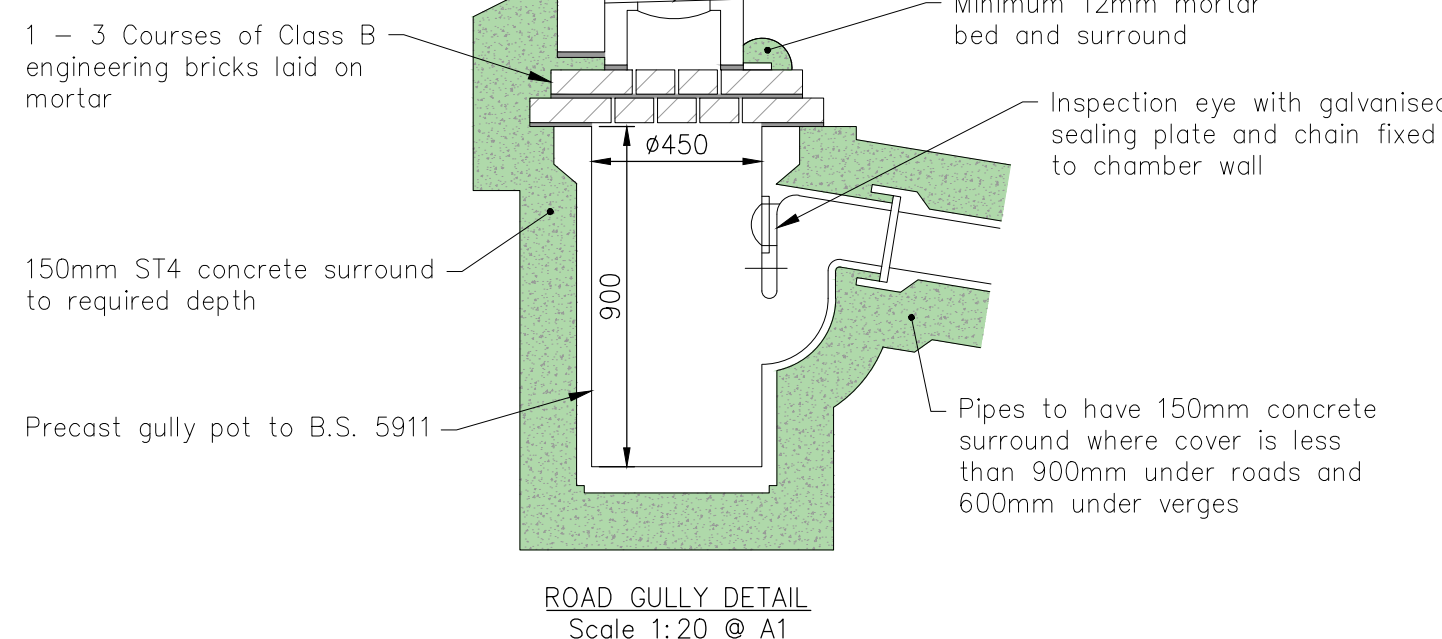
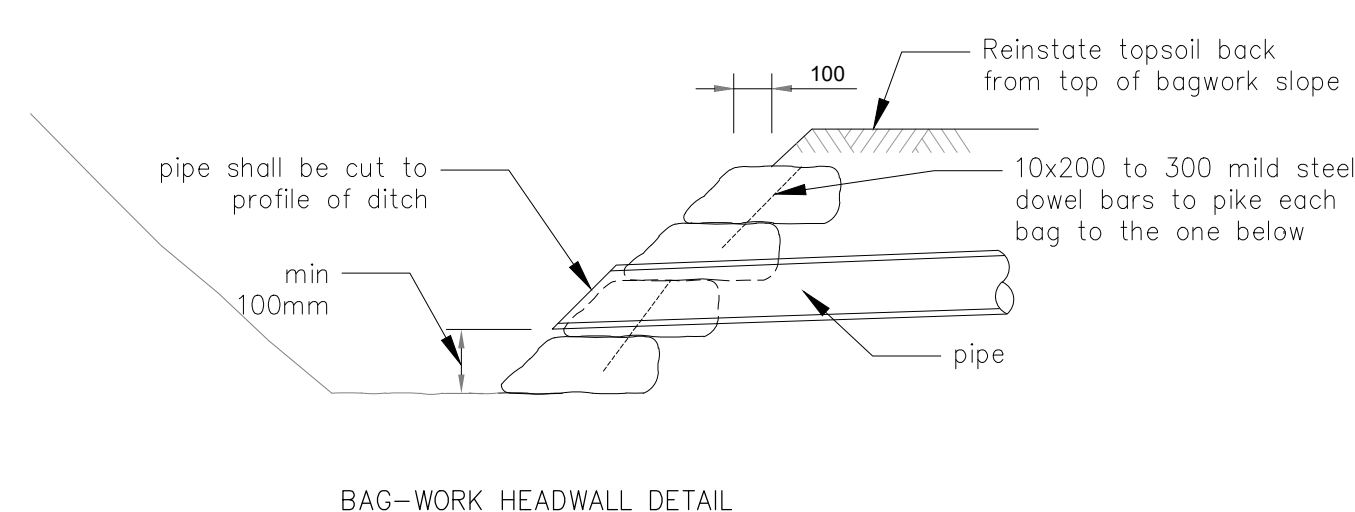
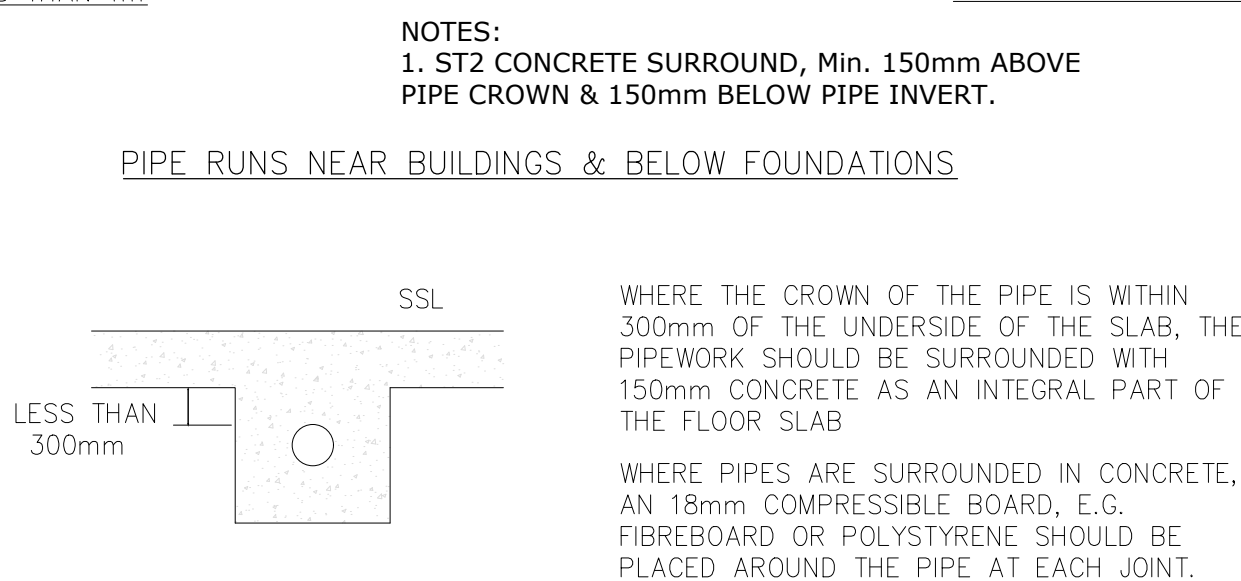
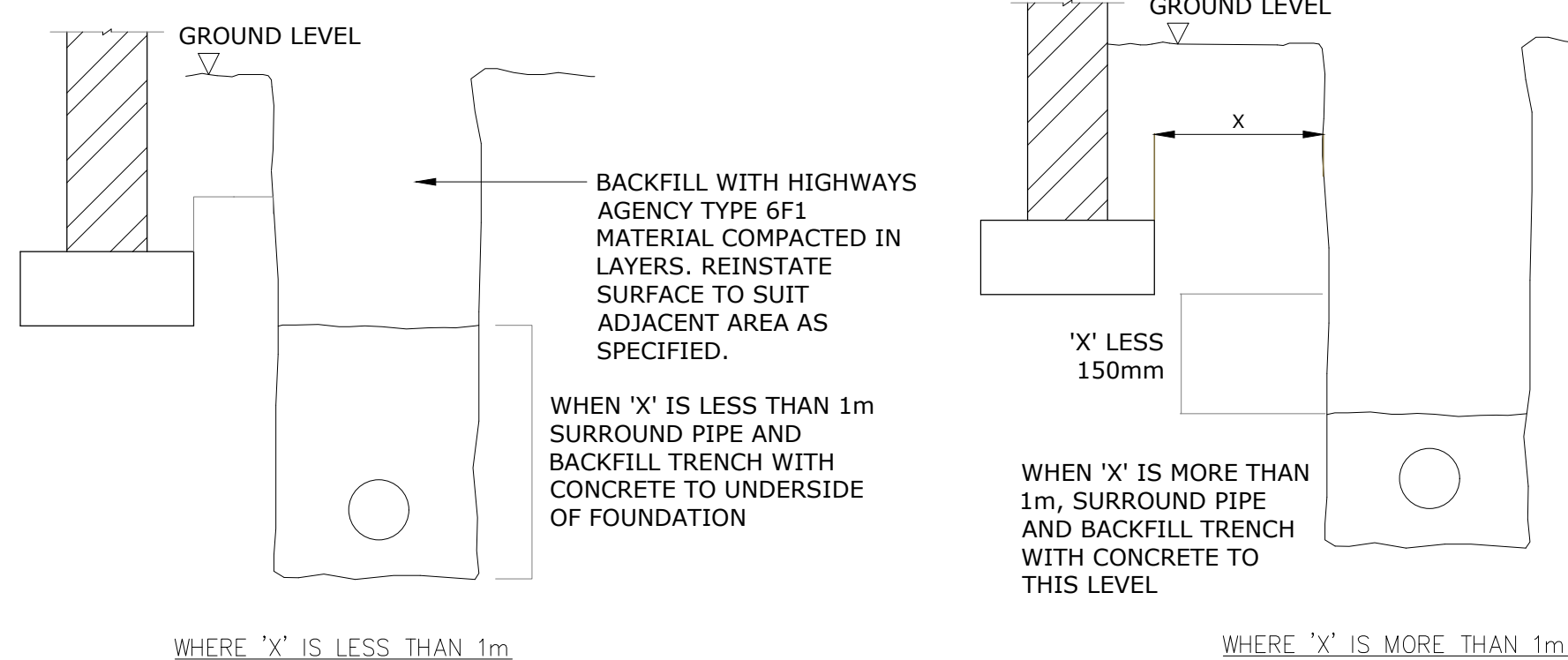
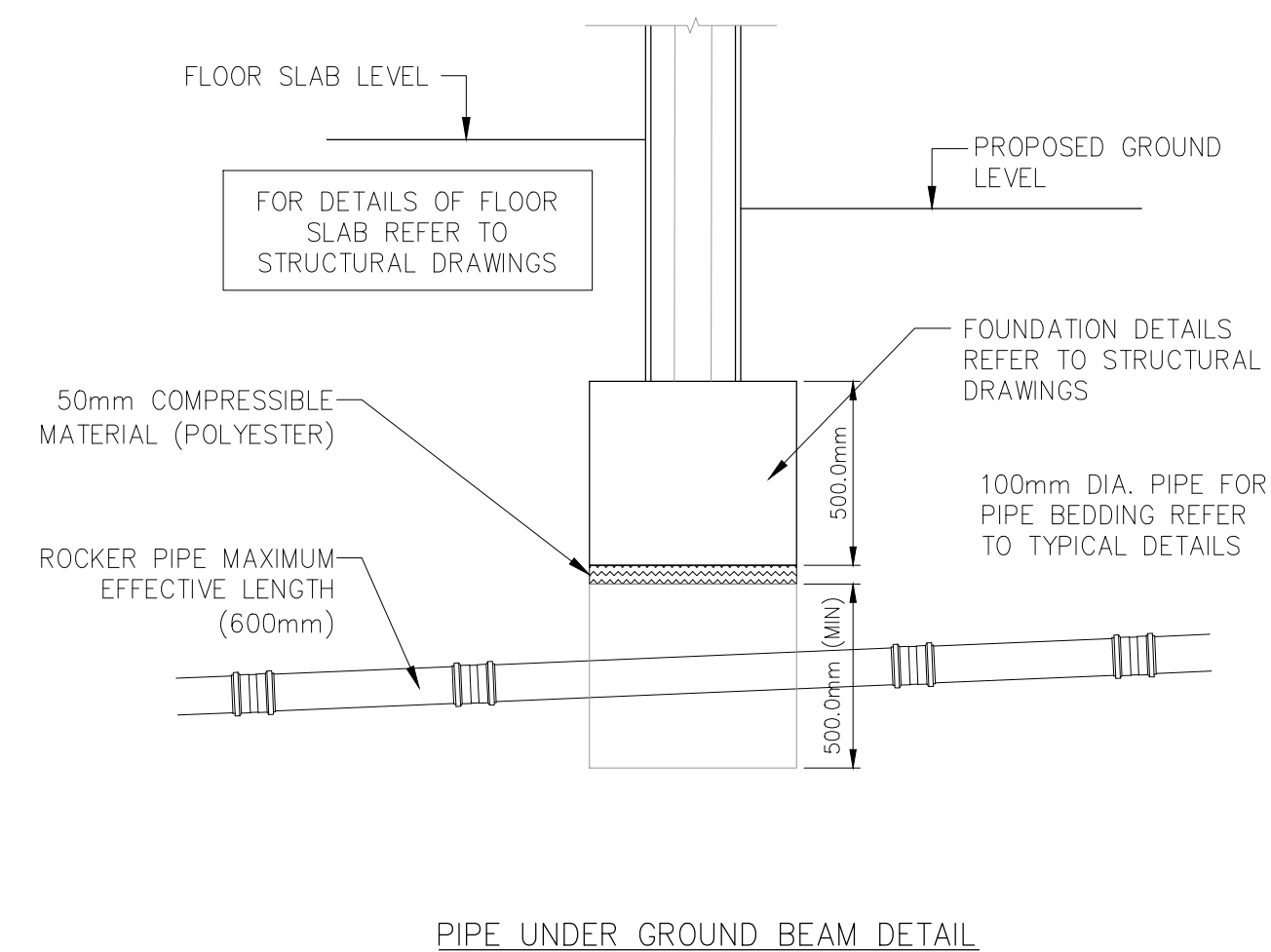
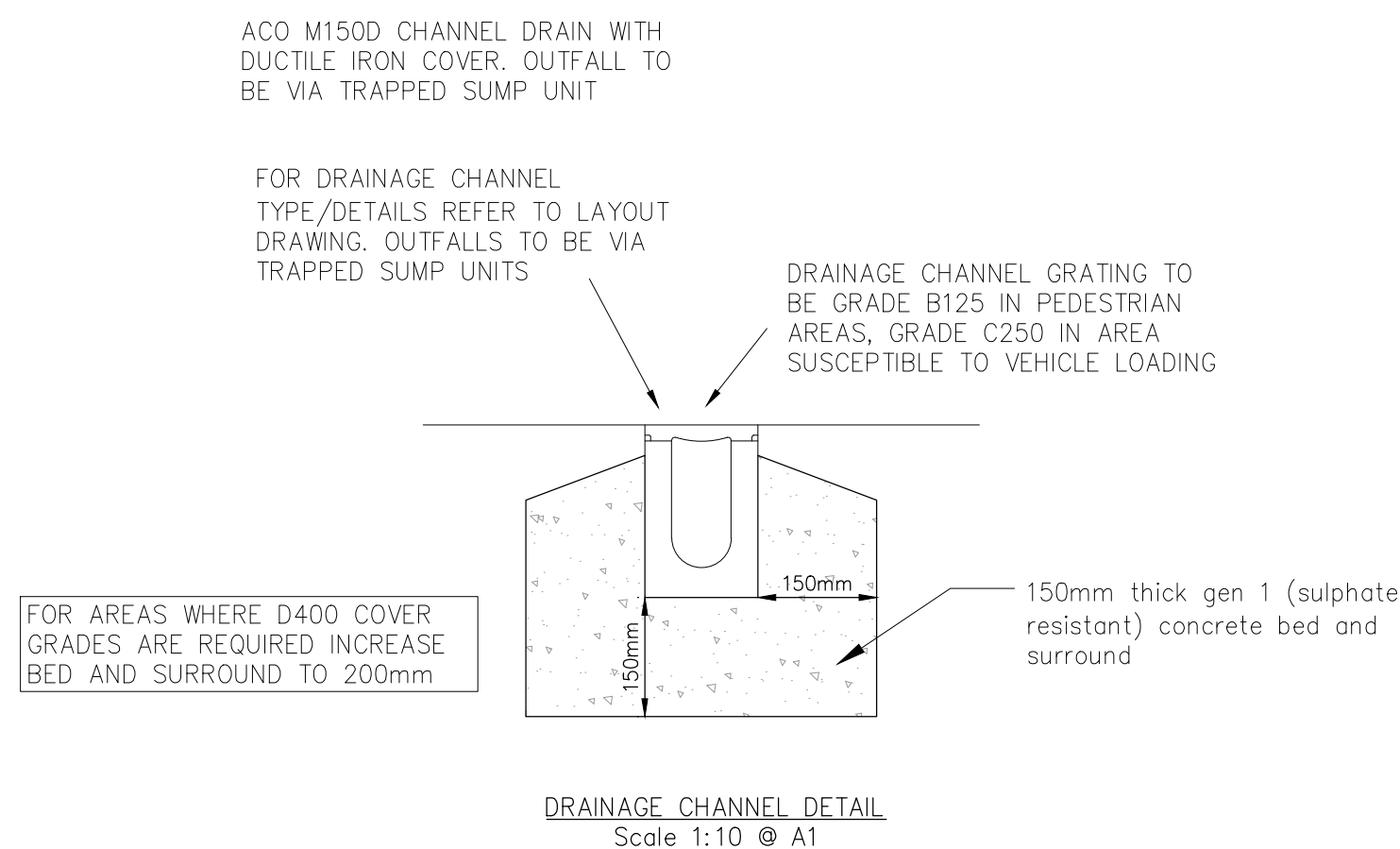
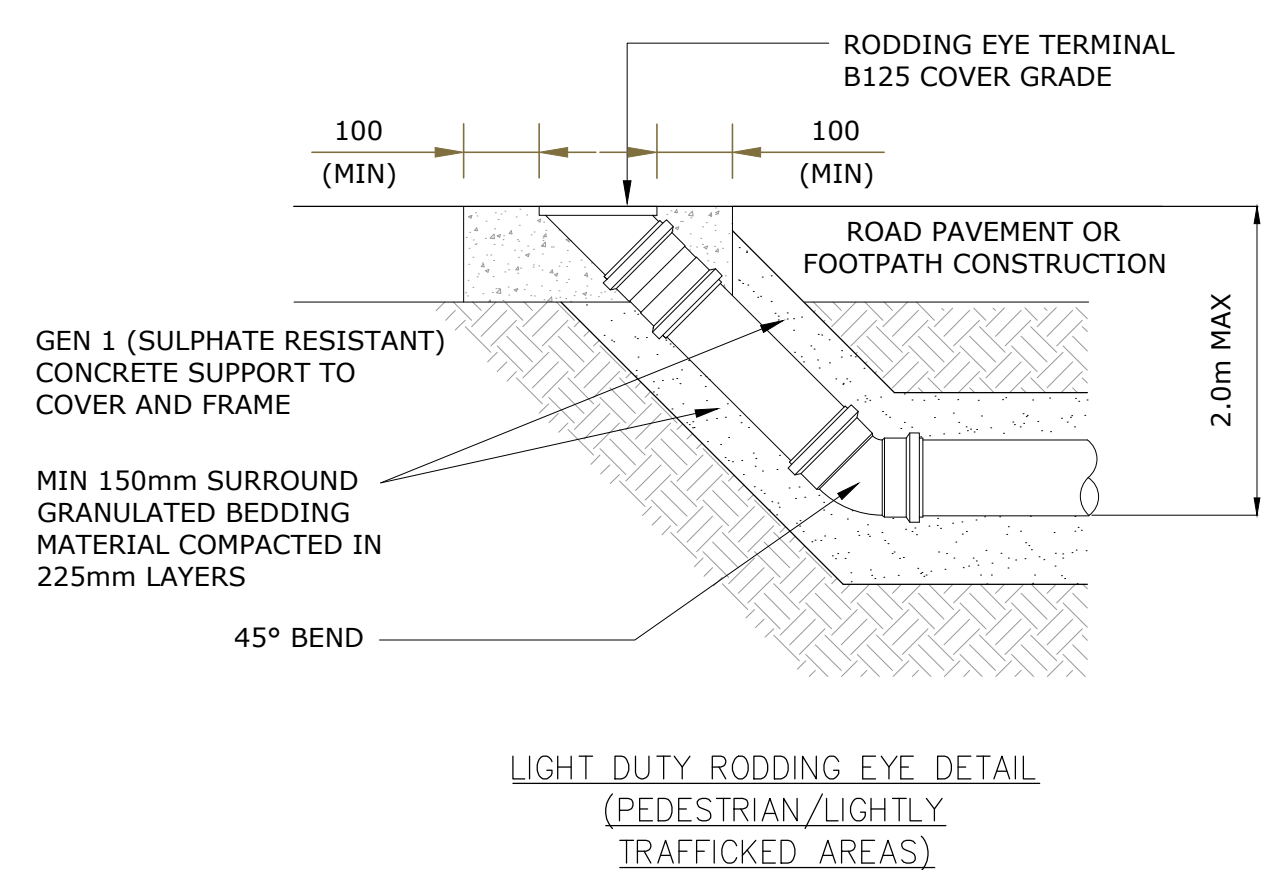
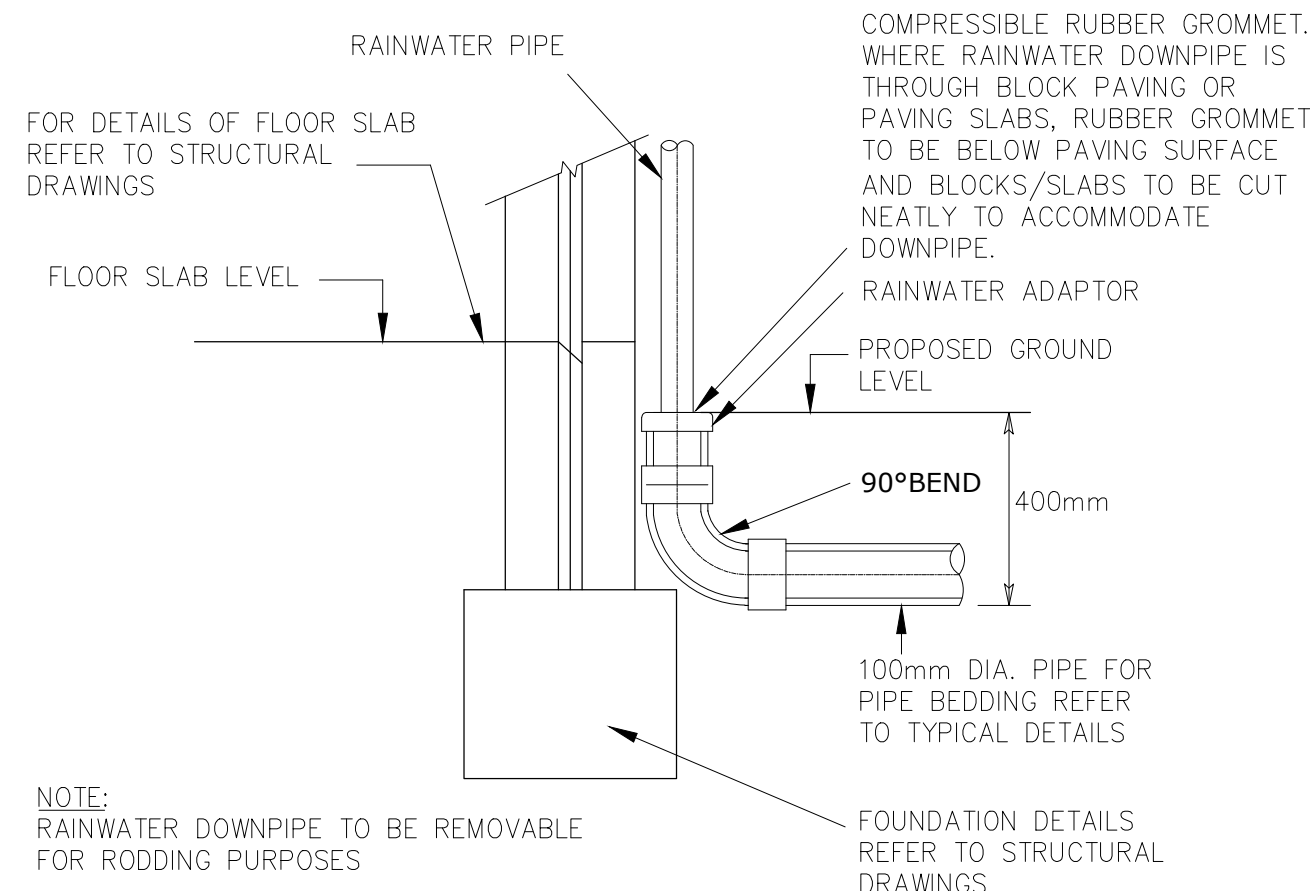
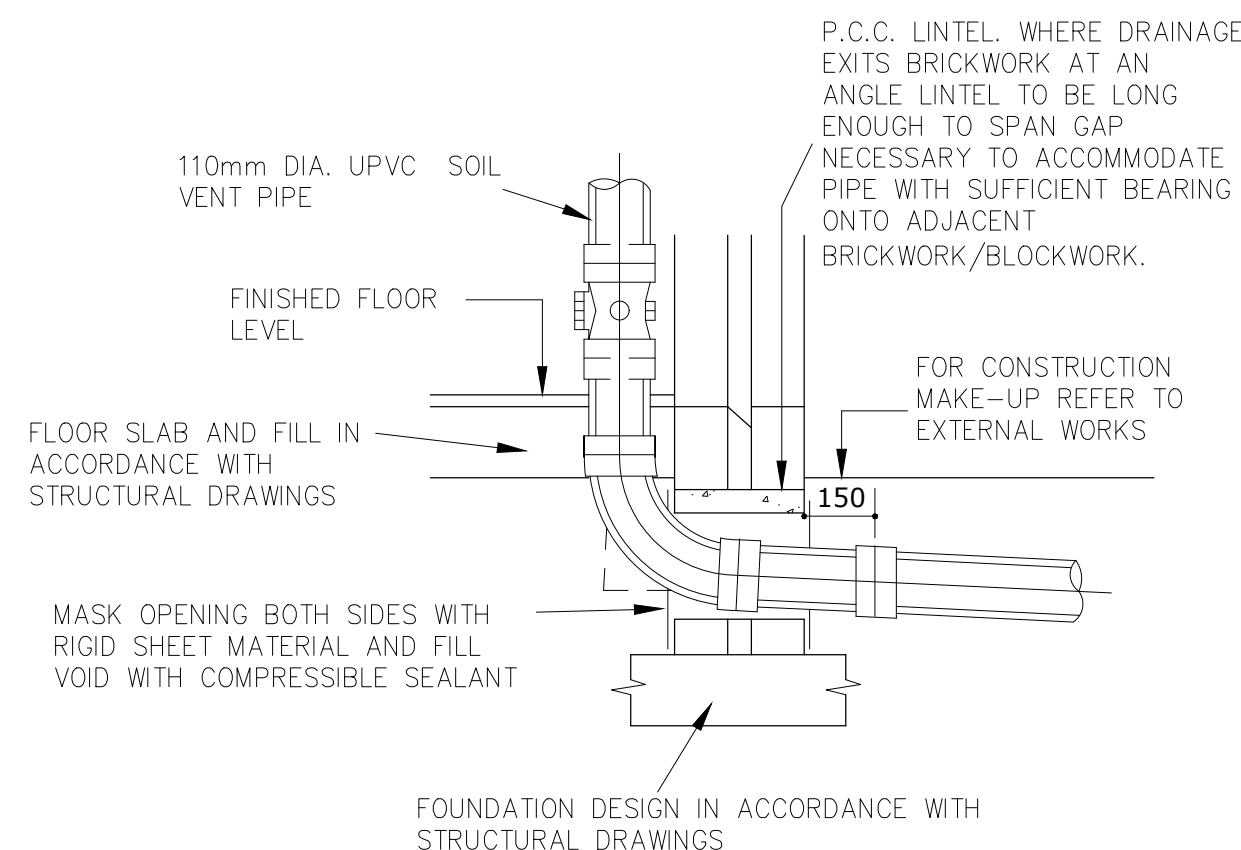
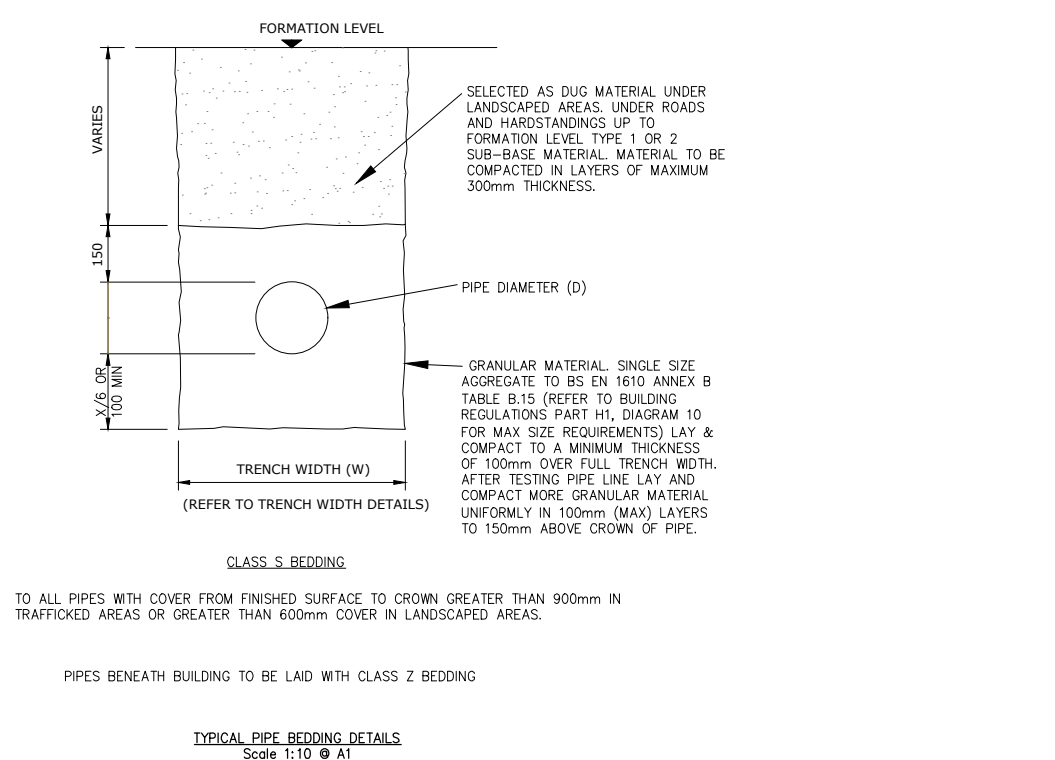
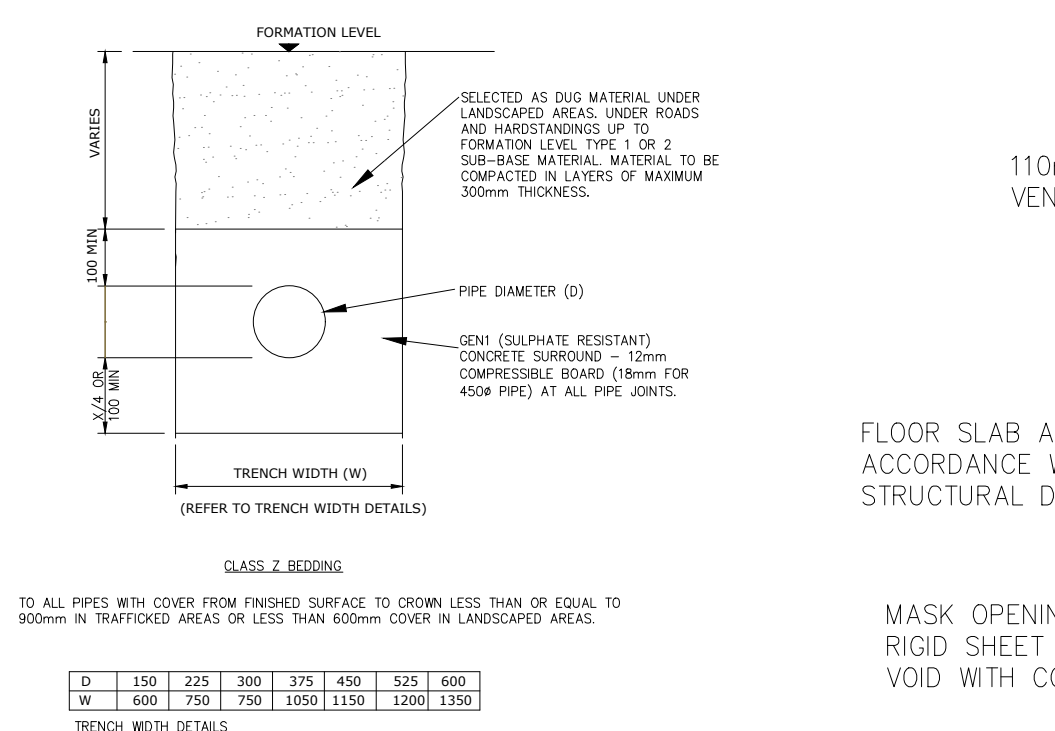
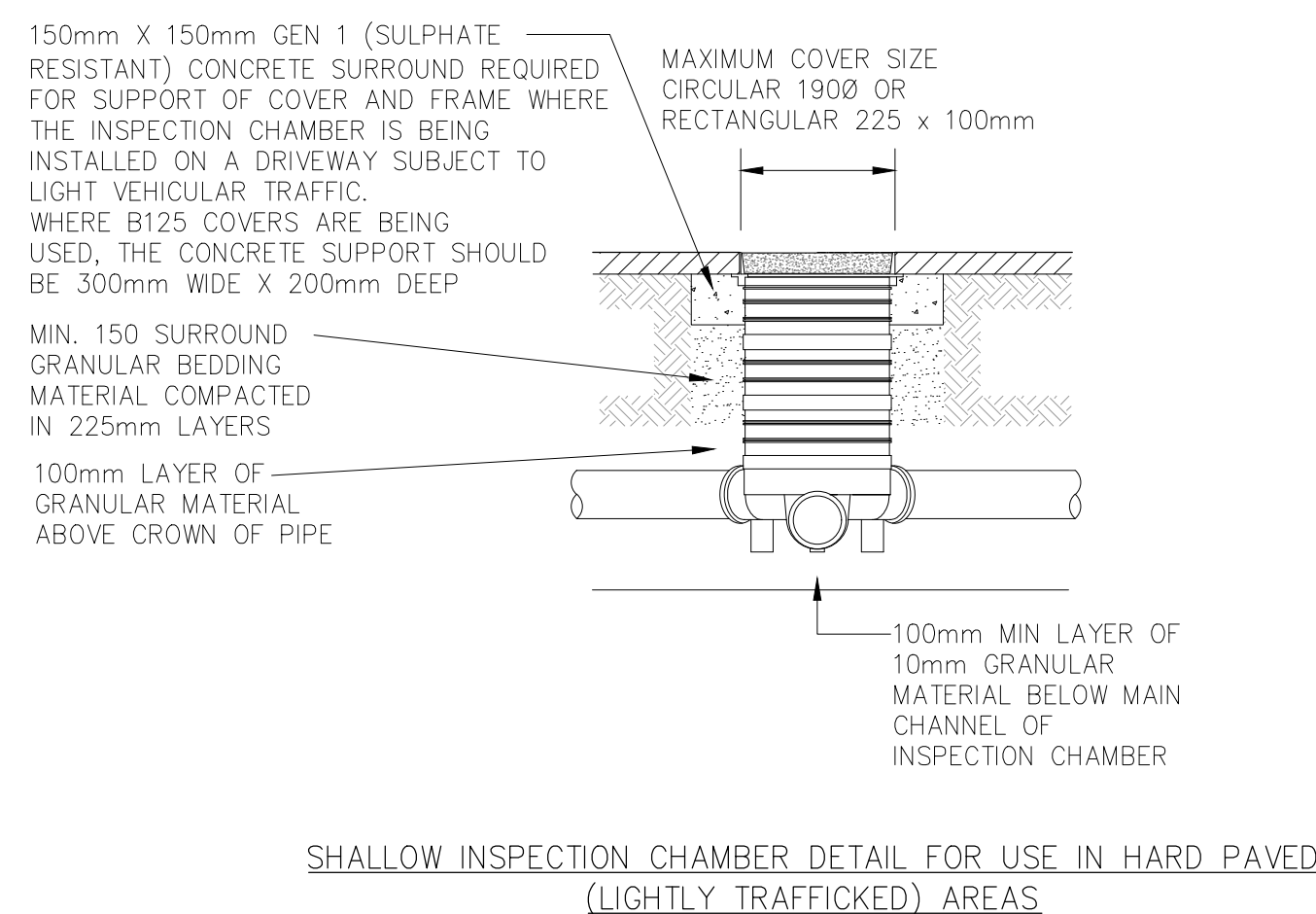
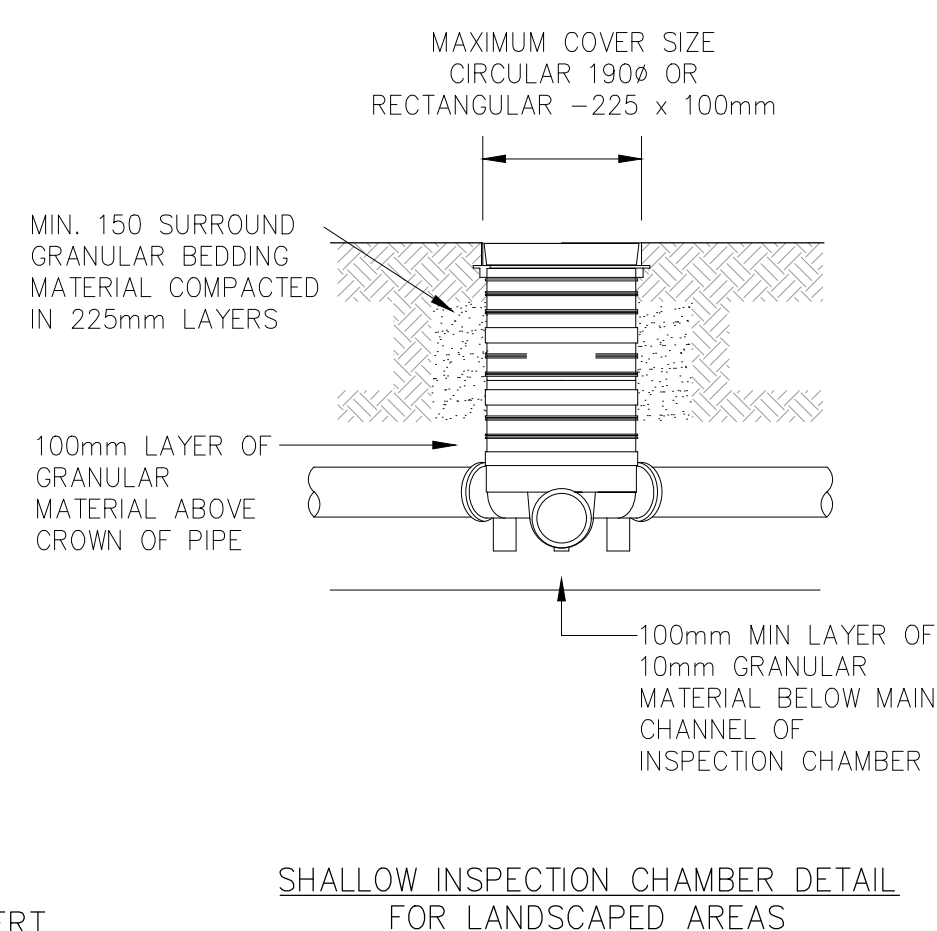
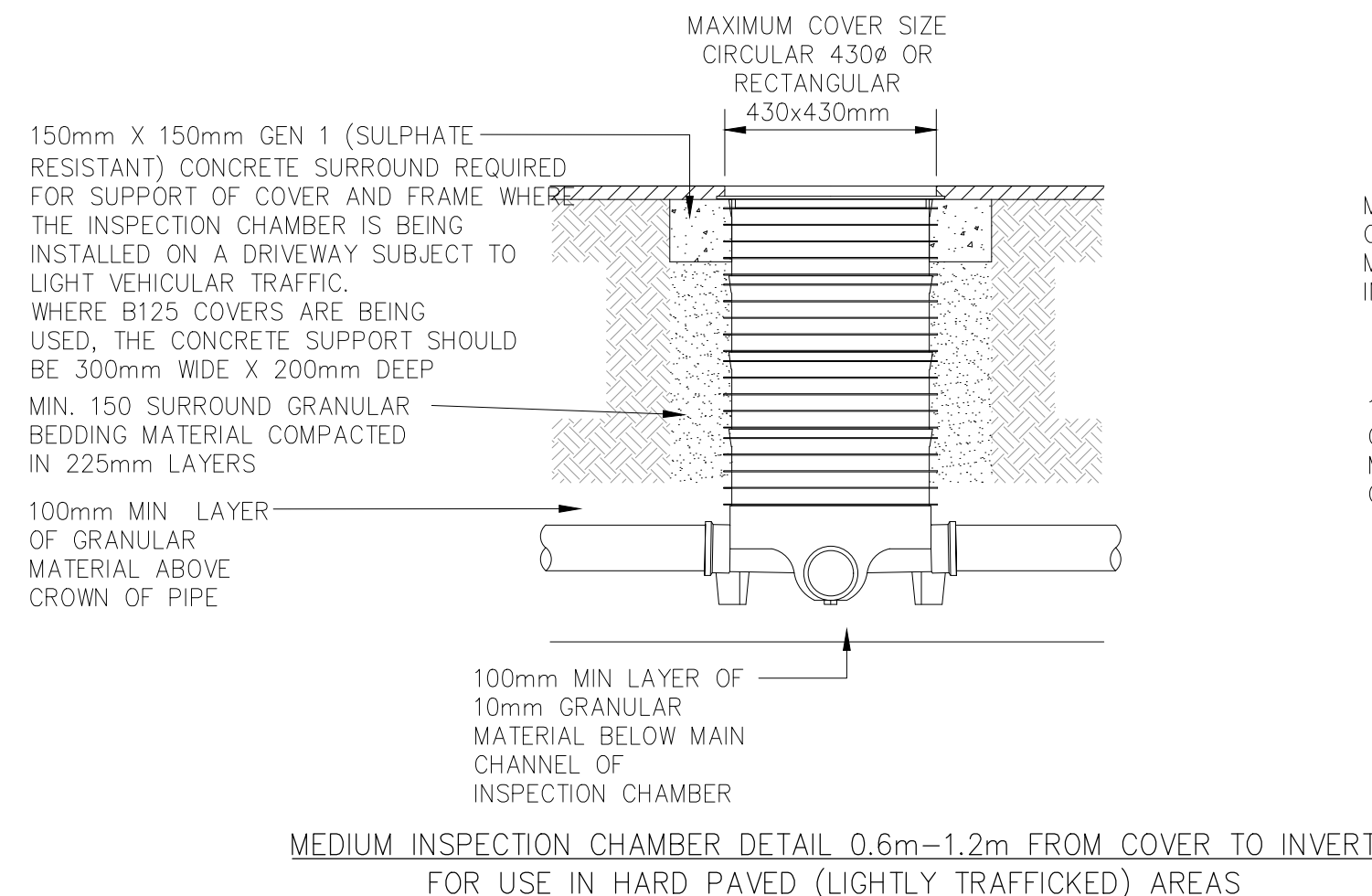
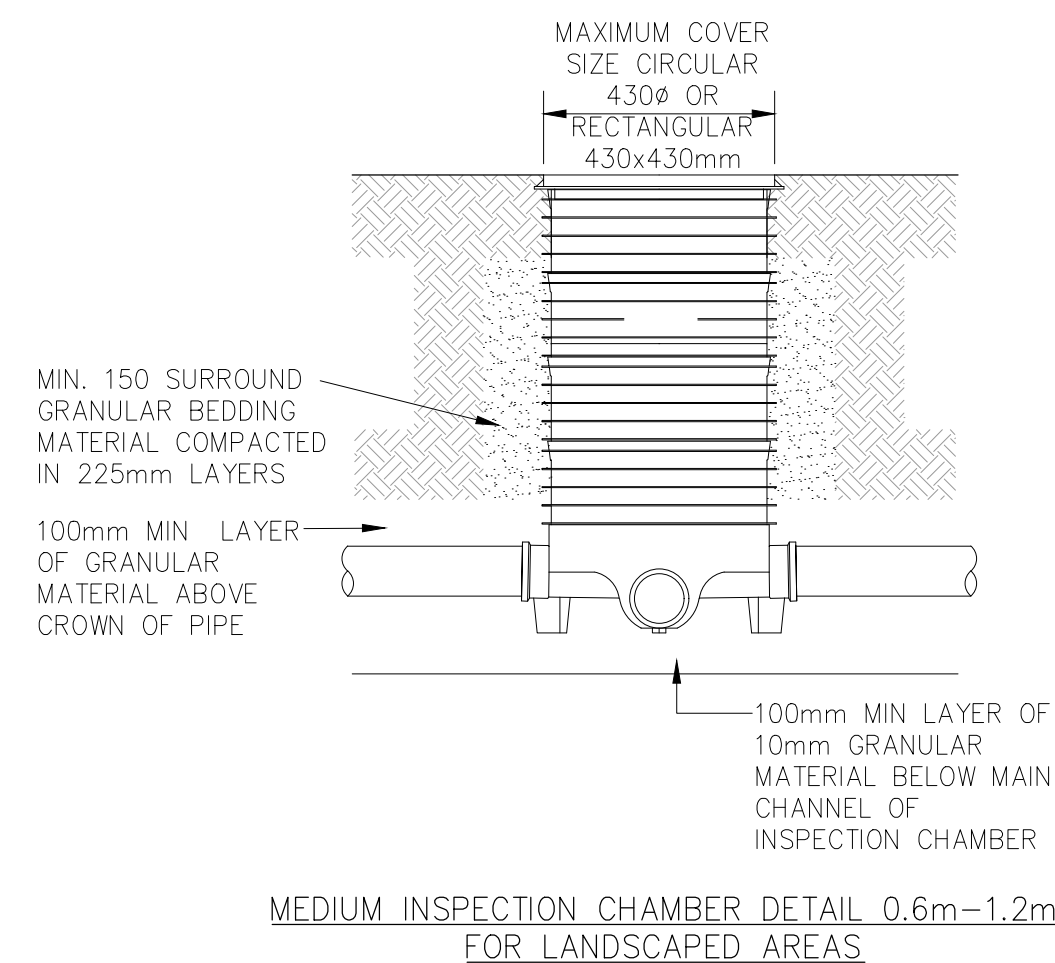
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SAINT HILL SITE 1&2
RH19 4JY

TITLE
PRIVATE DRAINAGE
GENERAL ARRANGEMENT
SHEET 2 OF 2

DRAWN RCC	ENGINEER RCC	CHECKED BY MT	APPROVED BY MT
DATE APPROVED	16/03/2026	SCALE @ A1	1:250

STATUS
S3 - Suitable for Review and Comment

DRAWING No. 25-649-QED-ZZ-XX-DR-C-0501	REVISION P03
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- THE CONTRACTOR WILL ASCERTAIN THE CRB VALUE OF THE SUBGRADE IN ORDER TO DETERMINE THE REQUIRED CAPACITING THICKNESS. IF THE CONTRACTOR, BY ANY MATERIAL, THE SUBGRADE MUST BE INSPECTED AND ANY SOFT SPOTS REMOVED AND FILLED WITH 62F CAPCING MATERIAL.
- PRIOR TO THE CONSTRUCTION OF ANY DRAINAGE WORKS, THE CONTRACTOR IS TO CONFIRM THE INVERT LEVELS OF EXISTING MANHOLES, DRAINS AND SEWERS. ANY VARIATIONS FROM THE DESIGNED LEVELS SHOWN ON THE DRAWINGS ARE TO BE REPORTED TO QED STRUCTURES IMMEDIATELY IN ADVANCE OF CONSTRUCTION WORKS COMMENCING. ALL NEW SEWERS AND DRAINS ARE TO BE LAID IN SEQUENCE STARTING FROM THE OUTFALL LOCATION.
- ALL DRAINAGE TO INSTALL TO BE IN ACCORDANCE WITH RELEVANT BUILDING REGULATION DOCUMENTS AND CURRENT SEWAGE SECTOR GUIDANCE. CONNECTIONS TO PUBLIC SEWERS ARE TO BE AGREED AND INSPECTED BY THE WATER AUTHORITY.
- ALL DRAIN AND SEWER PIPES ARE Ø100MM AND LAID SLOFF TO SOFFIT. UNLESS SHOWN OTHERWISE.
- INVERT TO BASE OF SOIL STACK BENDS TO BE 450MM BELOW LOWEST BRANCH CONNECTION FOR UP TO THREE STOREY BUILDINGS; FOR BUILDINGS UP TO FIVE STOREYS, THE INVERT TO THE BASE OF SOIL STACK BENDS SHOULD NOT BE LESS THAN 750MM. ALL FOUL AND SURFACE WATER DRAINAGE SYSTEMS ARE TO HAVE 100MM DIA. 1000MM DEEP DRAINAGE COVERS. REFER TO ABOVE GROUND DRAINAGE LAYOUT(S) BY OTHERS.
- ALL BELOW GROUND CONNECTIONS ARE TO MATCH ABOVE GROUND OUTLET SIZE, MINIMUM Ø100MM. SVPS ARE TO PROVIDE 100MM ABOVE GROUND DRAINAGE COVERS.
- ALL INTERNAL MANHOLES AND INSPECTION CHAMBERS TO HAVE DOUBLE SEALED RECESSED COVERS TO SUIT FLOOR FINISHES AS DEFINED BY THE ARCHITECT.
- ALL MANHOLES AND INSPECTION CHAMBERS ARE TO HAVE RECESSED COVERS TO SUIT THE PAVING MATERIAL.

P01	Issued for information	27/03/2026	RCC	MT
REV	DESCRIPTION	DATE	BY	APP



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RH19 4JY

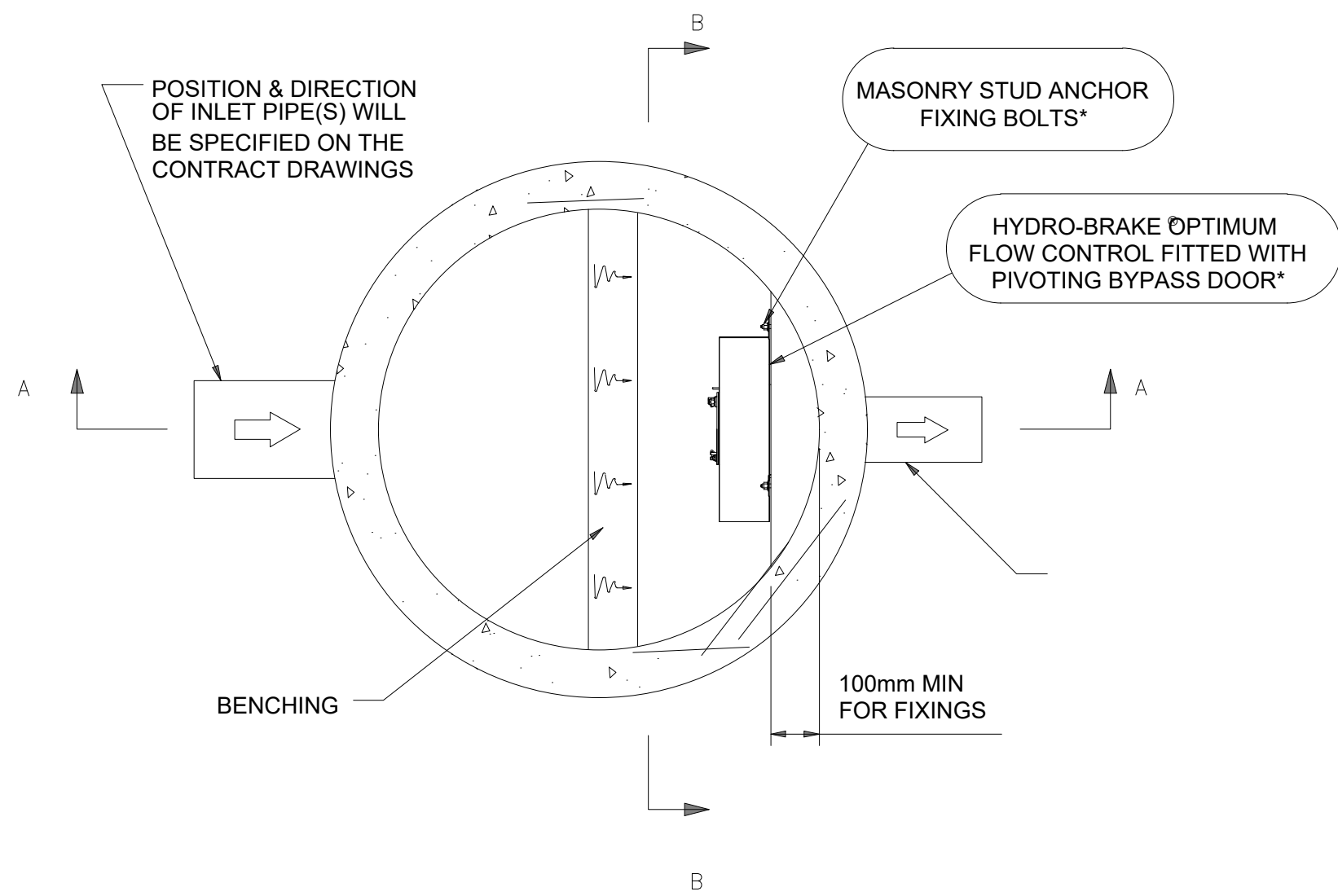
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PRIVATE DRAINAGE
CONSTRUCTION DETAILS
SHEET 1 OF 3

DRAWN RCC	ENGINEER RCC	CHECKED BY MT	APPROVED BY MT
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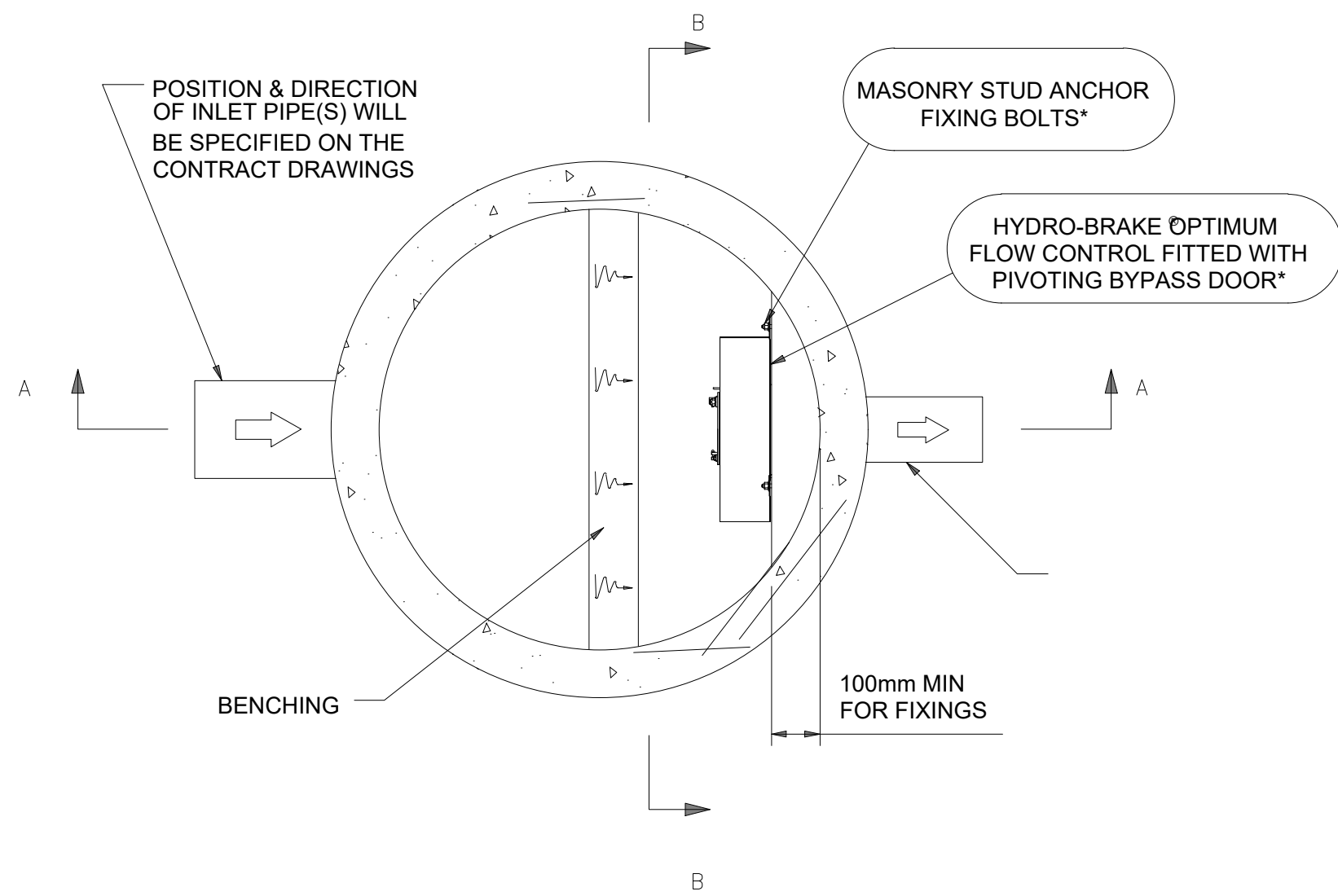
DATE APPROVED	/2026	SCALE @ A1 1:20 & 1:10
STATUS		

DRAWING No. 25-649-QED-ZZ-XX-DR-C-0510	REVISION P01
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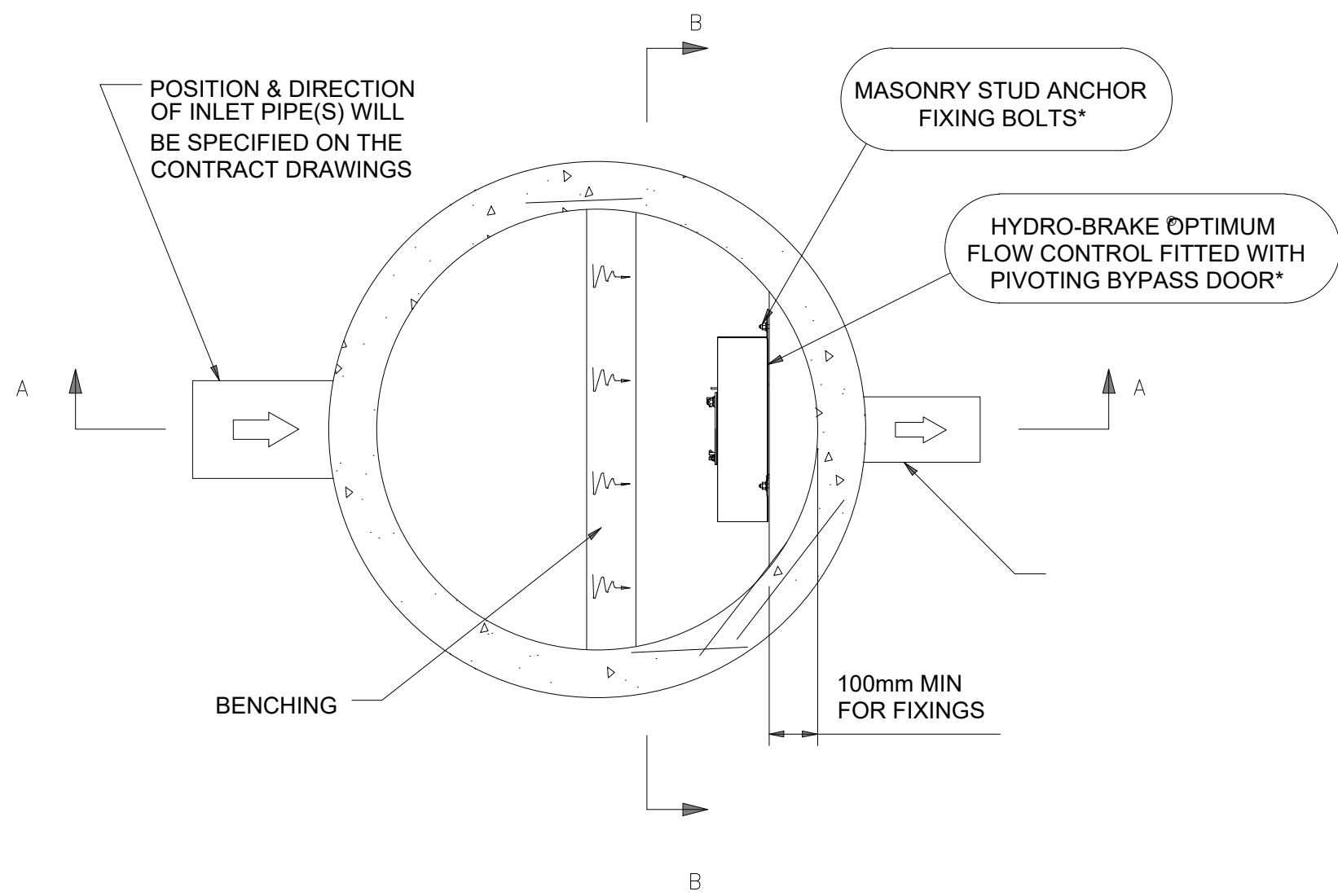




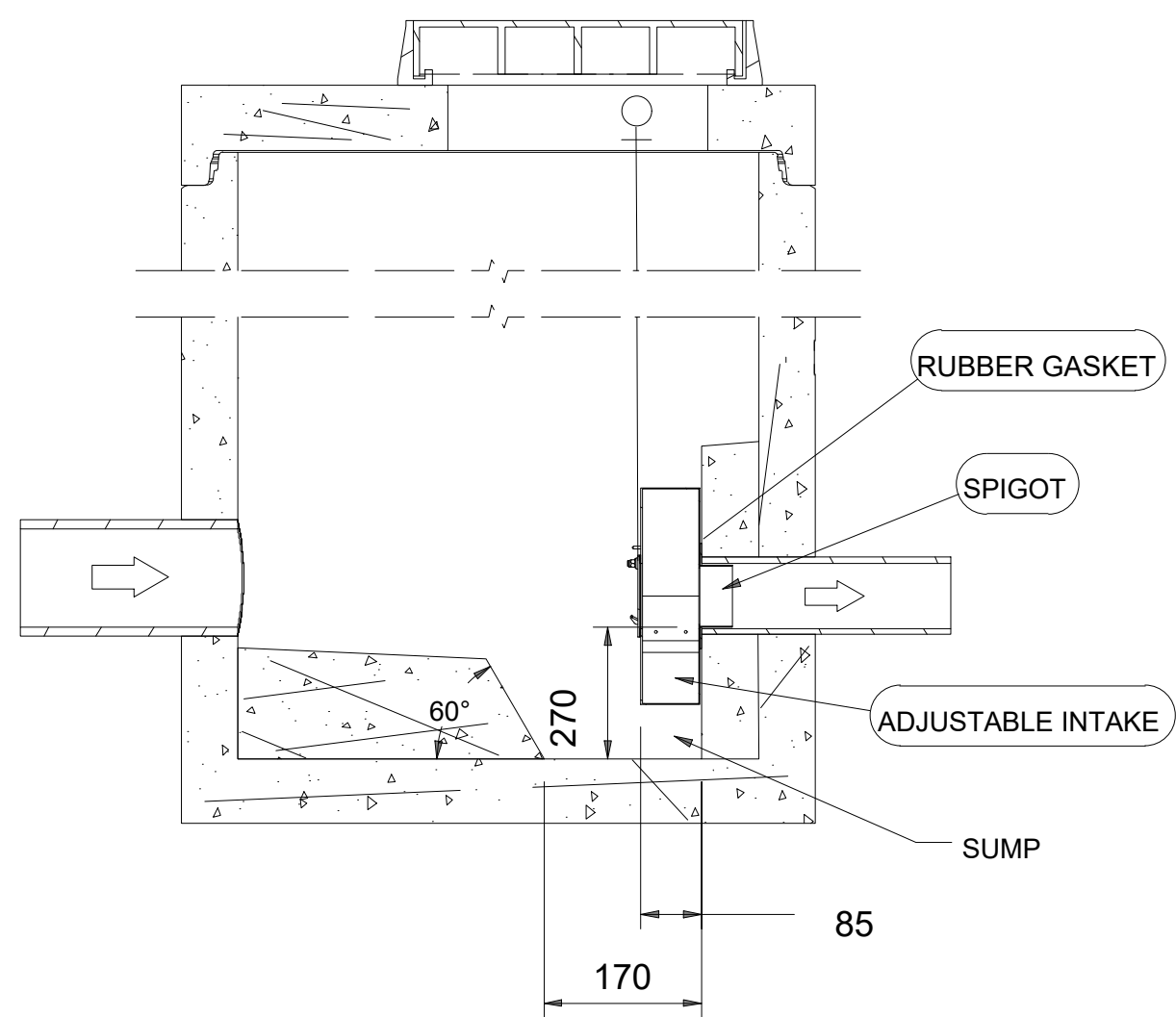
HYDROBRAKE CP1 FC DETAIL
Scale 1:20 @ A1



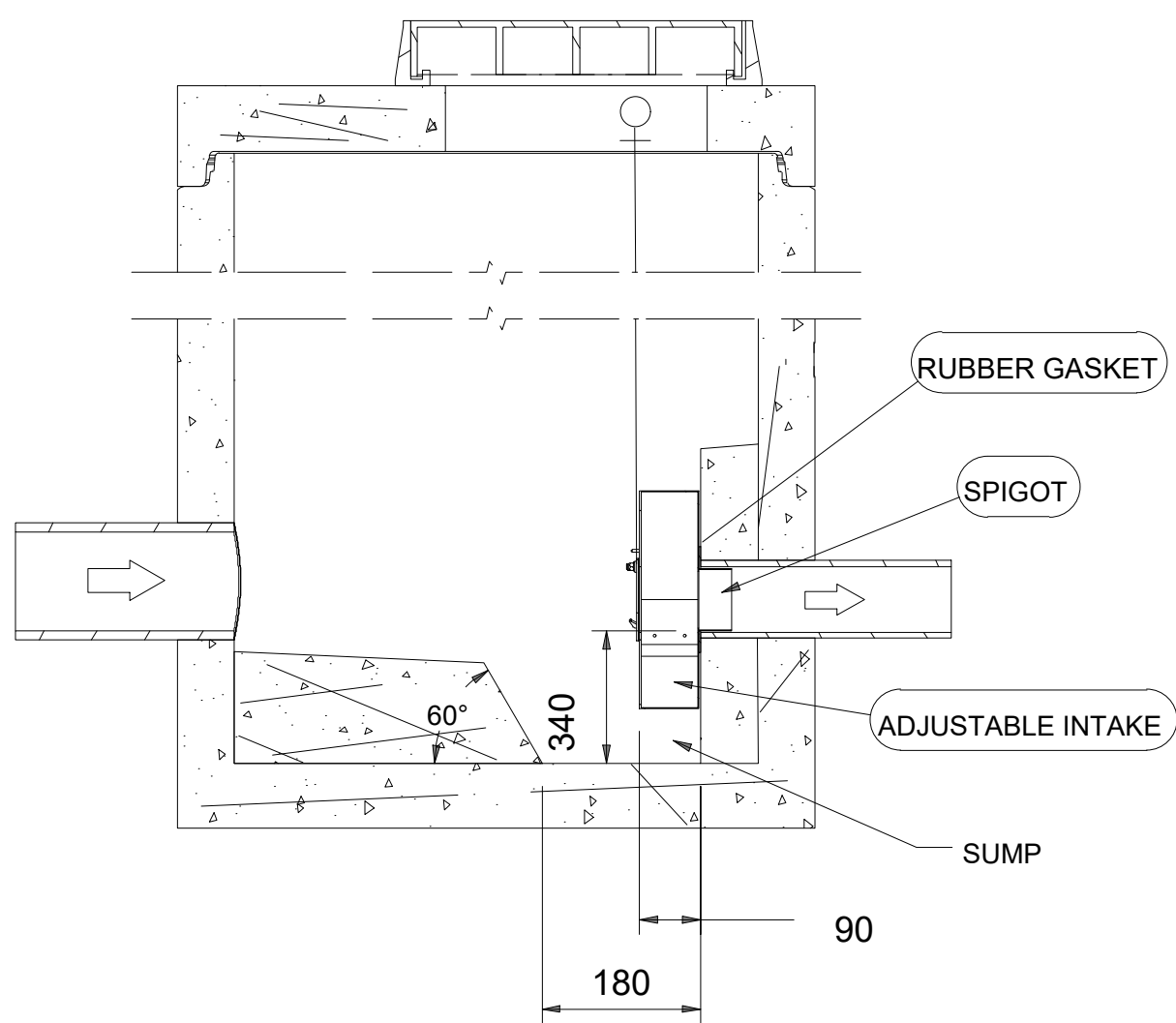
HYDROBRAKE CP2 FC DETAIL
Scale 1:20 @ A1



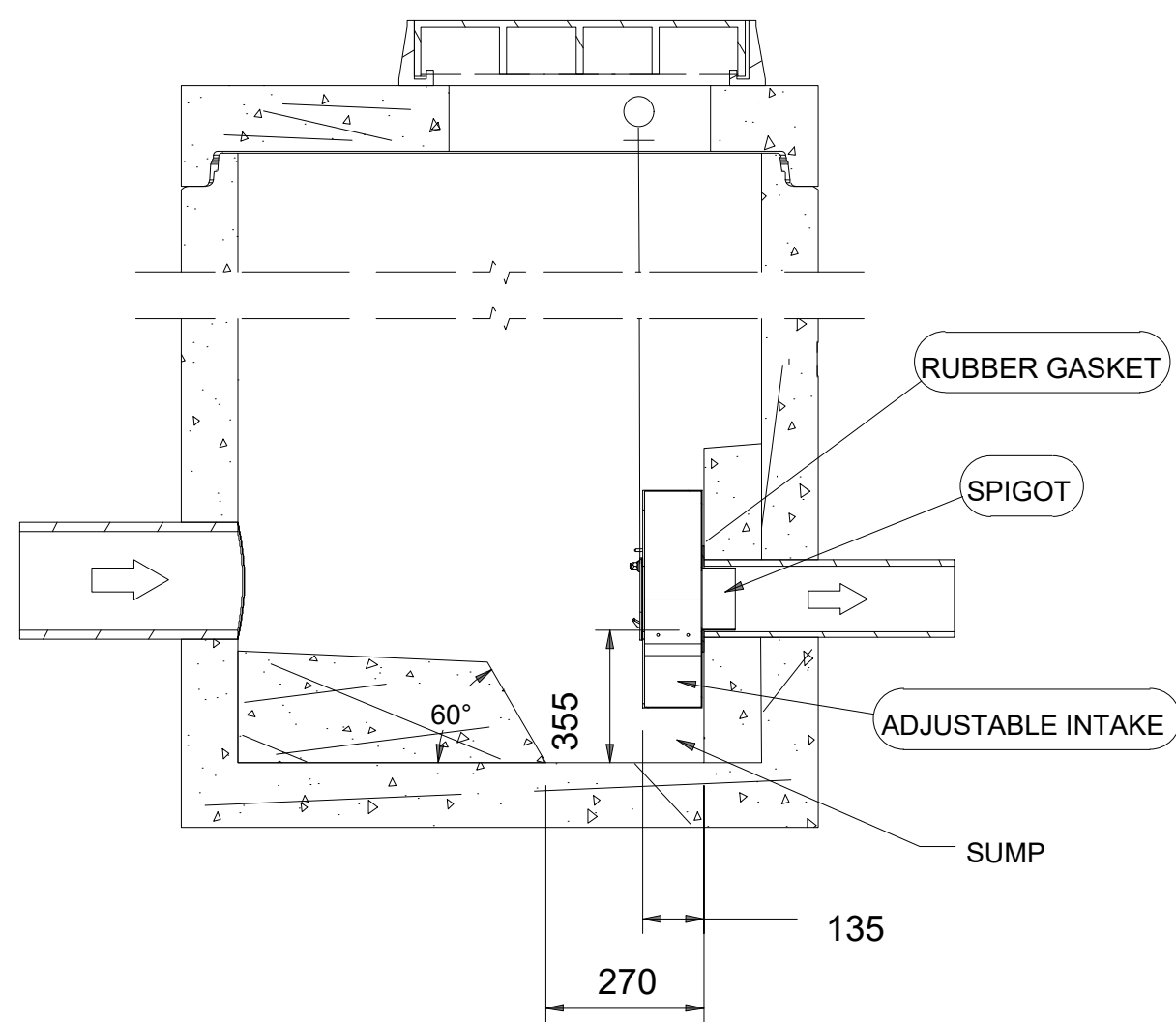
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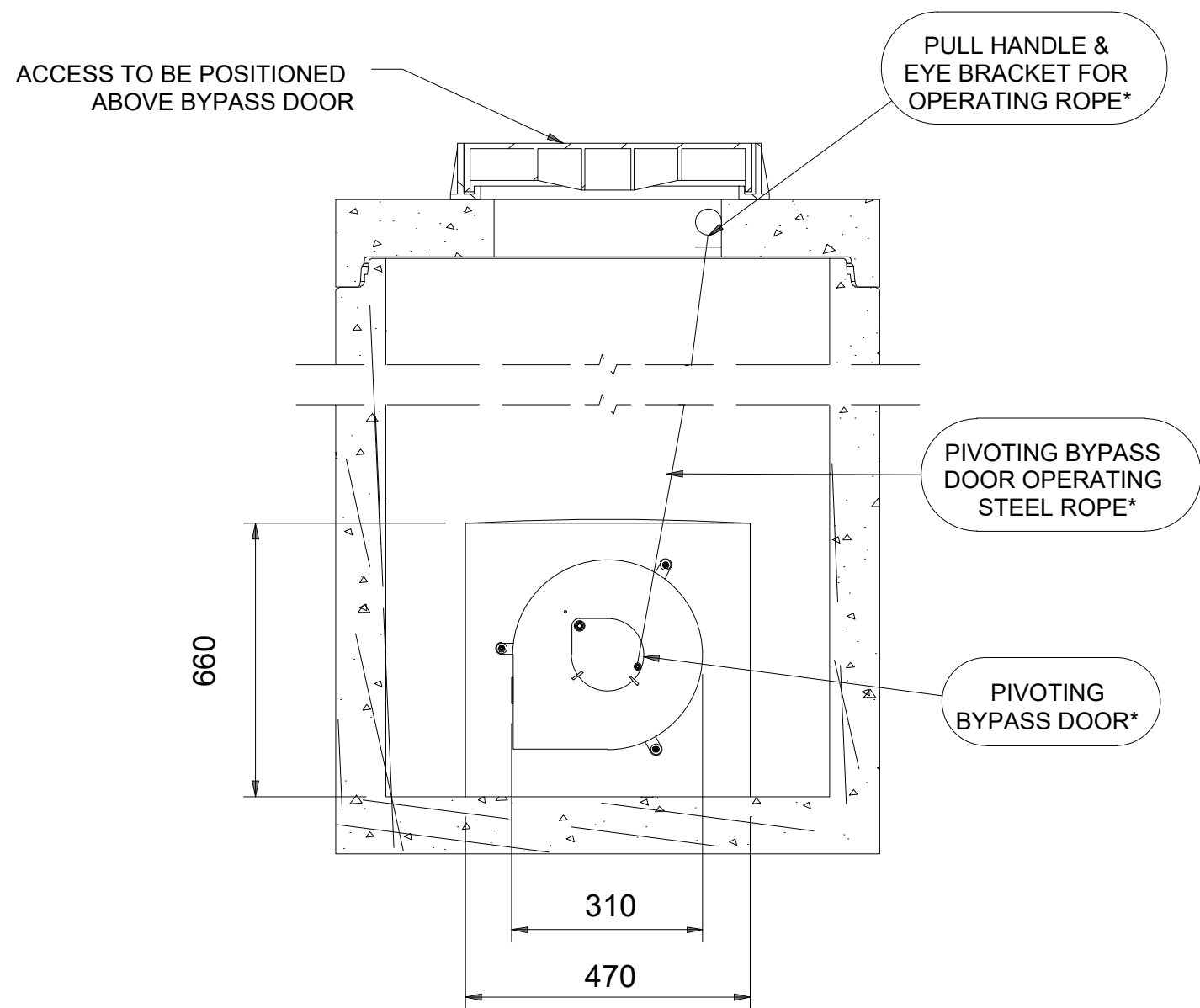
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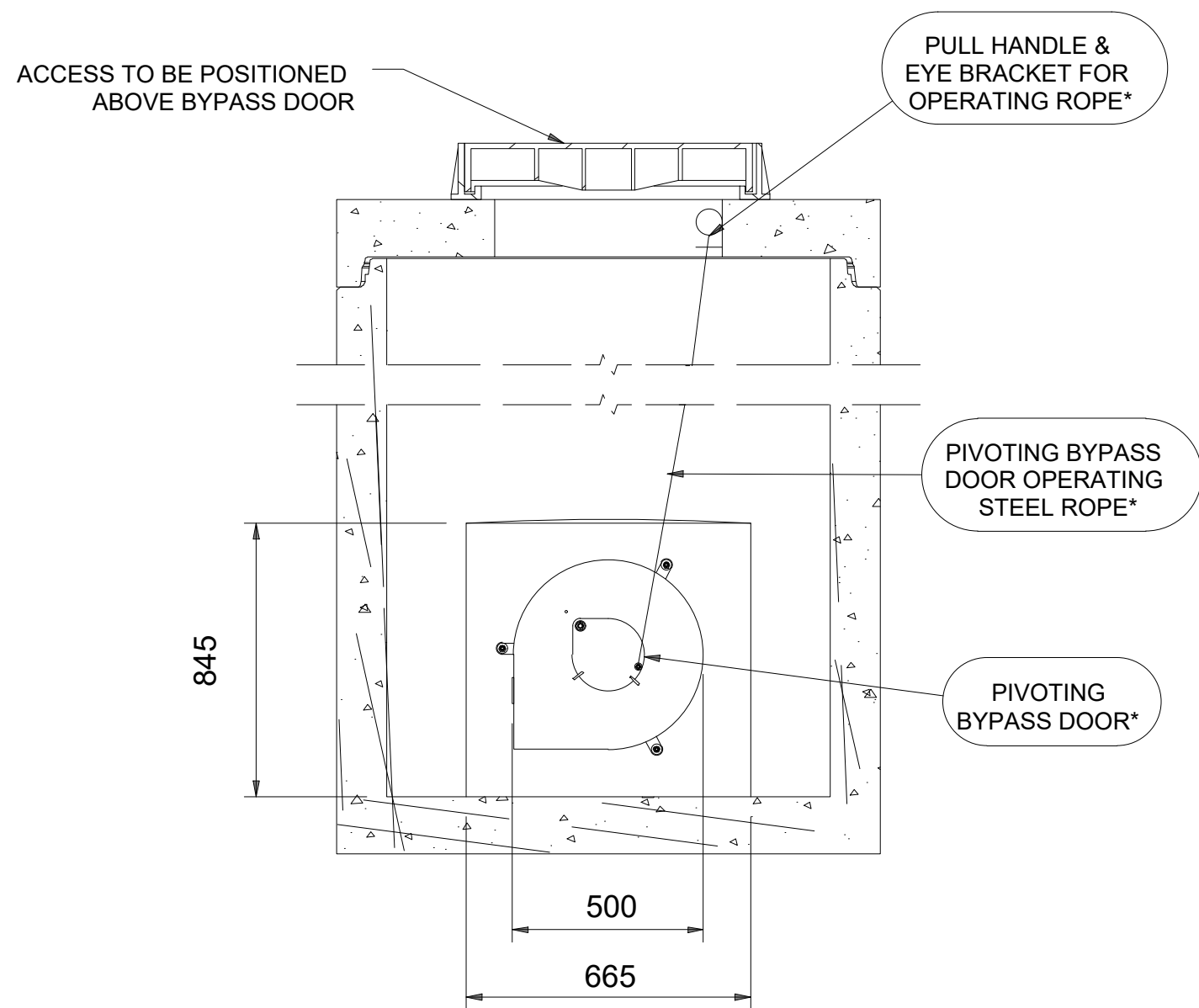
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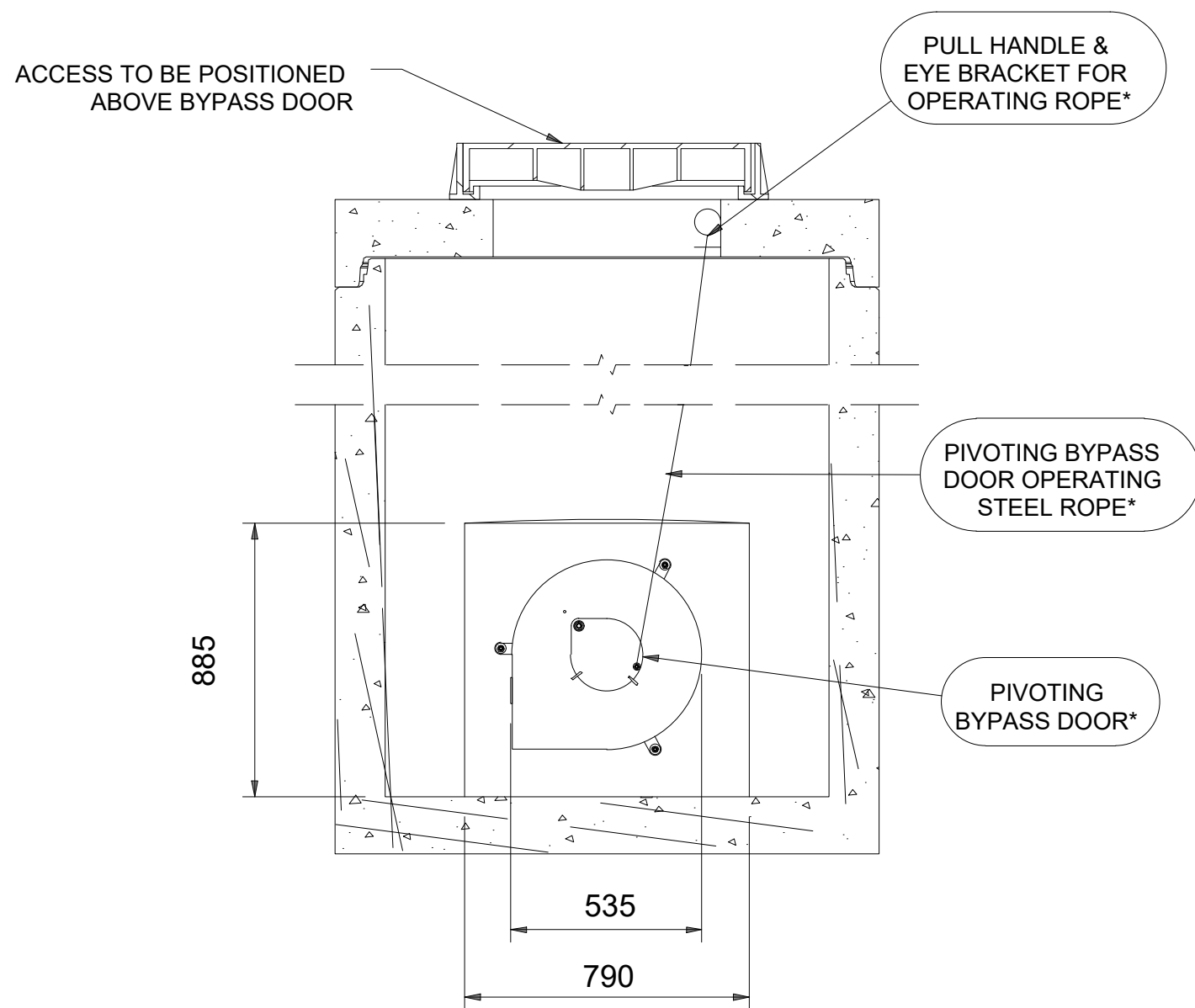
SECTION A-A



SECTION B-B



SECTION B-B



SECTION B-B

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 11. THIS DOCUMENT MUST NOT BE ALTERED, REPRODUCED OR DISTRIBUTED WITHOUT PRIOR WRITTEN CONSENT OF THE ORIGINATOR.
 12. THE CONTRACTOR WILL ASCERTAIN THE CBR VALUE OF THE SUBGRADE IN ORDER TO DETERMINE THE REQUIRED SUB-BASE / CAPPING THICKNESS. PRIOR TO LAYING ANY MATERIAL, THE SUBGRADE MUST BE INSPECTED AND ANY SOFT SPOTS REMOVED AND FILLED WITH 6F2 CAPPING MATERIAL.
 13. PRIOR TO THE CONSTRUCTION OF ANY DRAINAGE WORKS, THE CONTRACTOR IS TO CONFIRM THE INVERT LEVELS OF EXISTING MANHOLES, DRAINS AND SEWERS. ANY VARIATIONS FROM THE DESIGNED LEVELS SHOWN ON THE DRAWINGS MUST BE REPORTED TO THE DRAINAGE ENGINEER IN ADVANCE OF CONSTRUCTION WORKS COMMENCING. ALL NEW SEWERS AND DRAINS ARE TO BE LAID IN SEQUENCE STARTING FROM THE OUTFALL LOCATION.
 14. ALL DRAINAGE TO BE INSTALLED IN ACCORDANCE WITH RELEVANT BUILDING REGULATION DOCUMENTS AND CURRENT SEWAGE SECTOR GUIDANCE. CONNECTIONS TO PUBLIC SEWERS ARE TO BE AGREED AND INSPECTED BY THE WATER AUTHORITY.
 15. ALL DRAIN AND SEWER PIPES ARE Ø100MM AND LAID SOFFIT TO SOFFIT, UNLESS SHOWN OTHERWISE.
 16. INVERT TO BASE OF SOIL STACK BENDS TO BE 450MM BELOW LOWEST BRANCH CONNECTION FOR UP TO THREE STOREY BUILDINGS; FOR BUILDINGS UP TO FIVE STOREYS, THE INVERT TO THE BASE OF SOIL STACK BENDS SHOULD NOT BE LESS THAN 750MM. ALL FOUL AND SURFACE WATER DRAINAGE STACKS ARE TO HAVE ABOVE GROUND RODDING ACCESS. REFER TO ABOVE GROUND DRAINAGE LAYOUT(S) BY OTHERS.
 17. ALL BELOW GROUND CONNECTIONS ARE TO MATCH ABOVE GROUND OUTLET SIZE, MINIMUM Ø100MM. SVPS ARE TO PROJECT 100MM ABOVE FINISHED FLOOR LEVEL.
 18. ALL INTERNAL MANHOLES AND INSPECTION CHAMBERS TO HAVE DOUBLE SEALED RECESSED COVERS TO SUIT FLOOR FINISHES AS DEFINED BY THE ARCHITECT.
 19. ALL EXTERNAL COVERS IN NON-ASPHALT AREAS ARE TO HAVE RECESSED COVERS TO SUIT THE PAVING MATERIAL.

P01	Issued for information	27/03/2026	RCC	MT
REV	DESCRIPTION	DATE	BY	APP



CONSULTING CIVIL AND
STRUCTURAL ENGINEERS
TEL +44 (0) 1273 033680

QED PROJECT No.
25-564

CLIENT
**INTERNATIONAL ASSOCIATION OF
SCIENTOLOGISTS**

PROJECT
**JUHRING & HOBBS
SAINT HILL SITE 1&2
RH19 4JY**

TITLE
**PRIVATE DRAINAGE
CONSTRUCTION DETAILS
SHEET 3 OF 3**

DRAWN RCC	ENGINEER RCC	CHECKED BY MT	APPROVED BY MT
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DATE APPROVED /2026 SCALE @ A1 1:20

STATUS
S3 - Suitable for Review and Comment

DRAWING No. 25-649-QED-ZZ-XX-DR-C-0512	REVISION P01
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APPENDIX III – CALCULATIONS

Calculated by:

Kalvin Bassi

Site name:

Saint hills main car park

Site location:

rh19 4jy

Site Details

Latitude:

51.10764° N

Longitude:

0.03121° W

Reference:

2661284901

Date:

Jan 30 2025 15:54

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

Runoff estimation approach

IH124

Site characteristics

Total site area (ha):

2.49

Methodology

Q_{BAR} estimation method:

Calculate from SPR and SAAR

SPR estimation method:

Calculate from SOIL type

Notes

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

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

Soil characteristics

	Default	Edited
SOIL type:	4	5
HOST class:	N/A	N/A
SPR/SPRHOST:	0.47	0.53

(2) Are flow rates $< 5.0 \text{ l/s}$?

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

Hydrological characteristics

	Default	Edited
SAAR (mm):	846	846
Hydrological region:	7	7
Growth curve factor 1 year:	0.85	0.85
Growth curve factor 30 years:	2.3	2.3
Growth curve factor 100 years:	3.19	3.19
Growth curve factor 200 years:	3.74	3.74

(3) Is $\text{SPR/SPRHOST} \leq 0.3$?

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

Greenfield runoff rates

	Default	Edited
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Q_{BAR} (l/s):	15	19.47
1 in 1 year (l/s):	12.75	16.55
1 in 30 years (l/s):	34.51	44.79
1 in 100 year (l/s):	47.86	62.12
1 in 200 years (l/s):	56.12	72.83

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement , which can both be found at www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.

Nodes

	Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Depth (m)
✓	Formal CP 1	0.873	10.00	133.400		1.050
✓	CP1 FC Eastern			133.500	1350	1.188
✓	3			133.700	1350	1.527
✓	Attenuation 1	0.729	10.00	132.000		2.200
✓	CP2 FC Western			131.750	1350	2.027
✓	6			131.000	1350	1.390
✓	7			128.768	1350	1.050
✓	8			125.700	1350	1.050
✓	9			122.850	1350	1.050
✓	ATTENUATION 2	0.551	10.00	122.200		2.000
✓	11			122.500	1500	2.862
✓	12			121.400	1800	1.833
✓	MARQUEE PAD 14	1.739	10.00	124.400		1.050
✓	FC3 MARQUEE15			124.200	1350	1.148
✓	16			122.900	600	1.050
✓	FC4 Turning			122.500	1350	2.535

Links

	Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
✓	1.000	Formal CP 1	CP1 FC Eastern	15.227	0.600	132.350	132.312	0.038	400.7	450	10.25	50.0
✓	1.001	CP1 FC Eastern	3	56.360	0.600	132.312	132.173	0.139	405.5	450	11.19	50.0
?	1.002	3	6	79.761	0.600	132.173	129.950	2.223	35.9	450	11.58	50.0
?	2.000	Attenuation 1	CP2 FC Western	24.907	0.600	129.800	129.723	0.077	323.5	375	10.41	50.0
?	2.001	CP2 FC Western	6	12.323	0.600	129.723	129.685	0.038	324.3	375	10.62	50.0
?	1.003	6	7	22.210	0.600	129.610	127.718	1.892	11.7	450	11.64	50.0
?	1.004	7	8	36.509	0.600	127.718	124.650	3.068	11.9	450	11.74	50.0
?	1.005	8	9	55.316	0.600	124.650	121.800	2.850	19.4	450	11.94	50.0
?	1.006	9	11	14.510	0.600	121.800	121.450	0.350	41.5	450	12.02	50.0
✓	3.000	MARQUEE PAD 14	FC3 MARQUEE15	23.828	0.600	123.350	123.052	0.298	80.0	450	10.17	50.0
?	3.001	FC3 MARQUEE15	16	41.905	0.600	123.052	121.850	1.202	34.9	225	10.49	50.0
?	3.002	16	ATTENUATION 2	37.357	0.600	121.850	121.150	0.700	53.4	225	10.84	50.0
?	3.003	ATTENUATION 2	FC4 Turning	35.271	0.600	120.200	119.965	0.235	150.1	450	11.19	50.0
?	3.004	FC4 Turning	11	6.406	0.600	119.965	119.938	0.027	237.3	300	11.30	50.0

	Name	US Node	DS Node	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
	1.000	Formal CP 1	CP1 FC Eastern	1.009	160.5	118.3	0.600	0.738	0.873	0.0	288	1.099
	1.001	CP1 FC Eastern	3	1.003	159.6	118.3	0.738	1.077	0.873	0.0	290	1.095
	1.002	3	6	3.402	541.1	118.3	1.077	0.600	0.873	0.0	142	2.746
	2.000	Attenuation 1	CP2 FC Western	1.002	110.6	98.8	1.825	1.652	0.729	0.0	278	1.127
	2.001	CP2 FC Western	6	1.000	110.5	98.8	1.652	0.940	0.729	0.0	278	1.125
	1.003	6	7	5.958	947.6	217.1	0.940	0.600	1.602	0.0	145	4.872
	1.004	7	8	5.917	941.1	217.1	0.600	0.600	1.602	0.0	146	4.853
	1.005	8	9	4.630	736.4	217.1	0.600	0.600	1.602	0.0	167	4.049
	1.006	9	11	3.164	503.2	217.1	0.600	0.600	1.602	0.0	206	3.051
	3.000	MARQUEE PAD 14	FC3 MARQUEE15	2.275	361.8	235.7	0.600	0.698	1.739	0.0	265	2.415
	3.001	FC3 MARQUEE15	16	2.223	88.4	235.7	0.923	0.825	1.739	0.0	225	2.264
	3.002	16	ATTENUATION 2	1.794	71.3	235.7	0.825	0.825	1.739	0.0	225	1.827
	3.003	ATTENUATION 2	FC4 Turning	1.657	263.5	310.4	1.550	2.085	2.290	0.0	450	1.678
	3.004	FC4 Turning	11	1.016	71.8	310.4	2.235	2.262	2.290	0.0	300	1.029

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
? 1.007	11	12	7.061	0.600	119.638	119.567	0.071	99.4	600	12.07	50.0

Name	US Node	DS Node	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.007	11	12	2.442	690.4	527.5	2.262	1.233	3.892	0.0	395	2.676

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	15.227	400.7	450	Circular	133.400	132.350	0.600	133.500	132.312	0.738
1.001	56.360	405.5	450	Circular	133.500	132.312	0.738	133.700	132.173	1.077
1.002	79.761	35.9	450	Circular	133.700	132.173	1.077	131.000	129.950	0.600
2.000	24.907	323.5	375	Circular	132.000	129.800	1.825	131.750	129.723	1.652
2.001	12.323	324.3	375	Circular	131.750	129.723	1.652	131.000	129.685	0.940
1.003	22.210	11.7	450	Circular	131.000	129.610	0.940	128.768	127.718	0.600
1.004	36.509	11.9	450	Circular	128.768	127.718	0.600	125.700	124.650	0.600
1.005	55.316	19.4	450	Circular	125.700	124.650	0.600	122.850	121.800	0.600
1.006	14.510	41.5	450	Circular	122.850	121.800	0.600	122.500	121.450	0.600

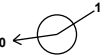
Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	Formal CP 1		Junction		CP1 FC Eastern	1350	Manhole	SW_HB
1.001	CP1 FC Eastern	1350	Manhole	SW_HB	3	1350	Manhole	SW_Standard
1.002	3	1350	Manhole	SW_Standard	6	1350	Manhole	SW_Standard
2.000	Attenuation 1		Junction		CP2 FC Western	1350	Manhole	SW_HB
2.001	CP2 FC Western	1350	Manhole	SW_HB	6	1350	Manhole	SW_Standard
1.003	6	1350	Manhole	SW_Standard	7	1350	Manhole	SW_Standard
1.004	7	1350	Manhole	SW_Standard	8	1350	Manhole	SW_Standard
1.005	8	1350	Manhole	SW_Standard	9	1350	Manhole	SW_Standard
1.006	9	1350	Manhole	SW_Standard	11	1500	Manhole	SW_Standard

Pipeline Schedule

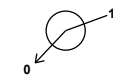
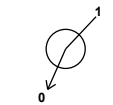
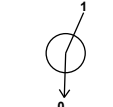
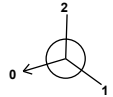
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
3.000	23.828	80.0	450	Circular	124.400	123.350	0.600	124.200	123.052	0.698
3.001	41.905	34.9	225	Circular	124.200	123.052	0.923	122.900	121.850	0.825
3.002	37.357	53.4	225	Circular	122.900	121.850	0.825	122.200	121.150	0.825
3.003	35.271	150.1	450	Circular	122.200	120.200	1.550	122.500	119.965	2.085
3.004	6.406	237.3	300	Circular	122.500	119.965	2.235	122.500	119.938	2.262
1.007	7.061	99.4	600	Circular	122.500	119.638	2.262	121.400	119.567	1.233

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
3.000	MARQUEE PAD 14		Junction		FC3 MARQUEE15	1350	Manhole	SW_Standard
3.001	FC3 MARQUEE15	1350	Manhole	SW_Standard	16	600	Manhole	SW_Standard
3.002	16	600	Manhole	SW_Standard	ATTENUATION 2		Junction	
3.003	ATTENUATION 2		Junction		FC4 Turning	1350	Manhole	SW_Standard
3.004	FC4 Turning	1350	Manhole	SW_Standard	11	1500	Manhole	SW_Standard
1.007	11	1500	Manhole	SW_Standard	12	1800	Manhole	SW_Standard

Manhole Schedule

Node	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
Formal CP 1	133.400	1.050					
CP1 FC Eastern	133.500	1.188	1350		0	1.000	132.350
					1	1.000	132.312
					0	1.001	132.312
3	133.700	1.527	1350		0	1.001	132.173
					1	1.001	132.173
					0	1.002	132.173

Manhole Schedule

Node	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
Attenuation 1	132.000	2.200						
				0	2.000	129.800	375	
CP2 FC Western	131.750	2.027	1350		1	2.000	129.723	375
				0	2.001	129.723	375	
6	131.000	1.390	1350		1	2.001	129.685	375
				2	1.002	129.950	450	
				0	1.003	129.610	450	
7	128.768	1.050	1350		1	1.003	127.718	450
				0	1.004	127.718	450	
8	125.700	1.050	1350		1	1.004	124.650	450
				0	1.005	124.650	450	
9	122.850	1.050	1350		1	1.005	121.800	450
				0	1.006	121.800	450	
ATTENUATION 2	122.200	2.000			1	3.002	121.150	225
				0	3.003	120.200	450	
11	122.500	2.862	1500		1	3.004	119.938	300
				2	1.006	121.450	450	
				0	1.007	119.638	600	

Manhole Schedule

Node	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
12	121.400	1.833	1800		1	1.007	119.567	600
MARQUEE PAD 14	124.400	1.050			0	3.000	123.350	450
FC3 MARQUEE15	124.200	1.148	1350		1	3.000	123.052	450
					0	3.001	123.052	225
16	122.900	1.050	600		1	3.001	121.850	225
					0	3.002	121.850	225
FC4 Turning	122.500	2.535	1350		1	3.003	119.965	450
					0	3.004	119.965	300

Simulation Settings

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

Storm Durations

15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440 | 2160

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)	Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0	30	40	0	0
2	40	0	0	100	0	0	0
30	0	0	0	100	40	0	0

Node CP1 FC Eastern Online Orifice Control

Flap Valve	x	Replaces Downstream Link	✓	Design Depth (m)	0.600	Diameter (m)	0.080
Downstream Link	1.001	Invert Level (m)	132.312	Design Flow (l/s)	10.0	Discharge Coefficient	0.600

Node CP1 FC Eastern Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	132.850	Product Number	CTL-SHE-0169-1300-0600-1300
Design Depth (m)	0.600	Min Outlet Diameter (m)	0.225
Design Flow (l/s)	13.0	Min Node Diameter (mm)	1200

Node CP2 FC Western Online Orifice Control

Flap Valve	x	Replaces Downstream Link	✓	Design Depth (m)	0.600	Diameter (m)	0.056
Downstream Link	2.001	Invert Level (m)	129.723	Design Flow (l/s)	5.0	Discharge Coefficient	0.600

Node CP2 FC Western Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	130.350	Product Number	CTL-SHE-0180-1500-0600-1500
Design Depth (m)	0.600	Min Outlet Diameter (m)	0.225
Design Flow (l/s)	15.0	Min Node Diameter (mm)	1200

Node FC4 Turning Online Orifice Control

Flap Valve	x	Replaces Downstream Link	✓	Design Depth (m)	0.650	Diameter (m)	0.085
Downstream Link	3.004	Invert Level (m)	119.965	Design Flow (l/s)	12.0	Discharge Coefficient	0.600

Node FC4 Turning Online Orifice Control

Flap Valve	x	Invert Level (m)	120.650	Design Flow (l/s)	14.2	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Design Depth (m)	0.620	Diameter (m)	0.094		

Node FC3 MARQUEE15 Online Orifice Control

Flap Valve	x	Replaces Downstream Link	✓	Design Depth (m)	1.000	Diameter (m)	0.069
Downstream Link	3.001	Invert Level (m)	123.052	Design Flow (l/s)	10.0	Discharge Coefficient	0.600

Node Formal CP 1 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Width (m)	21.000	Depth (m)	
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	132.350	Length (m)	100.000	Inf Depth (m)	
Safety Factor	2.0	Time to half empty (mins)	424	Slope (1:X)	999.0		

Node Attenuation 1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	129.800
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	536

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	600.0	0.0	0.900	600.0	0.0	0.901	0.0	0.0

Node ATTENUATION 2 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	120.200
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	392

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	400.0	0.0	0.909	400.0	0.0	0.910	0.0	0.0

Node MARQUEE PAD 14 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Width (m)	100.000	Depth (m)
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	123.350	Length (m)	100.000	Inf Depth (m)
Safety Factor	2.0	Time to half empty (mins)	1410	Slope (1:X)	999.0	

Other (defaults)

Entry Loss (manhole)	0.250	Entry Loss (junction)	0.000	Apply Recommended Losses	x
Exit Loss (manhole)	0.250	Exit Loss (junction)	0.000	Flood Risk (m)	0.300

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.58%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute summer	Formal CP 1	264	132.628	0.277	40.1	143.1724	0.0000	OK
360 minute summer	CP1 FC Eastern	264	132.627	0.315	7.0	0.4513	0.0000	OK
360 minute summer	3	264	132.209	0.036	7.0	0.0513	0.0000	OK
720 minute summer	Attenuation 1	510	130.064	0.264	21.1	150.3598	0.0000	OK
720 minute summer	CP2 FC Western	510	130.064	0.341	3.7	0.4876	0.0000	OK
480 minute summer	6	344	129.644	0.034	10.6	0.0485	0.0000	OK
480 minute summer	7	344	127.752	0.033	10.6	0.0479	0.0000	OK
480 minute summer	8	344	124.688	0.038	10.6	0.0537	0.0000	OK
480 minute summer	9	344	121.846	0.046	10.6	0.0664	0.0000	OK
480 minute summer	ATTENUATION 2	344	120.479	0.279	34.0	105.9043	0.0000	OK
480 minute summer	11	344	119.716	0.077	21.0	0.1369	0.0000	OK
480 minute summer	12	344	119.638	0.071	21.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
360 minute summer	Formal CP 1	1.000	CP1 FC Eastern	7.0	0.229	0.044	1.6844	
360 minute summer	CP1 FC Eastern	Orifice	3	7.0				
360 minute summer	CP1 FC Eastern	Hydro-Brake®	3	0.0				
360 minute summer	3	1.002	6	7.0	1.202	0.013	0.4652	
720 minute summer	Attenuation 1	2.000	CP2 FC Western	3.7	0.171	0.033	2.3422	
720 minute summer	CP2 FC Western	Orifice	6	3.7				
720 minute summer	CP2 FC Western	Hydro-Brake®	6	0.0				
480 minute summer	6	1.003	7	10.6	1.991	0.011	0.1185	
480 minute summer	7	1.004	8	10.6	1.841	0.011	0.2107	
480 minute summer	8	1.005	9	10.6	1.440	0.014	0.4100	
480 minute summer	9	1.006	11	10.6	1.271	0.021	0.1213	
480 minute summer	ATTENUATION 2	3.003	FC4 Turning	36.8	0.385	0.139	4.6124	
480 minute summer	11	1.007	12	21.0	1.056	0.030	0.1403	1160.7

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.58%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
480 minute winter	MARQUEE PAD 14	464	123.522	0.172	68.4	364.5334	0.0000	OK
600 minute winter	FC3 MARQUEE15	480	123.582	0.530	35.1	0.7577	0.0000	SURCHARGED
600 minute summer	16	510	121.897	0.047	6.9	0.0132	0.0000	OK
240 minute summer	FC4 Turning	152	120.485	0.520	40.0	0.7447	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
480 minute winter	MARQUEE PAD 14	3.000	FC3 MARQUEE15	34.7	0.377	0.096	2.5484	
600 minute winter	FC3 MARQUEE15	Orifice	16	7.0				
600 minute summer	16	3.002	ATTENUATION 2	6.7	1.132	0.094	0.2214	
240 minute summer	FC4 Turning	Orifice	11	10.4				
240 minute summer	FC4 Turning	Orifice	11	0.0				

Results for 2 year +40% CC Critical Storm Duration. Lowest mass balance: 99.58%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
480 minute summer	Formal CP 1	344	132.745	0.395	48.0	217.1385	0.0000	OK
480 minute summer	CP1 FC Eastern	344	132.745	0.433	8.4	0.6194	0.0000	OK
480 minute summer	3	344	132.212	0.039	8.4	0.0558	0.0000	OK
720 minute summer	Attenuation 1	540	130.192	0.392	29.6	223.5238	0.0000	SURCHARGED
720 minute summer	CP2 FC Western	540	130.192	0.469	4.3	0.6712	0.0000	SURCHARGED
480 minute summer	6	360	129.647	0.037	12.7	0.0527	0.0000	OK
480 minute summer	7	360	127.754	0.036	12.7	0.0519	0.0000	OK
480 minute summer	8	360	124.691	0.041	12.7	0.0583	0.0000	OK
480 minute summer	9	360	121.851	0.051	12.7	0.0724	0.0000	OK
600 minute summer	ATTENUATION 2	420	120.604	0.404	43.2	153.4748	0.0000	OK
480 minute summer	11	360	119.722	0.084	24.3	0.1478	0.0000	OK
480 minute summer	12	360	119.643	0.076	24.3	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
480 minute summer	Formal CP 1	1.000	CP1 FC Eastern	8.4	0.226	0.052	2.3141	
480 minute summer	CP1 FC Eastern	Orifice	3	8.4				
480 minute summer	CP1 FC Eastern	Hydro-Brake®	3	0.0				
480 minute summer	3	1.002	6	8.4	1.273	0.015	0.5250	
720 minute summer	Attenuation 1	2.000	CP2 FC Western	4.3	0.175	0.039	2.7472	
720 minute summer	CP2 FC Western	Orifice	6	4.3				
720 minute summer	CP2 FC Western	Hydro-Brake®	6	0.0				
480 minute summer	6	1.003	7	12.7	2.102	0.013	0.1338	
480 minute summer	7	1.004	8	12.7	1.950	0.013	0.2377	
480 minute summer	8	1.005	9	12.7	1.511	0.017	0.4645	
480 minute summer	9	1.006	11	12.7	1.338	0.025	0.1375	
600 minute summer	ATTENUATION 2	3.003	FC4 Turning	28.2	0.311	0.107	5.4390	
480 minute summer	11	1.007	12	24.3	1.101	0.035	0.1562	1589.1

Results for 2 year +40% CC Critical Storm Duration. Lowest mass balance: 99.58%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
720 minute winter	MARQUEE PAD 14	690	123.589	0.239	60.7	566.7402	0.0000	OK
720 minute winter	FC3 MARQUEE15	705	123.604	0.552	32.6	0.7905	0.0000	SURCHARGED
720 minute winter	16	660	121.898	0.048	7.2	0.0136	0.0000	OK
600 minute summer	FC4 Turning	420	120.603	0.638	28.2	0.9136	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
720 minute winter	MARQUEE PAD 14	3.000	FC3 MARQUEE15	32.6	0.336	0.090	2.9070	
720 minute winter	FC3 MARQUEE15	Orifice	16	7.2				
720 minute winter	16	3.002	ATTENUATION 2	7.1	1.151	0.099	0.2297	
600 minute summer	FC4 Turning	Orifice	11	11.6				
600 minute summer	FC4 Turning	Orifice	11	0.0				

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.59%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute winter	Formal CP 1	224	132.915	0.565	75.1	323.9622	0.0000	SURCHARGED
240 minute winter	CP1 FC Eastern	224	132.914	0.602	12.8	0.8619	0.0000	SURCHARGED
240 minute winter	3	224	132.221	0.048	12.8	0.0682	0.0000	OK
480 minute winter	Attenuation 1	456	130.370	0.569	37.2	324.6096	0.0000	SURCHARGED
480 minute winter	CP2 FC Western	456	130.369	0.646	5.4	0.9248	0.0000	SURCHARGED
240 minute winter	6	228	129.653	0.043	17.8	0.0621	0.0000	OK
240 minute winter	7	228	127.761	0.043	17.8	0.0610	0.0000	OK
240 minute winter	8	228	124.698	0.048	17.8	0.0685	0.0000	OK
240 minute winter	9	228	121.860	0.060	17.8	0.0858	0.0000	OK
360 minute winter	ATTENUATION 2	272	120.751	0.551	48.4	209.3851	0.0000	SURCHARGED
360 minute winter	11	280	119.739	0.101	35.0	0.1790	0.0000	OK
360 minute winter	12	280	119.657	0.090	35.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
240 minute winter	Formal CP 1	1.000	CP1 FC Eastern	12.8	0.248	0.080	2.4126	
240 minute winter	CP1 FC Eastern	Orifice	3	10.0				
240 minute winter	CP1 FC Eastern	Hydro-Brake®	3	2.8				
240 minute winter	3	1.002	6	12.8	1.442	0.024	0.7076	
480 minute winter	Attenuation 1	2.000	CP2 FC Western	5.4	0.188	0.049	2.7472	
480 minute winter	CP2 FC Western	Orifice	6	5.1				
480 minute winter	CP2 FC Western	Hydro-Brake®	6	0.3				
240 minute winter	6	1.003	7	17.8	2.327	0.019	0.1702	
240 minute winter	7	1.004	8	17.8	2.157	0.019	0.3018	
240 minute winter	8	1.005	9	17.8	1.665	0.024	0.5937	
240 minute winter	9	1.006	11	17.8	1.475	0.035	0.1755	
360 minute winter	ATTENUATION 2	3.003	FC4 Turning	31.6	0.374	0.120	5.5885	
360 minute winter	11	1.007	12	35.0	1.212	0.051	0.2040	1861.2

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.59%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
720 minute winter	MARQUEE PAD 14	705	123.681	0.331	81.2	843.0524	0.0000	OK
720 minute winter	FC3 MARQUEE15	705	123.681	0.629	34.3	0.9004	0.0000	SURCHARGED
720 minute winter	16	705	121.900	0.050	7.7	0.0141	0.0000	OK
360 minute winter	FC4 Turning	272	120.750	0.785	31.6	1.1231	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
720 minute winter	MARQUEE PAD 14	3.000	FC3 MARQUEE15	34.3	0.330	0.095	3.3780	
720 minute winter	FC3 MARQUEE15	Orifice	16	7.7				
720 minute winter	16	3.002	ATTENUATION 2	7.7	1.178	0.107	0.2430	
360 minute winter	FC4 Turning	Orifice	11	13.0				
360 minute winter	FC4 Turning	Orifice	11	4.2				

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.68%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute winter	Formal CP 1	188	133.088	0.738	105.1	433.4201	0.0000	SURCHARGED
240 minute winter	CP1 FC Eastern	188	133.087	0.775	24.4	1.1094	0.0000	SURCHARGED
240 minute winter	3	188	132.238	0.065	24.4	0.0930	0.0000	OK
480 minute winter	Attenuation 1	344	130.514	0.714	52.1	407.0516	0.0000	SURCHARGED
480 minute winter	CP2 FC Western	344	130.512	0.789	18.6	1.1284	0.0000	SURCHARGED
360 minute winter	6	272	129.677	0.067	42.9	0.0956	0.0000	OK
360 minute winter	7	272	127.783	0.065	42.9	0.0925	0.0000	OK
360 minute winter	8	272	124.723	0.073	42.9	0.1042	0.0000	OK
360 minute winter	9	272	121.895	0.094	42.9	0.1352	0.0000	OK
360 minute summer	ATTENUATION 2	248	120.941	0.741	78.2	281.5094	0.0000	SURCHARGED
360 minute winter	11	272	119.781	0.143	66.4	0.2526	0.0000	OK
360 minute winter	12	272	119.690	0.123	66.4	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
240 minute winter	Formal CP 1	1.000	CP1 FC Eastern	24.4	0.263	0.152	2.4126	
240 minute winter	CP1 FC Eastern	Orifice	3	11.5				
240 minute winter	CP1 FC Eastern	Hydro-Brake®	3	13.0				
240 minute winter	3	1.002	6	24.4	1.750	0.045	1.1134	
480 minute winter	Attenuation 1	2.000	CP2 FC Western	18.6	0.191	0.168	2.7472	
480 minute winter	CP2 FC Western	Orifice	6	5.7				
480 minute winter	CP2 FC Western	Hydro-Brake®	6	12.9				
360 minute winter	6	1.003	7	42.9	3.002	0.045	0.3175	
360 minute winter	7	1.004	8	42.9	2.818	0.046	0.5573	
360 minute winter	8	1.005	9	42.9	2.118	0.058	1.1259	
360 minute winter	9	1.006	11	42.9	1.875	0.085	0.3322	
360 minute summer	ATTENUATION 2	3.003	FC4 Turning	37.3	0.405	0.142	5.5885	
360 minute winter	11	1.007	12	66.4	1.432	0.096	0.3279	2383.3

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.68%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
960 minute winter	MARQUEE PAD 14	930	123.826	0.476	73.3	1276.0550	0.0000	SURCHARGED
960 minute winter	FC3 MARQUEE15	930	123.826	0.773	36.2	1.1069	0.0000	SURCHARGED
960 minute winter	16	930	121.903	0.053	8.5	0.0149	0.0000	OK
360 minute summer	FC4 Turning	248	120.939	0.974	37.3	1.3932	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
960 minute winter	MARQUEE PAD 14	3.000	FC3 MARQUEE15	36.2	0.356	0.100	3.7754	
960 minute winter	FC3 MARQUEE15	Orifice	16	8.5				
960 minute winter	16	3.002	ATTENUATION 2	8.5	1.215	0.120	0.2627	
360 minute summer	FC4 Turning	Orifice	11	14.6				
360 minute summer	FC4 Turning	Orifice	11	9.1				

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.67%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute winter	Formal CP 1	188	133.015	0.665	93.3	386.9930	0.0000	SURCHARGED
240 minute winter	CP1 FC Eastern	188	133.014	0.702	22.8	1.0041	0.0000	SURCHARGED
240 minute winter	3	188	132.236	0.063	22.8	0.0900	0.0000	OK
960 minute summer	Attenuation 1	615	130.466	0.666	42.0	379.3461	0.0000	SURCHARGED
960 minute summer	CP2 FC Western	615	130.464	0.741	13.4	1.0606	0.0000	SURCHARGED
480 minute winter	6	352	129.670	0.060	35.0	0.0864	0.0000	OK
480 minute winter	7	352	127.777	0.059	35.0	0.0839	0.0000	OK
480 minute winter	8	352	124.716	0.066	35.0	0.0943	0.0000	OK
480 minute winter	9	352	121.885	0.085	35.0	0.1213	0.0000	OK
480 minute summer	ATTENUATION 2	320	120.863	0.663	59.8	251.9986	0.0000	SURCHARGED
480 minute summer	11	328	119.769	0.131	56.2	0.2308	0.0000	OK
480 minute summer	12	328	119.681	0.114	56.2	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
240 minute winter	Formal CP 1	1.000	CP1 FC Eastern	22.8	0.257	0.142	2.4126	
240 minute winter	CP1 FC Eastern	Orifice	3	10.9				
240 minute winter	CP1 FC Eastern	Hydro-Brake®	3	12.0				
240 minute winter	3	1.002	6	22.8	1.715	0.042	1.0612	
960 minute summer	Attenuation 1	2.000	CP2 FC Western	13.4	0.177	0.121	2.7472	
960 minute summer	CP2 FC Western	Orifice	6	5.5				
960 minute summer	CP2 FC Western	Hydro-Brake®	6	7.9				
480 minute winter	6	1.003	7	35.0	2.833	0.037	0.2742	
480 minute winter	7	1.004	8	35.0	2.646	0.037	0.4826	
480 minute winter	8	1.005	9	35.0	2.006	0.047	0.9685	
480 minute winter	9	1.006	11	35.0	1.774	0.069	0.2860	
480 minute summer	ATTENUATION 2	3.003	FC4 Turning	36.9	0.434	0.140	5.5885	
480 minute summer	11	1.007	12	56.2	1.372	0.081	0.2899	2341.5

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.67%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
960 minute winter	MARQUEE PAD 14	930	123.779	0.429	69.1	1137.1870	0.0000	OK
960 minute winter	FC3 MARQUEE15	930	123.779	0.727	36.3	1.0406	0.0000	SURCHARGED
960 minute winter	16	930	121.902	0.052	8.3	0.0147	0.0000	OK
480 minute summer	FC4 Turning	320	120.861	0.896	36.9	1.2827	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
960 minute winter	MARQUEE PAD 14	3.000	FC3 MARQUEE15	36.3	0.371	0.100	3.7449	
960 minute winter	FC3 MARQUEE15	Orifice	16	8.3				
960 minute winter	16	3.002	ATTENUATION 2	8.3	1.204	0.116	0.2567	
480 minute summer	FC4 Turning	Orifice	11	13.9				
480 minute summer	FC4 Turning	Orifice	11	7.5				

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.74%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute summer	Formal CP 1	264	133.278	0.927	139.3	552.4974	0.0000	FLOOD RISK
360 minute summer	CP1 FC Eastern	264	133.276	0.964	25.2	1.3798	0.0000	FLOOD RISK
120 minute summer	3	122	132.239	0.066	25.1	0.0942	0.0000	OK
480 minute summer	Attenuation 1	328	130.669	0.869	97.7	495.2475	0.0000	SURCHARGED
480 minute summer	CP2 FC Western	328	130.666	0.943	21.2	1.3488	0.0000	SURCHARGED
720 minute summer	6	450	129.679	0.069	46.2	0.0993	0.0000	OK
720 minute summer	7	450	127.785	0.067	46.2	0.0959	0.0000	OK
720 minute summer	8	450	124.726	0.075	46.2	0.1080	0.0000	OK
720 minute summer	9	450	121.898	0.098	46.2	0.1407	0.0000	OK
480 minute summer	ATTENUATION 2	312	121.268	1.068	81.4	345.6100	0.0000	SURCHARGED
480 minute summer	11	312	119.793	0.155	77.0	0.2739	0.0000	OK
480 minute summer	12	312	119.700	0.133	77.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
360 minute summer	Formal CP 1	1.000	CP1 FC Eastern	25.2	0.245	0.157	2.4126	
360 minute summer	CP1 FC Eastern	Orifice	3	12.8				
360 minute summer	CP1 FC Eastern	Hydro-Brake®	3	13.0				
120 minute summer	3	1.002	6	25.1	1.764	0.046	1.1339	
480 minute summer	Attenuation 1	2.000	CP2 FC Western	21.2	0.200	0.192	2.7472	
480 minute summer	CP2 FC Western	Orifice	6	6.3				
480 minute summer	CP2 FC Western	Hydro-Brake®	6	15.0				
720 minute summer	6	1.003	7	46.2	3.067	0.049	0.3348	
720 minute summer	7	1.004	8	46.2	2.878	0.049	0.5872	
720 minute summer	8	1.005	9	46.2	2.159	0.063	1.1896	
720 minute summer	9	1.006	11	46.2	1.912	0.092	0.3508	
480 minute summer	ATTENUATION 2	3.003	FC4 Turning	37.3	0.416	0.141	5.5885	
480 minute summer	11	1.007	12	77.0	1.488	0.112	0.3661	3027.1

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.74%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute winter	MARQUEE PAD 14	1380	123.985	0.634	69.1	1752.0850	0.0000	SURCHARGED
1440 minute winter	FC3 MARQUEE15	1380	123.984	0.932	36.4	1.3340	0.0000	FLOOD RISK
1440 minute winter	16	1380	121.906	0.055	9.4	0.0157	0.0000	OK
480 minute summer	FC4 Turning	312	121.264	1.299	37.3	1.8585	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
1440 minute winter	MARQUEE PAD 14	3.000	FC3 MARQUEE15	36.4	0.372	0.101	3.7754	
1440 minute winter	FC3 MARQUEE15	Orifice	16	9.4				
1440 minute winter	16	3.002	ATTENUATION 2	9.4	1.249	0.132	0.2816	
480 minute summer	FC4 Turning	Orifice	11	16.9				
480 minute summer	FC4 Turning	Orifice	11	13.9				



APPENDIX IV – FLOOD MAP PLANNING

Flood map for planning

Your reference
Unspecified

Location (easting/northing)
537975/135894

Created
30 March 2026 18:58

Your selected location is in flood zone 1, an area with a low probability of flooding.

You will need to do a flood risk assessment if your site is **any of the following**:

- bigger than 1 hectare (ha)
- in an area with critical drainage problems as notified by the Environment Agency
- identified as being at increased flood risk in future by the local authority's strategic flood risk assessment
- at risk from other sources of flooding (such as surface water or reservoirs) and its development would increase the vulnerability of its use (such as constructing an office on an undeveloped site or converting a shop to a dwelling)

Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

Flood risk data is covered by the Open Government Licence which sets out the terms and conditions for using government data. <https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3>

Use of the address and mapping data is subject to Ordnance Survey public viewing terms under Crown copyright and database rights 2026 AC0000807064. <https://flood-map-for-planning.service.gov.uk/os-terms>



Flood map for planning

Your reference

Unspecified

Location (easting/northing)

537975/135894

Scale

1:2,500

Created

30 Mar 2026 18:59

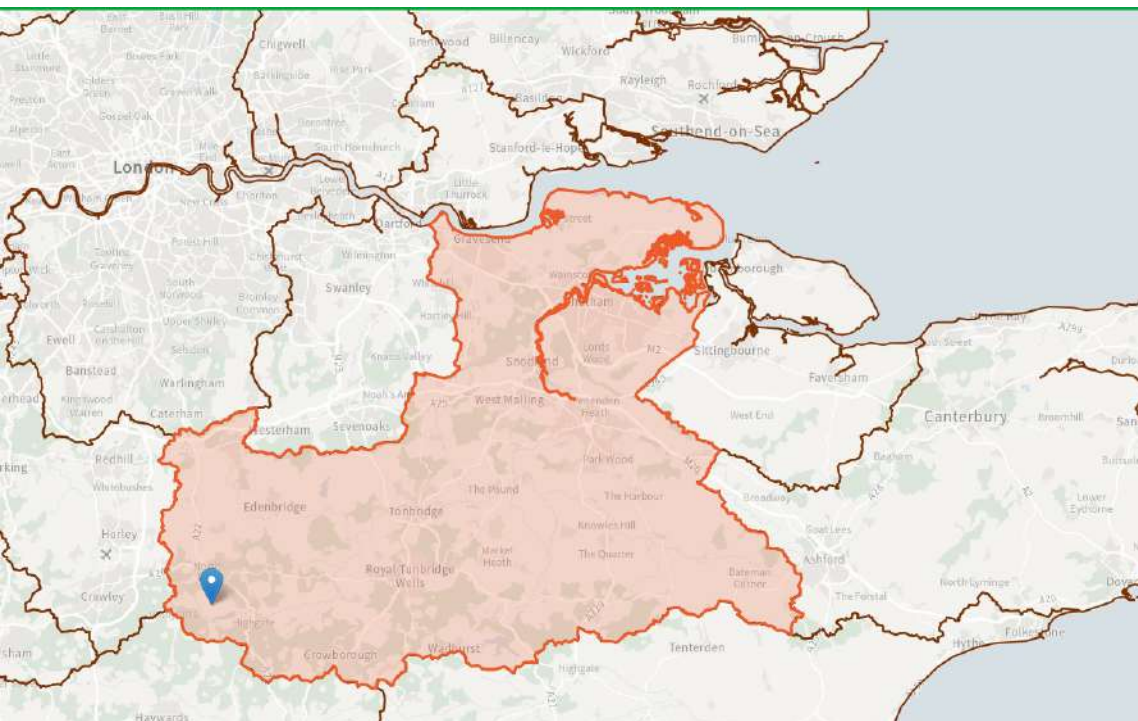
-  Selected area
-  Flood zone 3
-  Flood zone 2
-  Flood zone 1
-  Flood defence
-  Main river
-  Water storage area



0 20 40 60m



APPENDIX V – CLIMATE CHANGE ALLOWANCE



Medway Management Catchment peak river flow allowances			
	Central	Higher	Upper
2020s	14%	19%	29%
2060s	15%	21%	37%
2080s	27%	37%	62%

This map contains information generated by [UK Centre for Ecology and Hydrology](#) using UK Climate projections.



APPENDIX VI – GROUND INVESTIGATION

soiltechnics

environmental • geotechnical • building fabric

Ground Investigation Report

Proposed Development

Saint Hill Road, East Grinstead

November 2024



Project Details

Site: Saint Hill Road, East Grinstead
Document Title: Ground Investigation Report
Document no.: STW6679-R01-Rev_A
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Document history and status

Revision	Date	Description	Author	Checker	Reviewer
A	November 2024	DRAFT Issue – Pending outstanding sulphate testing.	SH	GL	ID



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Appendix J	Geoenvironmental Laboratory Test Results
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Appendix L	Waste Characterisation Analysis
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Drawing Register

Title	Produced by	Date	Reference
Proposed Juhring Field Plans	Carnegie Architecture	April 2024	1093-004-H
Area 1, 2 and 3 briefing	Carnegie Architecture	July 2024	1093-SK50-A
Exploratory Hole Location Plan	Soiltechnics	November 2024	STW6679-D01

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1 Introduction

1.1 Scheme Outline

1.1.1 It is understood that the proposed development comprises several different aspects. They are summarised below.

- Juhring Field – This field is located at the northern extent of the site and will comprise the construction of a permanent asphalt surfaced car park with a toilet block in the west and a new road providing access to an events field to the southwest.
- Area 1 – This area comprises Hobbs Field which is used for events and was occupied by temporary tent structures at the time of investigation. It is understood that proposals include an access road and turning circle to connect the field with the proposed Juhring Field carpark to the north. A crane pad, washroom, substation and backup generator are also proposed to the southeast of the area.
- Area 2 – This area consists of the existing castle buildings. There are two proposed extensions to the castle, one to the west and one to the north. The extensions are understood to include basements.
- Area 3 – This area is located in the southeast of the site and proposed development includes two washrooms.

1.1.2 The report is based on the project proposals and information outlined above; should the scheme change then it will be necessary to review the conclusions and recommendations presented in this report.

1.2 Brief

1.2.1 This report has been prepared following instructions received from our Client, Carnegie Group. The overall brief of works is to:

- i) Undertake a ground investigation at the site to establish the prevailing ground conditions and identify potential abnormal development constraints in areas of proposed structures.
- ii) Determine the CBR value of near surface deposits in Juhring Field to enable road and hardstanding design.
- iii) Undertake laboratory testing of Topsoil deposits in Juhring Field to assess its suitability for reuse.
- iv) Determine geotechnical parameters and provide a geotechnical appraisal for all proposed building structures.
- v) Provide a working platform specification for the proposed crane pad, providing the crane leg loads can be provided.
- vi) Undertake infiltration testing to inform drainage design.
- vii) Assess potential contamination onsite to inform the waste classification of any Made Ground on site.

1.3 Definition of Scope

1.3.1 The phasing and scope of the ground investigation works is broadly defined by the following documents.

Title	Document Reference	Publisher	Investigation Scope
Code of practice for ground investigations	BS 5930: 2015	British Standards Institution	Phase 2: Preliminary investigation
Eurocode 7 — Geotechnical design Part 2: Ground investigation and Testing	BS EN 1997-2: 2007	British Standards Institution	Preliminary Investigation

Table 1-A: Definition of investigation scope

1.4 Limitations

1.4.1 Soiltechnics disclaims any responsibility to our Client and others in respect of any matters outside the scope of this report. This report has been prepared with reasonable skill, care and diligence in accordance with the terms of our contract, taking account of the resources, investigations and testing devoted to it by agreement with our Client. This report is confidential to our Client and Soiltechnics accepts no responsibility of whatsoever nature to third parties to whom this report or any part thereof is made known. Any such party relies upon the report at their own risk.

2 Site Description

- 2.1.1
- The proposed development lies 1.2km southwest from East Grinstead. The post code for the site is RH19 4JY, and the site is accessed from Saint Hill Road which lies adjacent to the site’s northeastern boundary.
- 2.1.2
- An aerial image showing the site and approximate development area boundaries is presented below, followed by a table summarising the key site features. A Site Plan is provided within Appendix A.

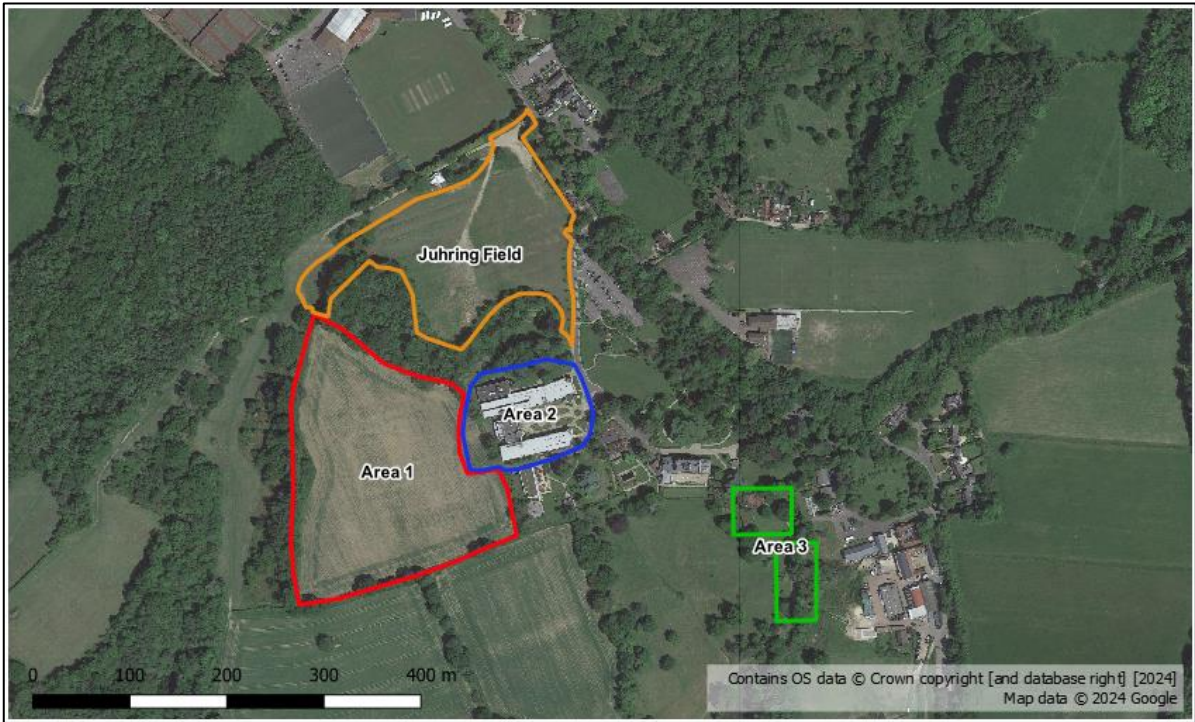


Figure 2-A: Aerial photograph and development areas boundaries.

Theme	Feature
Current site use	The site is currently occupied by The Church of Scientology and comprises Juhring Field and Hobbs Field to the north and west, which are both undeveloped open fields. Existing castle buildings are present in the centre of the site which include areas of soft landscaping and hardstanding. Saint Hill Manor is present in the east of the site with an additional open field to the southeast. At the time of the investigation, a large temporary tent structure was present in Hobbs Field.
Topography	The topography of the site and surrounding area generally falls to the south.
Vegetation	Mature trees are present at along the west and south boundaries of the Hobbs field and northern boundary between the Juhring field. Two mature trees are present in the north and west of Area 2, within close proximity to the castle. Mature trees are also present throughout Area 3. All trees are approximately between 7m and 15m in height.

Table 2-A: Site description

3 Ground Investigation

3.1 Objectives

- 3.1.1 The ground investigation scope and location of exploratory holes was determined by Soiltechnics Ltd, based upon our overall brief outlined in Section 1.
- 3.1.2 The objectives of the fieldwork were to:
- i) Establish ground and groundwater conditions at the site.
 - ii) Obtain samples for subsequent laboratory testing.
 - iii) Prove existing foundation arrangements.

3.2 Fieldwork Summary

- 3.2.1 Fieldwork was undertaken between 1st and 4th October 2024.
- 3.2.2 A summary of the works completed is set out in the table below, along with the location of the exploratory logs. Photographic records of the trial pits and rock cores are presented in Appendix E, and the exploratory hole location plan is presented within Appendix A.

Exploratory Hole Logs	Method	Qty	Final Depth Range (m bgl)	Comments
Appendix B	Hand Pits	9	0.30 – 0.40	HP01 to HP09 Terminated at scheduled depth.
Appendix B	Machine-excavated trial pits	8	1.00 – 4.00	TP03 to TP10 Trial pits terminated at scheduled depth.
Appendix C	Dynamic windowless sampling boreholes	8	1.38 - 2.44	WLS01 to WLS08 Boreholes terminated due to refusal in Sandstone.
Appendix C	Rotary boreholes	2	10.2-15.5	BH01 and BH02 Boreholes terminated at scheduled depth.
Appendix D	Foundation Pit	1	1.30	TP01 Trial pit terminated at practical working limit of hand excavation. Base depth of foundation not proven.
		2	0.08-0.50	TP02 and TP11 Trial pits terminated due to obstructions which prevented further excavation.
		1	1.20	TP12 Trial pits terminated upon proving base of foundation.

Table 3-A: Summary of fieldwork undertaken

- 3.2.3 All soils encountered were described in accordance with BS EN ISO 14688 “Identification and Classification of soil”. Rock was described in accordance with BS EN ISO 14689 “Identification and classification of rock”.

3.3 Unexploded Ordnance (UXO)

- 3.3.1 The site was assessed to have a low risk of encountering UXO and were supervised by a site engineer who has had UXO awareness training.
- 3.3.2 No items of suspected UXO were observed.

3.4 Underground Infrastructure

- 3.4.1 Copies of all utility plans obtained are presented as Appendix M. The plans are provided for information only and should not be relied upon to be accurate. In addition, it is worth noting that the public utility plans provided by the asset owners typically exclude private service runs.
- 3.4.2 The plans show many services crossing the site, including but not limited to BT Internet, UK Power Networks, Southern Water.

3.5 Sampling

- 3.5.1 During the fieldwork, sampling of soil and rock for geotechnical purposes has been undertaken in accordance with BS EN ISO 22475-1 *“Geotechnical Investigation and testing – sampling by drilling and excavation and groundwater measurements”*.
- 3.5.2 Samples collected for chemical analysis have been taken and handled in accordance with BS ISO 18400-105:2017 *“Soil quality — Sampling Part 105: Packaging, transport, storage and preservation of samples”*.
- 3.5.3 Various sampling and sub-sampling methodologies have been adopted as appropriate, with the primary aim of obtaining the highest quality sample class practicable.
- 3.5.4 Untested chemical and geotechnical samples will be held for a period of 4 weeks from the date of the first report issue, after which they will be disposed of.

3.6 In-situ Testing

- 3.6.1 The following table summarises the field testing carried out. The results are summarised on individual exploratory hole logs where appropriate and detailed within the Appendices indicated.

Tests	Qty	Applicable standard / guidance	Location of Results
Standard penetration test (SPT)	21	BS EN ISO 22476-3	Included within logs Detailed in Appendix F
Pocket penetrometer	10	Manufacturer’s instructions	Included within logs Detailed in Appendix F
Hand shear vane	17	Manufacturer’s instructions	Included within logs Detailed in Appendix F
Dynamic cone penetrometer (DCP) using TRL probe	9	DMRB: CS229	Appendix G
Soakaway test	4	BRE 365	Appendix H

Table 3-B: Summary of field testing undertaken

3.7 Investigation Constraints

- 3.7.1 The table below outlines restrictions and constraints to the investigation methods which either limited the design of the original scope of work or resulted in a deviation from the agreed scope.

Detail	Impact
Pre-commencement constraints	
Area 2 is an active commercial premises with hardstanding and areas of soft landscaping.	Exploratory methods were selected to minimise surface damage, and the overall frequency and locations of
Area 3 is located within an area of soft landscaping	

Detail	Impact
	exploratory holes were limited due to active working areas and building footprints.
Fieldwork constraints	
An extensive temporary tent was present in Hobbs Field to the west and due to recent heavy rainfall, the field was extremely boggy.	Exploratory hole locations were limited in this area.
Foundation trial pit TP02 could not be fully excavated due to the presence of an obstruction, possibly a formed plastic, which extended from the foundation projection.	Due to the close proximity to tanks and pipes, this obstruction was not penetrated. An alternative location (TP11) was attempted, however there was a covering of concrete beneath the paving slabs which could not be easily penetrated and time constraints on site prevented further investigation in this area.

Table 3-C: Table of site restrictions

4 Laboratory testing

4.1 Overview

- 4.1.1 Samples obtained from exploratory holes were sent to independent accredited laboratories for geotechnical and chemical testing.

4.2 Geotechnical Testing

- 4.2.1 The geotechnical testing schedule was prepared by Soiltechnics using a targeted and judgemental approach, based upon the scheme proposals and our initial understanding of the ground conditions.
- 4.2.2 Geotechnical laboratory test results are presented in Appendix I, and the total number of geotechnical tests undertaken is summarised below:

Qty	Test
9	Moisture content
9	Atterberg limits
1	Particle size distribution (coarse)
7	Point load test
2	BRE SD1 Suite A
8	BRE SD1 Suite B

Table 4-A: Summary of geotechnical laboratory testing

4.3 Chemical Testing

- 4.3.1 The chemical testing schedule was prepared by Soiltechnics using a targeted and judgemental approach, based upon fieldwork observations.
- 4.3.2 Chemical laboratory test results are presented in Appendix J, and the total number of chemical tests undertaken is summarised below:

Sample Type	Qty	Testing	Suite Name
Soils	3	Basic Contamination Suite [metals, cyanides, PAHs, phenol]	ST Suite 1
	4	Basic Classification Suite [metals, cyanides, PAHs, phenol, banded TPH & asbestos]	Basic Classification Suite
	3	Topsoil analysis to BS3882	-
	3	Asbestos screening	-
	2	Full WAC Suite (2-stage leachate)	-

Table 4-B: Summary of chemical laboratory testing

5 Ground Investigation Findings

5.1 Ground Models

5.1.1 The tables below present our generalised interpretation of geological and hydrogeological conditions for the different development areas across the site.

5.1.2 Juhring Field – Car park and toilet block

5.1.2.1 This ground model is based on information obtained by trial pits TP03-06 only. It is predominantly for the purpose of foundation design for the proposed toilet block.

Stratum	Brief description	Top depth range (m bgl)	Adopted model top depth (m bgl)	Thickness (m)
Topsoil	Soft, brown, slightly gravelly clay with gravels of siltstone, sandstone, ironstone and flint.	G.L	G.L.	0.3-0.35m
Grinstead Clay Member	Soft to firm, orangish brown and grey, slightly sandy, slightly gravelly clay with occasional cobbles of sandstone, siltstone and ironstone. Gravels are siltstone, sandstone, mudstone and ironstone.	0.3-0.35m	0.3m	2.8m
	Very weak to weak, brownish grey mudstone.	3.1m	3.1m	>4.0m

Table 5-A: Ground model – Juhring Field

5.1.2.2 No groundwater was encountered in any of the trial pits in this development area.

5.1.3 Area 1 – Hobbs Field

5.1.3.1 This ground model is based on information obtained from boreholes WLS01-08 only. It is predominantly for the purpose of the proposed crane pad working platform design.

Stratum	Brief description	Top depth range (m bgl)	Adopted model top depth (m bgl)	Thickness (m)
Topsoil	Soft, dark brown, gravelly clay with gravels of sandstone and flint.	G.L	G.L.	0.2-0.3m
Made Ground	Firm, orangish brown, gravelly clay with gravels of brick, tile, flint and sandstone.	0.2-0.3m	0.3m	0.2-0.3m
Ardingly Sandstone Member	Firm becoming very stiff, orangish brown and yellowish orange, slightly sandy, slightly gravelly clay with occasional cobbles of sandstone. Gravels are sandstone.	0.3-0.55m	0.4m	>2.14m
	OR Dense, yellowish orange, gravelly, clayey sand with occasional cobbles of sandstone. Gravels are sandstone.			

Table 5-B: Ground model – Area 1 – Hobbs Field

5.1.3.2 It should be noted that Made Ground was also encountered in WLS02 from 0.0-0.3m depth however it is only recorded as Made Ground, as opposed to Topsoil, due to the presence of occasional brick cobbles. It is likely that this is an isolated occurrence of anthropogenic materials in the Topsoil type material.

5.1.3.3 No groundwater was encountered in any of the boreholes in this development area.

5.1.4 Area 2 – Castle buildings

5.1.4.1 This ground model is based on information obtained from boreholes BH01, BH02 and WLS08 only. It is predominantly for the purpose of the foundation design for the proposed extensions and basements.

Stratum	Brief description	Top depth range (m bgl)	Adopted model top depth (m bgl)	Thickness (m)
Topsoil	Soft, brown, gravelly clay with gravels of sandstone and flint.	G.L.	G.L.	0.2-0.3m
Made Ground	Firm, orangish brown and brown, slightly sandy, gravelly clay with gravels of brick, tile, flint and sandstone.	0.2-0.3m	0.3m	0.6-1.0m
Ardingly Sandstone Member	Firm, yellowish orange and brown, slightly sandy, gravelly clay with cobbles of sandstone. Gravels are sandstone. OR Medium dense, brown, very clayey gravel of sandstone. OR Medium dense, yellowish brown, slightly gravelly, slightly clayey sand with gravels of sandstone.	0.6-1.2m	1.0m	0.6-4.3m
	Very weak to weak, pale brown and grey sandstone.	1.2-5.5m	5.0m	>10.0m

Table 5-C: Ground model – Area 2 – Castle Buildings

5.1.4.2 No groundwater was encountered in any of the boreholes in this development area.

5.1.5 Area 3

5.1.5.1 This ground model is based on information from trial pits TP07-10 only. It is for the foundation design of the proposed toilet blocks in this area.

Stratum	Brief description	Top depth range (m bgl)	Adopted model top depth (m bgl)	Thickness
Topsoil	Soft, brown, gravelly, sandy clay with gravels of sandstone, siltstone and flint.	G.L.	G.L.	0.2m
Lower Tunbridge Wells Sand	Soft to firm, yellowish orange and pale brown, slightly gravelly, clayey silt with occasional cobbles of siltstone. Gravels are siltstone.	0.2m	0.2m	0.45-1.2m

Stratum	Brief description	Top depth range (m bgl)	Adopted model top depth (m bgl)	Thickness
	Firm, pale brown and orangish brown, gravelly, silty clay with occasional cobbles of siltstone and sandstone. Gravels are siltstone and sandstone.	0.2-1.1m	1.0m	1.2->2.0m
Wadhurst Clay Formation	Firm to stiff, brownish grey, slightly gravelly, silty clay. Gravel is sandstone and siltstone.	1.4m	1.4m	>2.6m

Table 5-D: Ground model – Area 3

- 5.1.5.2 Groundwater was encountered in TP07 at 3.1m depth and rose to 2.93m after 20 minutes. Groundwater was also encountered at 4m depth in TP10 however the water was insufficient to cover the base of the pit.

5.2 Existing Foundations

- 5.2.1 Investigations to determine the profile of existing foundations in Area 2 around the castle buildings was undertaken in TP01, TP02, TP11 and TP12.
- 5.2.2 Foundations in the location of TP01 were encountered at 1.25m depth and projected 0.28m from the wall. The foundations extended beyond 1.3m depth but the full thickness could not be determined due to the depth of the pit.
- 5.2.3 Foundations in the location of TP02 were encountered from surface and projected 0.4m from the wall. The foundations extended beyond 0.5m depth but the full thickness could not be determined due to the presence of an obstruction.
- 5.2.4 Foundations in the location of TP12 were encountered at 0.3m depth and projected between 0.4-0.6m from the wall. The foundations extended to 0.6m depth.

5.3 Evidence of Possible Contamination

- 5.3.1 During the ground investigation works, no significant visual or olfactory evidence of contamination was noted, except for the presence of anthropogenic materials contained within the Made Ground (brick and tile).

5.4 Obstructions and Instability

- 5.4.1 The table below summarises the obstructions and instability encountered that affected the progress of the investigation works.
- 5.4.2 The general stability of trial pits during excavation are also recorded on the trial pit logs.

Strata / Area	Depth range (m bgl)	Issue	Description
Ardingly Sandstone Member	1.27-2.44m	Obstructions	Hard stratum. Suspected bedrock encountered, leading to drill refusal in WLS01-08.

Table 5-E: Summary of obstructions and instability encountered during the investigation works

6 Geotechnical Discussion

6.1 Scheme Overview

6.1.1 The following assessments are made on the investigatory data presented in the preceding sections of this report and are made with reference to the specific nature of the development. Should scheme proposals change then it is recommended that the validity of the conclusions of this report in relation to the revised scheme are checked.

6.1.2 The project will comprise the construction of extensions to the castle buildings, four new toilet blocks, a large car park and a crane pad. The geotechnical design information for each of these developments is discussed individually below.

6.2 Geotechnical Category

6.2.1 In accordance with BS EN1997-1:2004 + A1:2013 (Eurocode 7), the project is designated as Geotechnical Category 2. This category includes projects with *conventional types of structures and foundations with no exceptional risk, or difficult ground or loading conditions*. Furthermore, *routine design procedures* are appropriate.

6.2.2 It should be noted that this Report does not constitute a Geotechnical Design Report (GDR) as defined in Eurocode 7. Accordingly, a GDR should be prepared by the designer during the detailed design phase

6.3 Geotechnical Parameters

6.3.1.1 The following geotechnical parameters have been derived for each development area in accordance with Eurocode 7.

Development area	Variable	Characteristic value	Derivation
Juhring Field – Toilet block and Area 1 – Hobbs Field	Weight density above water table, γ_b (kN/m ³)	18	BS8004:2015 Figure 1
	Undrained shear strength, c_u (kN/m ²)	50	In situ testing
	Undrained deformation modulus, E_u (kN/m ²)	500	Past experience and literature
Area 2 – Castle extensions	Uniaxial compressive strength, UCS (MN/m ²)	7	Correlation with point load indices
Area 3	Weight density above water table, γ_b (kN/m ³)	18	BS8004:2015 Figure 1
	Undrained shear strength, c_u (kN/m ²)	30	In situ testing
	Undrained deformation modulus, E_u (MN/m ²)	1000	Past experience and literature

Table 6-A: Summary of characteristic geotechnical parameters

6.4 Juhring Field and Hobbs Field Foundations

6.4.1.1 Based on the ground models provided in Table 5-A: Ground model – Juhring Field and Table 5-B: Ground model – Area 1 – Hobbs Field above, the geology in Juhring Field is likely to consist of firm Grinstead Clay Member to depths of approximately 3m with mudstone rock beneath. The geology in Hobbs Field is likely to consist of a thin covering of Topsoil and Made Ground with underlying Ardingly Sandstone Member comprising a mixture of clays and sands with potential sandstone at between 1.27-2.44m based on drill and SPT refusals. As the proposed toilet blocks, substation and generator will be relatively light weight, they will be adequately supported on traditional strip foundations or a shallow raft. As fine-grained soils are more sensitive, an undrained scenario has been adopted for this assessment.

6.4.1.2 It is anticipated that excavations in Hobbs Field to founding levels will encounter both fine-grained and coarse-grained soils. Whilst these soils will ultimately generate similar amounts of total settlement under applied foundation loads, the rate at which settlement will occur will differ. Granular soils will produce settlements almost immediately after loads are applied whereas fine grained soils continue to consolidate several years after completion of construction. Accordingly, traversing mixed soil types will be subject to differential settlement. To minimise the effects of such movement it is recommended that foundations are reinforced.

6.4.1.3 Ultimate limit state analyses (bearing capacity) have been undertaken in accordance with the approach outlined in Annex D of Eurocode 7 to derive the following design bearing resistances:

Type	Size / width (m)	Founding depth (m BGL)	Founding stratum	Bearing resistance	
				Combination 1	Combination 2
Raft	5.0 x 5.0	0.65	Grinstead Clay Member/Ardingly Sandstone Formation	315 kN/m ²	225 kN/m ²
Strip	0.45 x 5.0	0.75		270 kN/m ²	195 kN/m ²

Table 6-B: Summary of foundation ultimate limit state analyses

6.4.1.4 Serviceability limit state (SLS) has been assessed by undertaking settlement analyses in accordance with the approach outlined in Annex F of Eurocode 7 and adopting the following variables:

Stratum	Variable	Value adopted	Derivation
Grinstead Clay Member/Ardingly Sandstone Formation	Coefficient of volume compressibility, m_v (m ² /MN)	0.1	Literature
	Geological factor, μ_g	0.7	Literature

Table 6-C: Key geotechnical variables used in settlement analyses

6.4.1.5 The proposed loads are not known at this stage. Accordingly, the maximum bearing pressures have derived to ensure settlement is less than 25mm, which is typically adopted as a maximum tolerable limit. The following table summarises the results.

Foundation type	Size / width (m)	SLS bearing resistance
Raft	5.0 x 5.0	60 kN/m ²
Strip	0.45 x 5.0	635 kN/m ²

Table 6-D: SLS bearing resistance to ensure total settlement to <25mm

6.4.1.6 It should be noted that foundation design is iterative. Accordingly, a final check of ultimate and serviceability limit states should be undertaken following confirmation of foundation size and loads.

- 6.4.1.7 There are a number of trees within close proximity of the proposed development, which may impact upon the foundation design depth. It is recommended that a suitably qualified arboriculturist is appointed to undertake a survey such that building foundations can be designed appropriately. The survey should include the location, species, height (and mature height) and water demand of each tree and major vegetation. It is recommended that NHBC Chapter 4.2 is consulted with regards to the potential requirement for deepening foundations to extend through the zone of influence of any nearby vegetation.

6.5 Juhring Field Car Park Foundations

- 6.5.1.1 As part of the scheme development, it is understood that an access road and hardstanding areas will be constructed at or about existing ground level. In situ California Bearing Ratio (CBR) value for the subgrade has been determined from dynamic cone penetrometer testing in accordance with CS 229 Data for Pavement Construction.
- 6.5.1.2 Results of these tests are presented as Appendix G.
- 6.5.1.3 A CBR of value of 5% is deemed to be representative of the soils as a whole. It is recommended that the design values are validated with in situ testing immediately prior to construction. Furthermore, it is recommended that the formation level is trimmed and rolled following the requirements outlined in the Specification for Highway Works Series 600.
- 6.5.1.4 The Grinstead Clay Member deposits soils are considered frost and moisture susceptible, and this may override the CBR criteria for pavement foundation design purposes. It is recommended that the sub-base is laid as soon as practicable following establishment of formation.

6.6 Area 2 – Castle buildings

- 6.6.1 Two proposed extensions are present in this area, one to the north of the existing buildings and one to the west. Both extensions are single storey with a basement level. As such, it is anticipated that either a basement raft foundation or traditional strip footings with a ground bearing floor slab will be suitable options. Although there are some trees within the extension footprints which will require removal, there will be some trees remaining nearby which have root protection zones. These will need to be considered during the design.
- 6.6.2 With reference to the ground model provided in Table 5-C: Ground model – Area 2 – Castle Buildings, the two rotary boreholes in the areas of the extension encountered rock at varying depths. Borehole BH01 to the west of the buildings encountered sandstone rock at 1.2m depth, whilst BH02 to the north encountered rock at 5.5m depth.
- 6.6.3 The proposed basements will have a proposed ceiling height of 3m. When considering the formation thickness of the ceiling and floor slab, it is likely that the basement raft will be formed at approximately 4m bgl.
- 6.6.4 For the western extension, the basement will be formed directly into the rock material and a bearing resistance of 500kN/m² would be appropriate. Minimal to no settlement or heave is anticipated.
- 6.6.4.1 For the northern extension, the ultimate limit state analyses (bearing capacity) have been undertaken in accordance with the approach outlined in Annex D of Eurocode 7 to derive the following design bearing resistances:

Type	Size / width (m)	Founding depth (m BGL)	Founding stratum	Bearing resistance	
				Combination 1	Combination 2
Raft	5.0 x 5.0	0.5	Ardingly Sandstone Formation	470 kN/m ²	335 kN/m ²
Strip	0.45 x 5.0	0.5		400 kN/m ²	285 kN/m ²

Table 6-E: Summary of foundation ultimate limit state analyses

- 6.6.4.2 As there is only 1.5m of potentially compressible clay beneath the proposed basement level of 4m, and competent bedrock is located from 5.5m depth, which is not compressible, settlement is unlikely to exceed 25mm.
- 6.6.5 Excavating the basement will unload soils by approximately 72kN/m². As the proposed loads of the development are unknown, it is possible that some heave may occur if the development is relatively lightweight. It is considered unlikely that any heave will exceed 10mm.
- 6.6.6 With regards to temporary slope stability for the extension in the north, excavations would likely remain fairly stable if vertical in the short-term providing shoring and temporary props are utilised. Alternatively, if the excavation is unsupported then with reference to CIRIA 97 Trenching Practice, a slope of approximately 30/35° assuming no or minor seepages of water will likely remain stable for the short term. Slope stability for the extension in the west is not likely to be an issue as rock will likely be encountered from 1.2m depth. Breaking equipment will however be required in order to excavate through this material.

6.7 Area 3

- 6.7.1 Based on the ground model provided in Table 5-D: Ground model – Area 3 above, the geology in this area will likely comprise Lower Tunbridge Wells Sand, consisting of a mixture of silts and clays, overlying Wadhurst Clay Formation which comprises a silty clay. As the proposed toilet blocks will be relatively light weight, they will be adequately supported on traditional strip foundations or a shallow raft.
- 6.7.2 Ultimate limit state analyses (bearing capacity) have been undertaken in accordance with the approach outlined in Annex D of Eurocode 7 to derive the following design bearing resistances:

Type	Size / width (m)	Founding depth (m BGL)	Founding stratum	Bearing resistance	
				Combination 1	Combination 2
Raft	5.0 x 5.0	0.5	Lower Tunbridge Wells Sand	190 kN/m ²	135 kN/m ²
Strip	0.45 x 5.0	0.75	Lower Tunbridge Wells Sand	165 kN/m ²	120 kN/m ²

Table 6-F: Summary of foundation ultimate limit state analyses

- 6.7.3 Serviceability limit state (SLS) has been assessed by undertaking settlement analyses in accordance with the approach outlined in Annex F of Eurocode 7 and adopting the following variables:

Stratum	Variable	Value adopted	Derivation
Lower Tunbridge Wells Sand	Coefficient of volume compressibility, mv (m ² /MN)	0.1	Literature
	Geological factor, μ_g	0.7	Literature

Table 6-G: Key geotechnical variables used in settlement analyses

- 6.7.4 The proposed loads are not known at this stage. Accordingly, the maximum bearing pressures have derived to ensure settlement is less than 25mm, which is typically adopted as a maximum tolerable limit. The following table summarises the results.

Foundation type	Size / width (m)	SLS bearing resistance
Raft	5.0 x 5.0	60 kN/m ²
Strip	0.45 x 5.0	670 kN/m ²

Table 6-H: SLS bearing resistance to ensure total settlement to <25mm

- 6.7.5 It should be noted that foundation design is iterative. Accordingly, a final check of ultimate and serviceability limit states should be undertaken following confirmation of foundation size and loads.
- 6.7.6 There are a number of trees within close proximity of the proposed development, which may impact upon the foundation design depth. It is recommended that a suitably qualified arboriculturist is appointed to undertake a survey such that building foundations can be designed appropriately. The survey should include the location, species, height (and mature height) and water demand of each tree and major vegetation. It is recommended that NHBC Chapter 4.2 is consulted with regards to the potential requirement for deepening foundations to extend through the zone of influence of any nearby vegetation.

6.8 Aggressiveness of the Ground to Buried Concrete

- 6.8.1 The aggressiveness of the ground with respect to buried concrete has been assessed in accordance with Building Research Establishment Special Digest 1: Concrete in Aggressive Ground Third Edition (2005).
- 6.8.2 The site is interpreted to be a greenfield site where pyrite is unlikely to be present.
- 6.8.3 Laboratory testing has been undertaken on soil samples obtained from the investigation works.
- 6.8.4 The proposed foundations may extend into previously undisturbed soils that could contain pyrite. Excavating to form a foundation does not create 'disturbed' ground as defined in BRE SD-1. However, any arisings resulting from foundation excavation or replacement piling for example would be classified as 'disturbed' ground. Accordingly, the amount of oxidizable sulphides has also been considered when categorising the strata.
- 6.8.5 The classification of the strata is tabulated below:

Stratum	Disturbed / Undisturbed	Design sulphate class	Aggressive chemical environment for concrete class
Made Ground	Disturbed	DS-1	AC-1s
Ardingly Sandstone Formation	Disturbed and undisturbed	DS-1	AC-1s

Table 6-I: Summary of the aggressiveness of the ground to buried concrete

- 6.8.6 It should be noted that there are some outstanding testing results from the Grinstead Clay Member and Lower Tunbridge Wells Sand and as such, this section will require updating once the results have been issued.

6.9 Drainage

6.9.1 Infiltration testing has been undertaken at the site in accordance with BRE 365: Soakaway Design (2016). The results are presented as Appendix H and summarised below:

Exploratory hole ID	Stratum tested	Cycle	Infiltration rate (m/s)
TP03	Grinstead Clay Member	1	No infiltration over 218 minutes. Test failed.
TP06	Grinstead Clay Member	1	No infiltration over 60 minutes. Test failed.
TP08	Lower Tunbridge Wells Sand	1	Insufficient infiltration over 115 minutes. Test failed.
TP09	Wadhurst Clay Formation	1	No infiltration over 61 minutes. Test failed.

Table 6-J: Summary of infiltration test results undertaken in accordance with BRE 365

6.9.2 Testing was undertaken on deposits local to the proposed developments. Based on the above, these deposits are unlikely to be amenable to the use of soakaways. More granular deposits are present on site and there may be other areas more amenable to the use of soakaway systems, however the practicality of installing drainage runs to these areas will need to be considered. Further targeted testing in these areas is recommended to determine their suitability. Alternatively, a different drainage option will need to be considered.

6.10 Constructability

- 6.10.1 Under most standard contracts it is the responsibility of the Contractor to design, construct and maintain temporary works. Accordingly, the following discussion is provided for information only.
- 6.10.2 Groundwater is not anticipated to be encountered during excavations to form shallow spread foundations or service trenches. Excavation sides are anticipated to be stable in the short term. However, some overbreak of the Made Ground and other more granular deposits may occur.
- 6.10.3 It is possible that mudstone or sandstone rock will be encountered in excavations, at depths which vary across the site. These materials may require the use of breaking equipment to loosen the deposit prior to excavation.
- 6.10.4 In the event that a soft area is located in the course of foundation excavations then excavation should continue to locate stiffer / denser soils.

7 Reuse of Topsoil – Juhring Field

- 7.1.1 Due to the elevated organic content of topsoil materials in general, they are typically unsuitable for disposal at an inert landfill, therefore disposal to a non-hazardous waste landfill site is likely to be the appropriate disposal route. However, topsoil is also a nationally limited resource, and efforts should be made to avoid landfill disposal where possible. Where topsoil is in surplus, it should be separated from the underlying natural soils and set aside to be recovered elsewhere, for instance through a Direct Transfer scenario or to a Soil Treatment Facility under the DoW CoP.
- 7.1.2 Part of our brief included the assessment of suitability for reuse of Topsoil deposits present in Juhring Field in the north of the site, where the proposed car park is situated. As such, three composite samples of Topsoil have been tested for suitability following BS3882. The composite samples were taken from the following locations.
- COMP01 – HP01-03
 - COMP02 – HP04-06
 - COMP03 – HP07-09
- 7.1.3 In addition, samples at 0.05m depth in HP03, HP05 and HP09 were also tested for the presence of commonly occurring contaminants so that an assessment of the potential risk to human health could be undertaken.
- 7.1.4 The laboratory test results are provided in Appendix J.
- 7.1.5 Essentially, none of the samples were compliant with the multipurpose range, predominantly due to low levels of extractable phosphorus and potassium. The recorded concentrations of extractable phosphorus were measured in the range of 3.7-14mg/l with the multipurpose range being 16-140mg/l. The recorded concentrations of extractable potassium were measured in the range of 86-110mg/l with the multipurpose range being 121-1500mg/l. In addition, COMP01 had 35% of >2mm stone content which is above the maximum allowable value of 30%.
- 7.1.6 It is likely that Topsoil could be treated or used in areas where lower nutritional value is required. Alternatively, appropriate planting for these conditions could be chosen. We recommend a landscape architect is consulted as the Topsoil deposits may still be suitable.
- 7.1.7 When comparing the concentrations of commonly occurring contaminants to the public open space (park) guideline values for human health, none of the three samples had concentrations above the guidelines and as such, the topsoil material is considered to be safe and suitable for use in a public open space (park) environment. The material is not suitable for reuse in a residential setting due to elevated concentrations of PAHs. These elevations are summarised in the table below. No asbestos was identified.

Contaminant	Residential with uptake guideline (mg/kg)	Public Open Space (park) guideline (mg/kg)	Maximum recorded concentration (mg/kg)
Benzo(a)pyrene	5	21	6
Benzo(b)fluoranthene	2.6	13	6.5
Dibenz(a,h)anthracene	0.24	1.1	0.73

Table 7-A: Summary of PAH results.

8 Soil and Waste Management

8.1 Sustainability

- 8.1.1 Where possible, disposal of soils to landfill should be avoided in preference for more sustainable alternatives. Such alternatives are set out below and rely on appropriate planning and design.
- 8.1.2 Soiltechnics can provide additional support and guidance to assist in overall material management and soil waste minimisation upon request.

8.2 Waste Hierarchy

- 8.2.1 Under the Waste Regulations, there is a requirement to apply (where reasonable) the waste management hierarchy, which is summarised below. Within the hierarchy, soil disposal to landfill should be limited to the necessary minimum.

Stage (in order of preference)	Example application
Prevention / Reduce	Design, planning, Site Waste Management Plans (SWMP).
Reuse	Reuse of soils under exemption, permit or Materials Management Plan (MMP), sorting at the point of excavation, screening of excavated material.
Recycling	Recycling aggregate, waste segregation, screening and sorting.
Recovery	Remediation works, transfer to a Soil Treatment Facility
Pre-treatment	Non-hazardous and hazardous soils do not need to be treated, where such treatment would not reduce the volume of waste.
Disposal	If the waste hierarchy steps outline above are followed, the remaining waste can be disposed of to a landfill without any further treatment.

Table 8-A: Waste management hierarchy

8.3 Liability of Waste Management

- 8.3.1 Part III of the Finance Act was amended in 2018 to extend the scope of landfill tax to cover any site (not exclusively landfills) operating without an appropriate environmental permit, exemption, or MMP.
- 8.3.2 These changes have given HMRC the powers to work with the Environment Agency to identify non-compliant sites and pursue and penalise the person(s) illegally disposing of waste, and anyone who knowingly facilitates the disposal. This includes sites filling site-won soils which are surplus to requirement.

8.4 Materials Management

- 8.4.1 In terms of the development, where reasonably practicable, landfill disposal should be minimised through the reuse of site-won materials on site, or off-site transfer of surplus soils to other development schemes or Soil Treatment Facilities. Early consideration of the site's overall material balance at the design stage is also critical in reducing the need for off-site disposal, limiting costs, and increasing the overall sustainability of the development.
- 8.4.2 Where Made Ground soils are to be reused onsite or materials transferred between sites, a Materials Management Plan (MMP) or Waste Exemption is recommended.

- 8.4.3 The process of an MMP allows soils that are suitable for reuse and have a certainty of use to not be considered a waste, and therefore not fall under the waste regulations. This scheme is self-regulated within the industry and is supported in principle by the Environment Agency.

8.5 Waste Characterisation Governance

- 8.5.1 The classification of soils for disposal to landfill is undertaken in accordance with WM3 (v1.2GB), and a Waste Acceptance Criteria assessment (WAC) undertaken in accordance with the limits in Annex II of the Landfill Directive (Directive 1999/31/EC).

8.6 Waste Populations

- 8.6.1 Based on the site observations, development proposals and laboratory results, the following potential waste populations have been identified for preliminary assessment purposes:

Potential Waste Population	Description
Made Ground in Area 1 – Hobbs Field	Orangish brown, gravelly clay with gravels of brick, tile, flint and sandstone.
Made Ground in Area 2 – Castle buildings	Orangish brown and brown, slightly sandy, gravelly clay with gravels of brick, tile, flint and sandstone.
Clean naturally occurring soils	Natural, uncontaminated clays and sands.

Table 8-B: Potential waste populations

- 8.6.2 Each of the potential waste populations can be readily identified and segregated at the point of excavation, based upon visual and olfactory observations.

8.7 Sampling and Testing

- 8.7.1 The hazardous waste classification assessment has been undertaken by adopting the maximum recorded concentration of each compound from all the samples tested within the identified waste population, as outlined in WM3, Approach D.

- 8.7.2 For the Waste Acceptance Criteria (WAC) assessment, representative composite samples were obtained by combining soils from multiple exploratory holes. These are as follows:

- WAC01: Made Ground in Area 1 – Hobbs Field
- WAC02: Made Ground in Area 2 – Castle buildings

- 8.7.3 The rate of testing has been chosen to provide a preliminary waste categorisation only.

8.8 Waste Characterisation

- 8.8.1 Where testing has been carried out, the waste classification assessment sheets are enclosed within Appendix L, and a summary of the findings is presented in the table below.

- 8.8.2 Observations from the fieldwork indicate that the underlying natural soils are not impacted by contamination, and therefore are considered suitable for disposal as non-hazardous waste in an inert landfill site without the requirement for further testing.

Potential Waste Population	Hazardous Classification (LoW code)	Landfill Classification	Comments
Made Ground in Area 1 – Hobbs Field	Non-hazardous (17-05-04)	Inert	N/A
Made Ground in Area 2 – Castle buildings	Non-hazardous (17-05-04)	Inert	N/A
Clean, uncontaminated, natural materials	Non-hazardous (17-05-04)	Inert	Considered non-hazardous and inert without any testing required.
Topsoil	Non-hazardous	No WAC testing undertaken	Topsoil typically unsuitable for disposal to inert landfill sites due to high organic carbon content

Table 8-C: Waste characterisation summary

8.9 Application of Advice

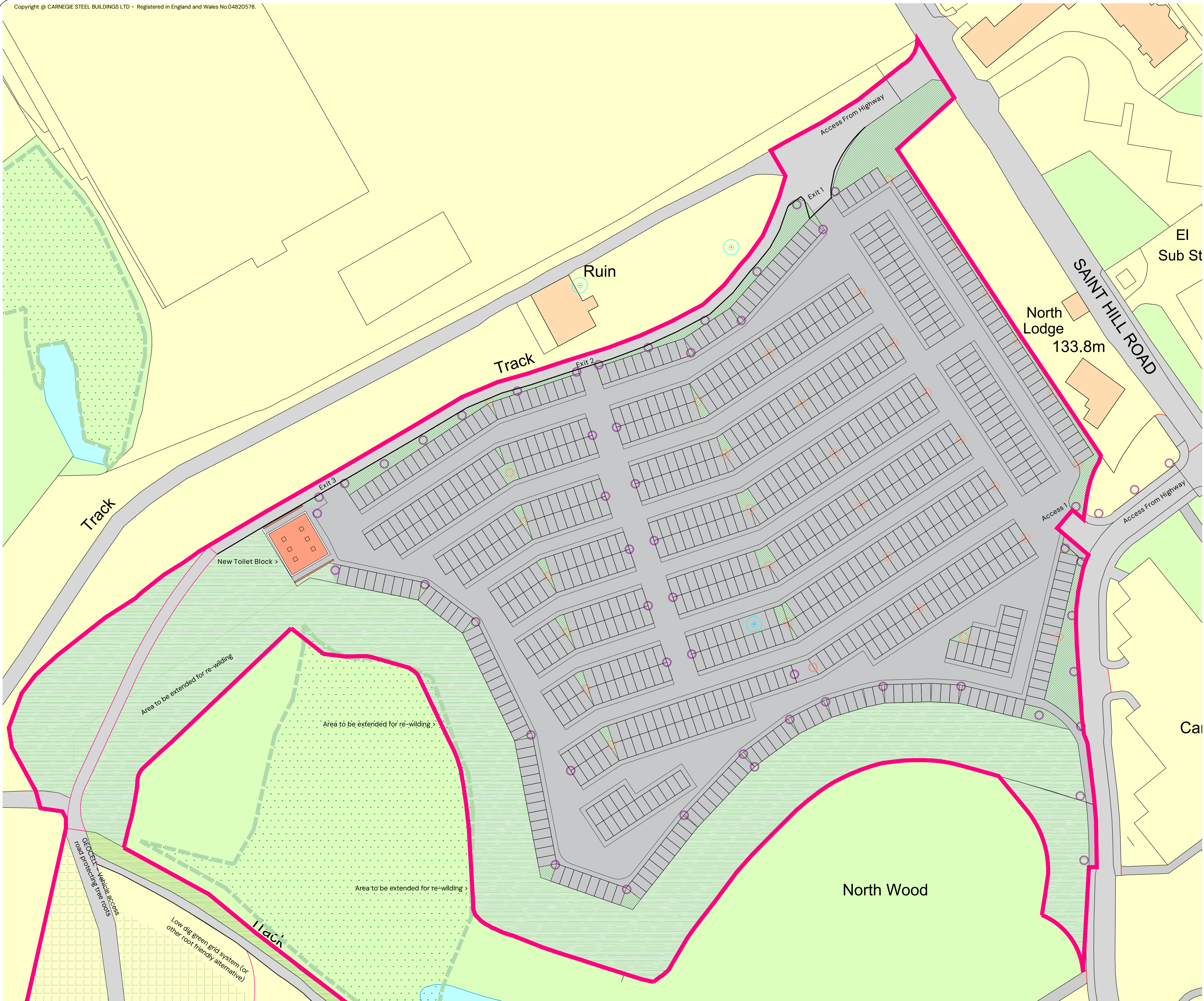
- 8.9.1 Where assessments have been carried out of soils currently in-situ at the time of investigation and not of stockpiled waste soils, they should be treated as provisional only.
- 8.9.2 There is no obligation on any waste operator to accept our waste characterisation assessments. Landfill operators may consider your waste to fall under a different classification and/or may require additional testing of waste soils prior to acceptance. It is therefore recommended that this report along with the chemical results is provided to the preferred facility to confirm (or otherwise) it can accept the waste.
- 8.9.3 It should be noted that there remains the potential for unexpected or previously unencountered contamination to be encountered. Any such materials intended for waste disposal should be segregated and tested to determine the appropriate classification and disposal route.

9 Recommendations for Further Works

9.1.1 No further works are recommended.

9.1.2 If the use of soakaway systems distant from proposed developments but situated in areas where more granular deposits were encountered is considered for the development, we would recommend more targeted testing in these areas to confirm the suitability.

Appendix A Drawings



General Note(s):

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Juhring Field Parking

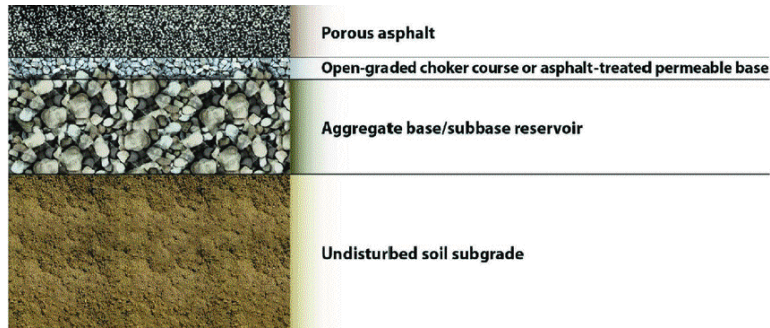
- 907 Proposed Spaces
- 5% Electric Vehicle (EV) space with 15% EV ready.
- Lighting to be provided and ensured to only light the area when safety and security requirements.
- Pedestrian level lighting Westminster 20W LED Bollard with Access Door:



- Down Lighting P850 LED - CU Phosco



- Road ways are intended to be Asphalt for continuous and durable use. Entrances into the car park are to be made wider to allow larger vehicles access to the areas.

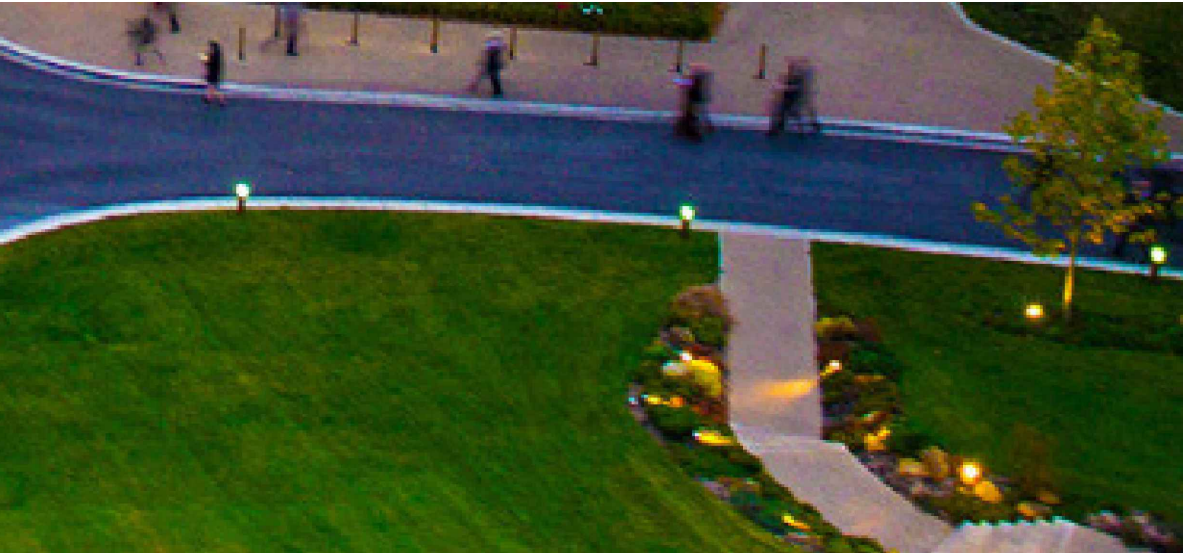


- Roads near root areas to be GEOCELL for allowing vehicle access whilst protecting tree roots (or similarly applied products).

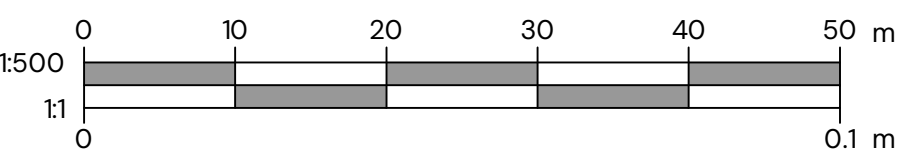
- Expected Areas for Grading Areas:

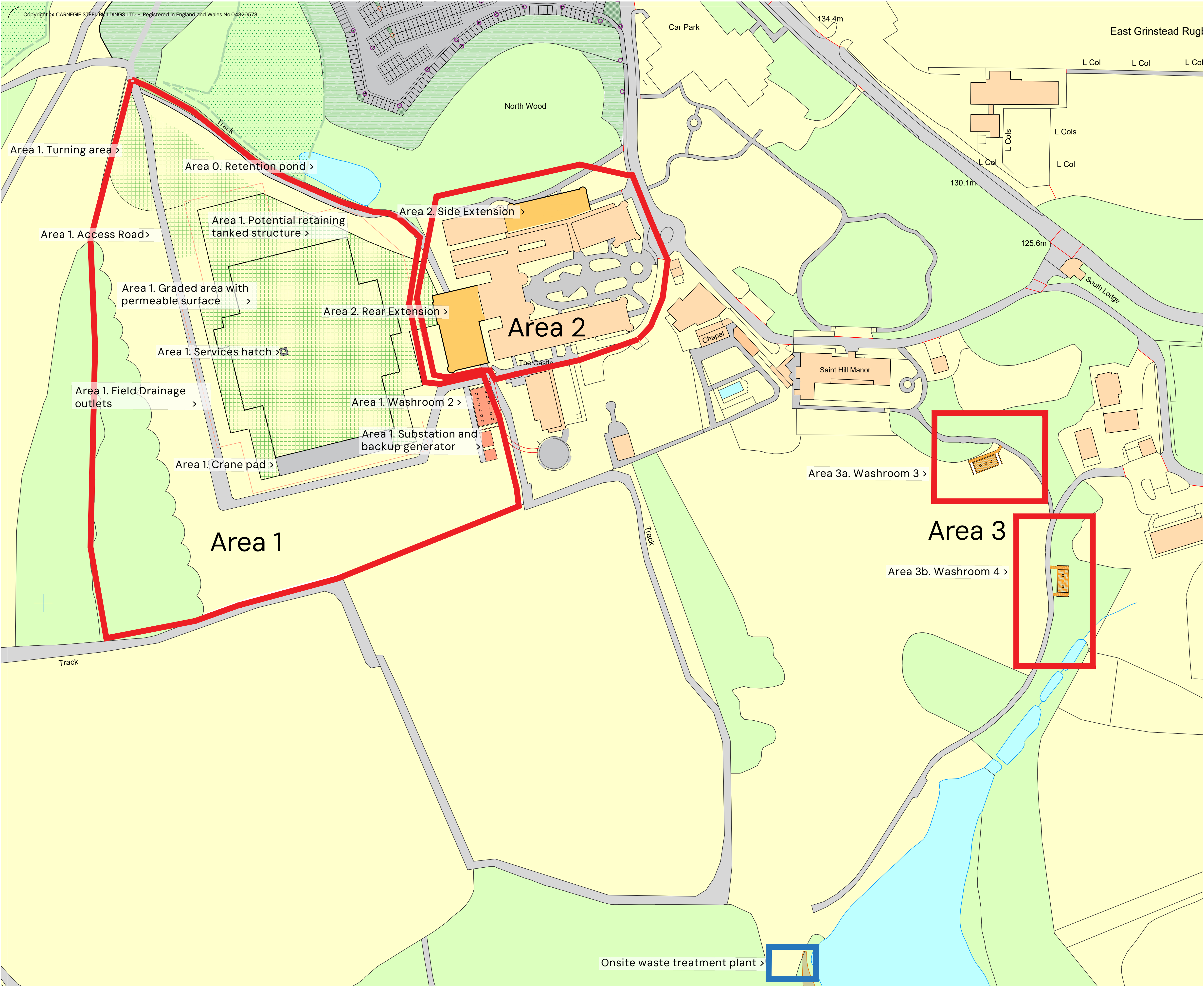


- Infill areas between handstanding and event space to be designated for rewilding. The intention of this is to replace the loss of grassland with more eco diverse wild areas.



- Roadways and paths to be lit in similar pattern to existing site to unify scheme with castle grounds.





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The Scheme

We are proposing to make permanent upgrades to the field to the rear of the Castle for the purpose of improving the capacity to host events, extend the castle, and install washrooms to the rear of St Hill manor.

The planning strategy is not yet confirmed and therefore we require quote for Area 1, Area 2 and Area 3 separately.

Area 1

The field to the rear of the castle is the field in which the client holds their large event each year. They wish to improve the running of this event by making the erection of their large tent easier. These works include:

Turning circle for heavy plant equipment. To be finished in Greengrid or similar.TBC

Access Road. To be finished in permeable hard wearing surface. TBC

Grading of 12000m². To be finished in Greengrid or similar TBC. To have drainage designed by others.

The grading may require a retaining structure to retain the nearby retention pond.

The grading will require drainage outlets to the west or south.

Service hatch to supply power to the center of the event space.

Crane Pad to erect the tent. To be tarmac finish. TBC

Washroom 2. The proposed washrooms will have a modular design which means there will be several sizes with very similar design. Biodiverse brown roof TBC. The will be plumbed into the existing waste treatment works on site.

Substation and Generator. Location TBC. Concrete Foundation required.

Area 2

We are proposing to extend the castle to the West and to the North. These extensions will have large basements. The extensions are in root protection areas of nearby trees.

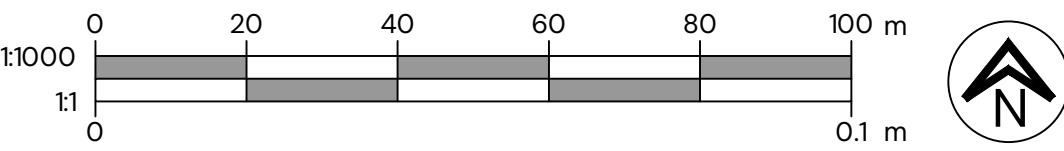
North Basement area 494m²
Basement ceiling height 3m
North extension to be covered by roof garden.

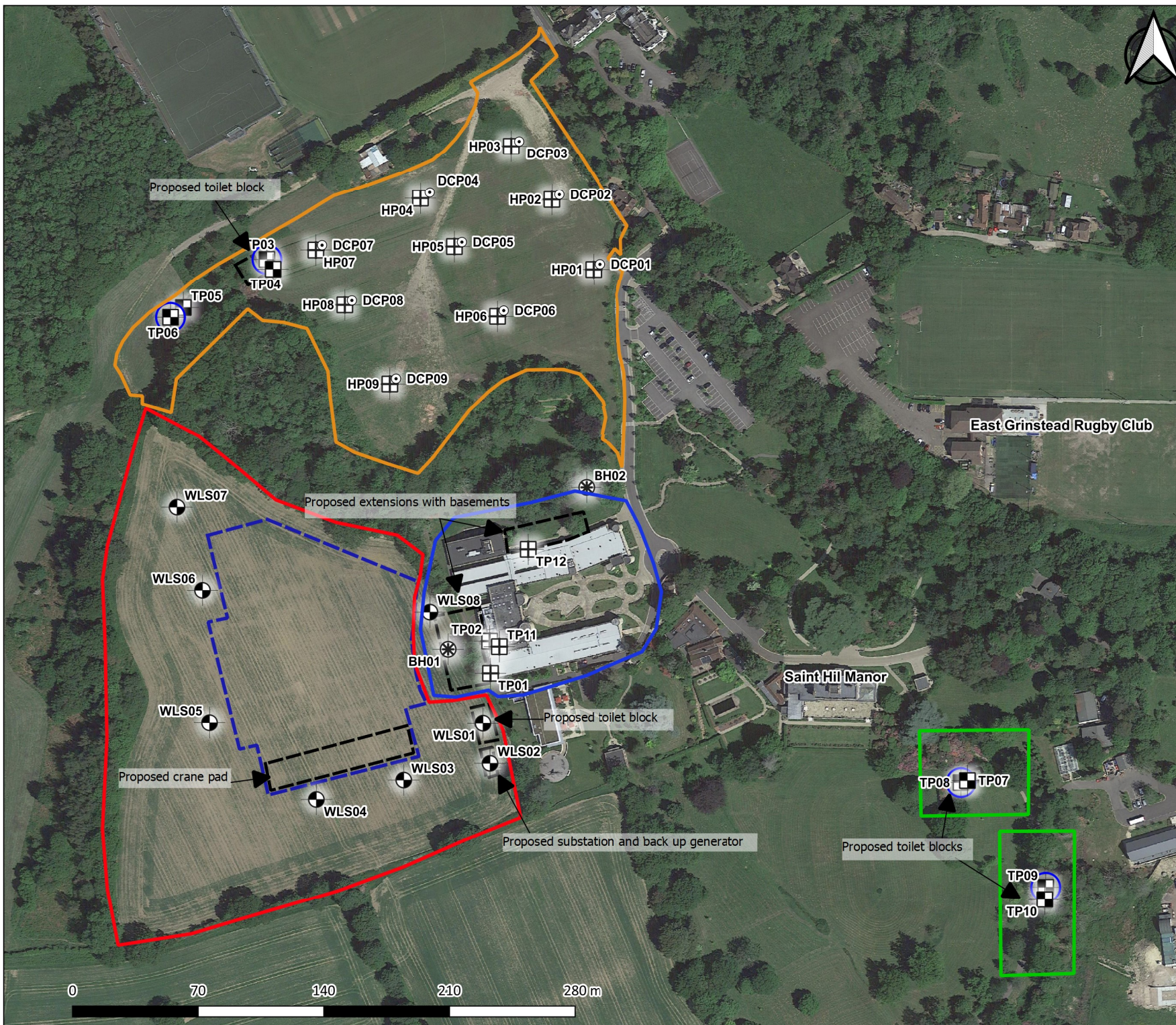
West Basement area 353 m²
Basement ceiling height 3m
Above ground area 1010 m²
Above ground external height 5m

Area 3

We are proposing to situate two washrooms to the rear of St. Hill Manor. This is a listed building. The washrooms will be located close to and within several root protection areas.

The proposed washrooms will have a modular design which means there will be several sizes with very similar design. Biodiverse brown roof TBC. The will be plumbed into the existing waste treatment works on site.





Key:

- Area 1 - Hobbs Field
- Area 2
- Area 3
- Juhring Field - Car park and toilet block
- Approximate Location of Proposed Buildings
- Approximate Area of temporary tent structure
- Rotary Borehole Location
- Windowless Sampling Borehole Location
- Machine Excavated Trial Pit Location
- Hand Excavated Trial Pit Location
- Dynamic Cone Penetrometer Location
- Infiltration testing Location

Notes

1) Base image provided by Google.

2) All drawn features are approximate.

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A	Nov 2024	First issue
REV	DATE	COMMENT ON VARIATION

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PROJECT
Saint Hill Road, East Grinstead

TITLE
Exploratory Hole Location Plan

DRAWING No.
STW6679-D01

Appendix B Exploratory Hole Logs: Trial Pits

Key to legends

Composite materials, soils and lithology					
	Topsoil		Made Ground		Boulders
	Clay		Coal		Cobbles
	Gravel		Limestone		Mudstone
	Sand		Sandstone		Silt
					Siltstone
					Chalk
					Concrete
					Peat

Note: Composite soil types are signified by combined symbols.

Key to 'test results' and 'sampling' columns

Test result		Sampling	
Depth	Records depth that the test was carried out (i.e.: at 2.10m or between 2.10m and 2.55m)	From (m) To (m)	Records depth of sampling
	PP – Pocket penetrometer result reported as an equivalent undrained shear strength (kN/m ²) by applying a factor of 50.		D Disturbed sample
			B Bulk disturbed sample
			ES Environmental sample
Result	SV – Hand held shear vane result reported as an undrained shear strength (kN/m ²). Where multiple readings are taken at the same level the average value is shown on the log. * Signifies that instrument limit reached.	Type	W Water sample
			U Undisturbed thick-walled sample 100mm diameter sampler
			UT Undisturbed thin walled sample 100mm diameter sampler
			UTF Failed undisturbed sample

Water observations

Described at foot of log and shown in the 'water strike' column.

▼ Water level observed after specified delay in drilling

∇ Water strike

Density

Density recorded in brackets determined by qualitative field assessment or inferred from density testing and soil descriptions from across the site (i.e.: [Medium dense]).

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[illegible]

Notes Trial pit sides remained upright and stable. Trial pit terminated at scheduled depth.	Groundwater observations		Title	Dimensions (w x l)	Date(s)
	Strike (m)	Comments	Trial pit record	0.30m x 0.30m	01/10/2024
			Method Hand Excavated Trial Pit	Plant used Hand Tools	Sheet number Sheet 1 of 1
			Level (m OD) -	Logged by SH	Revision A
			Co-ordinates -	Status FINAL	HP01
	No groundwater encountered				

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Notes Trial pit sides remained upright and stable. Trial pit terminated at scheduled depth.	Groundwater observations		Title	Dimensions (w x l)	Date(s)
	Strike (m)	Comments	Trial pit record	0.30m x 0.30m	01/10/2024
			Method Hand Excavated Trial Pit	Plant used Hand Tools	Sheet number Sheet 1 of 1
			Level (m OD) -	Logged by SH	Revision A
			Co-ordinates -	Status FINAL	HP02
	No groundwater encountered				

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Notes Trial pit sides remained upright and stable. Trial pit terminated at scheduled depth.	Groundwater observations		Title	Dimensions (w x l)	Date(s)
	Strike (m)	Comments	Trial pit record	0.30m x 0.30m	01/10/2024
			Method Hand Excavated Trial Pit	Plant used Hand Tools	Sheet number Sheet 1 of 1
			Level (m OD) -	Logged by SH	Revision A
			Co-ordinates -	Status FINAL	HP03
	No groundwater encountered				

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Notes Trial pit sides remained upright and stable. Trial pit terminated at scheduled depth.	Groundwater observations		Title	Dimensions (w x l)	Date(s)
	Strike (m)	Comments	Trial pit record	0.30m x 0.30m	01/10/2024
			Method Hand Excavated Trial Pit	Plant used Hand Tools	Sheet number Sheet 1 of 1
			Level (m OD) -	Logged by SH	Revision A
			Co-ordinates -	Status FINAL	HP04
	No groundwater encountered				

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STRATA				WATER STRIKES	IN SITU TESTING		SAMPLING		
DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
Grass onto brown slightly sandy slightly gravelly CLAY with frequent rootlets. Gravel is fine to coarse subrounded to angular flint. (TOPSOIL)	0.10						0.05		ES
Firm brown slightly sandy slightly gravelly CLAY with occasional rootlets. Gravel is fine to coarse subrounded to angular flint, brick, asphalt and calcareous deposits. (MADE GROUND)	0.30						0.20		ES
TRIAL PIT TERMINATED AT 0.30m									

Notes Trial pit sides remained upright and stable. Trial pit terminated at scheduled depth.	Groundwater observations		Title	Dimensions (w x l)	Date(s)
	Strike (m)	Comments	Trial pit record	0.30m x 0.30m	01/10/2024
			Method Hand Excavated Trial Pit	Plant used Hand Tools	Sheet number Sheet 1 of 1
			Level (m OD) -	Logged by SH	Revision A
			Co-ordinates -	Status FINAL	HP05
	No groundwater encountered				

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STRATA				WATER STRIKES	IN SITU TESTING		SAMPLING		
DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
Grass onto brown slightly sandy slightly gravelly CLAY with frequent rootlets. Gravel is fine to coarse subrounded to angular flint. (TOPSOIL)	0.10						0.05		ES
Firm brown slightly sandy gravelly CLAY with occasional rootlets. Gravel is fine to coarse subrounded to angular flint and sandstone. (SUBSOIL)	0.30								ES
TRIAL PIT TERMINATED AT 0.30m									

Notes Trial pit sides remained upright and stable. Trial pit terminated at scheduled depth.	Groundwater observations		Title	Dimensions (w x l)	Date(s)
	Strike (m)	Comments	Trial pit record	0.30m x 0.30m	01/10/2024
			Method Hand Excavated Trial Pit	Plant used Hand Tools	Sheet number Sheet 1 of 1
			Level (m OD) -	Logged by SH	Revision A
			Co-ordinates -	Status FINAL	HP06
	No groundwater encountered				

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STRATA				WATER STRIKES	IN SITU TESTING		SAMPLING		
DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
Grass onto brown slightly sandy slightly gravelly CLAY with frequent rootlets. Gravel is fine to coarse subrounded to angular flint. (TOPSOIL)	0.10						0.05		ES
Firm brown slightly sandy gravelly CLAY with occasional rootlets. Gravel is fine to coarse subrounded to angular flint and sandstone. (SUBSOIL)	0.30						0.20		ES
TRIAL PIT TERMINATED AT 0.30m									
			</						

Notes Trial pit sides remained upright and stable. Trial pit terminated at scheduled depth.	Groundwater observations		Title	Dimensions (w x l)	Date(s)
	Strike (m)	Comments	Trial pit record	0.30m x 0.30m	01/10/2024
			Method Hand Excavated Trial Pit	Plant used Hand Tools	Sheet number Sheet 1 of 1
			Level (m OD) -	Logged by SH	Revision A
			Co-ordinates -	Status FINAL	HP07
	No groundwater encountered				

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Notes Trial pit sides remained upright and stable. Trial pit terminated at scheduled depth.	Groundwater observations		Title	Dimensions (w x l)	Date(s)
	Strike (m)	Comments	Trial pit record	0.30m x 0.30m	01/10/2024
			Method Hand Excavated Trial Pit	Plant used Hand Tools	Sheet number Sheet 1 of 1
			Level (m OD) -	Logged by SH	Revision A
			Co-ordinates -	Status FINAL	HP08
	No groundwater encountered				

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Notes Trial pit sides remained upright and stable. Trial pit terminated at scheduled depth.	Groundwater observations		Title	Dimensions (w x l)	Date(s)
	Strike (m)	Comments	Trial pit record	0.30m x 0.30m	01/10/2024
			Method Hand Excavated Trial Pit	Plant used Hand Tools	Sheet number Sheet 1 of 1
			Level (m OD) -	Logged by SH	Revision A
			Co-ordinates -	Status FINAL	HP09
	No groundwater encountered				

STRATA				WATER STRIKES	IN SITU TESTING		SAMPLING		
DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
Grass onto soft brown gravelly CLAY. Gravel is coarse subrounded to subangular flint and angular sandstone. (TOPSOIL)									
Soft orangish brown slightly gravelly CLAY with occasional cobbles of flint, siltstone and ironstone. (GRINSTEAD CLAY MEMBER)	0.35 0.50								
Soft becoming firm orangish grey mottled brown slightly gravelly CLAY with occasional cobbles of sandstone. Gravel is fine to coarse subrounded to subangular siltstone. (GRINSTEAD CLAY MEMBER)	0.80 1.00								
Firm greyish mottled brown silty CLAY. (GRINSTEAD CLAY MEMBER)									
TRIAL PIT TERMINATED AT 1.00m									

Notes Trial pit sides remained upright and stable. Trial pit terminated at scheduled depth. Infiltration test performed.	Groundwater observations		Title	Dimensions (w x l)	Date(s)
	Strike (m)	Comments	Trial pit record	0.60m x 1.00m	03/10/2024
			Method Machine Excavated	Plant used 3CX	Sheet number Sheet 1 of 1
			Level (m OD) -	Logged by TB	Revision A
			Co-ordinates -	Status FINAL	TP03
	No groundwater encountered				

STRATA				WATER STRIKES	IN SITU TESTING		SAMPLING		
DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
Grass onto soft brown slightly gravelly CLAY. Gravel is fine to coarse subrounded to angular sandstone and ironstone. (TOPSOIL)	0.30						0.20		ES
Soft orangish brown slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded sandstone and siltstone. (GRINSTEAD CLAY MEMBER)	0.65				PP 0.55	PP 54	0.55		D
Firm orangish mottled brown slightly gravelly CLAY. Gravel is fine to coarse subrounded siltstone. (GRINSTEAD CLAY MEMBER)	0.95				PP 0.90	PP 58	0.90		D
Firm brownish grey CLAY. (GRINSTEAD CLAY MEMBER)	1.90				PP 1.60	PP 54	1.60		D
Firm to stiff brown gravelly CLAY. Gravel is fine to coarse subangular to subrounded mudstone. (GRINSTEAD CLAY MEMBER)	3.10						2.00		D
Very weak to weak brownish grey friable becoming thinly laminated MUDSTONE with bands of stiff gravelly clay. (GRINSTEAD CLAY MEMBER)	3.80								
Very weak to weak brownish grey weathered MUDSTONE. (GRINSTEAD CLAY MEMBER)	4.00						3.90		D
TRIAL PIT TERMINATED AT 4.00m									

Notes Trial pit sides remained upright and stable. Trial pit terminated at scheduled depth.	Groundwater observations		Title	Dimensions (w x l)	Date(s)
	Strike (m)	Comments	Trial pit record	0.50m x 1.70m	03/10/2024
			Method Machine Excavated	Plant used 3CX	Sheet number Sheet 1 of 1
			Level (m OD) -	Logged by TB	Revision A
			Co-ordinates -	Status FINAL	TP04
	No groundwater encountered				

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STRATA				WATER STRIKES	IN SITU TESTING		SAMPLING		
DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
Grass onto soft brown occasionally gravelly CLAY. Gravel is fine to coarse subrounded to subangular flint and siltstone. (TOPSOIL)	0.30								
Soft orangish brown slightly gravelly CLAY. Gravel is fine to coarse subrounded to subangular siltstone. (GRINSTEAD CLAY MEMBER)	0.65								
Soft to firm orangish brown CLAY. (GRINSTEAD CLAY MEMBER)	0.95								
Firm blueish brown silty CLAY. (GRINSTEAD CLAY MEMBER)	1.70								
Firm brown gravelly friable CLAY becoming weathered mudstone. (GRINSTEAD CLAY MEMBER)	2.50								
TRIAL PIT TERMINATED AT 2.50m									

Notes Trial pit sides remained upright and stable. Trial pit terminated at scheduled depth.	Groundwater observations		Title	Dimensions (w x l)	Date(s)
	Strike (m)	Comments	Trial pit record	0.50m x 1.75m	03/10/2024
			Method Machine Excavated	Plant used 3CX	Sheet number Sheet 1 of 1
			Level (m OD) -	Logged by TB	Revision A
			Co-ordinates -	Status FINAL	TP05
	No groundwater encountered				

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STRATA				WATER STRIKES	IN SITU TESTING		SAMPLING		
DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
Grass onto soft brown occasionally gravelly CLAY. Gravel is coarse subangular siltstone and sandstone. (TOPSOIL)	0.30				PP 1.00	PP 63	0.25		ES
Soft becoming firm orangish brown slightly gravelly sandy CLAY. Gravel is fine to coarse angular to subangular ironstone and mudstone. (GRINSTEAD CLAY MEMBER)									
Firm to stiff greyish brown slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded mudstone. (GRINSTEAD CLAY MEMBER)	0.90				PP 1.00	PP 63	1.00		D
Soft becoming firm orangish brown slightly gravelly sandy CLAY. Gravel is fine to coarse subangular mudstone. (GRINSTEAD CLAY MEMBER)	1.10								
Firm to stiff orangish brown becoming brown gravelly CLAY becoming weathered mudstone. Gravel is fine to coarse angular to subrounded mudstone, sandstone and ironstone. (GRINSTEAD CLAY MEMBER)	1.80				PP 2.00	PP 79	2.00		D
									
TRIAL PIT TERMINATED AT 2.55m	2.55						2.50		ES

Notes Trial pit sides remained upright and stable. Trial pit terminated at scheduled depth. Infiltration test performed.	Groundwater observations		Title	Dimensions (w x l)	Date(s)
	Strike (m)	Comments	Trial pit record	0.60m x 1.00m	03/10/2024
			Method Machine Excavated	Plant used 3CX	Sheet number Sheet 1 of 1
			Level (m OD) -	Logged by TB	Revision A
			Co-ordinates -	Status FINAL	TP06
	No groundwater encountered				

STRATA				WATER STRIKES	IN SITU TESTING		SAMPLING		
DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
Grass onto soft brown gravelly sandy CLAY. Gravel is coarse subrounded to angular siltstone and sandstone. (TOPSOIL)	0.20						0.20		ES
Soft yellowish orange clayey SILT. (LOWER TUNBRIDGE WELLS SAND)	0.65								
Firm pale brown slightly gravelly clayey SILT with occasional cobbles of siltstone. Gravel is fine to coarse subrounded to subangular siltstone. (LOWER TUNBRIDGE WELLS SAND)	1.10						1.10		D
Firm pale brown gravelly silty CLAY with occasional cobbles of sandstone. Gravel is coarse subangular to angular sandstone. (LOWER TUNBRIDGE WELLS SAND)					PP 2.00	PP 33	2.00		D
					PP 2.80	PP 46	2.80		D
Firm orangish brown sandy gravelly CLAY with occasional cobbles of sandstone. Gravel is fine to coarse subangular sandstone. (LOWER TUNBRIDGE WELLS SAND)	3.00 3.10								
TRIAL PIT TERMINATED AT 3.10m									

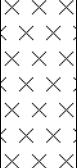
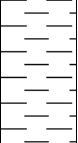
Notes Water strike recorded at 3.1m depth with water level at 2.93m depth after 20 minutes. Trial pit sides remained upright and stable. Trial pit terminated at scheduled depth.	Groundwater observations		Title	Dimensions (w x l)	Date(s)
	Strike (m)	Comments	Trial pit record	0.50m x 1.75m	03/10/2024
	3.10		Method	Plant used	Sheet number
			Machine Excavated	3CX	Sheet 1 of 1
			Level (m OD)	Logged by	Revision
			-	TB	A
			Co-ordinates	Status	TP07
			-	FINAL	

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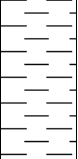
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STRATA				WATER STRIKES	IN SITU TESTING		SAMPLING		
DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
Grass onto soft brown sandy gravelly CLAY. Gravel is subrounded to subangular flint and sandstone. (TOPSOIL)	0.20								
Soft yellowish orange clayey SILT. (LOWER TUNBRIDGE WELLS SAND)	0.65								
Firm orangish yellow slightly sandy silty CLAY with occasional cobbles of siltstone. Gravel is fine to coarse subrounded to subangular siltstone. (LOWER TUNBRIDGE WELLS SAND)	1.00								
TRIAL PIT TERMINATED AT 1.00m									

Notes Trial pit sides remained upright and stable. Trial pit terminated at scheduled depth. Infiltration test performed.	Groundwater observations		Title	Dimensions (w x l)	Date(s)
	Strike (m)	Comments	Trial pit record	0.60m x 1.00m	03/10/2024
			Method Machine Excavated	Plant used 3CX	Sheet number Sheet 1 of 1
			Level (m OD) -	Logged by TB	Revision A
			Co-ordinates -	Status FINAL	TP08
	No groundwater encountered				

STRATA				WATER STRIKES	IN SITU TESTING		SAMPLING		
DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
Grass onto soft brown sandy gravelly CLAY. Gravel is fine to coarse subrounded to subangular siltstone and sandstone. (TOPSOIL)	0.20								
Soft orangish brown clayey SILT with occasional cobbles of subrounded siltstone. (LOWER TUNBRIDGE WELLS SAND)									
Firm to stiff brownish grey becoming grey occasionally mottled silty CLAY. (WADHURST CLAY FORMATION)	1.40								
TRIAL PIT TERMINATED AT 2.50m	2.50								

Notes Trial pit sides remained upright and stable. Trial pit terminated at scheduled depth. Infiltration test performed.	Groundwater observations		Title	Dimensions (w x l)	Date(s)
	Strike (m)	Comments	Trial pit record	0.60m x 1.00m	03/10/2024
			Method Machine Excavated	Plant used 3CX	Sheet number Sheet 1 of 1
			Level (m OD) -	Logged by TB	Revision A
			Co-ordinates -	Status FINAL	TP09
	No groundwater encountered				

STRATA				WATER STRIKES	IN SITU TESTING		SAMPLING		
DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
Grass onto soft brown gravelly sandy CLAY. Gravel is subangular siltstone and sandstone. (TOPSOIL)	0.20						0.20		ES
Soft orangish brown silty CLAY with occasional cobbles of subrounded to angular siltstone. (LOWER TUNBRIDGE WELLS SAND)					PP 0.80	PP 13	0.80		D
	1.40				PP 1.30	PP 54	1.30		D
Firm to stiff brownish grey slightly gravelly CLAY. Gravel is fine to coarse angular sandstone. (WADHURST CLAY FORMATION)									
	3.10						3.40		D
Firm to stiff brownish grey gravelly friable CLAY. Gravel is fine to coarse subangular siltstone. (WADHURST CLAY FORMATION)	3.60								
Firm brownish and orangish grey gravelly CLAY. Gravel is fine to coarse subangular siltstone. (WADHURST CLAY FORMATION)	4.00				PP 4.00	PP 42	4.00		D
TRIAL PIT TERMINATED AT 4.00m									

Notes Water strike recorded at 4.0m depth but water volume insufficient to cover base of pit. Trial pit sides remained upright and stable. Trial pit terminated at scheduled depth.	Groundwater observations		Title	Dimensions (w x l)	Date(s)
	Strike (m)	Comments	Trial pit record	0.50m x 1.75m	03/10/2024
	4.00		Method	Plant used	Sheet number
			Machine Excavated	3CX	Sheet 1 of 1
			Level (m OD)	Logged by	Revision
			-	TB	A
			Co-ordinates	Status	TP10
			-	FINAL	

Appendix C Exploratory Hole Logs: Boreholes

Key to legends

Composite materials, soils and lithology					
	Topsoil		Made Ground		Boulders
	Clay		Coal		Cobbles
	Gravel		Limestone		Mudstone
	Sand		Sandstone		Silt
					Siltstone
					Chalk
					Concrete
					Peat

Note: Composite soil types are signified by combined symbols.

Key to 'test results' and 'sampling' columns

Test result		From (m) To (m)	Records depth of sampling	
Depth	Records depth that the test was carried out (i.e.: at 2.10m or between 2.10m and 2.55m)		D	Disturbed sample
			B	Bulk disturbed sample
			ES	Environmental sample
			SPTLS	SPT liner sample
		Type	W	Water sample
			U	Undisturbed thick-walled sample 100mm diameter sampler
			UT	Undisturbed thin walled sample 100mm diameter sampler
			UTF	Failed undisturbed sample
Result	PP – Pocket penetrometer result reported as an equivalent undrained shear strength (kN/m²) by applying a factor of 50. SV – Hand held shear vane result reported as an undrained shear strength (kN/m²). Where multiple readings are taken at the same level the average value is shown on the log. * Signifies that instrument limit reached. SPT – Standard Penetration Test result (N value uncorrected)^{1,2,3} SPT(c) – Standard Penetration Test result (solid cone) (N value) (uncorrected)^{1,2,3} * Signifies that the test was terminated before full penetration was achieved. UT – Undisturbed sample 100mm diameter sampler with number of blows of driving equipment required to obtain sample			
Sampling				

Note 1: Total seating blows recorded in brackets.

Note 2: Casing depth records depth of casing when SPT or SPT(c) was carried out.

Note 3: Water depth records depth of water when SPT or SPT(c) was carried out.

Water observations

Described at foot of log and shown in the 'water strike' column.

 Water level observed after specified delay in drilling

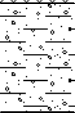
 Water strike

Density

Density recorded in brackets determined by qualitative field assessment or inferred from density testing and soil descriptions from across the site (i.e.: [Medium dense]).

Installation details

	Gravel filter		Bentonite
	Slotted pipe		Unslotted pipe
	Arisings		Grout
	Extensometer magnet		Vibrating wire piezometer

INSTALL	STRATA				WATER STRIKES	CORING					SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (MOD)	LEGEND		DEPTH (m)	TCR (%)	SCR (%)	RQD (%)	FI	TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
	Grass onto brown gravelly CLAY. Gravel is fine to coarse subrounded to subangular flint and sandstone. (TOPSOIL)	0.30															0.10		ES
	Firm orangish brown gravelly CLAY. Gravel is fine to coarse angular to subrounded brick, tile, flint and sandstone. (MADE GROUND)	0.60															0.50		ES
	Firm yellowish orange slightly sandy gravelly CLAY with medium cobble content of sandstone. Gravel is fine to coarse subangular to angular sandstone. (ARDINGLY SANDSTONE MEMBER)	1.20									S 1.20	(10) 20					1.00		ES
	Very weak to weak very thinly to thinly bedded pale yellowish brown stained dark brown highly weathered fine to medium SANDSTONE. Discontinuities are sub-horizontal, closely spaced, undulating rough, stained dark brown with zones of alteration approximately 20mm thick. (ARDINGLY SANDSTONE MEMBER)					1.20 - 2.70	80	50	16	9.0							1.60		B
	Weak very thinly to thinly bedded pale yellowish brown stained dark brown moderately weathered fine to medium SANDSTONE. Bedding fractures are sub-horizontal, closely to medium spaced, undulating rough, stained dark brown. Fracture set 1: Sub-vertical, undulating rough, stained dark brown. (ARDINGLY SANDSTONE MEMBER)	2.50				2.70 - 4.20	87	80	30	4.2	S 2.70	(24) 50*					3.70		B
		4.50				4.20 - 5.70	100	70	40	>25.0	S 4.20	(21) 50*					4.50		B
										1.1									
																			
																			
																			

CONTINUED ON NEXT SHEET.

Notes Inspection pit excavated to 1.2m depth. Water added to aid drilling.	Groundwater observations						Title Borehole record		Date(s) 02/10/2024 - 03/10/2024	
	Strike (m)	5	10	15	20	Comments	Method Rotary Drilling		Plant used DR08	
							Level (m OD) -		Logged by SH	
							Co-ordinates -		Status FINAL	
	No groundwater encountered								Sheet number Sheet 1 of 3	
									Revision A	

BH01

INSTALL	STRATA				WATER STRIKES	CORING					SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (MOD)	LEGEND		DEPTH (m)	TCR (%)	SCR (%)	RQD (%)	FI	TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
	Very weak very thinly to thinly bedded yellowish brown stained black and dark brown highly weathered fine SANDSTONE. Bedding fractures are sub-horizontal, medium spaced, undulating rough, stained brown. Fracture set 1: sub-vertical to 80°, undulating rough, stained dark brown and black with zone of alteration approximately 10mm thick. Non-intact zones between 4.50m-4.60m and 5.50m-5.70m. (ARDINGLY SANDSTONE MEMBER)	5.70		*****		4.20 - 5.70	100	70	40	1.1	S 5.70	(23) 50*							
				*****						>25.0							5.90		B
	NO RECOVERY. Inferred as SANDSTONE. (ARDINGLY SANDSTONE MEMBER)	6.10		*****													6.20		B
	Very weak very thinly to thinly bedded yellowish brown stained black and dark brown highly weathered fine SANDSTONE. Bedding fractures are sub-horizontal, medium spaced, undulating rough, stained brown. Fracture set 1: sub-vertical to 80°, undulating rough, stained dark brown and black with zone of alteration approximately 10mm thick. Non-intact zones between 4.50m-4.60m and 5.50m-5.70m. (ARDINGLY SANDSTONE MEMBER)	6.70		*****		5.70 - 7.20	73	28	20										

		7.20		*****						2.5	S 7.20	(25)* 50*							
	Weak to moderately weak grey moderately weathered fine SANDSTONE. Discontinuities are approximately 60°, medium spaced undulating rough, clean. Non-intact zone between 6.70m-6.80m. (ARDINGLY SANDSTONE MEMBER)			*****															
	NO RECOVERY. Inferred as SANDSTONE. (ARDINGLY SANDSTONE MEMBER)			*****		7.20 - 8.70	23	11	0	NR									
		8.35		*****															
	Extremely weak to very weak pale yellowish brown highly weathered fine SANDSTONE. Bedding fractures are sub-horizontal, very closely to closely spaced, planar smooth, brown staining. Inferred to extend to base of borehole due to no recovery between 8.70m and 10.20m. (ARDINGLY SANDSTONE MEMBER)	8.70		*****						14.3							8.50		B
				*****		8.70 - 10.20	0			NR									

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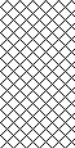
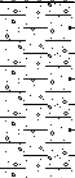
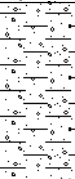
Notes Inspection pit excavated to 1.2m depth. Water added to aid drilling.	Groundwater observations						Title		Date(s)
	Strike (m)	5	10	15	20	Comments	Borehole record		02/10/2024 - 03/10/2024
							Method	Plant used	Sheet number
							Rotary Drilling	DR08	Sheet 2 of 3
							Level (m OD)	Logged by	Revision
	-	SH	A						
No groundwater encountered						Co-ordinates	Status	BH01	
						-	FINAL		

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Notes Inspection pit excavated to 1.2m depth. Water added to aid drilling.	Groundwater observations						Title		Date(s)
	Strike (m)	5	10	15	20	Comments	Borehole record		02/10/2024 - 03/10/2024
							Method	Plant used	Sheet number
							Rotary Drilling	DR08	Sheet 3 of 3
							Level (m OD)	Logged by	Revision
	-	SH	A						
						Co-ordinates	Status	BH01	
No groundwater encountered						-	FINAL		

INSTALL	STRATA				WATER STRIKES	CORING					SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (MOD)	LEGEND		DEPTH (m)	TCR (%)	SCR (%)	RQD (%)	FI	TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
	Grass onto brown gravelly CLAY. Gravel is fine to coarse subrounded to subangular flint and sandstone. (TOPSOIL)	0.20															0.50		ES
	Firm brown slightly sandy gravelly CLAY. Gravel is fine to coarse angular to subrounded brick, flint and sandstone. (MADE GROUND)																		
	Firm brown slightly gravelly CLAY. Gravel is fine to coarse angular to subrounded flint and sandstone. (ARDINGLY SANDSTONE MEMBER)	1.20				1.20 - 2.50	100				S 1.20	(1) 4					1.50		D
	Medium dense brown very clayey coarse angular GRAVEL of sandstone. (ARDINGLY SANDSTONE MEMBER)	2.20									S 2.50	(7) 25					2.20		D
	Medium dense yellowish brown slightly gravelly slightly clayey fine to coarse SAND. Gravel is fine to coarse subangular to angular sandstone. (ARDINGLY SANDSTONE MEMBER)	3.00				2.50 - 4.00	100										3.10		D
	Firm brown slightly gravelly CLAY. Gravel is fine to coarse angular to subrounded flint and sandstone. (ARDINGLY SANDSTONE MEMBER)	4.00				4.00 - 5.50	66				S 4.00	(6) 20					3.80		D

CONTINUED ON NEXT SHEET.

Notes Inspection pit excavated to 1.2m depth. Water added to aid drilling.	Groundwater observations						Title Borehole record		Date(s) 03/10/2024 - 04/10/2024
	Strike (m)	5	10	15	20	Comments			
							Method Rotary Drilling	Plant used DR08	Sheet number Sheet 1 of 4
							Level (m OD) -	Logged by SH	Revision A
							Co-ordinates -	Status FINAL	BH02
	No groundwater encountered								

INSTALL	STRATA				WATER STRIKES	CORING					SPT TESTING				OTHER IN SITU TESTING		SAMPLING			
	DESCRIPTION	DEPTH (m)	REDUCED LVL (MOD)	LEGEND		DEPTH (m)	TCR (%)	SCR (%)	RQD (%)	FI	TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE	
		5.50				4.00 - 5.50	66				S 5.50	(9) 25					5.10		D	
	Very weak to weak pale yellowish brown stained dark brown completely to highly weathered fine to medium SANDSTONE. Discontinuities are sub-horizontal, closely spaced, undulating rough, stained dark brown. (ARDINGLY SANDSTONE MEMBER)			5.50 - 7.00		66	33	17	>25.0											
		6.70									S 7.00	(22) 50*					7.50		B	
	Weak very thinly to thinly bedded pale yellowish brown stained dark brown highly to moderately weathered fine to medium SANDSTONE. Bedding fractures are sub-horizontal, closely to medium spaced, undulating rough, stained dark brown. Fracture set 1: Sub-vertical, undulating rough, stained dark brown. (ARDINGLY SANDSTONE MEMBER)			7.00 - 8.50																100
		7.70																		
	Weak to moderately weak grey moderately weathered fine SANDSTONE. Discontinuities are, medium spaced, undulating rough, clean. Discontinuities appear to be drilling induced. (ARDINGLY SANDSTONE MEMBER)			7.00 - 8.50																100
		7.85																		
	Weak pale yellowish brown moderately to highly weathered fine to medium SANDSTONE. Bedding fractures are sub-horizontal, very closely to closely spaced, planar smooth, brown staining. Fracture set 1: sub-vertical to 80°, undulating rough, stained dark brown. (ARDINGLY SANDSTONE MEMBER)			8.50 - 10.00																

CONTINUED ON NEXT SHEET.

Notes Inspection pit excavated to 1.2m depth. Water added to aid drilling.	Groundwater observations						Title Borehole record		Date(s) 03/10/2024 - 04/10/2024
	Strike (m)	5	10	15	20	Comments			
							Method Rotary Drilling	Plant used DR08	Sheet number Sheet 2 of 4
							Level (m OD) -	Logged by SH	Revision A
							Co-ordinates -	Status FINAL	BH02
	No groundwater encountered								

INSTALL	STRATA				WATER STRIKES	CORING					SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (mOD)	LEGEND		DEPTH (m)	TCR (%)	SCR (%)	RQD (%)	FI	TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
		10.30		• • • •		10.00 - 11.50	25	25	10	6.7	S 10.00	(25)* 50*					11.20		B
	NO RECOVERY. Inferred as SANDSTONE. (ARDINGLY SANDSTONE MEMBER)																		
				11.50 - 13.00		0			NR										
	NO RECOVERY. Inferred as MUDSTONE & CONGLOMERATE & SANDSTONE. (LOWER GRINSTEAD CLAY MUDSTONES? or CUCKFIELD STONE BED?)	13.00					13.00 - 14.50	10		8									
	14.35		○ ○ ○ ○					6.7											
	14.50				14.50 - 15.50	0			NR										

CONTINUED ON NEXT SHEET.

Notes Inspection pit excavated to 1.2m depth. Water added to aid drilling.	Groundwater observations						Title		Date(s)
	Strike (m)	5	10	15	20	Comments	Borehole record		03/10/2024 - 04/10/2024
							Method	Plant used	Sheet number
							Rotary Drilling	DR08	Sheet 3 of 4
							Level (m OD)	Logged by	Revision
	-	SH	A						
Co-ordinates	Status	BH02							
-	FINAL								
No groundwater encountered									

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Notes Inspection pit excavated to 1.2m depth. Water added to aid drilling.	Groundwater observations						Title		Date(s)
	Strike (m)	5	10	15	20	Comments	Borehole record		03/10/2024 - 04/10/2024
							Method	Plant used	Sheet number
							Rotary Drilling	DR08	Sheet 4 of 4
							Level (m OD)	Logged by	Revision
	-	SH	A						
Co-ordinates	Status	BH02							
-	FINAL								

Key to legends

Composite materials, soils and lithology							
	Topsoil		Made Ground		Boulders		Chalk
	Clay		Coal		Cobbles		Concrete
	Gravel		Limestone		Mudstone		Peat
	Sand		Sandstone		Silt		Siltstone

Note: Composite soil types are signified by combined symbols.

Key to 'test results' and 'sampling' columns

Test result		From (m) To (m)	Records depth of sampling	
Depth	Records depth that the test was carried out (i.e.: at 2.10m or between 2.10m and 2.55m)		D	Disturbed sample
			B	Bulk disturbed sample
			ES	Environmental sample
			SPTLS	SPT liner sample
		Type	W	Water sample
			U	Undisturbed thick-walled sample 100mm diameter sampler
			UT	Undisturbed thin walled sample 100mm diameter sampler
			UTF	Failed undisturbed sample
Result	PP – Pocket penetrometer result reported as an equivalent undrained shear strength (kN/m²) by applying a factor of 50. SV – Hand held shear vane result reported as an undrained shear strength (kN/m²). Where multiple readings are taken at the same level the average value is shown on the log. * Signifies that instrument limit reached. SPT – Standard Penetration Test result (N value uncorrected)^{1,2,3} SPT(c) – Standard Penetration Test result (solid cone) (N value) (uncorrected)^{1,2,3} * Signifies that the test was terminated before full penetration was achieved. UT – Undisturbed sample 100mm diameter sampler with number of blows of driving equipment required to obtain sample			
Sampling				

Note 1: Total seating blows recorded in brackets.

Note 2: Casing depth records depth of casing when SPT or SPT(c) was carried out.

Note 3: Water depth records depth of water when SPT or SPT(c) was carried out.

Water observations

Described at foot of log and shown in the 'water strike' column.

Water level observed after specified delay in drilling

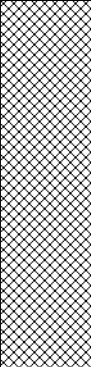
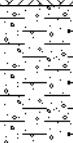
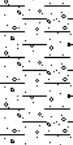
Water strike

Density

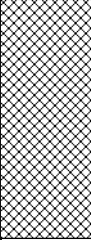
Density recorded in brackets determined by qualitative field assessment or inferred from density testing and soil descriptions from across the site (i.e.: [Medium dense]).

Installation details

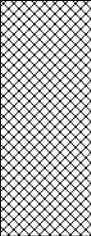
	Gravel filter		Bentonite
	Slotted pipe		Unslotted pipe
	Arisings		Grout
	Extensometer magnet		Vibrating wire piezometer

INSTALL	STRATA				WATER STRIKES	SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (mOD)	LEGEND		TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
	Grass onto soft dark brown gravelly CLAY with frequent rootlets. Gravel is fine to medium rounded to sub angular flint. (TOPSOIL)	0.30										0.20		ES
	Firm orangish brown slightly gravelly sandy CLAY. Gravel is fine to coarse angular sandstone. (ARDINGLY SANDSTONE MEMBER)									SV 0.50	SV 86	0.60		D
										SV 0.75	SV 22	1.00		D
	Stiff becoming very stiff yellowish orange slightly sandy slightly gravelly CLAY with occasional cobbles of angular and subangular sandstone. (ARDINGLY SANDSTONE MEMBER)	1.25				C 1.20	(4) 5		DRY			1.50	2.00	D
						C 2.00	(15) 50*		DRY					
	BOREHOLE TERMINATED AT 2.44m		2.44											

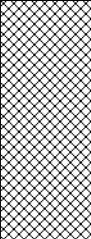
Notes Inspection pit excavated to 1.2m depth. Borehole terminated due to refusal	Groundwater observations						Recovery details		Title		Date(s)
	Strike (m)	5	10	15	20	Comments	Range (m)	Recovery (%)	Dynamic windowless sampling record		02/10/2024
							1.20 - 2.00	100	Method	Plant used	Sheet number
									Windowless Sampler	Premier 110 KSTDs1	Sheet 1 of 1
									Level (m OD)	Logged by	Revision
									-	TB	A
No groundwater encountered									Co-ordinates	Status	WLS01
									-	FINAL	

INSTALL	STRATA				WATER STRIKES	SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (mOD)	LEGEND		TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
	Grass onto dark brown gravelly CLAY with frequent rootlets and low cobble content of red brick. Gravel is fine to medium rounded to subangular flint and sandstone. (MADE GROUND)	0.30				C 1.20	(16) 39*		DRY	SV 0.25	SV 97	0.20 0.40	0.25	ES D
	Firm becoming stiff orangish brown slightly gravelly sandy CLAY. Gravel is fine to coarse angular sandstone. (ARDINGLY SANDSTONE MEMBER)	0.55												
	Dense yellowish orange fine clayey SAND with occasional cobbles of angular to subangular sandstone. (ARDINGLY SANDSTONE MEMBER)													
	BOREHOLE TERMINATED AT 1.58m	1.58												

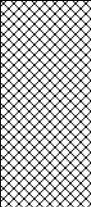
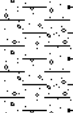
Notes Inspection pit excavated to 1.2m depth. Borehole terminated due to refusal	Groundwater observations						Recovery details		Title		Date(s)
	Strike (m)	5	10	15	20	Comments	Range (m)	Recovery (%)	Dynamic windowless sampling record		02/10/2024
									Method Windowless Sampler	Plant used Premier 110 KSTDs1	Sheet number Sheet 1 of 1
									Level (m OD) -	Logged by TB	Revision A
	No groundwater encountered								Co-ordinates -	Status FINAL	WLS02

INSTALL	STRATA				WATER STRIKES	SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (mOD)	LEGEND		TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
	Grass onto dark brown gravelly CLAY with frequent rootlets. Gravel is fine to medium rounded to subangular flint and sandstone. (TOPSOIL)	0.30								SV 0.25	SV 80	0.20	0.25	ES
	Firm orangish brown gravelly CLAY with low cobble content of subangular sandstone. Gravel is fine to coarse subangular to angular sandstone. (ARDINGLY SANDSTONE MEMBER)	0.50										0.40		D
	Very dense yellowish orange gravelly fine clayey SAND. Gravel is fine to coarse subangular to angular sandstone. (ARDINGLY SANDSTONE MEMBER)													
	BOREHOLE TERMINATED AT 1.56m	1.56				C 1.20	(24) 50*		DRY					

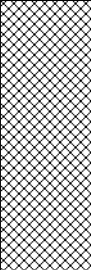
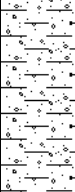
Notes Inspection pit excavated to 1.2m depth. Borehole terminated due to refusal	Groundwater observations						Recovery details		Title		Date(s)
	Strike (m)	5	10	15	20	Comments	Range (m)	Recovery (%)	Dynamic windowless sampling record		02/10/2024
									Method Windowless Sampler	Plant used Premier 110 KSTDs1	Sheet number Sheet 1 of 1
									Level (m OD) -	Logged by TB	Revision A
	No groundwater encountered								Co-ordinates -	Status FINAL	WLS03

INSTALL	STRATA				WATER STRIKES	SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (mOD)	LEGEND		TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
	Grass onto dark brown gravelly CLAY with frequent rootlets. Gravel is fine to medium rounded to subangular flint and sandstone. (TOPSOIL)	0.25										0.20	0.25	ES
	Firm orangish brown gravelly CLAY. Gravel is fine to coarse subangular to angular flint, sandstone and brick. (MADE GROUND)	0.55										0.45		D
	Firm becoming stiff yellowish orange sandy gravelly CLAY with low cobble content of sandstone. Gravel is fine to coarse subangular to angular sandstone. (ARDINGLY SANDSTONE MEMBER)					C 1.20	(24) 50*		DRY					
	BOREHOLE TERMINATED AT 1.60m	1.60												

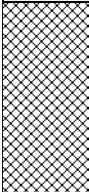
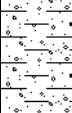
Notes Inspection pit excavated to 1.2m depth. Borehole terminated due to refusal	Groundwater observations						Recovery details		Title		Date(s)
	Strike (m)	5	10	15	20	Comments	Range (m)	Recovery (%)	Dynamic windowless sampling record		02/10/2024
									Method Windowless Sampler	Plant used Premier 110 KSTDS1	Sheet number Sheet 1 of 1
									Level (m OD) -	Logged by TB	Revision A
	No groundwater encountered								Co-ordinates -	Status FINAL	WLS04

INSTALL	STRATA				WATER STRIKES	SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (mOD)	LEGEND		TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
	Grass onto brown gravelly CLAY with frequent rootlets. Gravel is subrounded to subangular flint and sandstone. (TOPSOIL)	0.20				C 1.20	(24) 50*		DRY	SV 0.25	SV 47	0.10		ES
	Firm orangish brown gravelly CLAY. Gravel is fine to coarse angular to subrounded brick, tile, flint and sandstone. (MADE GROUND)	0.50								SV 0.50	SV 29	0.60		ES
	Firm becoming stiff yellowish orange sandy gravelly CLAY with medium cobble content of subangular sandstone. Gravel is fine to coarse subangular to angular sandstone. (ARDINGLY SANDSTONE MEMBER)											1.00		D
	BOREHOLE TERMINATED AT 1.38m	1.38												

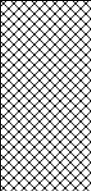
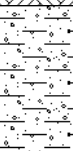
Notes Inspection pit excavated to 1.2m depth. Borehole terminated due to refusal	Groundwater observations						Recovery details		Title		Date(s)
	Strike (m)	5	10	15	20	Comments	Range (m)	Recovery (%)	Dynamic windowless sampling record		03/10/2024
									Method Windowless Sampler	Plant used Premier 110 KSTDS1	Sheet number Sheet 1 of 1
									Level (m OD) -	Logged by SH	Revision A
	No groundwater encountered								Co-ordinates -	Status FINAL	WLS05

INSTALL	STRATA				WATER STRIKES	SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (mOD)	LEGEND		TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
	Grass onto brown gravelly CLAY with frequent rootlets. Gravel is subrounded to subangular flint and sandstone. (TOPSOIL)	0.30				C 1.20	(24) 50		DRY			0.20		ES
	Firm orangish brown gravelly CLAY. Gravel is fine to coarse angular to subrounded brick, tile, flint and sandstone. (MADE GROUND)	0.50										0.40		ES
	Firm yellowish orange slightly sandy gravelly CLAY with medium cobble content of subangular sandstone. Gravel is fine to coarse subangular to angular sandstone. (ARDINGLY SANDSTONE MEMBER)											1.10		D
	BOREHOLE TERMINATED AT 1.80m	1.80												

Notes Inspection pit excavated to 1.2m depth. Borehole terminated due to refusal	Groundwater observations						Recovery details		Title		Date(s)
	Strike (m)	5	10	15	20	Comments	Range (m)	Recovery (%)	Dynamic windowless sampling record		03/10/2024
									Method Windowless Sampler	Plant used Premier 110 KSTDS1	Sheet number Sheet 1 of 1
									Level (m OD) -	Logged by SH	Revision A
	No groundwater encountered								Co-ordinates -	Status FINAL	WLS06

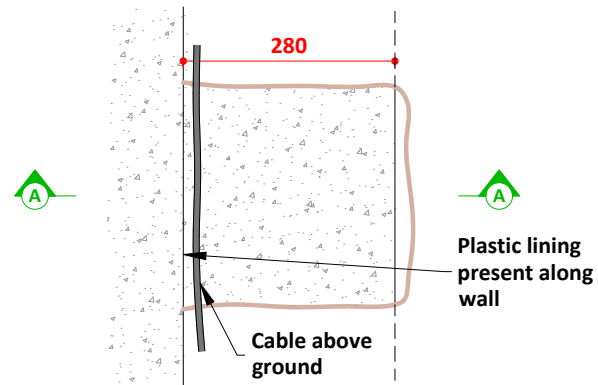
INSTALL	STRATA				WATER STRIKES	SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (mOD)	LEGEND		TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
	Grass onto brown gravelly CLAY with frequent rootlets. Gravel is subrounded to subangular flint and sandstone. (TOPSOIL)	0.30			C 1.20	(6) 10*		DRY	SV 0.50	SV 57	0.10		ES	
	Firm orangish brown gravelly CLAY. Gravel is fine to coarse angular to subrounded brick, tile, flint and sandstone. (MADE GROUND)	0.50									0.40		ES	
	Firm yellowish orange slightly sandy gravelly CLAY with medium cobble content of subangular sandstone. Gravel is fine to coarse subangular to angular sandstone. (ARDINGLY SANDSTONE MEMBER)	1.27									1.00		D	
	BOREHOLE TERMINATED AT 1.27m													

Notes Inspection pit excavated to 1.2m depth. Water level recorded at 0.9m depth 20 minutes following completion of the borehole. Borehole terminated due to refusal	Groundwater observations						Recovery details		Title		Date(s)
	Strike (m)	5	10	15	20	Comments	Range (m)	Recovery (%)	Dynamic windowless sampling record		03/10/2024
									Method		Sheet number
									Windowless Sampler	Plant used Premier 110 KSTDs1	
									Level (m OD)		Revision
									-	Logged by SH	A
No groundwater encountered									Co-ordinates		WLS07
									-	Status FINAL	

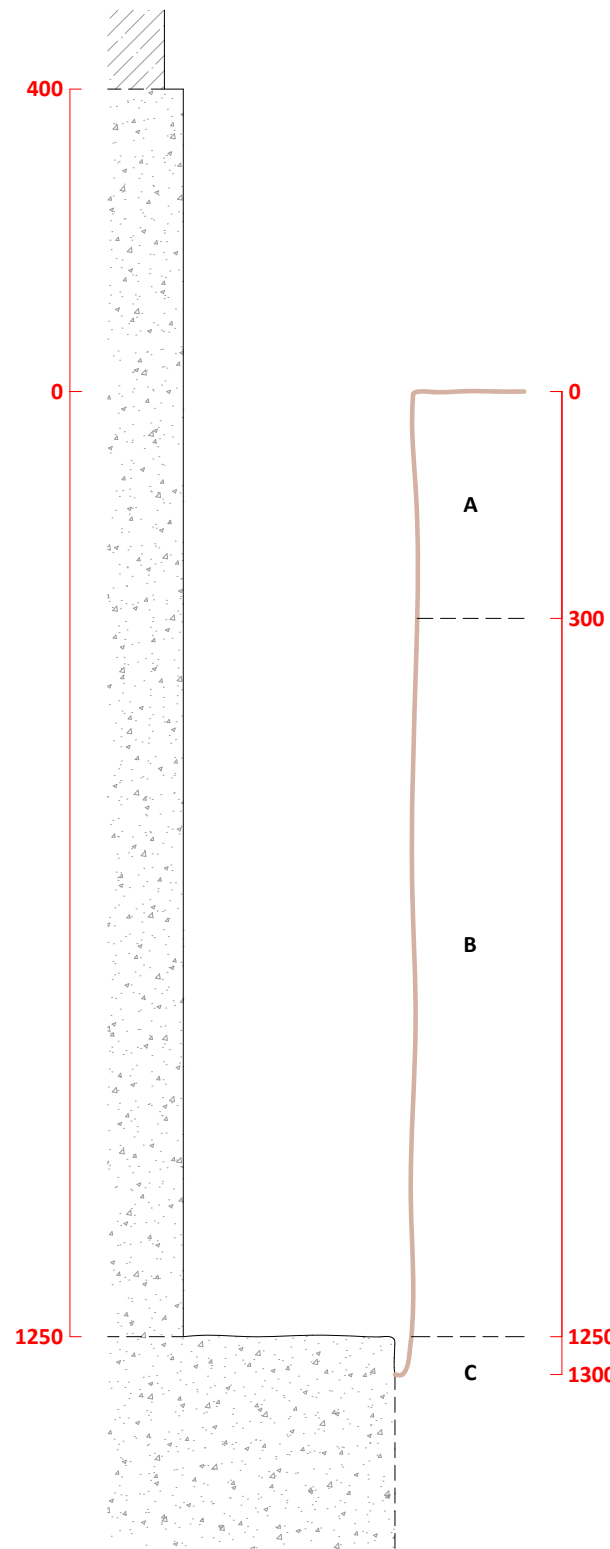
INSTALL	STRATA				WATER STRIKES	SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (mOD)	LEGEND		TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
	Grass onto brown gravelly CLAY with frequent rootlets. Gravel is subrounded to subangular flint and sandstone. (TOPSOIL)	0.30				C 1.20	(10) 14*		DRY	SV 0.50	SV 93	0.10		ES
	Firm yellowish orange slightly sandy gravelly CLAY with medium cobble content of subangular sandstone. Gravel is fine to coarse subangular to angular sandstone. (ARDINGLY SANDSTONE MEMBER)											1.00		D
	BOREHOLE TERMINATED AT 1.27m	1.27												

Notes Inspection pit excavated to 1.2m depth. Borehole terminated due to refusal	Groundwater observations						Recovery details		Title		Date(s)
	Strike (m)	5	10	15	20	Comments	Range (m)	Recovery (%)	Dynamic windowless sampling record		03/10/2024
									Method Windowless Sampler	Plant used Premier 110 KSTDs1	Sheet number Sheet 1 of 1
									Level (m OD) -	Logged by SH	Revision A
	No groundwater encountered								Co-ordinates -	Status FINAL	WLS08

Appendix D Exploratory Hole Logs: Foundation Pits



Section A-A



Photographic records



Key

- A. Stiff dark brown slightly sandy gravelly CLAY. Gravel is fine to coarse subrounded to angular flint and brick. (MADE GROUND)
- B. Stiff brown slightly sandy gravelly CLAY with roots ~10mm in diameter to 500mm depth. Gravel is fine to coarse angular to subrounded brick, flint, concrete and sandstone. (MADE GROUND)
- C. SANDSTONE. (ARDINGLY SANDSTONE MEMBER)

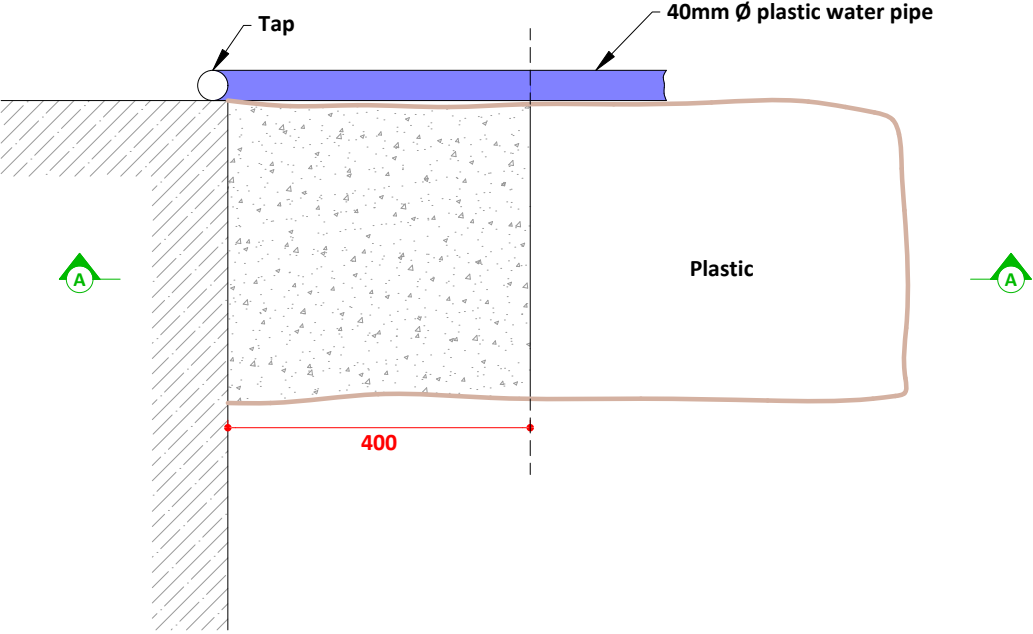
- Observed features
- Assumed features
- Excavation outline



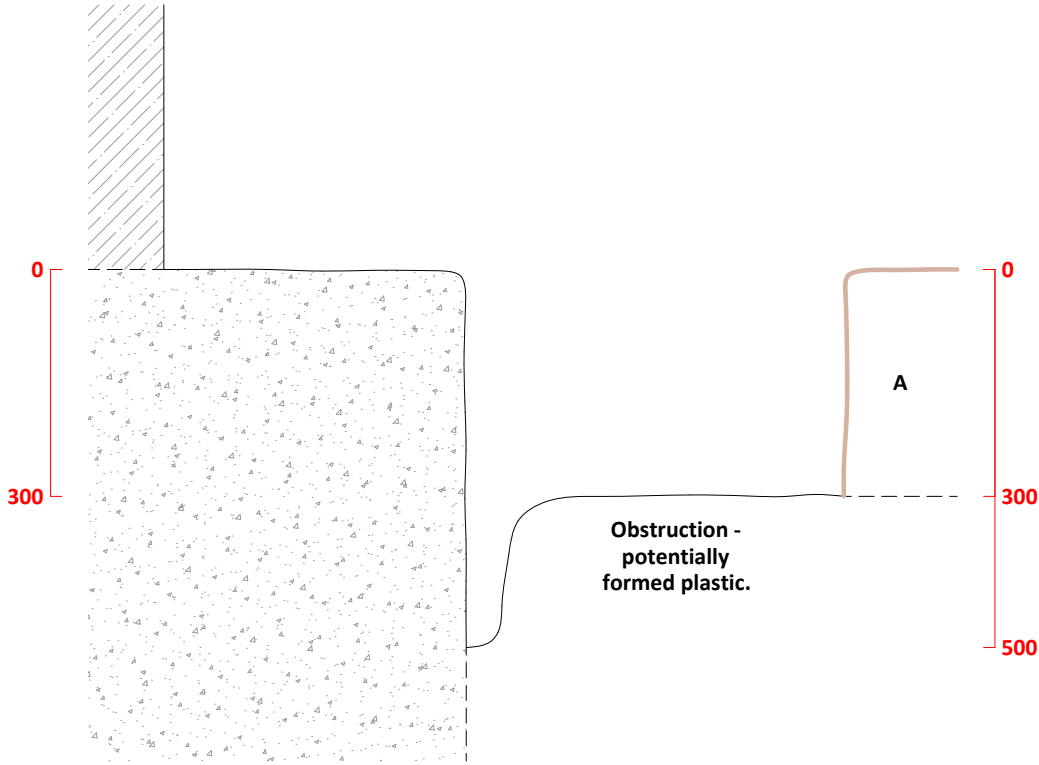
Notes

1. Trial pit sides remained upright and stable.
2. Dimensions shown in millimetres.
3. No groundwater encountered.
4. Unable to drill probe due to depth of pit.

A	First issue	SH	KD	08.10.2024
REV	DESCRIPTION	LOGD	PREP	DATE
soiltechnics environmental ▪ geotechnical ▪ building fabric				
PROJECT Saint Hill Road, East Grinstead				
TITLE Trial pit record				
METHOD Hand tools		DATE OF WORKS 02.10.2024		
PROJECT NO. STW6679	SCALE AT A3 1:10	LOCATION REFERENCE TP01		



Section A-A



Photographic records



Key

- A. Grass onto dark brown slightly sandy gravelly CLAY. Gravel is fine to coarse subrounded to angular brick, plastic, sandstone, flint and metal. (MADE GROUND)

— Observed features
- - - Assumed features
— Excavation outline

Stone Concrete

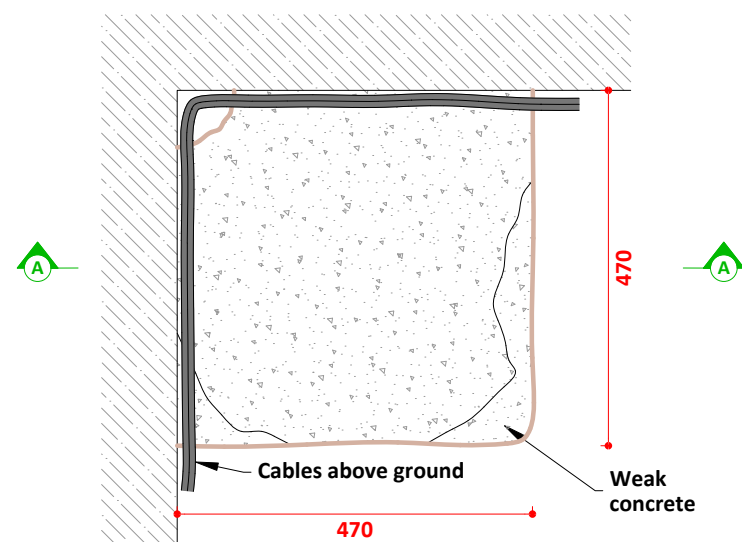
Notes

1. Trial pit sides remained upright and stable.
2. Dimensions shown in millimetres.
3. No groundwater encountered.
4. Drill probes to prove thickness of concrete not undertaken due to presence of nearby tanks and pipes.
5. Could not cut or dig through the obstruction, thought to be a type of formed plastic.

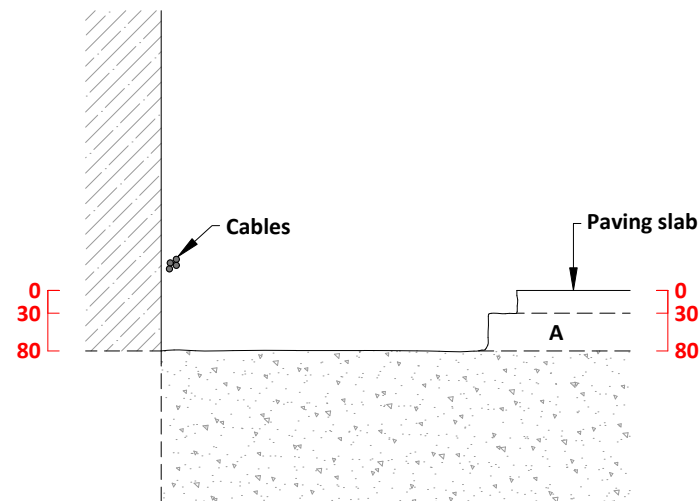
Samples - Disturbed (D) / Environmental (ES) / Bulk (B)

- 0.2m (ES)

A	First issue	SH	KD	08.10.2024
REV	DESCRIPTION	LOGD	PREP	DATE
soiltechnics environmental ■ geotechnical ■ building fabric				
PROJECT Saint Hill Road, East Grinstead				
TITLE Trial pit record				
METHOD Hand tools		DATE OF WORKS 02.10.2024		
PROJECT NO. STW6679	SCALE AT A3 1:10		LOCATION REFERENCE TP02	



Section A-A



Photographic records



Key

A. Orangish brown slightly clayey fine to coarse SAND.
(MADE GROUND)

- Observed features
- Assumed features
- Excavation outline

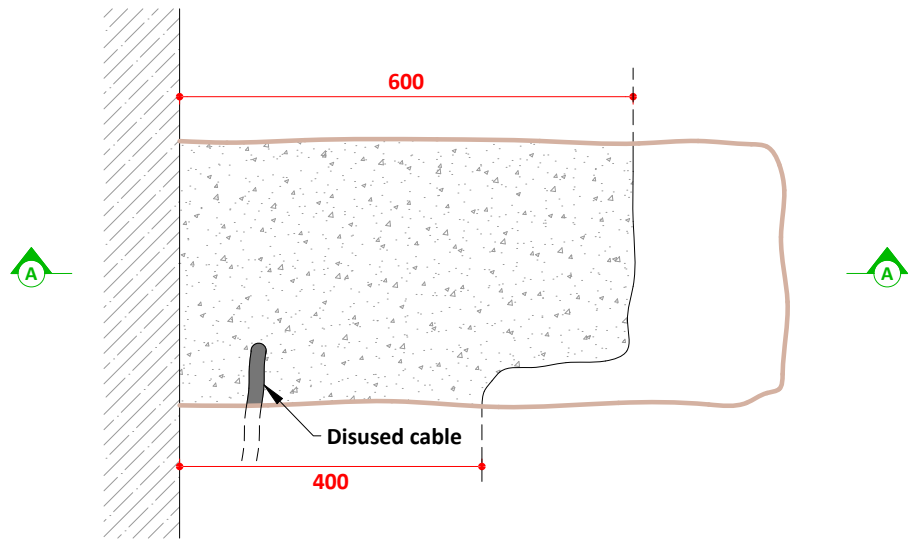
 Stone

 Concrete

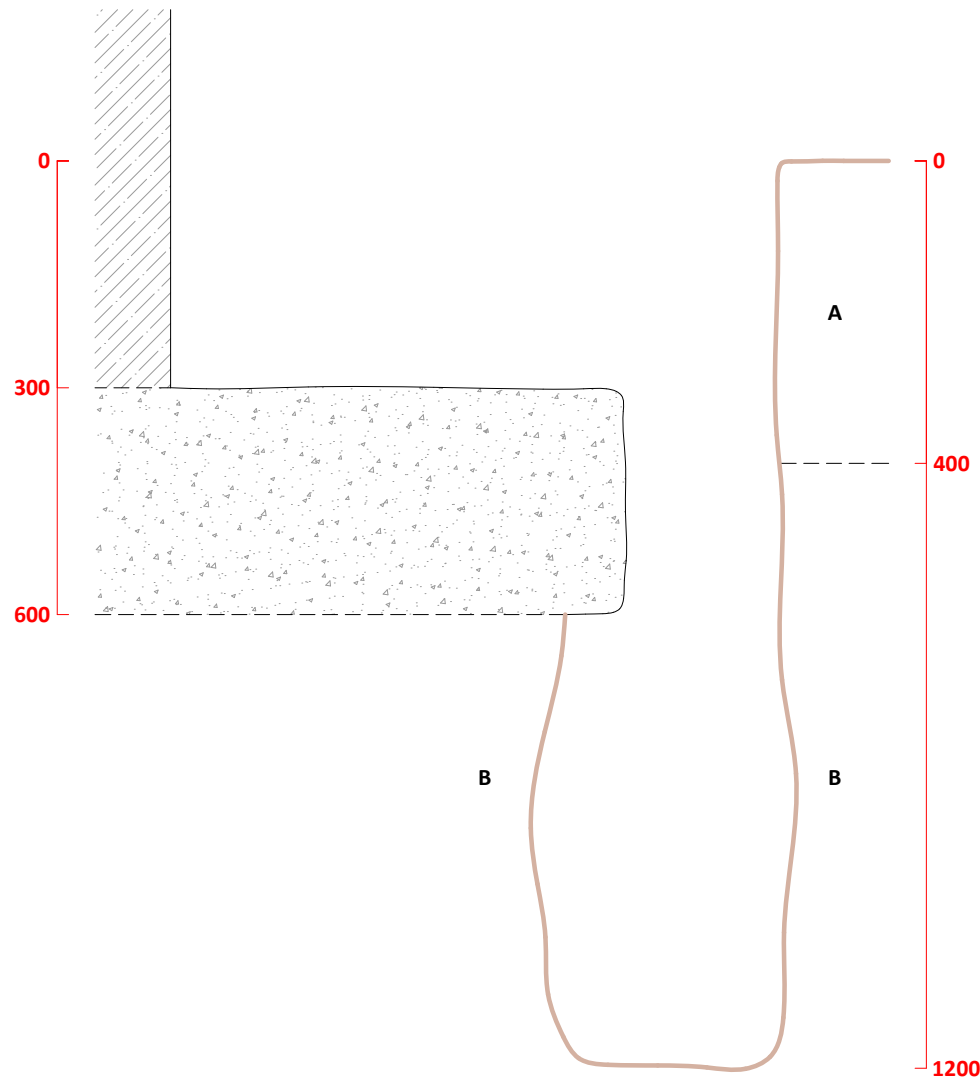
Notes

- Trial pit sides remained upright and stable.
- Dimensions shown in millimetres.
- No groundwater encountered.
- Location not drill probed due to time restrictions.

A	First issue	SH	KD	08.10.2024
REV	DESCRIPTION	LOGD	PREP	DATE
soiltechnics environmental ▪ geotechnical ▪ building fabric				
PROJECT Saint Hill Road, East Grinstead				
TITLE Trial pit record				
METHOD Hand tools		DATE OF WORKS 02.10.2024		
PROJECT NO. STW6679	SCALE AT A3 1:10		LOCATION REFERENCE TP11	



Section A-A



Photographic records



..\\..\\15. Fieldwork, Monitoring and Lab Testing\\8. Photographs\\Photos\\Area 3 - General\\IMG_7749.JPG

Key

- A. Dark brown slightly sandy gravelly organic CLAY with rare roots up to 30mm in diameter. Gravel is fine to coarse subrounded to angular sandstone, brick, concrete and flint. (MADE GROUND)
- B. Stiff orangish brown slightly sandy gravelly CLAY. Gravel is fine to coarse subrounded to angular sandstone and brick. (MADE GROUND)

—

Observed features

- - -

Assumed features

—

Excavation outline

Stone

Concrete

Notes

1. Trial pit sides remained upright and stable.
2. Dimensions shown in millimetres.
3. No groundwater encountered.

Samples - Disturbed (D) / Environmental (ES) / Bulk (B)

- 0.2m (ES)
- 0.5m (ES)

A	First issue	SH	KD	08.10.2024
REV	DESCRIPTION	LOGD	PREP	DATE
soiltechnics environmental ■ geotechnical ■ building fabric				
PROJECT Saint Hill Road, East Grinstead				
TITLE Trial pit record				
METHOD Hand tools		DATE OF WORKS 02.10.2024		
PROJECT NO. STW6679	SCALE AT A3 1:10	LOCATION REFERENCE TP12		

Appendix E Photographic Records

P1: Photograph showing large event tent located in Area 1.



P2: Photograph looking northeast toward the castle and the location of BH01.



Title

Photographic records of Area 1 – Hobbs Field

Photo sheet number

P1

Appendix

E

P3: Photograph looking west across Area 1.



P4: Photograph looking north across Area 1.



Title

Photographic records of Area 1 – Hobbs Field

Photo sheet number

P1

Appendix

E

P5: Photograph showing contents of inspection pit of WLS01.



P6: Photograph showing recovery from WLS01 between 1.2m and 2.0m depth.



Title

Photographic records of Area 1 – Hobbs Field

Photo sheet number

P1

Appendix

E

P7: Photograph showing contents of inspection pit of WLS02.



P8: Photograph showing contents of inspection pit of WLS03.



Title

Photographic records of Area 1 – Hobbs Field

Photo sheet number

P1

Appendix

E

P9: Photograph showing contents of inspection pit of WLS04.



P10: Photograph showing contents of inspection pit of WLS05.



Title

Photographic records of Area 1 – Hobbs Field

Photo sheet number

P1

Appendix

E

P11: Photograph showing contents of inspection pit of WLS06.



P12: Photograph showing contents of inspection pit of WLS07.



Title

Photographic records of Area 1 – Hobbs Field

Photo sheet number

P1

Appendix

E

P13: Photograph showing contents of inspection pit of WLS08.



Title	Photo sheet number	Appendix
Photographic records of Area 1 – Hobbs Field	P1	E

P1: Photograph looking west showing area of proposed extension to the north of the castle and location of BH02.



P2: Photograph looking east showing area of proposed extension to the north of the castle.



Title

Photographic records of Area 2

Photo sheet number

P2

Appendix

E

P3: Photograph showing western side of castle and area of proposed extension and location of BH01.



P4: Photograph showing contents of inspection pit from BH01.



Title

Photographic records of Area 2

Photo sheet number

P2

Appendix

E

P5: Photograph showing core run from BH01 between 1.2m and 2.7m depth.



P6: Photograph showing core run from BH01 between 2.7m and 4.2m depth.



P7: Photograph showing core run from BH01 between 4.2m and 5.7m depth.



Title	Photo sheet number	Appendix
Photographic records of Area 2	P2	E

P8: Photograph showing core run from BH01 between 5.7m and 7.2m depth.



P9: Photograph showing core run from BH01 between 7.2m and 8.7m depth.



Title

Photographic records of Area 2

Photo sheet number

P2

Appendix

E

P10: Photograph showing inspection pit from BH02.



P11: Core run from BH02 between 1.2m and 2.5m depth.



Title

Photographic records of Area 2

Photo sheet number

P2

Appendix

E

P12: Core run from BH02 between 2.5m and 4.0m depth.



P13: Core run from BH02 between 4.0m and 5.5m depth.



P14: Core run from BH02 between 5.5m and 7.0m depth.



Title	Photo sheet number	Appendix
Photographic records of Area 2	P2	E

P15: Core run from BH02 between 7.0m and 8.5m depth.



P16: Core run from BH02 between 8.5m and 10.0m depth.



P17: Core run from BH02 between 10.0m and 11.5m depth.



Title

Photographic records of Area 2

Photo sheet number

P2

Appendix

E

P18: Core run from BH02 between 13.0m and 14.5m depth.



Title

Photographic records of Area 2

Photo sheet number

P2

Appendix

E

P1: Photograph showing location of TP07 and TP08.



P2: Photograph showing location of TP09 and TP10.



Title	Photo sheet number	Appendix
Photographic records of Area 3	P3	E

P3: Photograph showing TP07.



P4: Photograph showing TP08 during soakaway test.



Title

Photographic records of Area 3

Photo sheet number

P3

Appendix

E

P5: Photograph showing TP09.



P6: Photograph showing TP10.



Title

Photographic records of Area 3

Photo sheet number

P3

Appendix

E

P1: Photograph looking northwest across the area.



P2: Photograph looking southwest across the area.



Title	Photo sheet number	Appendix
Photographic records of the Jurhing Field	P4	E

P3: Photograph showing the western corner of the area.



P4: Photograph showing contents of HP01.



Title

Photographic records of the Jurhing Field

Photo sheet number

P4

Appendix

E

P5: Photograph showing HP01.



P6: Photograph showing contents of HP02.



Title

Photographic records of the Jurhing Field

Photo sheet number

P4

Appendix

E

P7: Photograph showing HP02.



P8: Photograph showing contents of HP03.



Title

Photographic records of the Jurhing Field

Photo sheet number

P4

Appendix

E

P9: Photograph showing contents of HP04.



P10: Photograph showing HP04.



Title

Photographic records of the Jurhing Field

Photo sheet number

P4

Appendix

E

P11: Photograph contents of HP05.



P12: Photograph showing HP05.



Title

Photographic records of the Jurhing Field

Photo sheet number

P4

Appendix

E

P13: Photograph showing contents of HP06.



P14: Photograph showing HP06.



Title

Photographic records of the Jurhing Field

Photo sheet number

P4

Appendix

E

P15: Photograph showing contents HP08.



P16: Photograph showing HP08.



Title

Photographic records of the Jurhing Field

Photo sheet number

P4

Appendix

E

P17: Photograph showing contents of HP09.



P18: Photograph showing HP09.



Title

Photographic records of the Jurhing Field

Photo sheet number

P4

Appendix

E

P19: Photograph showing TP03.



P20: Photograph showing TP04.



Title	Photo sheet number	Appendix
Photographic records of the Jurhing Field	P4	E

P21: Photograph showing TP05.



P22: Photograph showing TP06.



Title	Photo sheet number	Appendix
Photographic records of the Jurhing Field	P4	E

Appendix F In Situ Test Results

Table summarising Pocket Penetrometer results

* Instrument limit reached.

Location	Start Depth (m)	Results 1-3	Average	Undrained Shear Strength (kN/m ²)
TP04	1.60	1.25/0.75/1.25	1.08	54
TP04	0.90	1/1/1.5	1.17	58
TP04	0.55	1.5/1/0.75	1.08	54
TP06	2.00	1.75/1.5/1.5	1.58	79
TP06	1.00	1.5/1/1.25	1.25	63
TP07	2.80	0.75/1/1	0.92	46
TP07	2.00	0.75/0.75/0.5	0.67	33
TP10	4.00	0.75/1/0.75	0.83	42
TP10	1.30	1/1.25/1	1.08	54
TP10	0.80	0.25/0.25/0.25	0.25	13

Table summarising Shear Vane results

* Instrument limit reached.

Location	Start Depth (m)	Results 1-3	Average	Undrained Shear Strength (kN/m ²)
WLS01	0.75	25/19/22	22.00	22
WLS01	0.50	86/89/82	85.67	86
WLS02	0.25	122/86/83	97.00	97
WLS03	0.25	89/77/74	80.00	80
WLS05	0.50	36/26/26	29.33	29
WLS05	0.25	32/58/52	47.33	47
WLS07	0.50	56/50/65	57.00	57
WLS08	0.50	98/80/100	92.67	93

Table summarising Standard Penetration Test (SPT) results

Location	Start Depth (m)	Penetration (mm)					
		Seating 1-2	Main 1-4	Total Seating	Total Main	Total Seating	Total Main
BH01	5.70	11/12	24/26/0/0	23	50	150	150
BH01	4.20	9/12	21/29/0/0	21	50	150	150
BH01	7.20	25	50/0/0/0	25	50	75	0
BH01	2.70	11/13	50/0/0/0	24	50	150	75
BH01	1.20	5/5	5/6/4/5	10	20	150	300
BH02	8.50	14/11	12/38/0/0	25	50	150	150
BH02	5.50	4/5	5/5/7/8	9	25	150	300
BH02	2.50	3/4	6/6/6/7	7	25	150	300
BH02	1.20	1/0	1/1/1/1	1	4	150	300
BH02	10.00	25/0	50/0/0/0	25	50	50	0
BH02	7.00	10/12	22/28/0/0	22	50	150	150
BH02	4.00	3/3	5/5/5/5	6	20	150	300
WLS01	2.00	8/7	12/12/14/12	15	50	150	290
WLS01	1.20	2/2	1/1/1/2	4	5	150	300
WLS02	1.20	7/9	13/13/13	16	39	150	225
WLS03	1.20	11/13	15/20/15	24	50	150	205
WLS04	1.20	12/12	14/15/15/6	24	50	150	245
WLS05	1.20	10/14	20/20/10	24	50	150	185
WLS06	1.20	12/12	12/12/13/13	24	50	150	300
WLS07	1.20	2/4	10	6	10	150	75
WLS08	1.20	3/7	14	10	14	150	75

Appendix G Dynamic Cone Penetrometer Results

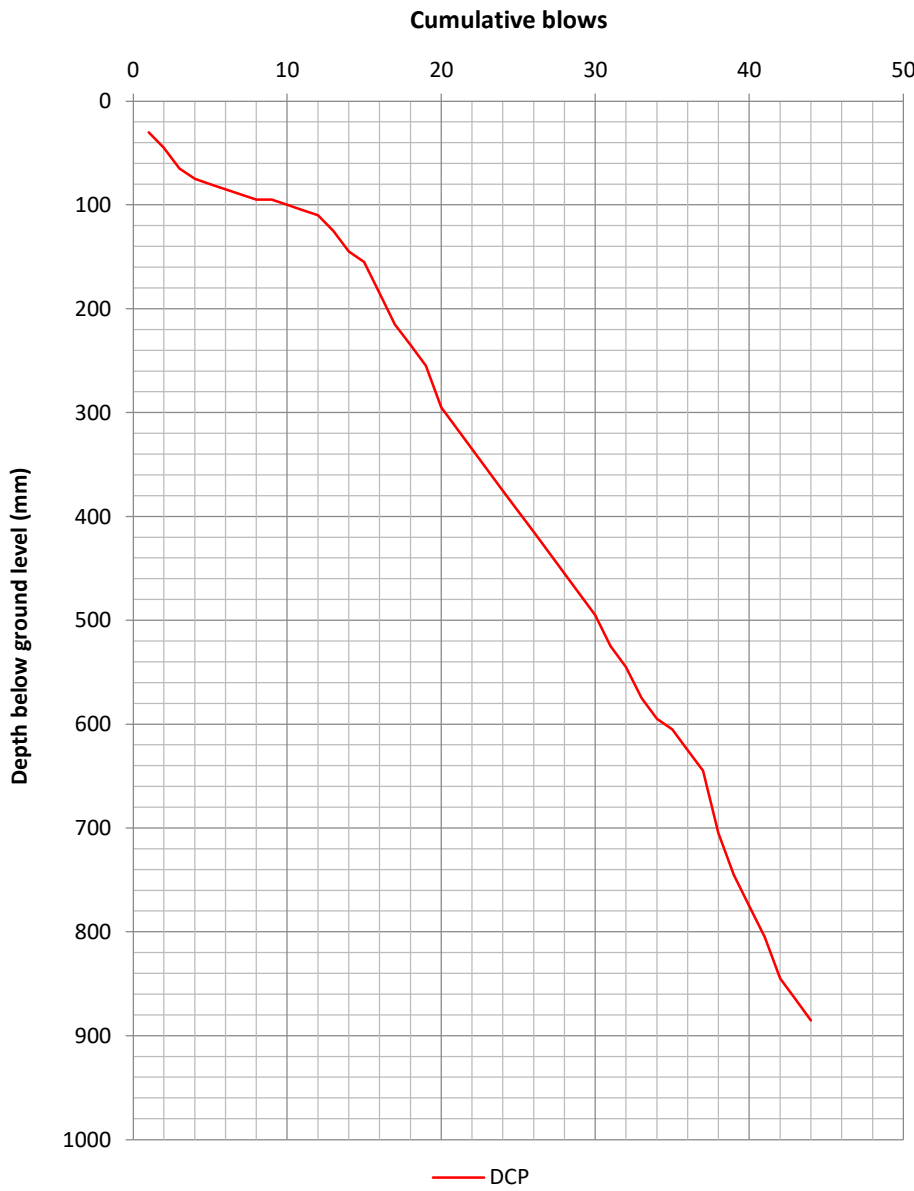
Dynamic Cone Penetrometer (DCP) summary

Location	Layer No.	CBR (%)	Thickness (mm)	Start depth (mmBGL)	Base depth (mmBGL)
DCP09	1	33.5	250	150	400
DCP09	2	9.3	250	400	650
DCP09	3	17.6	150	650	800
DCP08	1	7.5	350	100	450
DCP08	2	17.3	150	450	600
DCP08	3	9.3	250	600	850
DCP07	1	4.7	100	100	200
DCP07	2	7.7	300	200	500
DCP07	3	14.6	190	500	690
DCP06	1	3.1	220	100	320
DCP06	2	10.1	250	400	650
DCP06	3	19.5	200	650	850
DCP05	1	1.1	100	100	200
DCP05	2	3.4	280	200	480
DCP05	3	7.3	270	480	750
DCP04	1	6.4	120	100	220
DCP04	2	3.4	300	400	700
DCP03	1	9.3	150	200	350
DCP03	2	22.3	200	400	600
DCP03	3	5.7	300	600	900
DCP02	1	17.9	300	50	350
DCP02	2	45.7	100	350	450
DCP02	3	24.7	400	450	850
DCP01	1	10.0	650	200	850

Dynamic Cone Penetrometer (DCP) test

Location	Date of test	Start depth (mm)	Zero reading (mm)	Operator
DCP01	01/10/2024	0	65	Soiltechnics

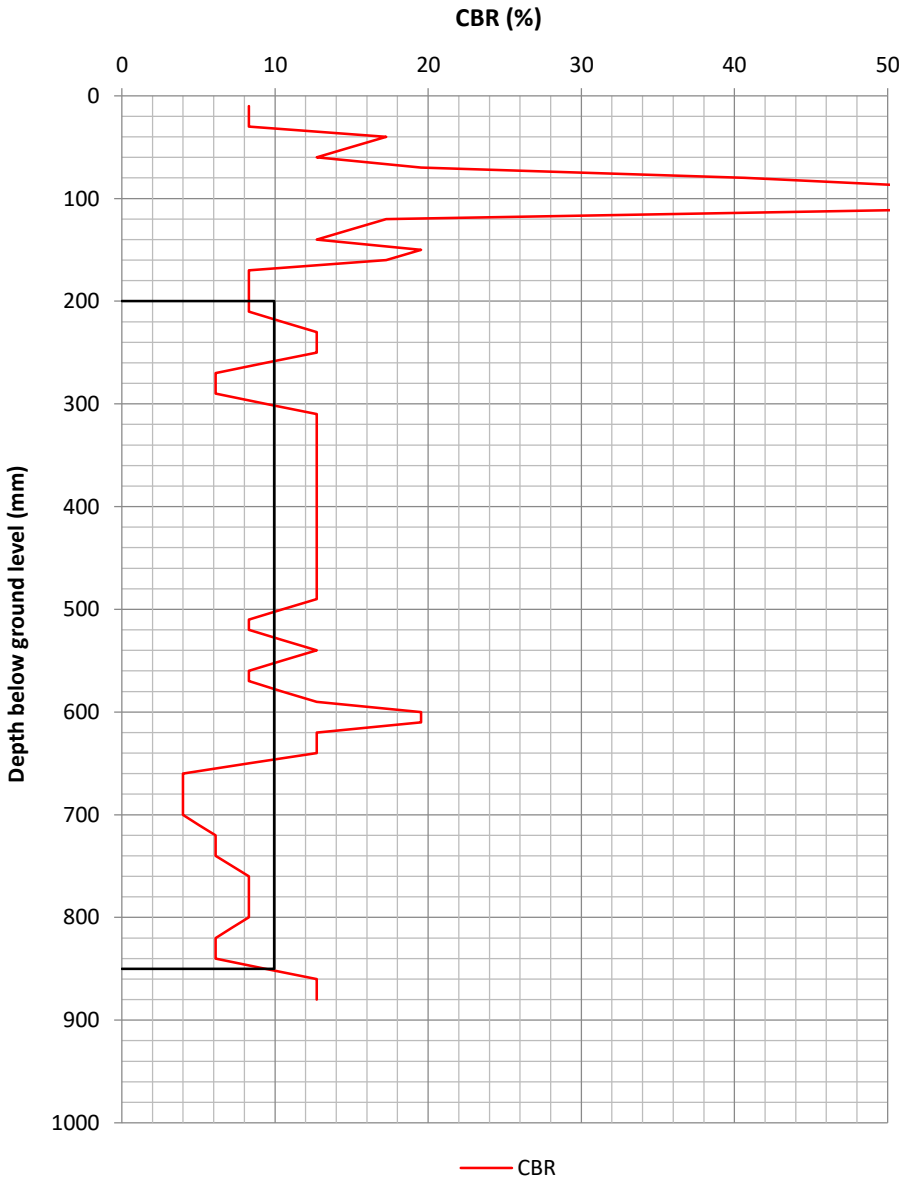
Plot showing number of blows against depth



Notes

1. Test procedure following Highways England Document CS229 Data for Pavement Assessment.

Plot showing CBR (%) against depth



Calculations

$\text{Log10 (Uncorrected (UC) CBR)} = 2.48 - 1.057\text{Log10}(\text{mm/blow})$

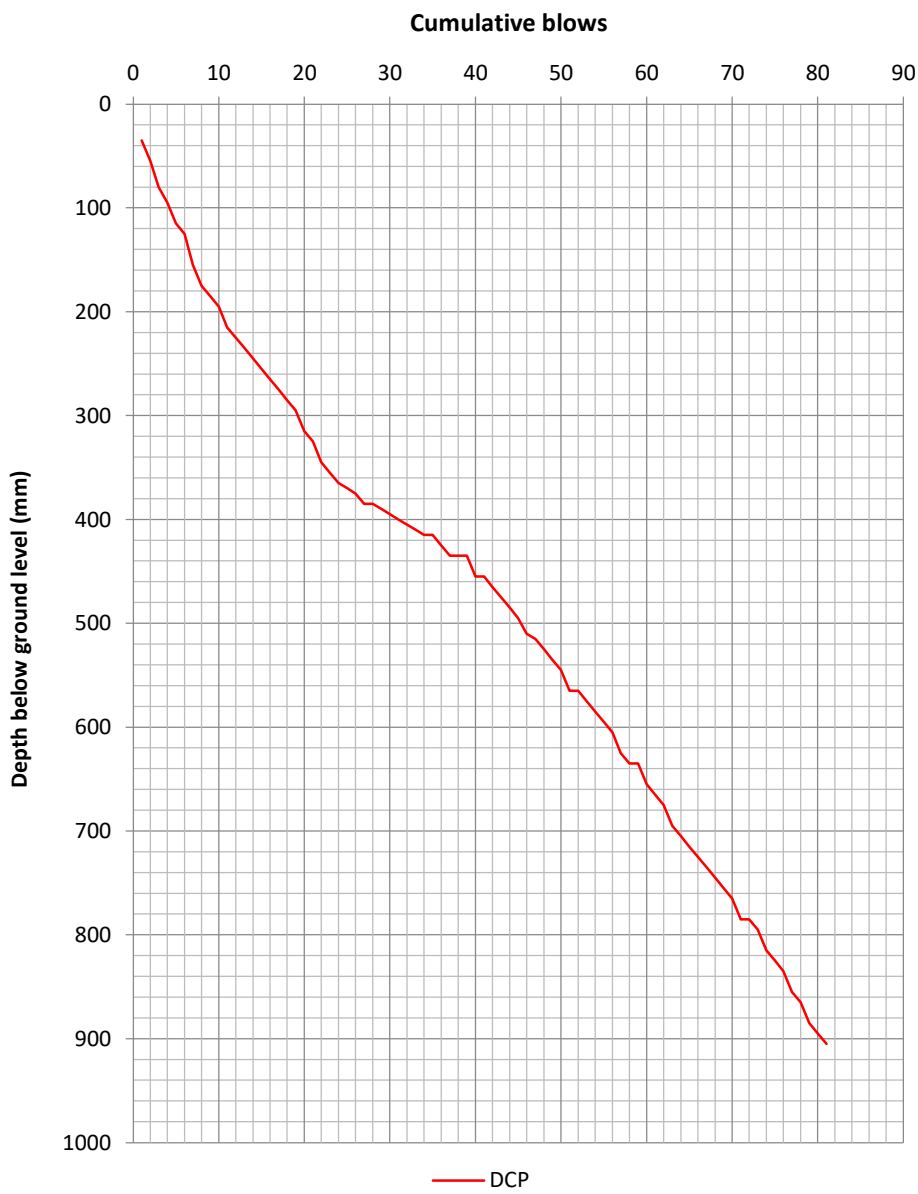
Layer properties

Layer No.	CBR (%)	Thickness (mm)	Start depth (mmBGL)	Base depth (mmBGL)
1	10.0	650	200	850

Dynamic Cone Penetrometer (DCP) test

Location	Date of test	Start depth (mm)	Zero reading (mm)	Operator
DCP02	01/10/2024	0	45	Soiltechnics

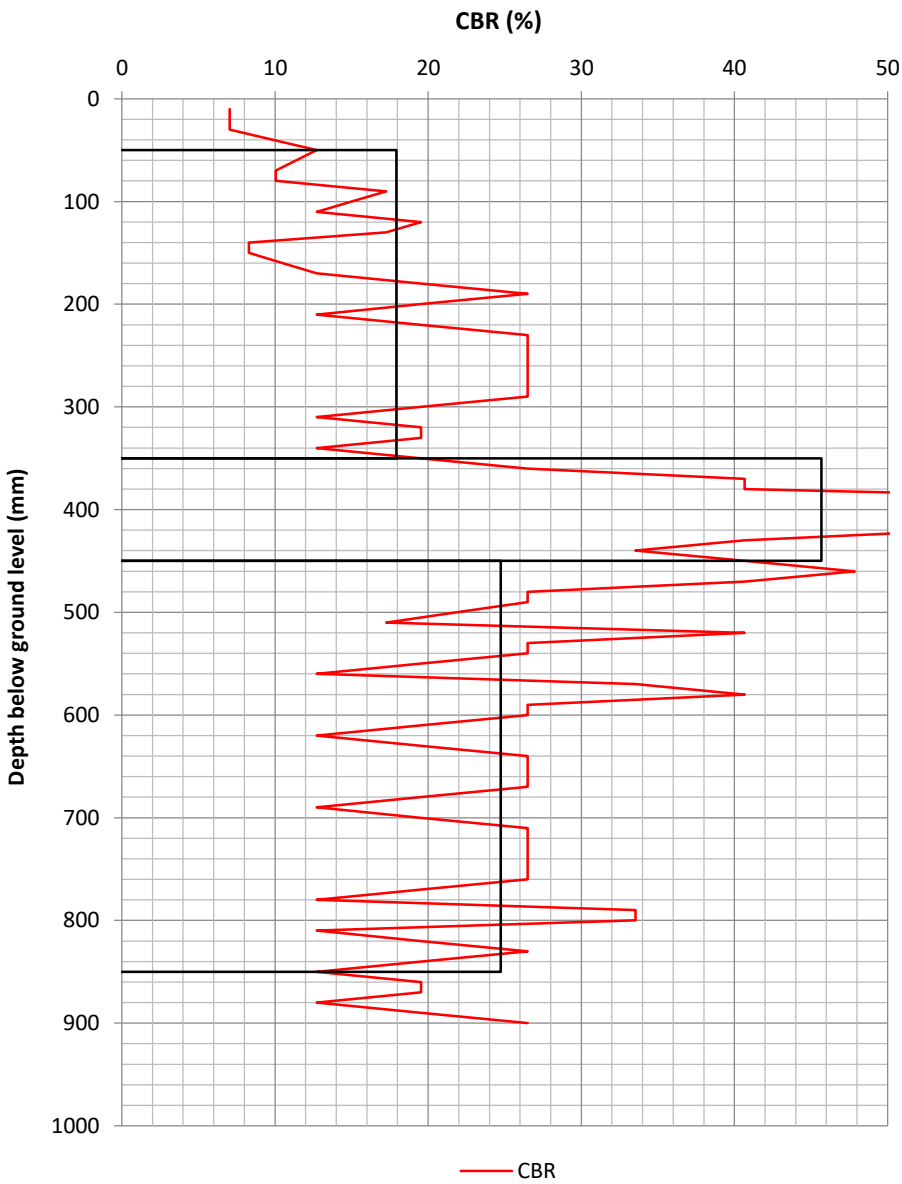
Plot showing number of blows against depth



Notes

1. Test procedure following Highways England Document CS229 Data for Pavement Assessment.

Plot showing CBR (%) against depth



Calculations

$\text{Log10 (Uncorrected (UC) CBR)} = 2.48 - 1.057\text{Log10(mm/blow)}$

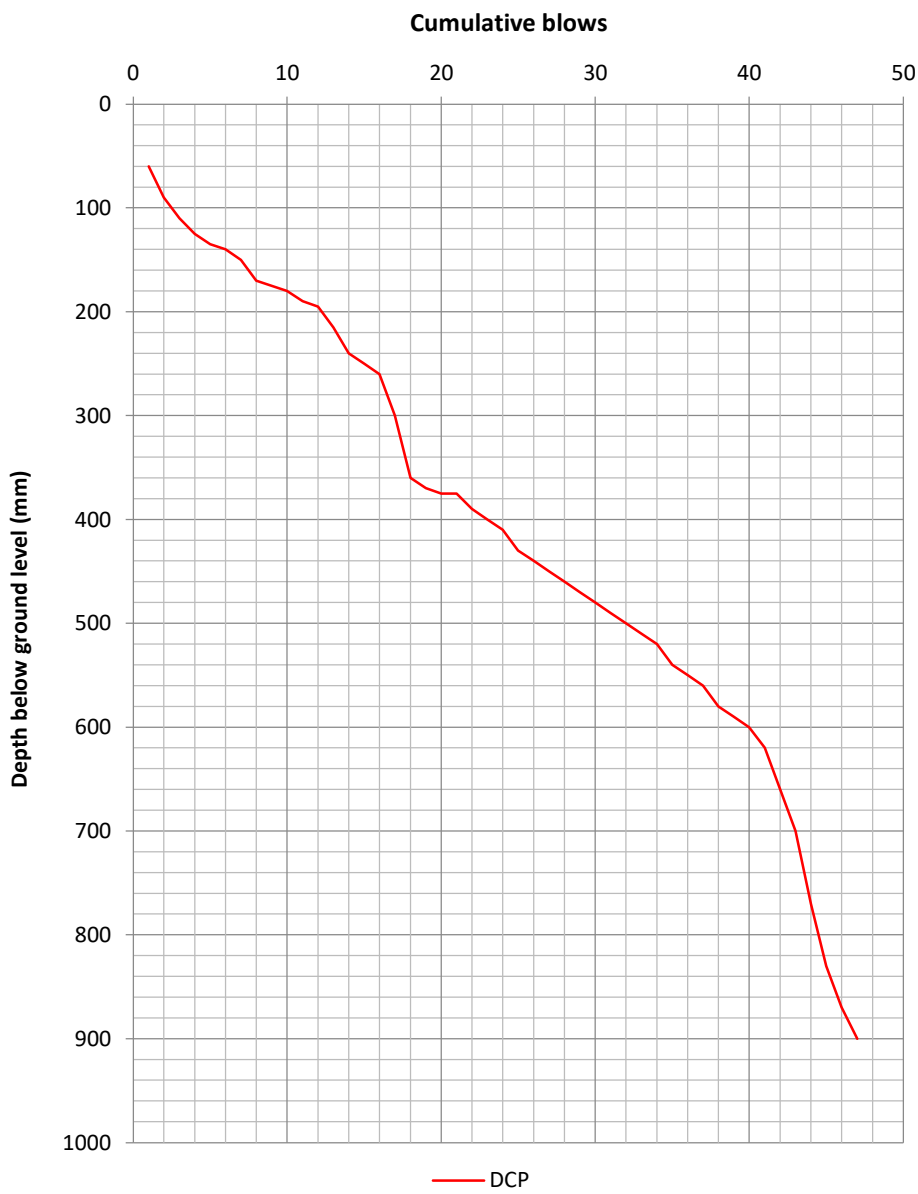
Layer properties

Layer No.	CBR (%)	Thickness (mm)	Start depth (mmBGL)	Base depth (mmBGL)
1	17.9	300	50	350
2	45.7	100	350	450
3	24.7	400	450	850

Dynamic Cone Penetrometer (DCP) test

Location	Date of test	Start depth (mm)	Zero reading (mm)	Operator
DCP03	01/10/2024	0	50	Soiltechnics

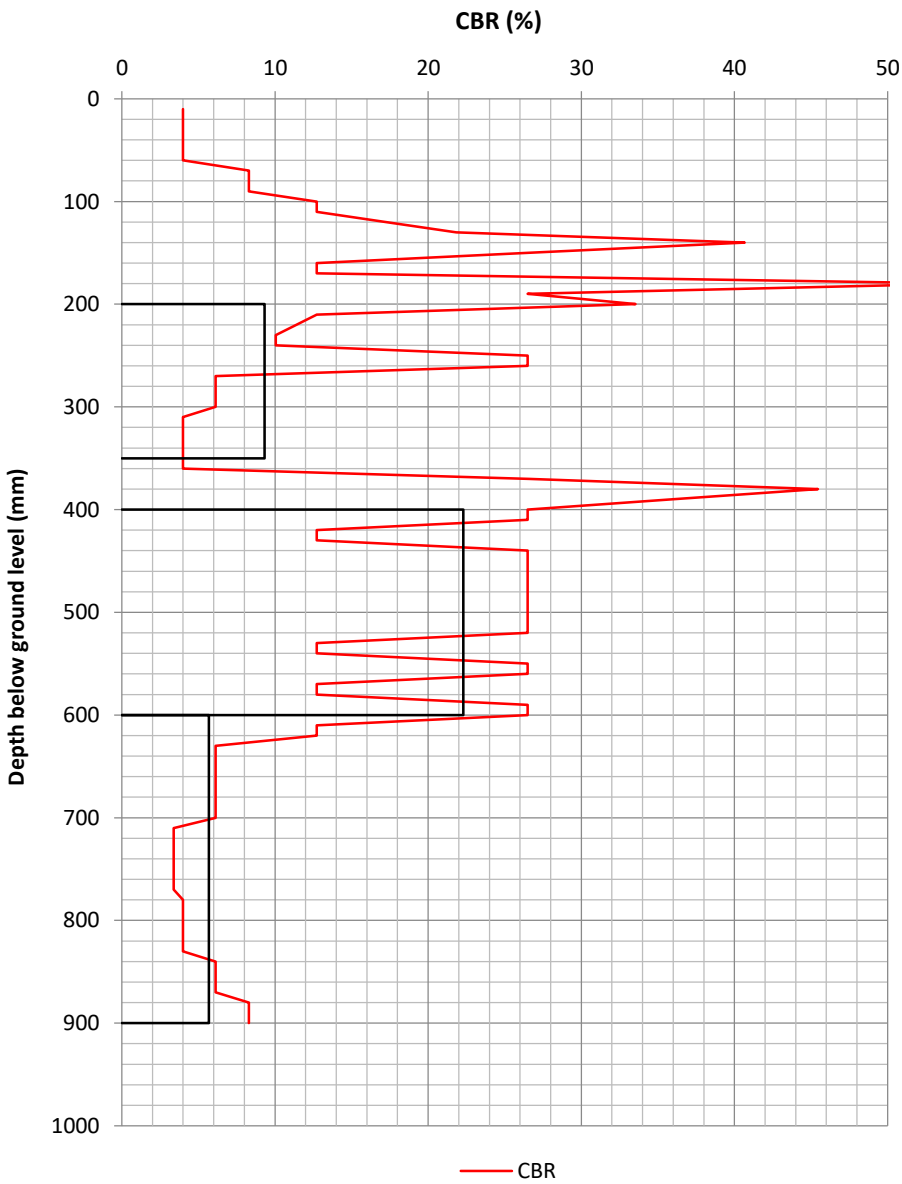
Plot showing number of blows against depth



Notes

1. Test procedure following Highways England Document CS229 Data for Pavement Assessment.

Plot showing CBR (%) against depth



Calculations

$\text{Log10 (Uncorrected (UC) CBR)} = 2.48 - 1.057\text{Log10}(\text{mm/blow})$

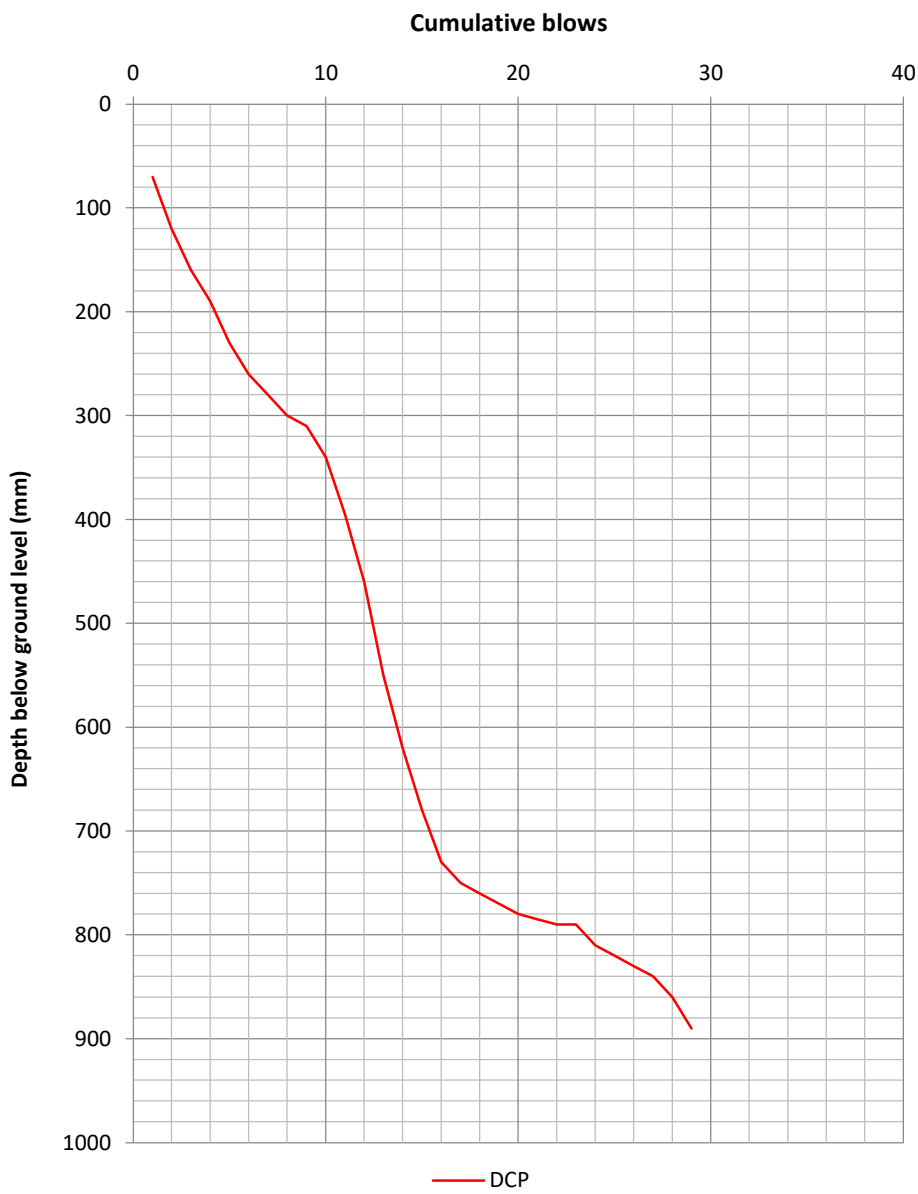
Layer properties

Layer No.	CBR (%)	Thickness (mm)	Start depth (mmBGL)	Base depth (mmBGL)
1	9.3	150	200	350
2	22.3	200	400	600
3	5.7	300	600	900

Dynamic Cone Penetrometer (DCP) test

Location	Date of test	Start depth (mm)	Zero reading (mm)	Operator
DCP04	01/10/2024	0	60	Soiltechnics

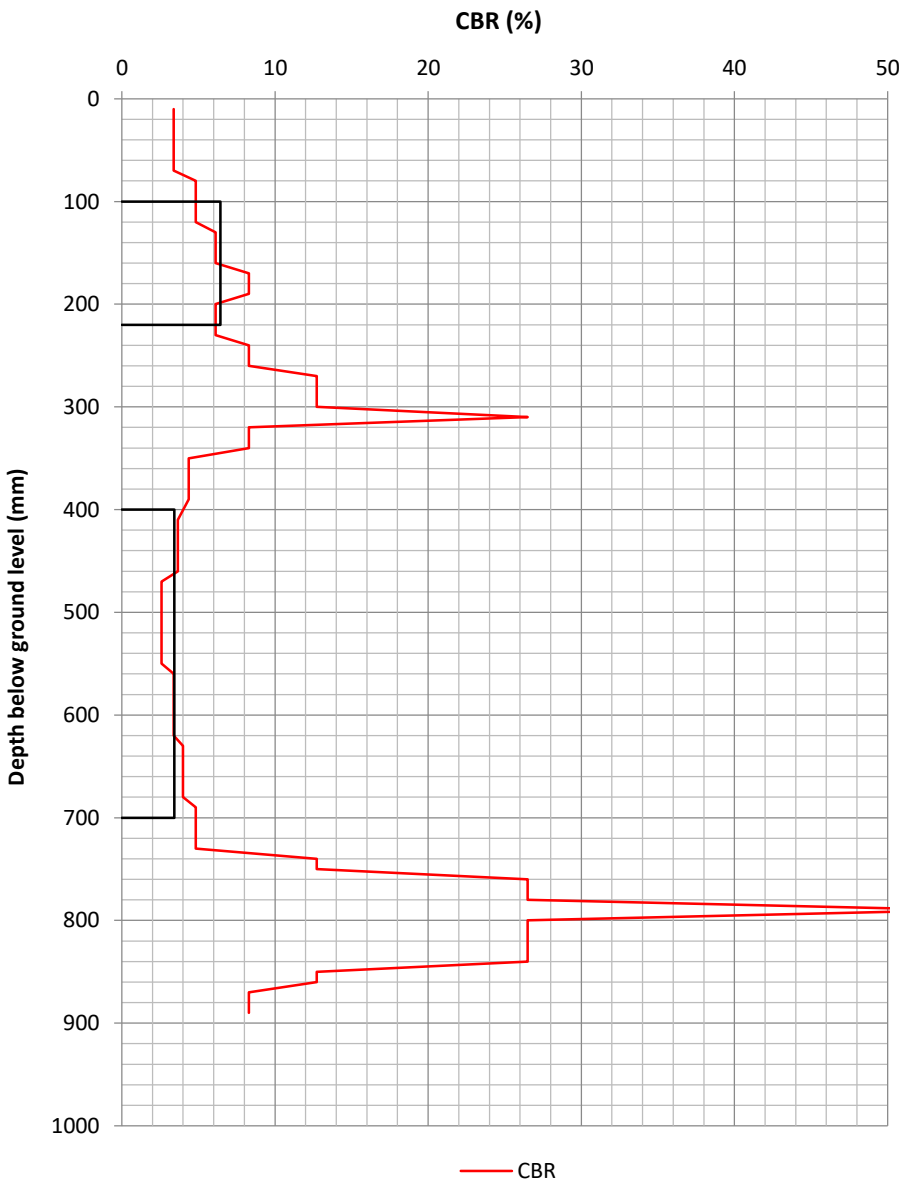
Plot showing number of blows against depth



Notes

1. Test procedure following Highways England Document CS229 Data for Pavement Assessment.

Plot showing CBR (%) against depth



Calculations

$$\text{Log10 (Uncorrected (UC) CBR)} = 2.48 - 1.057\text{Log10}(\text{mm/blow})$$

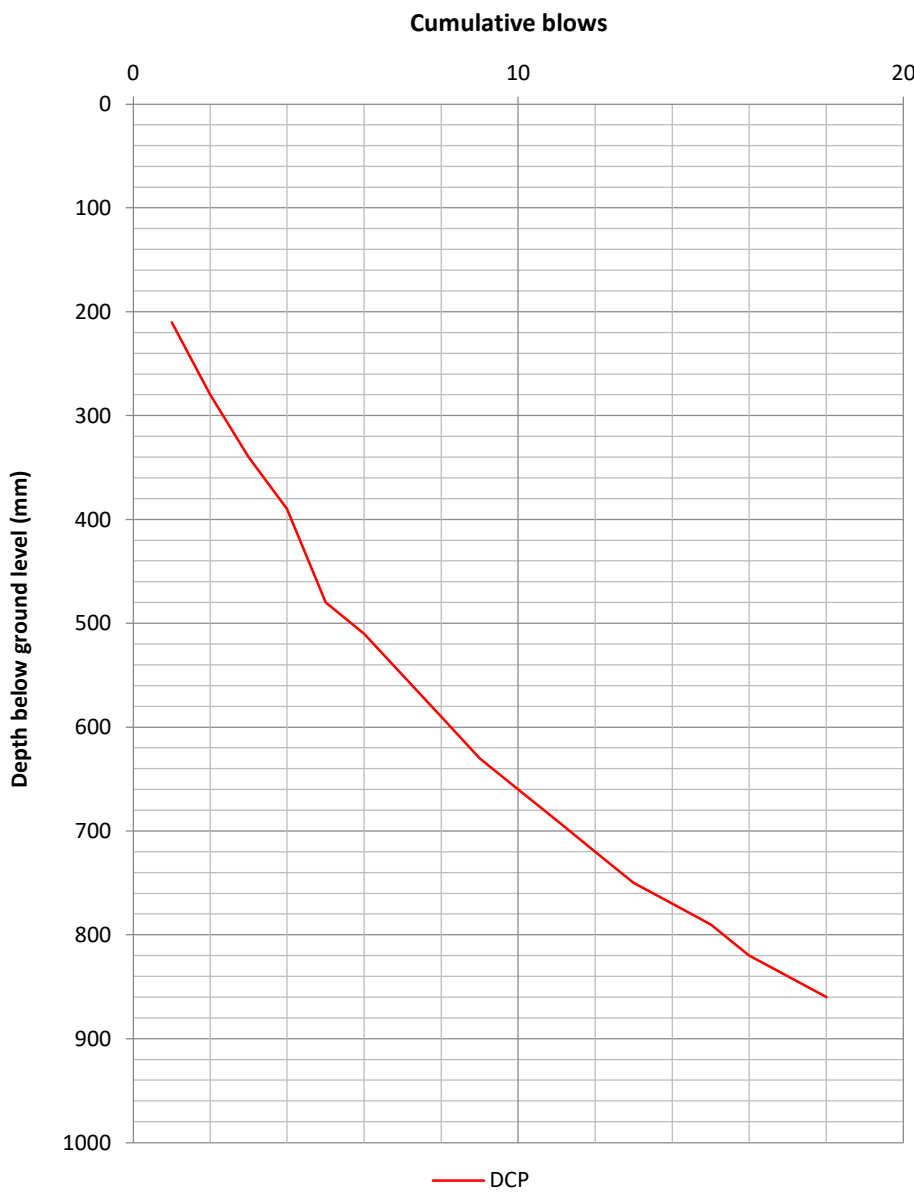
Layer properties

Layer No.	CBR (%)	Thickness (mm)	Start depth (mmBGL)	Base depth (mmBGL)
1	6.4	120	100	220
2	3.4	300	400	700

Dynamic Cone Penetrometer (DCP) test

Location	Date of test	Start depth (mm)	Zero reading (mm)	Operator
DCP05	01/10/2024	0	90	Soiltechnics

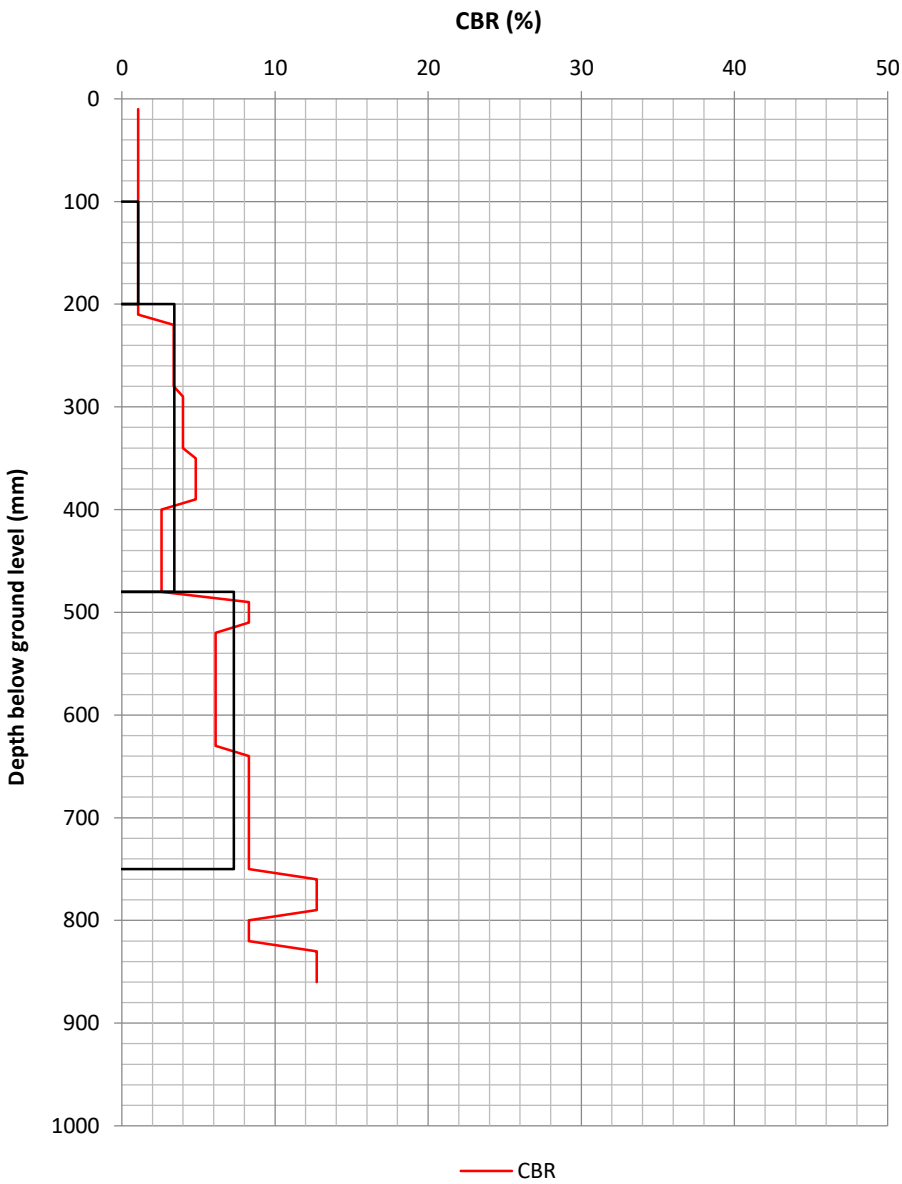
Plot showing number of blows against depth



Notes

1. Test procedure following Highways England Document CS229 Data for Pavement Assessment.

Plot showing CBR (%) against depth



Calculations

$\text{Log10 (Uncorrected (UC) CBR)} = 2.48 - 1.057\text{Log10(mm/blow)}$

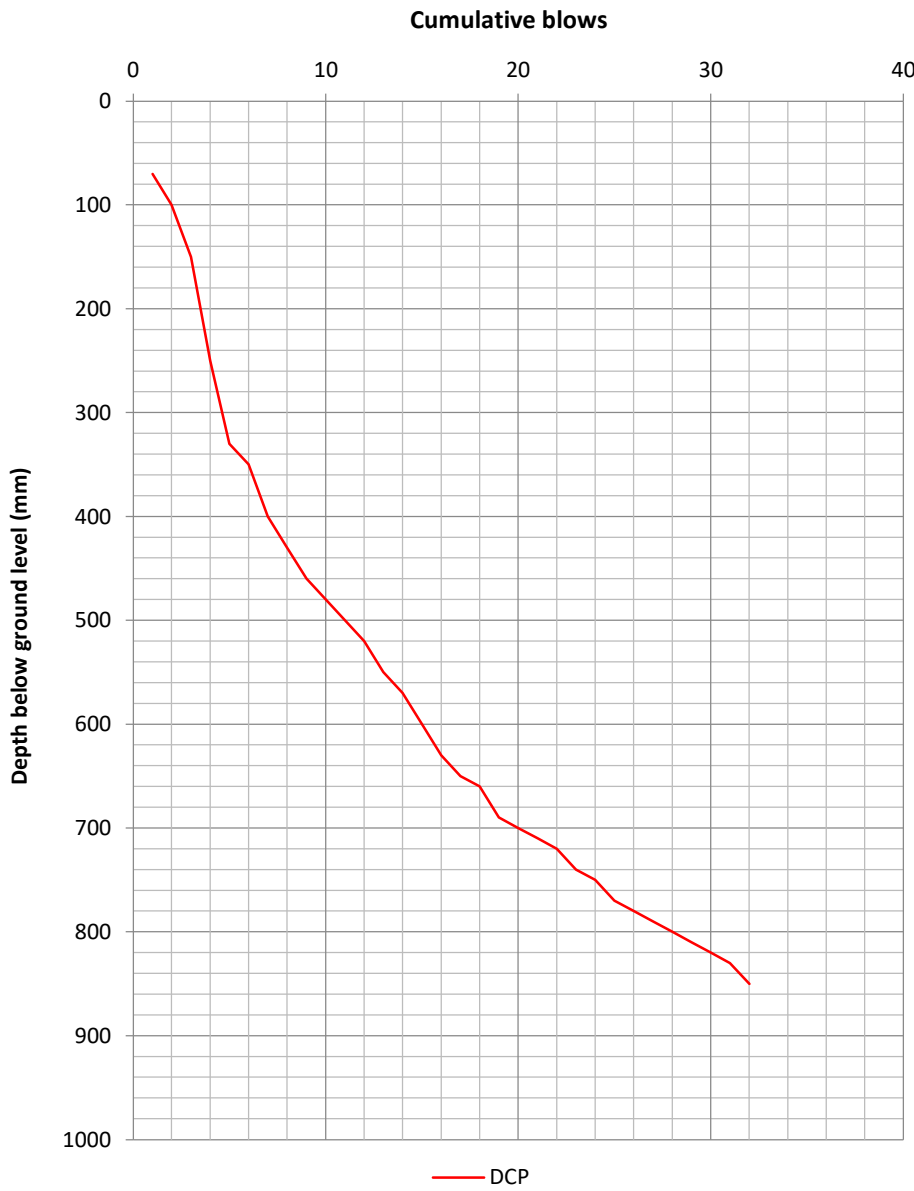
Layer properties

Layer No.	CBR (%)	Thickness (mm)	Start depth (mmBGL)	Base depth (mmBGL)
1	1.1	100	100	200
2	3.4	280	200	480
3	7.3	270	480	750

Dynamic Cone Penetrometer (DCP) test

Location	Date of test	Start depth (mm)	Zero reading (mm)	Operator
DCP06	01/10/2024	0	100	Soiltechnics

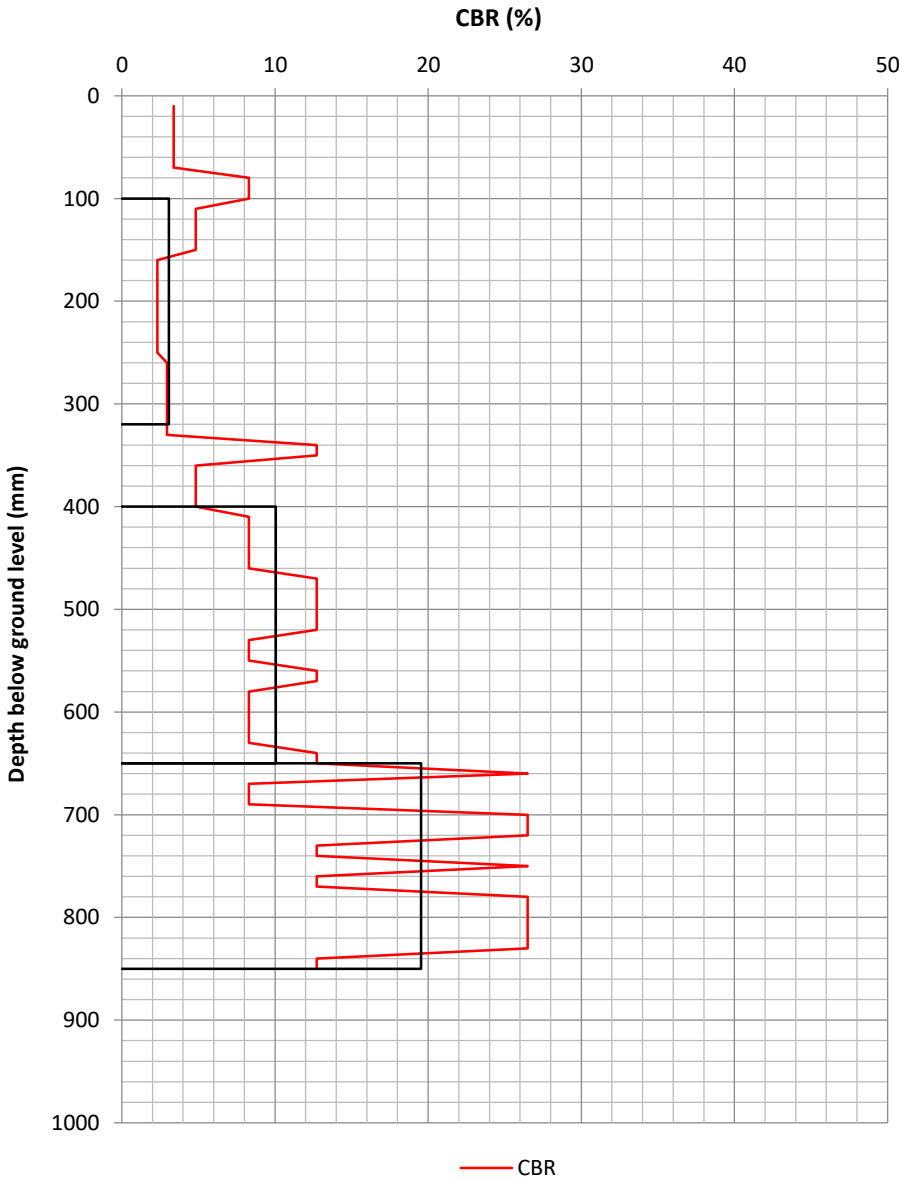
Plot showing number of blows against depth



Notes

1. Test procedure following Highways England Document CS229 Data for Pavement Assessment.

Plot showing CBR (%) against depth



Calculations

$\text{Log10 (Uncorrected (UC) CBR)} = 2.48 - 1.057\text{Log10(mm/blow)}$

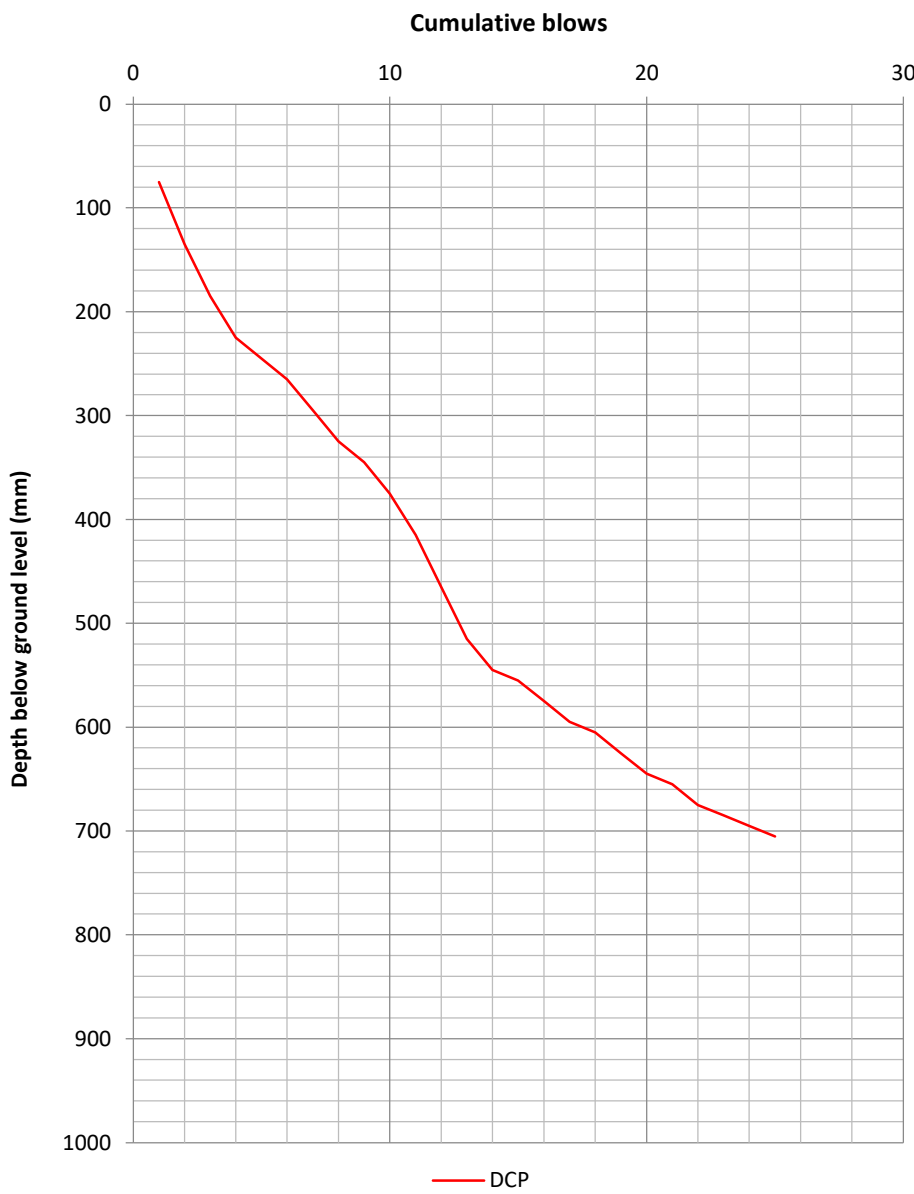
Layer properties

Layer No.	CBR (%)	Thickness (mm)	Start depth (mmBGL)	Base depth (mmBGL)
1	3.1	220	100	320
2	10.1	250	400	650
3	19.5	200	650	850

Dynamic Cone Penetrometer (DCP) test

Location	Date of test	Start depth (mm)	Zero reading (mm)	Operator
DCP07	01/10/2024	0	245	Soiltechnics

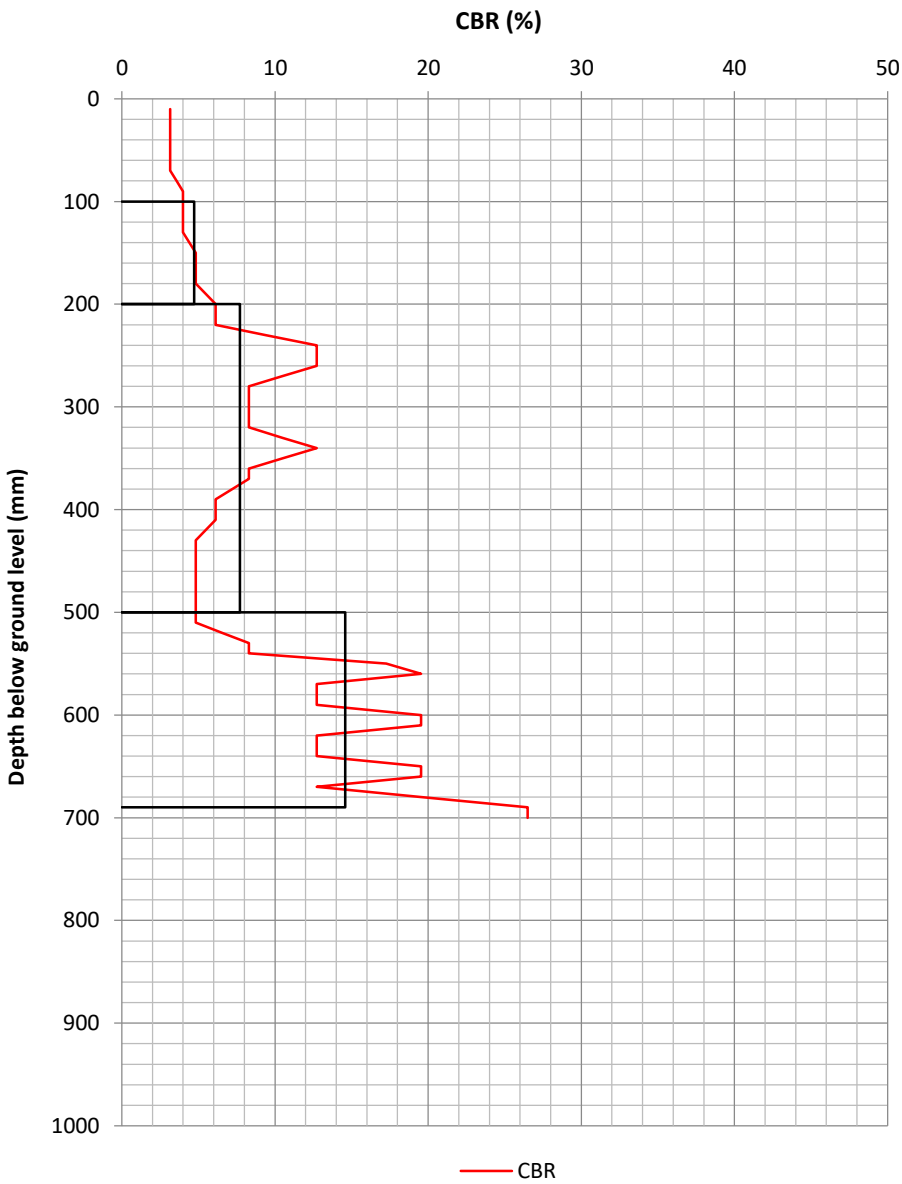
Plot showing number of blows against depth



Notes

1. Test procedure following Highways England Document CS229 Data for Pavement Assessment.

Plot showing CBR (%) against depth



Calculations

$\text{Log10 (Uncorrected (UC) CBR)} = 2.48 - 1.057\text{Log10}(\text{mm/blow})$

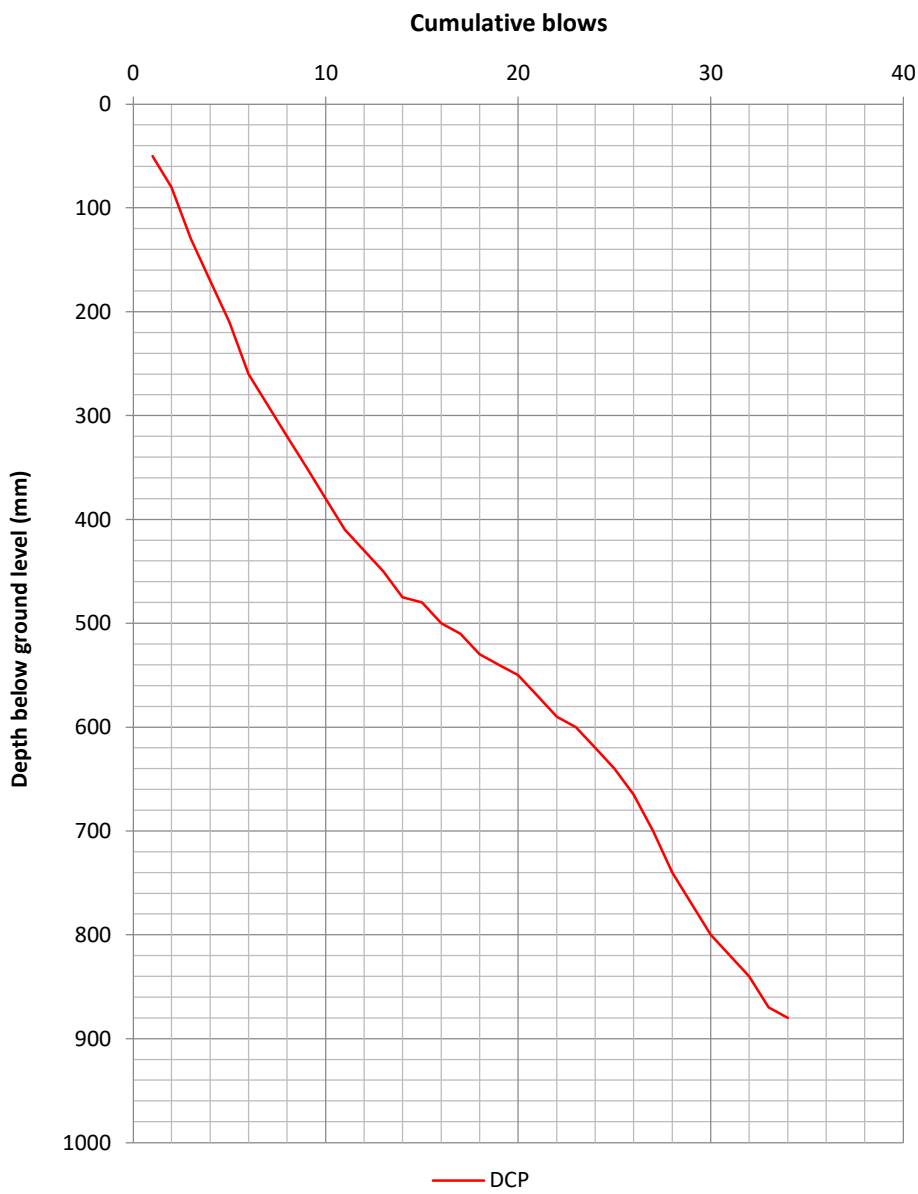
Layer properties

Layer No.	CBR (%)	Thickness (mm)	Start depth (mmBGL)	Base depth (mmBGL)
1	4.7	100	100	200
2	7.7	300	200	500
3	14.6	190	500	690

Dynamic Cone Penetrometer (DCP) test

Location	Date of test	Start depth (mm)	Zero reading (mm)	Operator
DCP08	01/10/2024	0	70	Soiltechnics

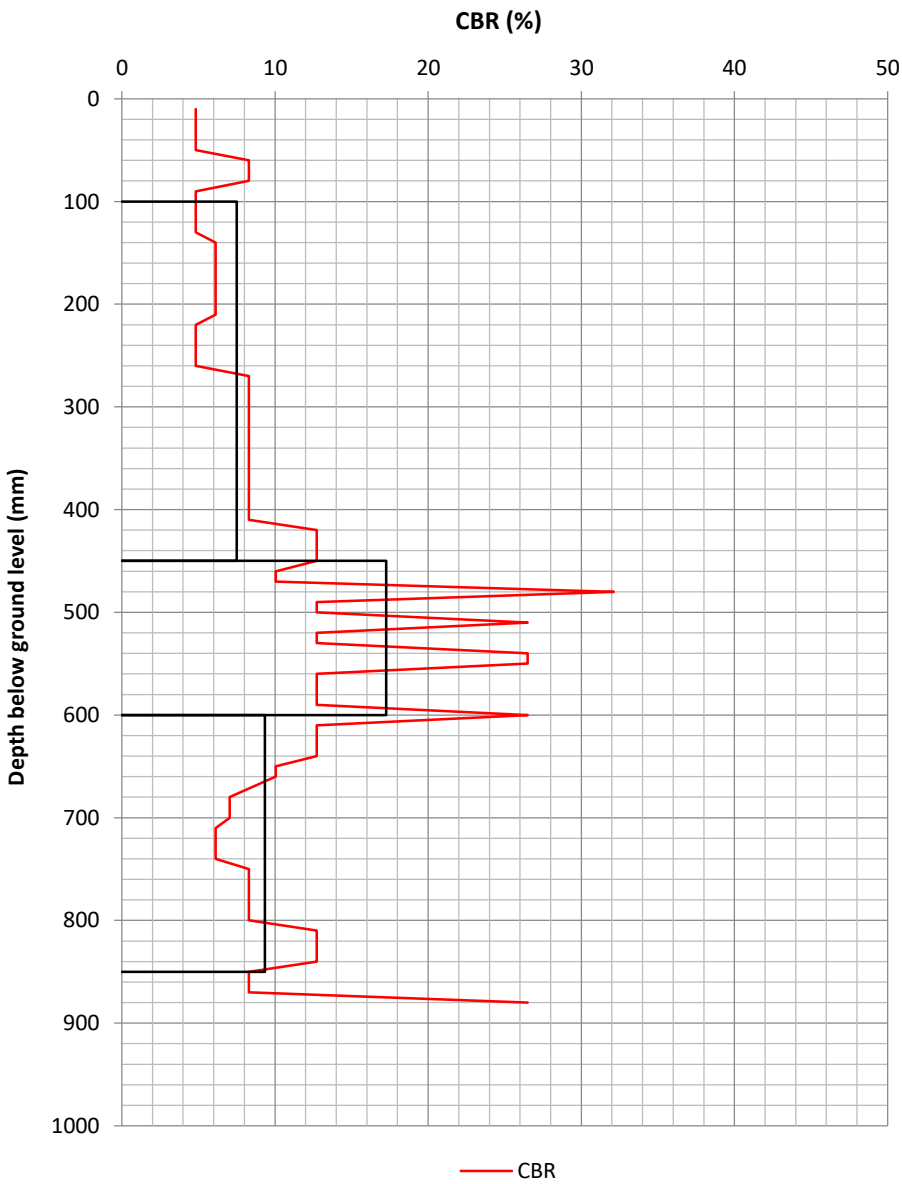
Plot showing number of blows against depth



Notes

1. Test procedure following Highways England Document CS229 Data for Pavement Assessment.

Plot showing CBR (%) against depth



Calculations

$\text{Log10 (Uncorrected (UC) CBR)} = 2.48 - 1.057\text{Log10}(\text{mm/blow})$

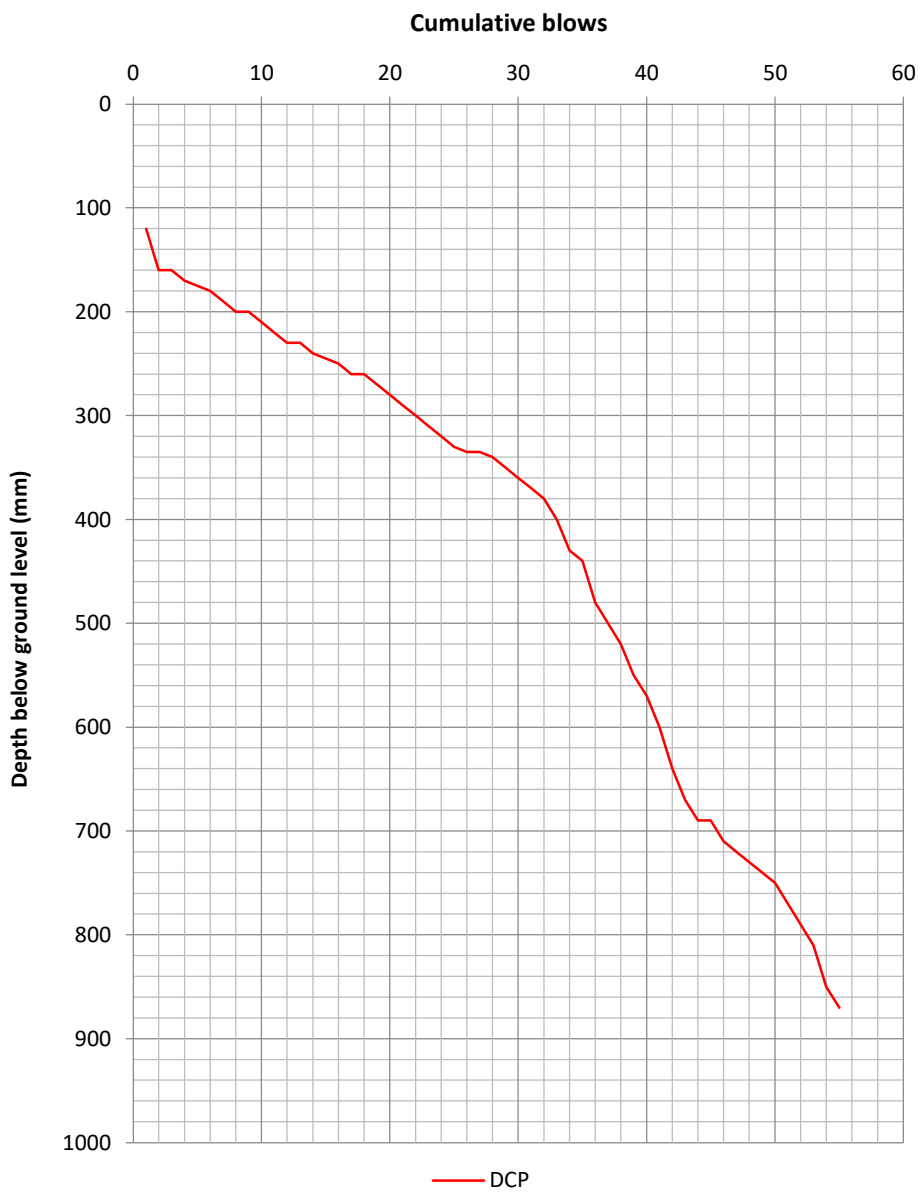
Layer properties

Layer No.	CBR (%)	Thickness (mm)	Start depth (mmBGL)	Base depth (mmBGL)
1	7.5	350	100	450
2	17.3	150	450	600
3	9.3	250	600	850

Dynamic Cone Penetrometer (DCP) test

Location	Date of test	Start depth (mm)	Zero reading (mm)	Operator
DCP09	01/10/2024	0	80	Soiltechnics

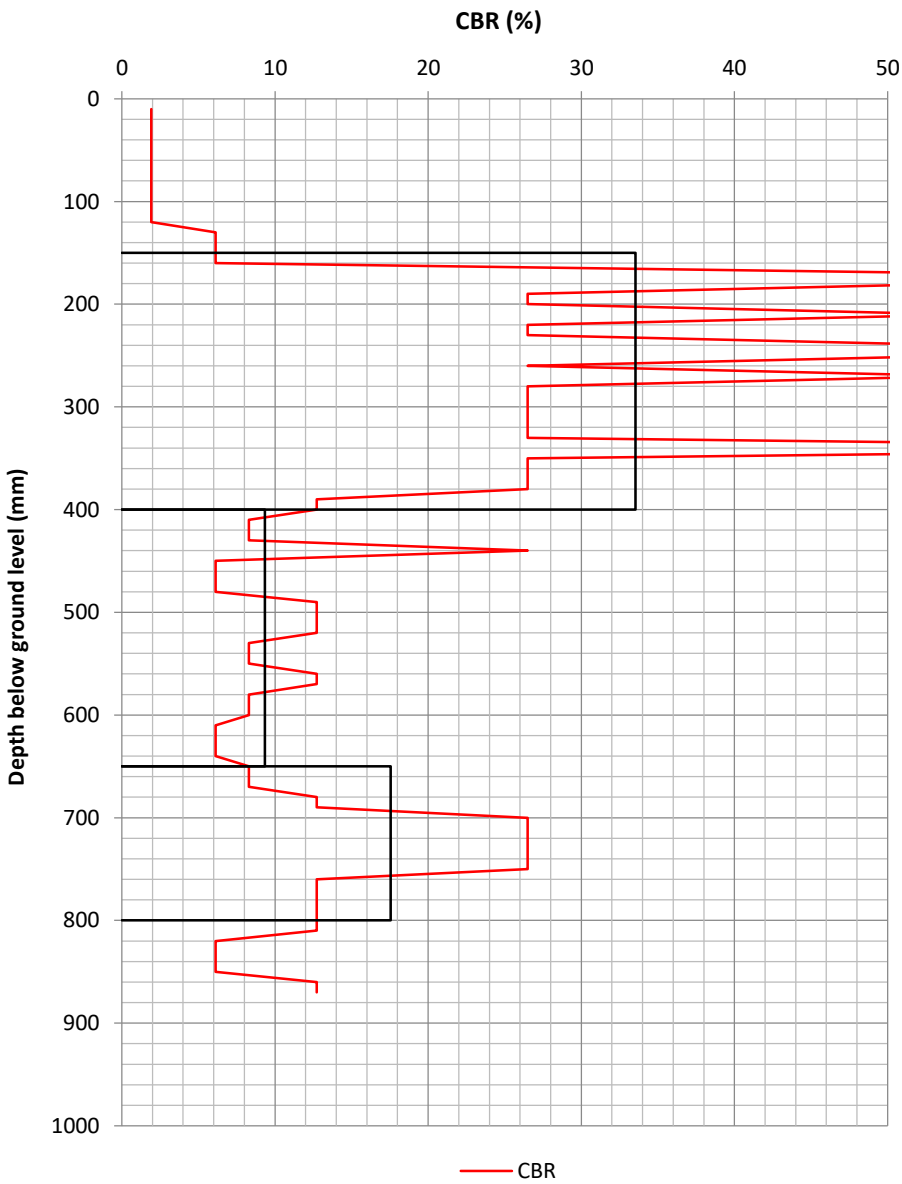
Plot showing number of blows against depth



Notes

1. Test procedure following Highways England Document CS229 Data for Pavement Assessment.

Plot showing CBR (%) against depth



Calculations

$\text{Log10 (Uncorrected (UC) CBR)} = 2.48 - 1.057\text{Log10(mm/blow)}$

Layer properties

Layer No.	CBR (%)	Thickness (mm)	Start depth (mmBGL)	Base depth (mmBGL)
1	33.5	250	150	400
2	9.3	250	400	650
3	17.6	150	650	800

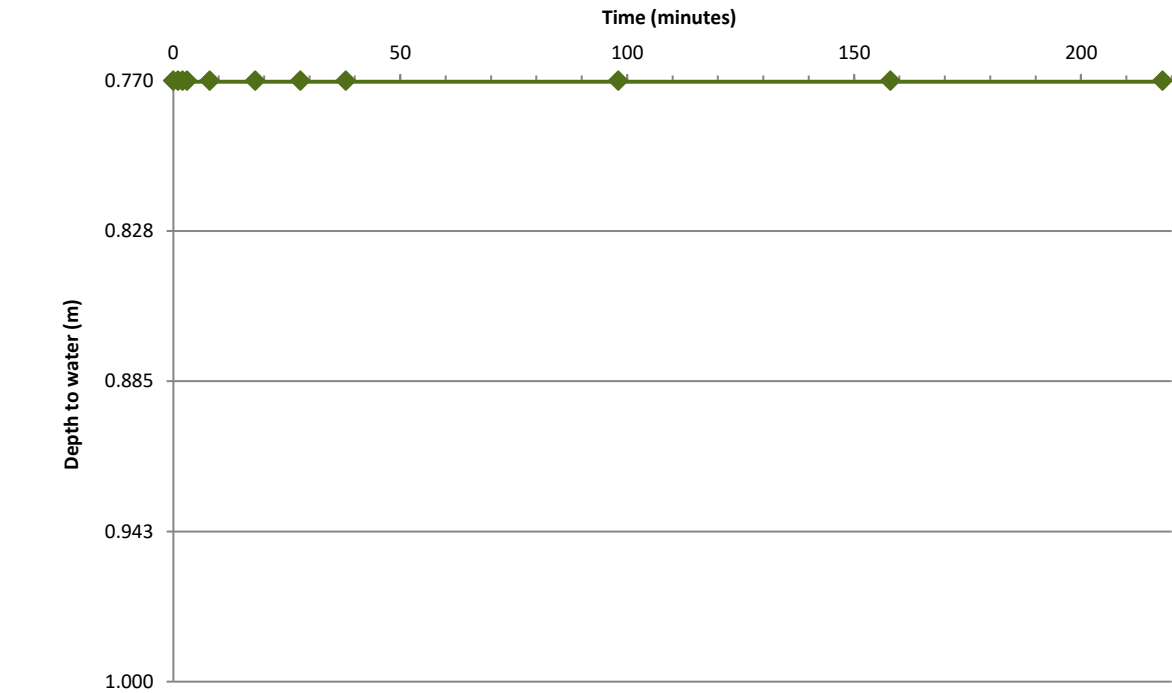
Appendix H In Situ Permeability Testing Results

Soil infiltration test (following BRE Digest 365 2016)

Location	Cycle	Test date	Plan dimensions (m)
TP03	1	03/10/2024	0.60 x 1.00

Groundwater observations (at time of excavation)
No groundwater encountered.

Depth of pit at start (m)	Depth of pit at end (m)
1	1



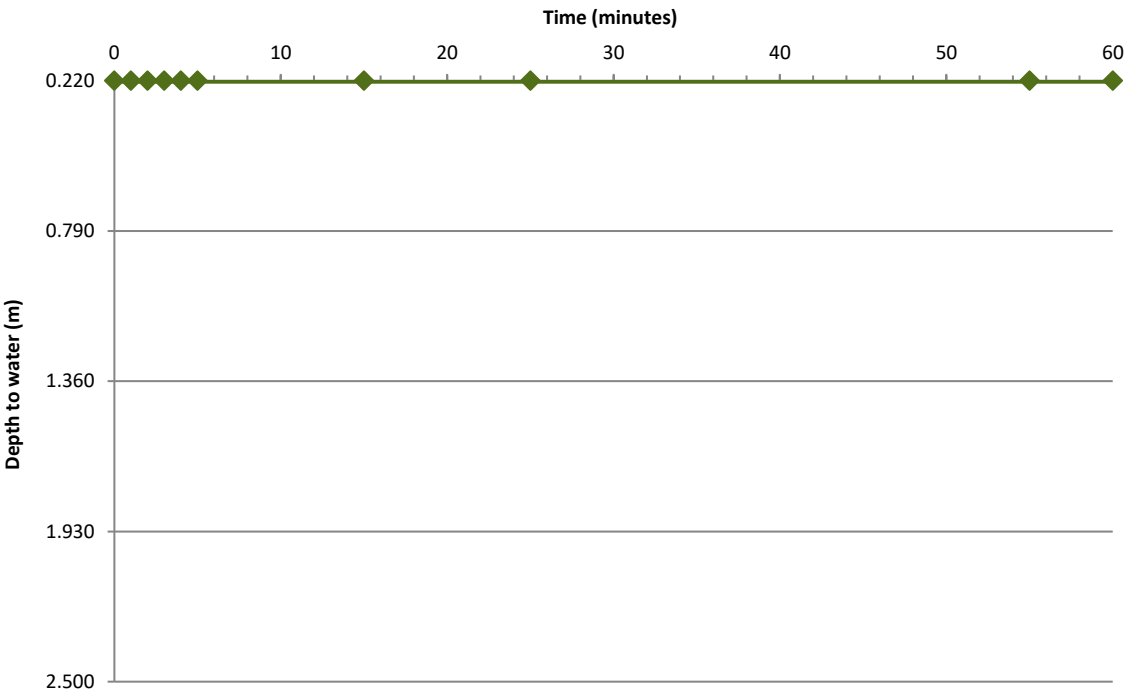
Insufficient infiltration over 218 minutes of monitoring therefore unable to calculate soil infiltration rate.

Soil infiltration test (following BRE Digest 365 2016)

Location	Cycle	Test date	Plan dimensions (m)
TP06	1	03/10/2024	0.60 x 1.00

Groundwater observations (at time of excavation)
No groundwater encountered.

Depth of pit at start (m)	Depth of pit at end (m)
2.5	2.5



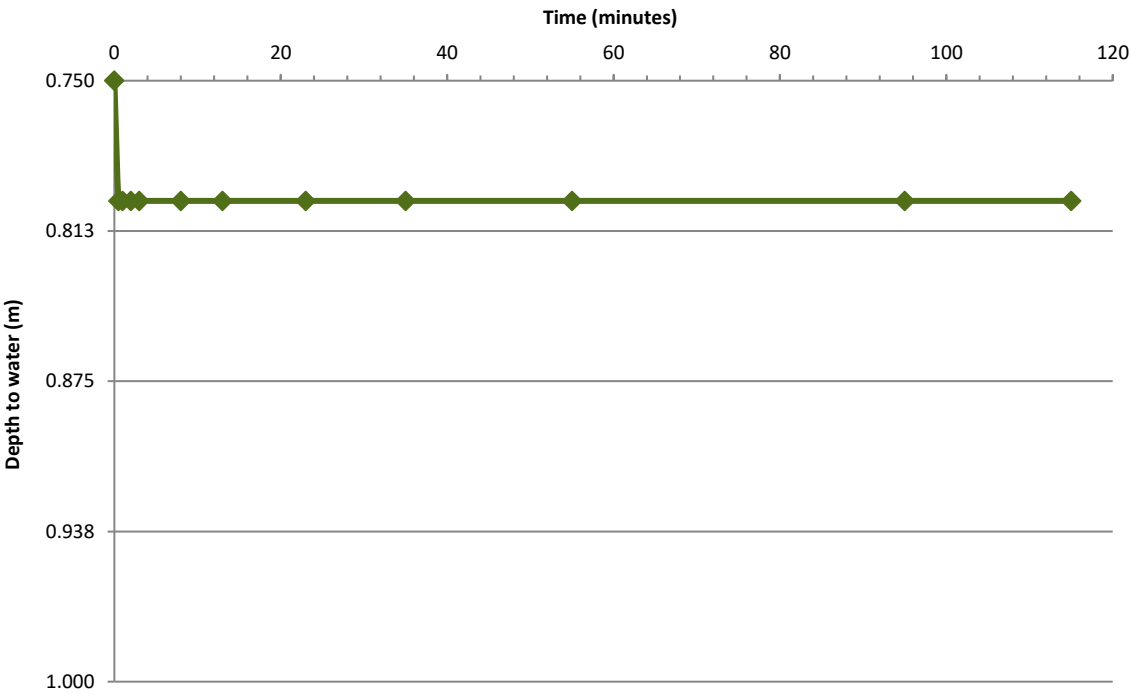
Insufficient infiltration over 60 minutes of monitoring therefore unable to calculate soil infiltration rate.

Soil infiltration test (following BRE Digest 365 2016)

Location	Cycle	Test date	Plan dimensions (m)
TP08	1	03/10/2024	0.60 x 1.00

Groundwater observations (at time of excavation)
No groundwater encountered.

Depth of pit at start (m)	Depth of pit at end (m)
1	1



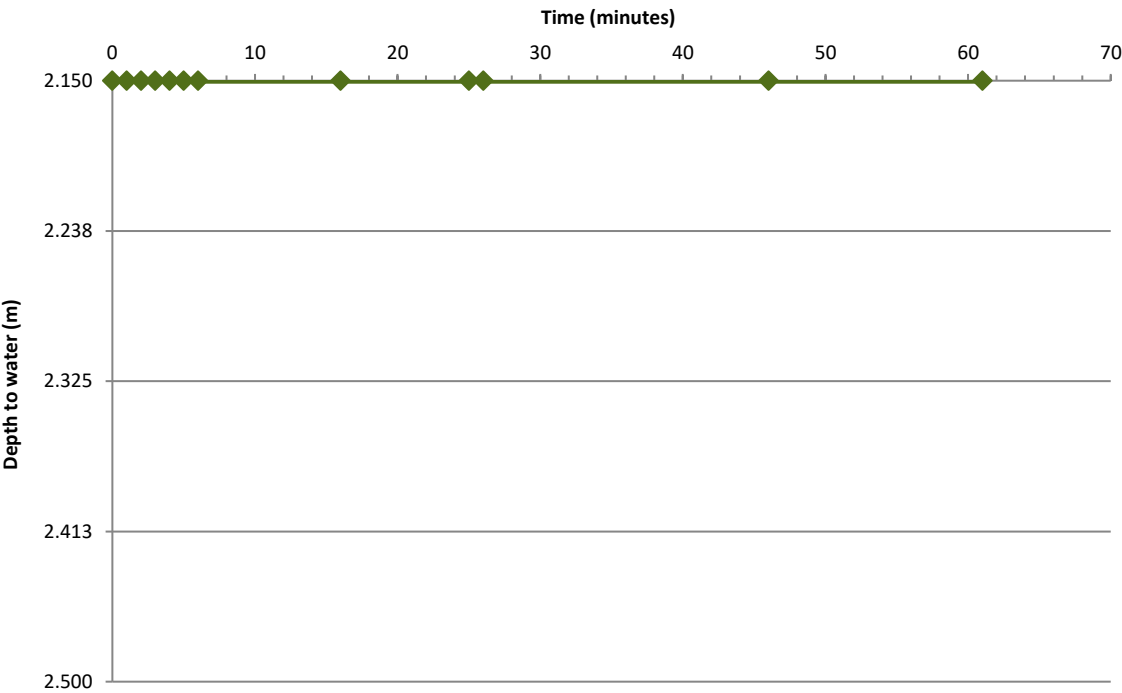
Insufficient infiltration over 115 minutes of monitoring therefore unable to calculate soil infiltration rate.

Soil infiltration test (following BRE Digest 365 2016)

Location	Cycle	Test date	Plan dimensions (m)
TP09	1	03/10/2024	0.60 x 1.00

Groundwater observations (at time of excavation)
No groundwater encountered.

Depth of pit at start (m)	Depth of pit at end (m)
2.5	2.5



Insufficient infiltration over 61 minutes of monitoring therefore unable to calculate soil infiltration rate.

Appendix I Geotechnical Laboratory Test Results



TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022,
cl 5.3.14, 5.5, Fall Cone Method, 1 Pt Test, BS 1377-2:2022,
cl 5.3, 6

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Environmental Science

4041

Client: Soiltechnics Limited
Client Address: Cedar Barn, White Lodge,
Walgrave, Northampton, NN6 9PY

Contact: Admin
Site Address: Saint Hill Road, East Grinstead

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Client Reference: STW6679
Job Number: 24-048022-2
Date Sampled: 04/10/2024
Date Received: 15/10/2024
Date Tested: 22/10/2024
Sampled By: Not Given

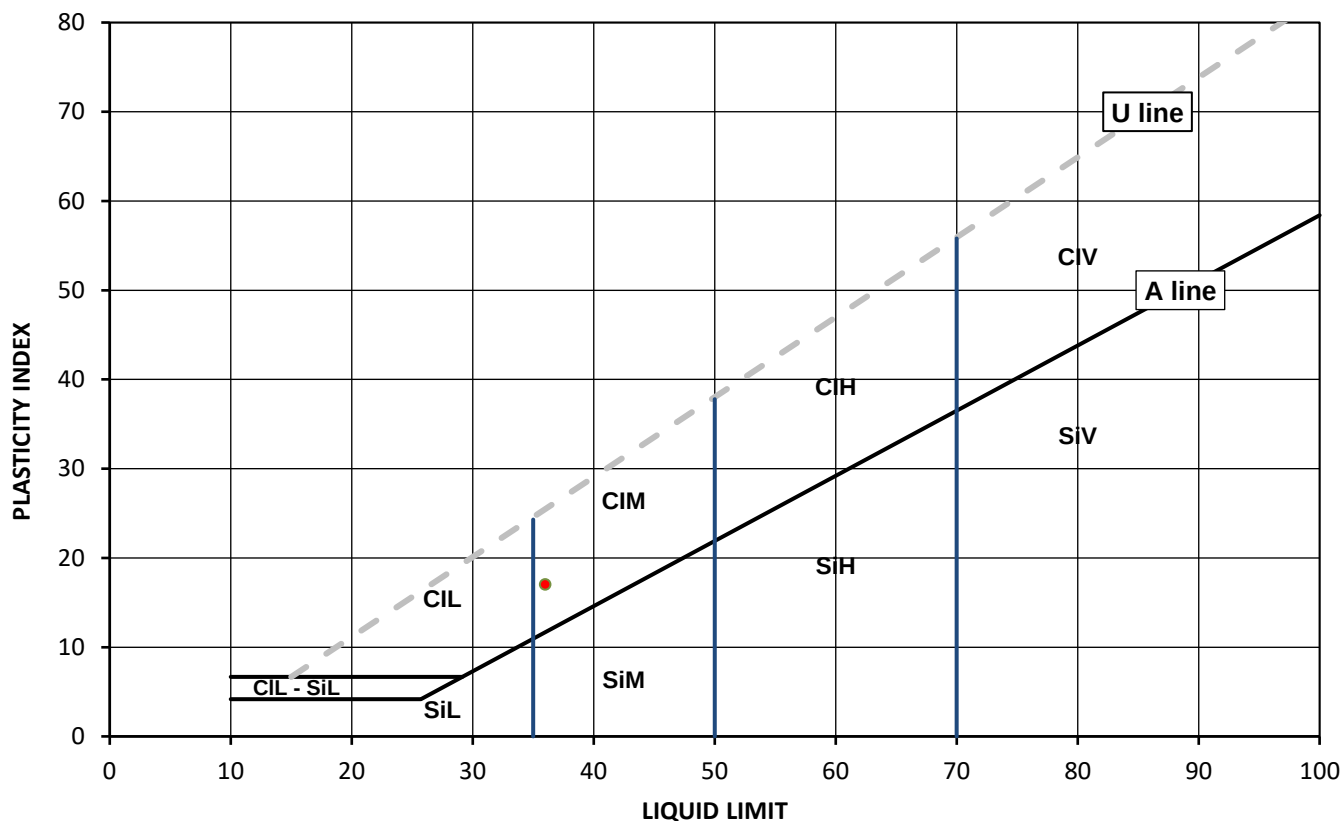
Test Results:

Laboratory Reference: 350031
Hole No.: BH02
Sample Reference: BH02-1.5-1
Sample Description: Brown slightly gravelly sandy CLAY

Depth Top [m]: 1.50
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after washing to remove >0.425 mm;
Cone Type: 80g/30deg

As Received Water Content [W] %	Corrected Liquid Limit [WL] %	Correlation Factor	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity index [IL] % #	Consistency index [IC] % #	% Passing 425µm BS Test Sieve
25.7	36	0.984	19	17	0.41	0.59	82



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl	Clay	below 35
Si	Silt	35 to 50
	L	Low
	M	Medium
	H	High
	V	Very high
	O	Organic
		append to classification for organic material (eg ClHO)

Note: Water Content by BS EN 17892-1:2014+A1:2022, BS 1377-2:2022; Correlation Factor by Clayton C.R.I and Jukes A.W (1978); # Non accredited

Remarks:

Signed:

Katarzyna Koziel

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

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cl 5.3.14, 5.5, Fall Cone Method, 1 Pt Test, BS 1377-2:2022,
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Date Tested: 22/10/2024
Sampled By: Not Given

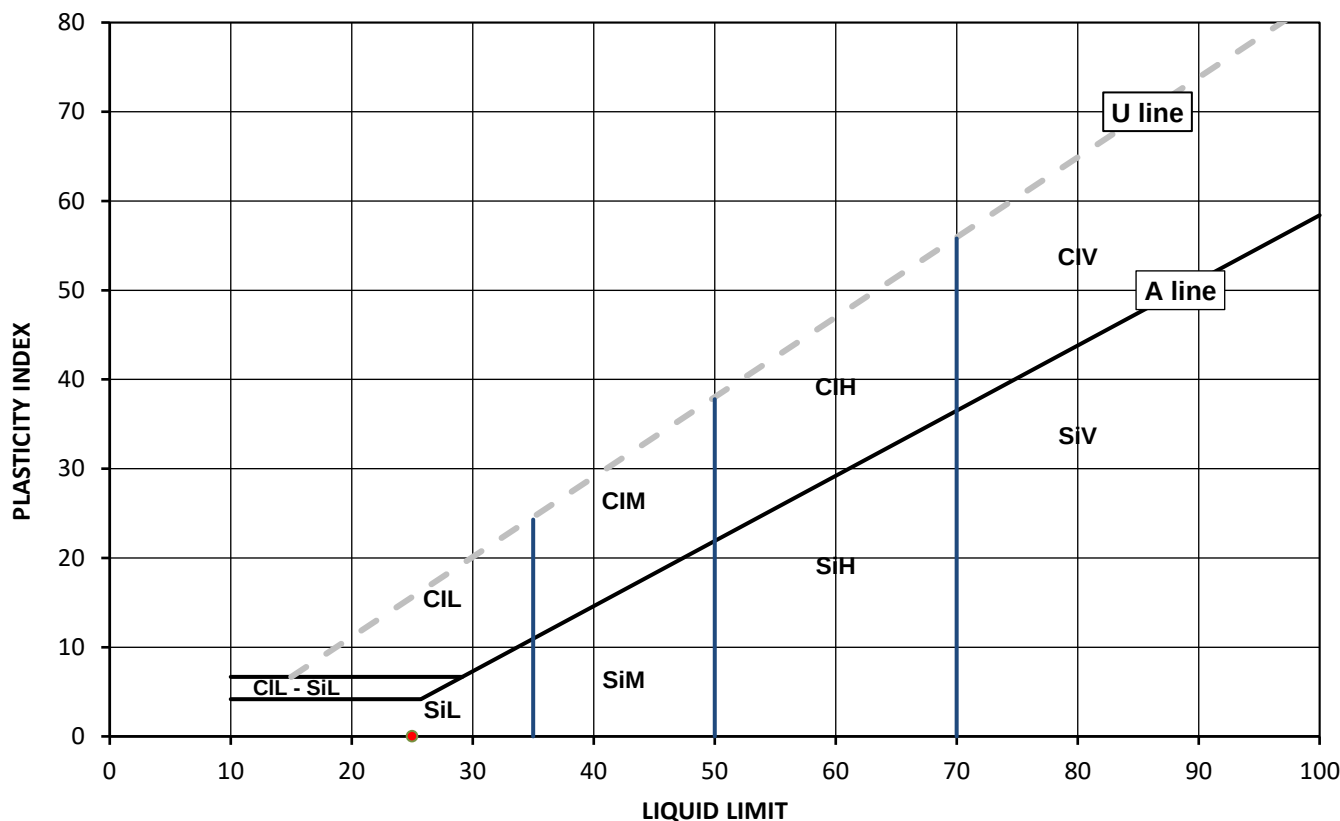
Test Results:

Laboratory Reference: 350032
Hole No.: BH02
Sample Reference: BH02-3.1-3
Sample Description: Light brown slightly gravelly slightly clayey SAND

Depth Top [m]: 3.10
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after washing to remove >0.425 mm;
Cone Type: 80g/30deg

As Received Water Content [W] %	Corrected Liquid Limit [WL] %	Correlation Factor	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity index [IL] % #	Consistency index [IC] % #	% Passing 425µm BS Test Sieve
22.9	25	1.015	NP	NP	N/A	N/A	99



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl	Clay	below 35
Si	Silt	35 to 50
	L	Low
	M	Medium
	H	High
	V	Very high
	O	Organic
		append to classification for organic material (eg ClHO)

Note: Water Content by BS EN 17892-1:2014+A1:2022, BS 1377-2:2022; Correlation Factor by Clayton C.R.I and Jukes A.W (1978); # Non accredited

Remarks: NP - non plastic.

Signed:

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cl 5.3.14, 5.5, Fall Cone Method, 1 Pt Test, BS 1377-2:2022,
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Client Reference: STW6679
Job Number: 24-048022-2
Date Sampled: 04/10/2024
Date Received: 15/10/2024
Date Tested: 22/10/2024
Sampled By: Not Given

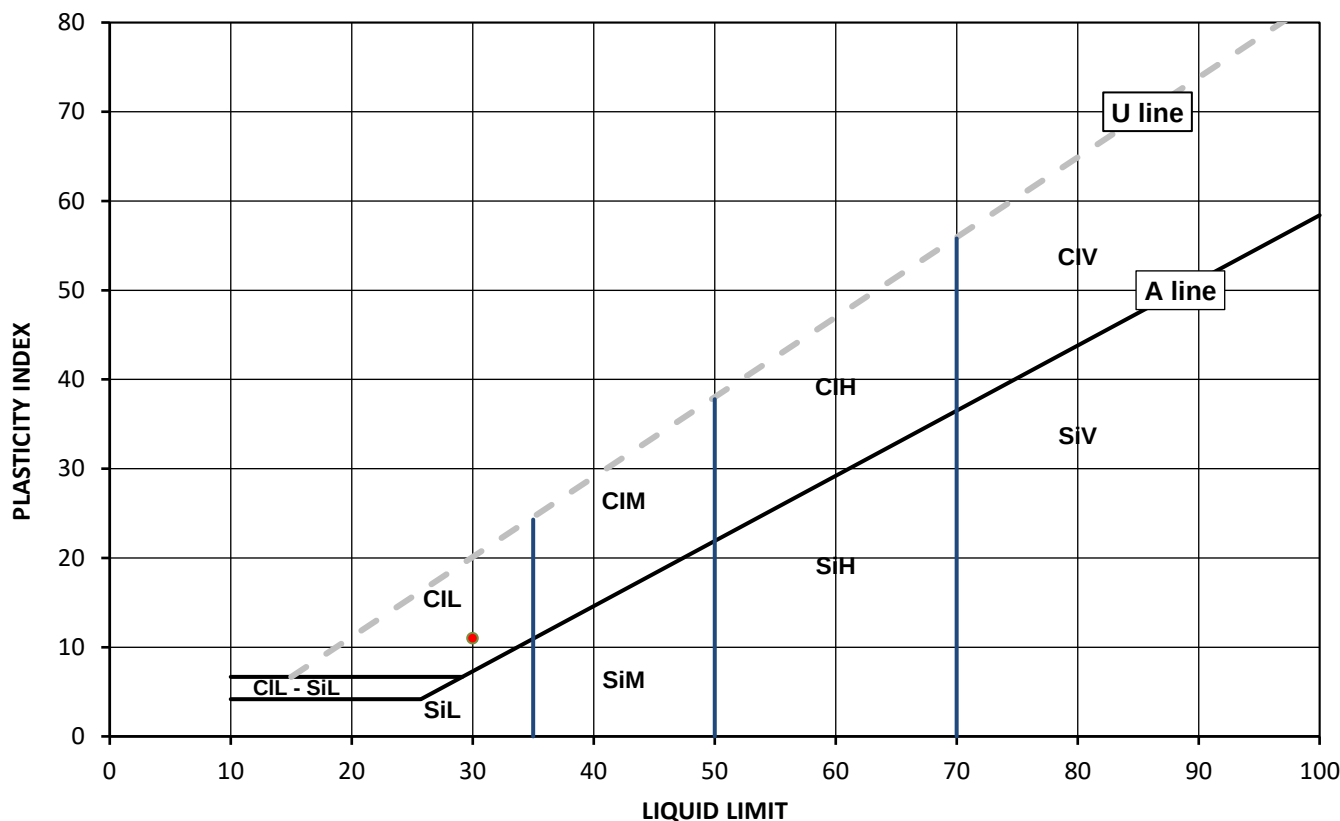
Test Results:

Laboratory Reference: 350033
Hole No.: BH02
Sample Reference: BH02-5.1-6
Sample Description: Brownish grey slightly gravelly very sandy CLAY

Depth Top [m]: 5.10
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after washing to remove >0.425 mm;
Cone Type: 80g/30deg

As Received Water Content [W] %	Corrected Liquid Limit [WL] %	Correlation Factor	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity index [IL] % #	Consistency index [IC] % #	% Passing 425µm BS Test Sieve
17.8	30	1.015	19	11	-0.09	1.09	87



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl	Clay	below 35
Si	Silt	35 to 50
	L Low	50 to 70
	M Medium	exceeding 70
	H High	
	V Very high	
	O Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS EN 17892-1:2014+A1:2022, BS 1377-2:2022; Correlation Factor by Clayton C.R.I and Jukes A.W (1978); # Non accredited

Remarks:

Signed:

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Client Reference: STW6679
Job Number: 24-048022-2
Date Sampled: 02/10/2024
Date Received: 15/10/2024
Date Tested: 22/10/2024
Sampled By: Not Given

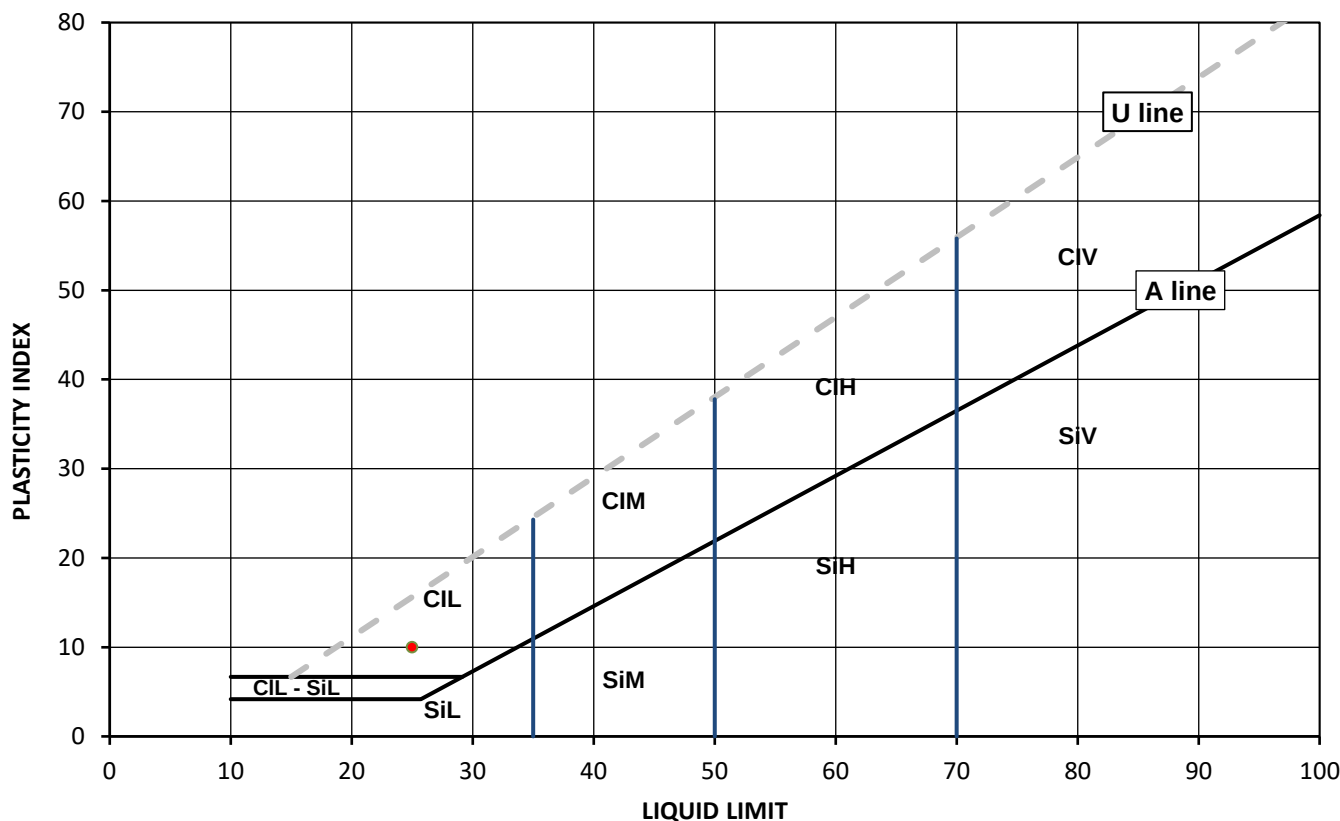
Test Results:

Laboratory Reference: 350037
Hole No.: WLS01
Sample Reference: WLS01-1-3
Sample Description: Yellowish brown slightly gravelly clayey SAND

Depth Top [m]: 1.00
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after washing to remove >0.425 mm;
Cone Type: 80g/30deg

As Received Water Content [W] %	Corrected Liquid Limit [WL] %	Correlation Factor	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity index [IL] % #	Consistency index [IC] % #	% Passing 425µm BS Test Sieve
12.2	25	1.015	15	10	-0.30	1.30	77



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl	Clay	below 35
Si	Silt	35 to 50
	L	Low
	M	Medium
	H	High
	V	Very high
	O	Organic
		append to classification for organic material (eg ClHO)

Note: Water Content by BS EN 17892-1:2014+A1:2022, BS 1377-2:2022; Correlation Factor by Clayton C.R.I and Jukes A.W (1978); # Non accredited

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Client Reference: STW6679
Job Number: 24-048022-2
Date Sampled: 02/10/2024
Date Received: 15/10/2024
Date Tested: 22/10/2024
Sampled By: Not Given

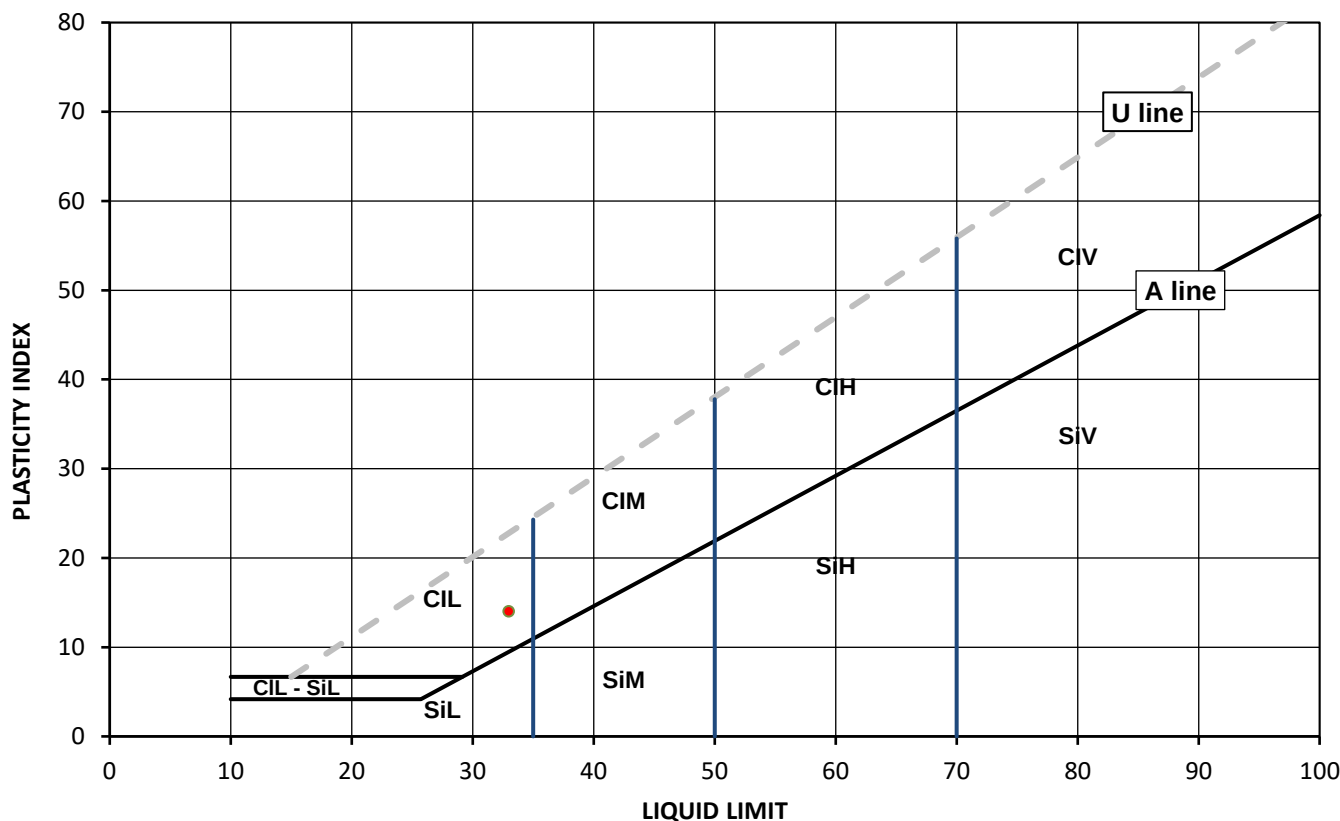
Test Results:

Laboratory Reference: 350039
Hole No.: WLS03
Sample Reference: WLS02-0.4-2
Sample Description: Yellowish brown slightly gravelly very sandy CLAY

Depth Top [m]: 0.40
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after washing to remove >0.425 mm;
Cone Type: 80g/30deg

As Received Water Content [W] %	Corrected Liquid Limit [WL] %	Correlation Factor	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity index [IL] % #	Consistency index [IC] % #	% Passing 425µm BS Test Sieve
15.8	33	0.984	19	14	-0.21	1.21	77



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

Plasticity		Liquid Limit
Cl	Clay	below 35
Si	Silt	35 to 50
L	Low	50 to 70
M	Medium	exceeding 70
H	High	append to classification for organic material (eg ClHO)
V	Very high	
O	Organic	

Note: Water Content by BS EN 17892-1:2014+A1:2022, BS 1377-2:2022; Correlation Factor by Clayton C.R.I and Jukes A.W (1978); # Non accredited

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Site Address: Saint Hill Road, East Grinstead

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Client Reference: STW6679
Job Number: 24-048022-2
Date Sampled: 03/10/2024
Date Received: 15/10/2024
Date Tested: 22/10/2024
Sampled By: Not Given

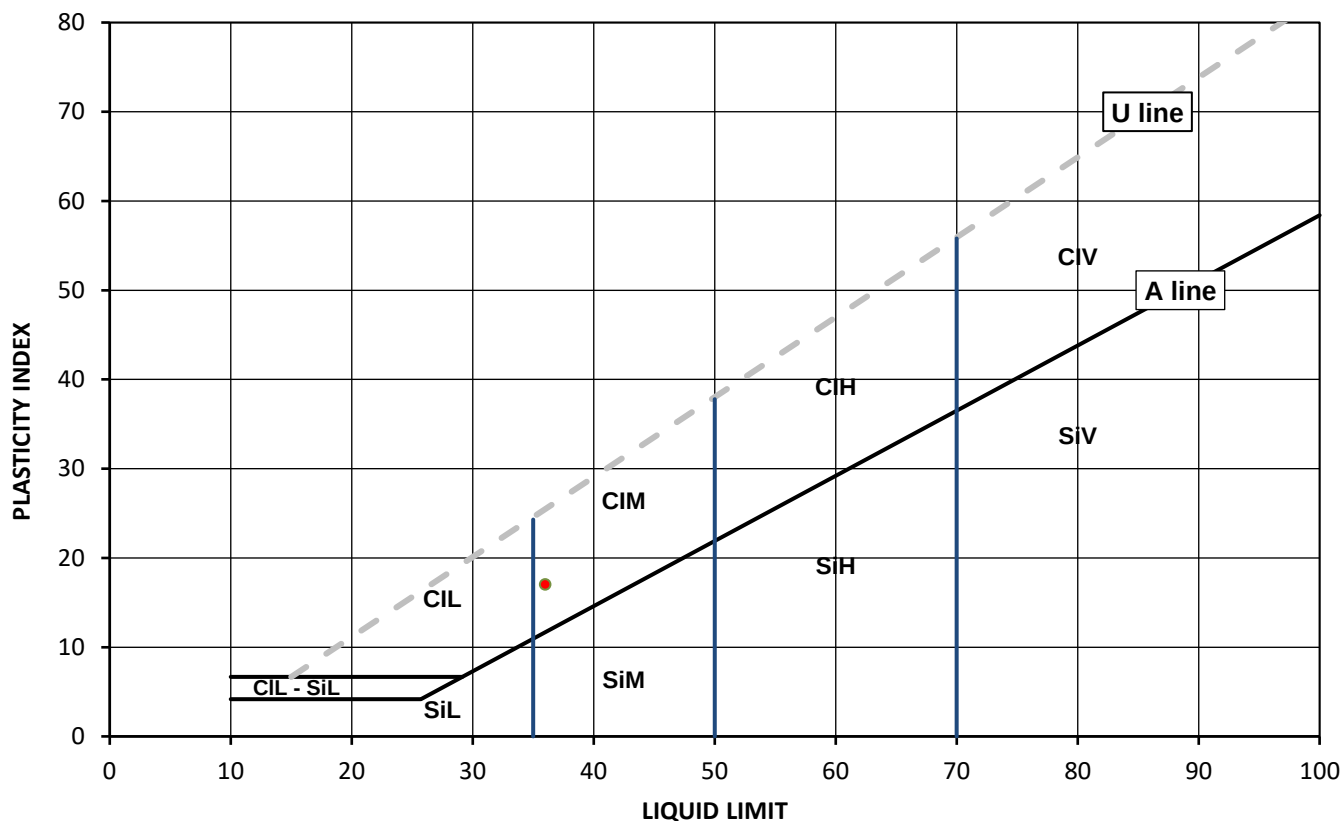
Test Results:

Laboratory Reference: 350040
Hole No.: WLS05
Sample Reference: WLS05-0.6-2
Sample Description: Yellowish brown slightly gravelly sandy CLAY

Depth Top [m]: 0.60
Depth Base [m]: Not Given
Sample Type: ES

Sample Preparation: Tested after washing to remove >0.425 mm;
Cone Type: 80g/30deg

As Received Water Content [W] %	Corrected Liquid Limit [WL] %	Correlation Factor	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity index [IL] % #	Consistency index [IC] % #	% Passing 425µm BS Test Sieve
17.3	36	0.968	19	17	-0.12	1.12	76



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl	Clay	below 35
Si	Silt	35 to 50
	L Low	50 to 70
	M Medium	exceeding 70
	H High	
	V Very high	
	O Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS EN 17892-1:2014+A1:2022, BS 1377-2:2022; Correlation Factor by Clayton C.R.I and Jukes A.W (1978); # Non accredited

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Client Reference: STW6679
Job Number: 24-048022-2
Date Sampled: 03/10/2024
Date Received: 15/10/2024
Date Tested: 22/10/2024
Sampled By: Not Given

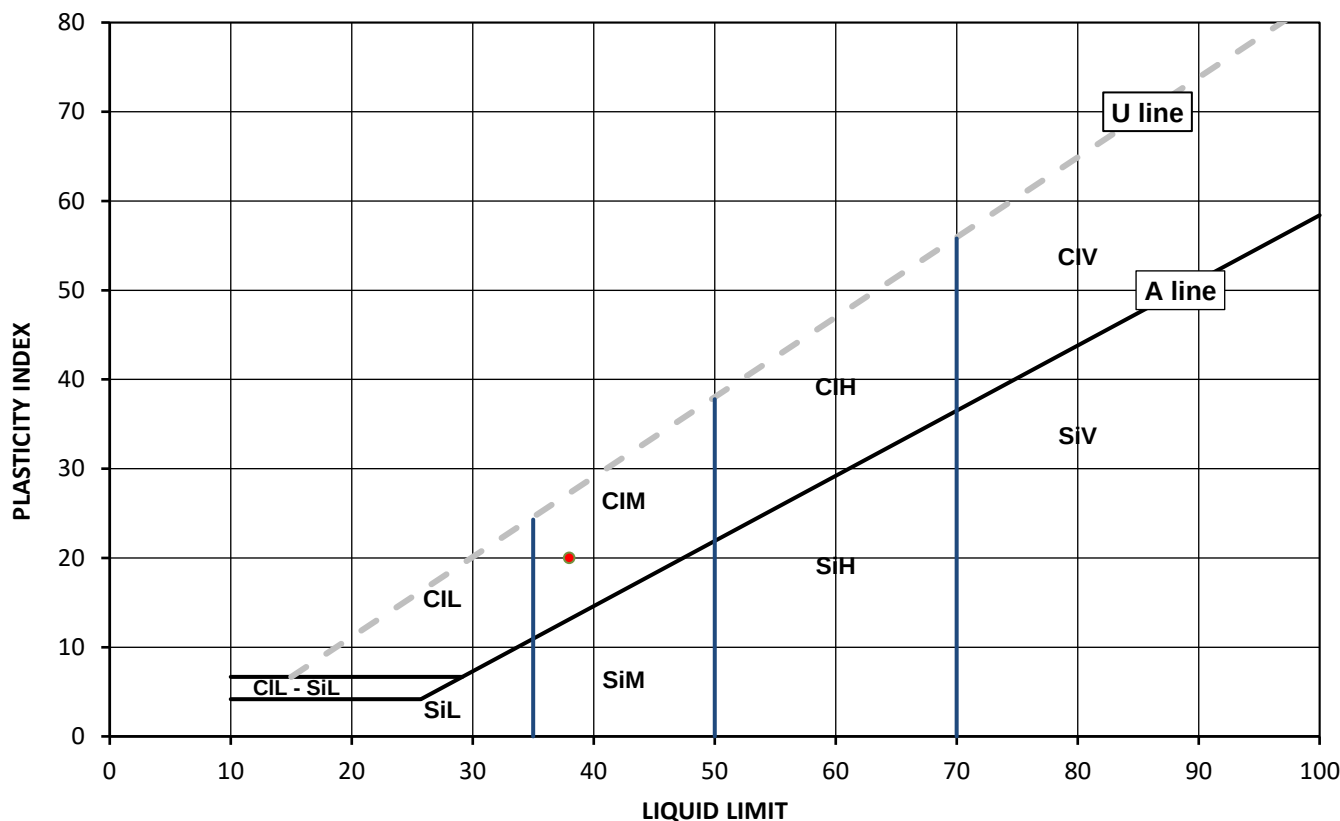
Test Results:

Laboratory Reference: 350041
Hole No.: WLS05
Sample Reference: WLS05-1-3
Sample Description: Yellowish brown slightly gravelly sandy CLAY

Depth Top [m]: 1.00
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after washing to remove >0.425 mm;
Cone Type: 80g/30deg

As Received Water Content [W] %	Corrected Liquid Limit [WL] %	Correlation Factor	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity index [IL] % #	Consistency index [IC] % #	% Passing 425µm BS Test Sieve
16.1	38	1.016	18	20	-0.10	1.10	83



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl	Clay	below 35
Si	Silt	35 to 50
	L	Low
	M	Medium
	H	High
	V	Very high
	O	Organic
		append to classification for organic material (eg ClHO)

Note: Water Content by BS EN 17892-1:2014+A1:2022, BS 1377-2:2022; Correlation Factor by Clayton C.R.I and Jukes A.W (1978); # Non accredited

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cl 5.3, 6

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Date Sampled: 03/10/2024
Date Received: 15/10/2024
Date Tested: 22/10/2024
Sampled By: Not Given

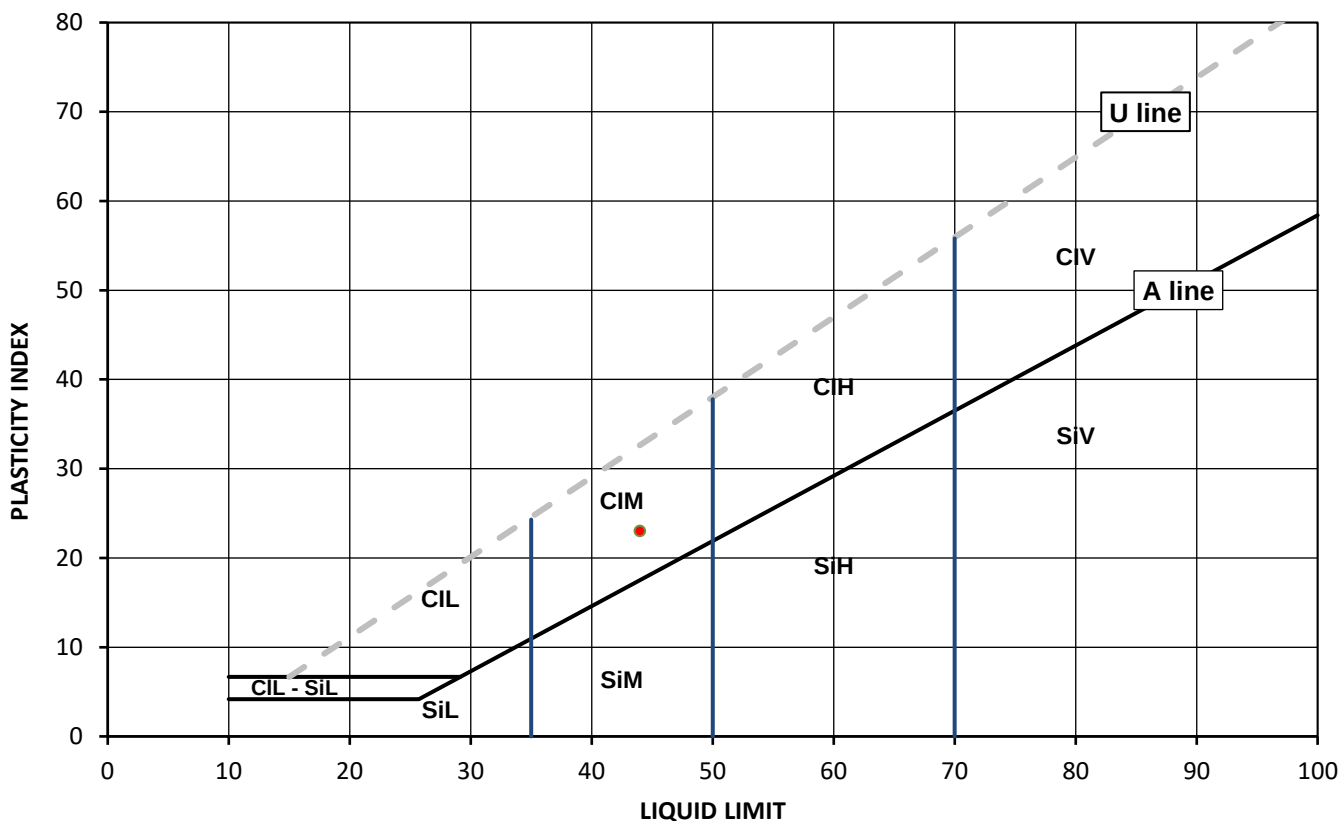
Test Results:

Laboratory Reference: 350042
Hole No.: WLS07
Sample Reference: WLS07-0.4-2
Sample Description: Light brown slightly gravelly sandy CLAY

Depth Top [m]: 0.40
Depth Base [m]: Not Given
Sample Type: ES

Sample Preparation: Tested after >0.425 mm removed by hand;
Cone Type: 80g/30deg

As Received Water Content [W] %	Corrected Liquid Limit [WL] %	Correlation Factor	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity index [IL] % #	Consistency index [IC] % #	% Passing 425µm BS Test Sieve
19.4	44	1.020	21	23	-0.09	1.09	77



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl	Clay	below 35
Si	Silt	35 to 50
	L	Low
	M	Medium
	H	High
	V	Very high
	O	Organic
		append to classification for organic material (eg ClHO)

Note: Water Content by BS EN 17892-1:2014+A1:2022, BS 1377-2:2022; Correlation Factor by Clayton C.R.I and Jukes A.W (1978); # Non accredited

Remarks:

Signed:

Katarzyna Koziel

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.



TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022,
cl 5.3.14, 5.5, Fall Cone Method, 1 Pt Test, BS 1377-2:2022,
cl 5.3, 6

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Environmental Science

4041

Client: Soiltechnics Limited
Client Address: Cedar Barn, White Lodge,
Walgrave, Northampton, NN6 9PY

Contact: Admin
Site Address: Saint Hill Road, East Grinstead

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Client Reference: STW6679
Job Number: 24-048022-2
Date Sampled: 03/10/2024
Date Received: 15/10/2024
Date Tested: 22/10/2024
Sampled By: Not Given

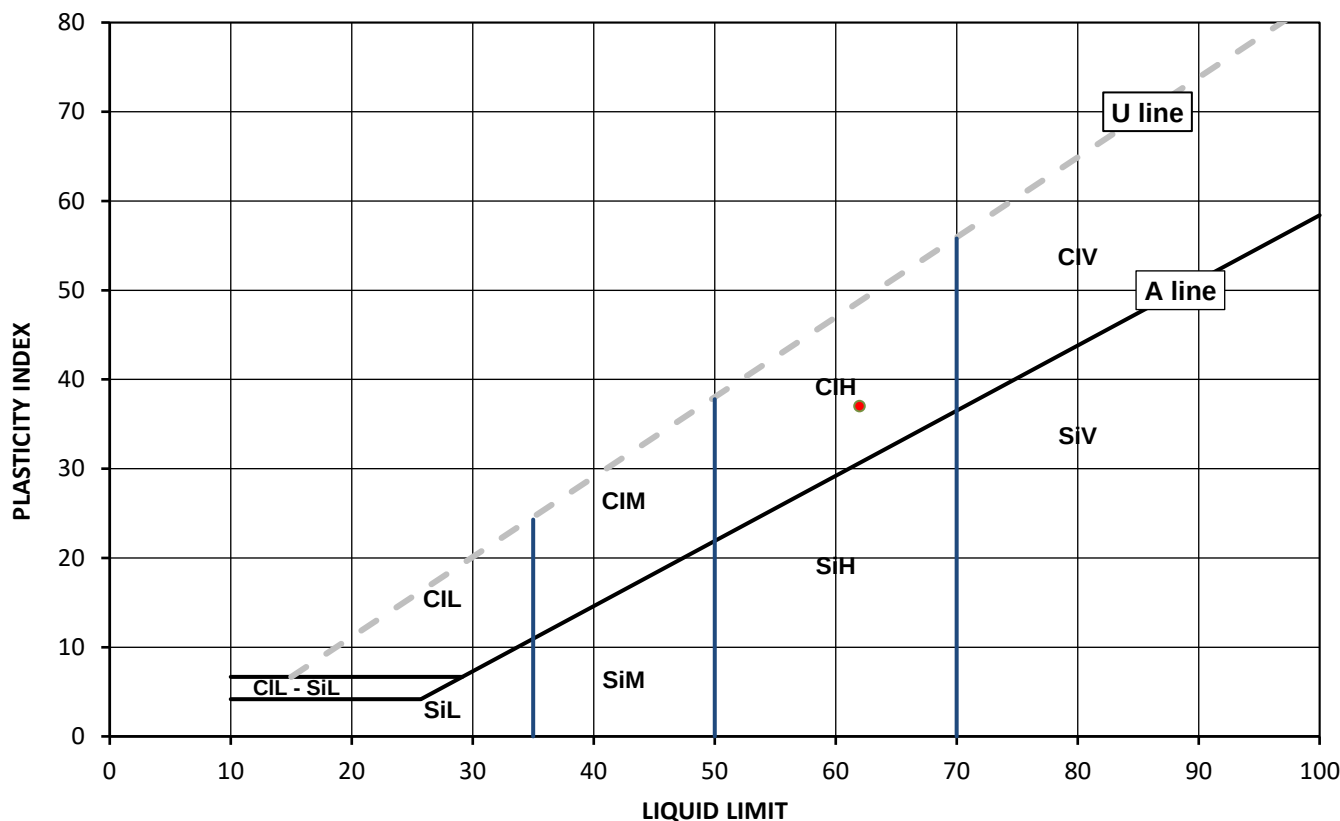
Test Results:

Laboratory Reference: 350043
Hole No.: WLS07
Sample Reference: WLS07-1-3
Sample Description: Brownish grey CLAY

Depth Top [m]: 1.00
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested in natural condition;
Cone Type: 80g/30deg

As Received Water Content [W] %	Corrected Liquid Limit [WL] %	Correlation Factor	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity index [IL] % #	Consistency index [IC] % #	% Passing 425µm BS Test Sieve
15.0	62	1.055	25	37	-0.27	1.27	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl	Clay	below 35
Si	Silt	35 to 50
	L	Low
	M	Medium
	H	High
	V	Very high
	O	Organic
		50 to 70
		exceeding 70
		append to classification for organic material (eg ClHO)

Note: Water Content by BS EN 17892-1:2014+A1:2022, BS 1377-2:2022; Correlation Factor by Clayton C.R.I and Jukes A.W (1978); # Non accredited

Remarks:

Signed:

Katarzyna Koziel

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

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SUMMARY REPORT

SUMMARY OF CLASSIFICATION TEST RESULTS

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Environmental Science

Tested in Accordance with:

BS EN ISO 17892-12:2018+A2:2022, cl 5.3.14, 5.5, Fall Cone Method, 1 Pt Test, BS 1377-2:2022, cl 5.3, 6. Correlation Factor by Clayton C.R.I and Jukes A.W (1978). W by BS EN ISO 17892-1:2014+A1:2022.

Client Reference: STW6679

Job Number: 24-048022-2

Date Sampled: 02/10 - 04/10/2024

Date Received: 15/10/2024

Date Tested: 22/10/2024

Sampled By: Not Given

4041

Client: Soiltechnics Limited

Client Address: Cedar Barn, White Lodge,
Walgrave, Northampton, NN6 9PY

Contact: Admin

Site Address: Saint Hill Road, East Grinstead

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	W	Liquid & Plastic Limit							Density		
		Reference	Depth Top	Depth Base	Type				% Passing 425um	WL*	Correlation Factor	Wp	Ip	Cone type	Sample Preparation	bulk	dry	PD
			m	m														
350031	BH02	BH02-1.5-1	1.50	Not Given	D	Brown slightly gravelly sandy CLAY	Atterberg 1 Point	25.7	82	36	0.984	19	17	80g/30 deg	WR			
350032	BH02	BH02-3.1-3	3.10	Not Given	D	Light brown slightly gravelly slightly clayey SAND	Atterberg 1 Point	22.9	99	25	1.015	NP	NP	80g/30 deg	WR			
350033	BH02	BH02-5.1-6	5.10	Not Given	D	Brownish grey slightly gravelly very sandy CLAY	Atterberg 1 Point	17.8	87	30	1.015	19	11	80g/30 deg	WR			
350037	WLS01	WLS01-1-3	1.00	Not Given	D	Yellowish brown slightly gravelly clayey SAND	Atterberg 1 Point	12.2	77	25	1.015	15	10	80g/30 deg	WR			
350039	WLS03	WLS02-0.4-2	0.40	Not Given	D	Yellowish brown slightly gravelly very sandy CLAY	Atterberg 1 Point	15.8	77	33	0.984	19	14	80g/30 deg	WR			
350040	WLS05	WLS05-0.6-2	0.60	Not Given	ES	Yellowish brown slightly gravelly sandy CLAY	Atterberg 1 Point	17.3	76	36	0.968	19	17	80g/30 deg	WR			
350041	WLS05	WLS05-1-3	1.00	Not Given	D	Yellowish brown slightly gravelly sandy CLAY	Atterberg 1 Point	16.1	83	38	1.016	18	20	80g/30 deg	WR			
350042	WLS07	WLS07-0.4-2	0.40	Not Given	ES	Light brown slightly gravelly sandy CLAY	Atterberg 1 Point	19.4	77	44	1.020	21	23	80g/30 deg	R			
350043	WLS07	WLS07-1-3	1.00	Not Given	D	Brownish grey CLAY	Atterberg 1 Point	15.0	100	62	1.055	25	37	80g/30 deg	N			

Note: # Non accredited; NP - Non plastic; N - Tested in natural condition, R - Tested after >0.425mm removed by hand, WR - Tested after washing to remove >425mm; * - One point liquid limit corrected as per the report Correlation Factor by Clayton C.R.I and Jukes A.W (1978)

Comments:

Signed:

Katarzyna Koziel

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

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SUMMARY REPORT
DETERMINATION OF WATER CONTENT

Tested in Accordance with: BS EN ISO 17892-1:2014+A1:2022, BS 1377-2: 2022, clause 4.1

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Environmental Science

4041
Client: Soiltechnics Limited
Client Address: Cedar Barn, White Lodge,
Walgrave, Northampton, NN6 9PY

Contact: Admin
Site Address: Saint Hill Road, East Grinstead
Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Client Reference: STW6679
Job Number: 24-048022-2
Date Sampled: 02/10 - 04/10/2024
Date Received: 15/10/2024
Date Tested: 22/10/2024
Sampled By: Not Given

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	WC											
		Reference	Depth Top m	Depth Base m	Type														
350031	BH02	BH02-1.5-1	1.50	Not Given	D	Brown slightly gravelly sandy CLAY		25.7											
350032	BH02	BH02-3.1-3	3.10	Not Given	D	Light brown slightly gravelly slightly clayey SAND		22.9											
350033	BH02	BH02-5.1-6	5.10	Not Given	D	Brownish grey slightly gravelly very sandy CLAY		17.8											
350037	WLS01	WLS01-1-3	1.00	Not Given	D	Yellowish brown slightly gravelly clayey SAND		12.2											
350039	WLS03	WLS02-0.4-2	0.40	Not Given	D	Yellowish brown slightly gravelly very sandy CLAY		15.8											
350040	WLS05	WLS05-0.6-2	0.60	Not Given	ES	Yellowish brown slightly gravelly sandy CLAY		17.3											
350041	WLS05	WLS05-1-3	1.00	Not Given	D	Yellowish brown slightly gravelly sandy CLAY		16.1											
350042	WLS07	WLS07-0.4-2	0.40	Not Given	ES	Light brown slightly gravelly sandy CLAY		19.4											
350043	WLS07	WLS07-1-3	1.00	Not Given	D	Brownish grey CLAY		15.0											

Comments:

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Signed:

Katarzyna Koziel

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd



4041

TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS EN ISO 17892-4:2016,
BS 1377-2:2022 cl. 10

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Environmental Science

Client: Soiltechnics Limited
Client Address: Cedar Barn, White Lodge,
Walgrave, Northampton, NN6 9PY

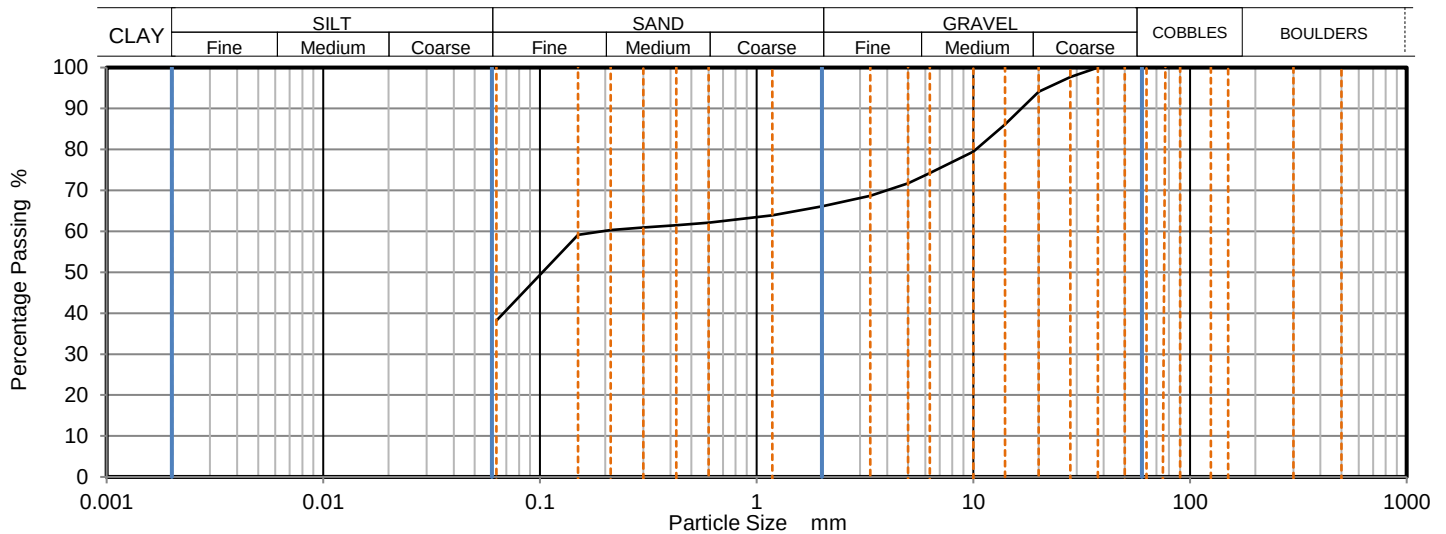
Contact: Admin
Site Address: Saint Hill Road, East Grinstead
Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Client Reference: STW6679
Job Number: 24-048022-2
Date Sampled: 02/10/2024
Date Received: 15/10/2024
Date Tested: 22/10/2024
Sampled By: Not Given

Test Results:

Laboratory Reference: 350038
Hole No.: WLS01
Sample Reference: WLS01-1.5-2
Sample Description: Brown slightly gravelly slightly sandy CLAY
Sample Preparation: Sample was quartered, oven dried at 108.5 °C and broken down by hand.

Depth Top [m]: 1.50
Depth Base [m]: 2.00
Sample Type: D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	98		
20	94		
14	86		
10	80		
6.3	74		
5	72		
3.35	69		
2	66		
1.18	64		
0.6	62		
0.425	62		
0.3	61		
0.212	60		
0.15	59		
0.063	38		

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	34.00
Sand	28.00
Fines <0.063 mm	38.00

Grading Analysis		
D100	mm	37.5
D60	mm	0.192
D30	mm	
D10	mm	
Uniformity Coefficient		3.1
Curvature Coefficient		

Uniformity and Curvature Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with ISO 17892 -4, by sieving on as received or wet sample

Remarks:

Signed:

Katarzyna Koziel

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

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SUMMARY REPORT

DETERMINATION OF POINT LOAD STRENGTH

Tested in Accordance with: ISRM: 2007, pages 125-132

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Environmental Science

4041

Client: Soiltechnics Limited
Client Address: Cedar Barn, White Lodge,
Walgrave, Northampton, NN6 9PY

Contact: Admin
Site Address: Saint Hill Road, East Grinstead

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Client Reference: STW6679
Job Number: 24-048022-2
Date Sampled: 02/10 - 04/10/2024
Date Received: 15/10/2024
Date Tested: 29/10 - 04/11/2024
Sampled By: Not Given

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks (including water content if measured)	Specimen Reference	Test Type see ISRM		Failure Valid (Y/N)	Dimensions				Force P kN	Equivalent diameter, De mm	Point Load Strength Index	
		Reference	Depth Top m	Depth Base m	Type				Type (D, A, I, B)	Direction (L, P or U)		Lne mm	W mm	Dps mm	Dps' mm			Is MPa	Is(50) MPa
350027	BH01	BH01-3.7-2	3.70	Not Given	B	Yellowish brown SANDSTONE	WC = 11.1%	1	I	U	YES	67.8	89.8	80.0	78.0	3.3	94.4	0.37	0.49
350028	BH01	BH01-4.5-3	4.50	Not Given	B	Light brown SANDSTONE	WC = 13.1%	1	A	U	YES	-	90.1	67.0	63.0	1.5	85.0	0.21	0.26
350029	BH01	BH01-5.9-4	5.90	Not Given	B	Light brown mottled brown SANDSTONE	WC = 9.3%	1	A	P	YES	-	89.6	59.0	47.0	0.9	73.2	0.16	0.19
350030	BH01	BH01-6.5-5	6.20	Not Given	B	Yellowish brown SANDSTONE	WC = 9.7%	1	I	U	YES	112.3	89.9	78.0	75.0	1.8	92.7	0.21	0.28
350034	BH02	BH02-8.4-9	8.40	Not Given	B	Yellowish brown SANDSTONE	WC = 9.8%	1	A	U	YES	-	88.6	62.0	47.0	2.3	72.8	0.42	0.50
350035	BH02	BH02-9.8-10	9.80	Not Given	B	Light brown mottled grey SANDSTONE	WC = 11.9%	1	A	P	YES	-	90.2	58.0	54.0	1.6	78.7	0.26	0.32
350036	BH02	BH02-11.2-11	11.20	Not Given	B	Yellowish brown SANDSTONE	WC = 7.4%	1	A	U	YES	-	98.3	43.0	38.0	1.7	68.9	0.36	0.41

Note: # non accredited; Test Type: D - Diametral, A - Axial, I - Irregular Lump, B - Block; Direction: L - parallel to planes of weakness, P - perpendicular to planes of weakness, U - unknown or random;
Dimensions: Dps - Distance between platens (platen separation), Dps' - at failure (see ISRM note 6), Lne - Length from platens to nearest free end W - Width of shortest dimension perpendicular to load, P;
Detailed legend for test and dimensions, based on ISRM, is shown above; Size factor, F = (De/50)0.45 for all tests

Equipment No.: i2 4341 Calibration Date: 15/03/2024 - 15/03/2025

Comments: Replaces Analytical Report Number 24-048022, issue no 1; Additional results of Point Load (samples 350027, 350030, 350036)

Signed:

Katarzyna Koziel

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

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Soiltechnics Limited
Cedar Barn
White Lodge
Walgrave, Northampton
NN6 9PY

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

e: admin@soiltechnics.net

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 24-048023

Project / Site name:	Saint Hill Road, East Grinstead	Samples received on:	15/10/2024
Your job number:	STW6679	Samples instructed on/ Analysis started on:	16/10/2024
Your order number:	POR020119	Analysis completed by:	25/10/2024
Report Issue Number:	1	Report issued on:	30/10/2024
Samples Analysed:	8 soil samples		

Signed: _____

Anna Goc
PL Head of Reporting Team
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.



4041



Environmental Science

Analytical Report Number: 24-048023

Project / Site name: Saint Hill Road, East Grinstead

Your Order No: POR020119

Lab Sample Number				350044	350045	350046	350047	350048
Sample Reference				BH01	BH02	BH01	BH02	WLS01
Sample Number				BH01-8.5-6	BH02-7.5-8	BH01-1-3	BH02-1.5-1	WLS01-0.2-1
Depth (m)				8.50	7.50	1.00	1.50	0.20
Date Sampled				02/10/2024	04/10/2024	03/10/2024	04/10/2024	02/10/2024
Time Taken				None Supplied	None Supplied	1440	None Supplied	1443
Analytical Parameter (Soil Analysis)				Units	Test Limit of detection	Test Accreditation Status		

Stone Content	%	0.1	NONE	53	< 0.1	< 0.1	< 0.1	16.3
Moisture Content	%	0.01	NONE	7.3	6.7	13	16	13
Total mass of sample received	kg	0.1	NONE	0.5	0.5	0.5	0.5	0.5

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	8.2	8.3	7.9	8.1	7.5
Total Sulphate as SO ₄	%	0.005	MCERTS	-	-	0.025	0.053	0.064
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	38	99	62	62	25
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	19.2	49.6	30.8	31	12.4
Total Sulphur	mg/kg	50	MCERTS	-	-	140	170	410
Total Sulphur	%	0.005	MCERTS	-	-	0.014	0.017	0.041

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number: 24-048023

Project / Site name: Saint Hill Road, East Grinstead

Your Order No: POR020119

Lab Sample Number				350049	350050	350051
Sample Reference				WLS04	WLS06	WLS07
Sample Number				WLS04-0.45-2	WLS06-0.4-2	WLS07-0.1-1
Depth (m)				0.45	0.40	0.10
Date Sampled				02/10/2024	03/10/2024	03/10/2024
Time Taken				1449	1353	1415
Analytical Parameter (Soil Analysis)				Units	Test Limit of detection	Test Accreditation Status

Stone Content	%	0.1	NONE	41.9	45.8	11.7
Moisture Content	%	0.01	NONE	12	11	16
Total mass of sample received	kg	0.1	NONE	0.5	0.5	0.5

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	7.3	7.9	7.4
Total Sulphate as SO ₄	%	0.005	MCERTS	0.049	0.029	0.05
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	25	13	28
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	12.6	6.7	14.2
Total Sulphur	mg/kg	50	MCERTS	130	140	240
Total Sulphur	%	0.005	MCERTS	0.013	0.014	0.024

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected



Analytical Report Number : 24-048023

Project / Site name: Saint Hill Road, East Grinstead

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
350044	BH01	BH01-8.5-6	8.5	Brown sand with stones
350045	BH02	BH02-7.5-8	7.5	Brown sandy clay
350046	BH01	BH01-1-3	1	Brown clay and sand with gravel
350047	BH02	BH02-1.5-1	1.5	Brown loam and clay with gravel
350048	WLS01	WLS01-0.2-1	0.2	Brown loam and clay with stones
350049	WLS04	WLS04-0.45-2	0.45	Brown sandy clay with stones
350050	WLS06	WLS06-0.4-2	0.4	Brown loam and clay with stones
350051	WLS07	WLS07-0.1-1	0.1	Brown loam and clay with stones

Analytical Report Number : 24-048023

Project / Site name: Saint Hill Road, East Grinstead

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Total sulphate (as SO ₄ in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES	In-house method	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES	In-house method	L038B	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099-PL	D	MCERTS

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30°C.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Quality control parameter failure associated with individual result applies to calculated sum of individuals.

The result for sum should be interpreted with caution

Appendix J Geoenvironmental Laboratory Test Results



Amended Report

Report No.:	24-32750-2		
Initial Date of Issue:	17-Oct-2024	Date of Re-Issue:	25-Oct-2024
Re-Issue Details:	This report has been revised and directly supersedes 24-32750-1 in its entirety		
Client	Soiltechnics Limited		
Client Address:	1st Floor Unit 9 Westpoint Enterprise Park Clarence Avenue Trafford Park Manchester M17 1QS		
Contact(s):	Admin		
Project	STW6679 Saint Hill Road		
Quotation No.:		Date Received:	10-Oct-2024
Order No.:	POR020068	Date Instructed:	10-Oct-2024
No. of Samples:	10		
Turnaround (Wkdays):	11	Results Due:	24-Oct-2024
Date Approved:	25-Oct-2024	Subcon Results Due:	31-Oct-2024
Approved By:			

Details: David Smith, Technical Director

For details about application of accreditation to specific matrix types, please refer to the Table at the back of this report

Results - Soil

Project: STW6679 Saint Hill Road

Client: Soiltechnics Limited		Chemtest Job No.:				24-32750	24-32750	24-32750	24-32750	24-32750	24-32750	24-32750	24-32750
Quotation No.:		Chemtest Sample ID.:				1878494	1878495	1878496	1878497	1878498	1878499	1878500	1878501
Order No.: POR020068		Client Sample Ref.:				1	1	1	1	1	1	1	1
		Client Sample ID.:				BH01-0.1-1	BH02-0.5-1	COMP01-0.0-1	COMP02-0.0-1	COMP03-0.0-1	HP03-0.05-1	HP05-0.05-1	HP09-0.05-1
		Sample Location:				BH01	BH02	COMP01	COMP02	COMP03	HP03	HP05	HP09
		Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):				0.10	0.50	0.00	0.00	0.00	0.05	0.05	0.05
		Date Sampled:				03-Oct-2024	04-Oct-2024	01-Oct-2024	01-Oct-2024	01-Oct-2024	01-Oct-2024	01-Oct-2024	01-Oct-2024
		Time Sampled:				14:39	0:00	9:35	9:35	9:49	10:00	10:36	13:09
		Asbestos Lab:				DURHAM	DURHAM				DURHAM	DURHAM	DURHAM
Determinand	HWOL Code	Accred.	SOP	Units	LOD								
ACM Type		U	2192		N/A	-	-				-	-	-
Asbestos Identification		U	2192		N/A	No Asbestos Detected	No Asbestos Detected				No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture		N	2030	%	0.020	16	15	12	23	24	13	15	12
Soil Colour		N	2040		N/A	Brown	Brown				Brown	Brown	Brown
Other Material		N	2040		N/A	Stones, Roots and Wood	Stones				Stones, Roots and Wood	Stones, Roots and Wood	Stones, Roots and Wood
Soil Texture		N	2040		N/A	Loam	Loam				Loam	Clay	Loam
pH at 20C		M	2010		4.0	8.0	9.6				7.9	8.5	8.2
Boron (Hot Water Soluble)		M	2120	mg/kg	0.40	0.76	0.57				0.70	0.89	0.66
Cyanide (Complex)		M	2300	mg/kg	0.50	< 0.50	< 0.50				< 0.50	< 0.50	< 0.50
Cyanide (Free)		M	2300	mg/kg	0.50	< 0.50	< 0.50				< 0.50	< 0.50	< 0.50
Cyanide (Total)		M	2300	mg/kg	0.50	< 0.50	< 0.50				< 0.50	< 0.50	< 0.50
Arsenic		M	2455	mg/kg	0.5	12	10				11	6.9	8.5
Beryllium		U	2455	mg/kg	0.5	< 0.5	< 0.5				< 0.5	< 0.5	0.6
Cadmium		M	2455	mg/kg	0.10	< 0.10	< 0.10				< 0.10	0.16	0.30
Chromium		M	2455	mg/kg	0.5	17	15				17	15	21
Copper		M	2455	mg/kg	0.50	29	20				31	22	28
Mercury		M	2455	mg/kg	0.05	0.10	0.08				0.15	0.08	0.10
Nickel		M	2455	mg/kg	0.50	15	13				15	12	17
Lead		M	2455	mg/kg	0.50	60	52				66	60	60
Selenium		M	2455	mg/kg	0.25	0.40	0.34				0.34	0.42	0.61
Vanadium		U	2455	mg/kg	0.5	25	23				27	18	26
Zinc		M	2455	mg/kg	0.50	79	64				100	66	100
Chromium (Hexavalent)		N	2490	mg/kg	0.50	< 0.50	< 0.50				< 0.50	< 0.50	< 0.50
Organic Matter		M	2625	%	0.40	2.9	2.1				3.6	2.9	3.6
TPH >C5-C6	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0						
TPH >C6-C7	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0						
TPH >C7-C8	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0						
TPH >C8-C10	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0						
TPH >C10-C12	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0						
TPH >C12-C16	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0						
TPH >C16-C21	EH_1D_Total	N	2670	mg/kg	1.0	7.3	25						
TPH >C21-C35	EH_1D_Total	N	2670	mg/kg	1.0	28	55						
Total TPH >C5-C35		N	2670	mg/kg	10	36	80						

Results - Soil

Project: STW6679 Saint Hill Road

Client: Soiltechnics Limited		Chemtest Job No.:				24-32750	24-32750	24-32750	24-32750	24-32750	24-32750	24-32750	24-32750
Quotation No.:		Chemtest Sample ID.:				1878494	1878495	1878496	1878497	1878498	1878499	1878500	1878501
Order No.: POR020068		Client Sample Ref.:				1	1	1	1	1	1	1	1
		Client Sample ID.:				BH01-0.1-1	BH02-0.5-1	COMP01-0.0-1	COMP02-0.0-1	COMP03-0.0-1	HP03-0.05-1	HP05-0.05-1	HP09-0.05-1
		Sample Location:				BH01	BH02	COMP01	COMP02	COMP03	HP03	HP05	HP09
		Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):				0.10	0.50	0.00	0.00	0.00	0.05	0.05	0.05
		Date Sampled:				03-Oct-2024	04-Oct-2024	01-Oct-2024	01-Oct-2024	01-Oct-2024	01-Oct-2024	01-Oct-2024	01-Oct-2024
		Time Sampled:				14:39	0:00	9:35	9:35	9:49	10:00	10:36	13:09
		Asbestos Lab:				DURHAM	DURHAM				DURHAM	DURHAM	DURHAM
Determinand	HWOL Code	Accred.	SOP	Units	LOD								
Naphthalene		M	2800	mg/kg	0.10	0.50	0.51			2.5	0.14	0.33	
Acenaphthylene		N	2800	mg/kg	0.10	< 0.10	0.13			< 0.10	< 0.10	0.48	
Acenaphthene		M	2800	mg/kg	0.10	< 0.10	0.15			0.22	< 0.10	0.35	
Fluorene		M	2800	mg/kg	0.10	< 0.10	0.22			0.17	< 0.10	0.39	
Phenanthrene		M	2800	mg/kg	0.10	0.81	1.4			1.0	0.85	3.6	
Anthracene		M	2800	mg/kg	0.10	0.21	0.47			0.25	0.28	1.2	
Fluoranthene		M	2800	mg/kg	0.10	0.94	2.5			1.1	2.9	8.9	
Pyrene		M	2800	mg/kg	0.10	0.74	2.1			0.86	2.5	7.5	
Benzo[a]anthracene		M	2800	mg/kg	0.10	0.39	1.2			0.72	1.6	4.5	
Chrysene		M	2800	mg/kg	0.10	0.34	0.92			0.72	1.6	4.5	
Benzo[b]fluoranthene		M	2800	mg/kg	0.10	0.54	1.6			1.2	2.7	6.5	
Benzo[k]fluoranthene		M	2800	mg/kg	0.10	0.20	0.67			0.39	0.94	2.5	
Benzo[a]pyrene		M	2800	mg/kg	0.10	0.38	1.4			0.73	2.3	6.0	
Indeno(1,2,3-c,d)Pyrene		M	2800	mg/kg	0.10	0.33	1.0			0.62	1.6	3.8	
Dibenz(a,h)Anthracene		N	2800	mg/kg	0.10	< 0.10	0.23			0.25	0.31	0.73	
Benzo[g,h,i]perylene		M	2800	mg/kg	0.10	0.27	0.97			0.51	1.4	3.3	
Total Of 16 PAH's		N	2800	mg/kg	2.0	5.7	16			11	19	55	
Total Phenols		M	2920	mg/kg	0.10	< 0.10	< 0.10			< 0.10	< 0.10	< 0.10	

Results - Soil

Project: STW6679 Saint Hill Road

Client: Soiltechnics Limited		Chemtest Job No.:				24-32750	24-32750
Quotation No.:		Chemtest Sample ID.:				1878502	1878503
Order No.: POR020068		Client Sample Ref.:				2	2
		Client Sample ID.:				TP01-0.5-2	TP12-0.5-2
		Sample Location:				TP01	TP12
		Sample Type:				SOIL	SOIL
		Top Depth (m):				0.50	0.50
		Date Sampled:				02-Oct-2024	04-Oct-2024
		Time Sampled:				15:10	0:00
		Asbestos Lab:				DURHAM	DURHAM
Determinand	HWOL Code	Accred.	SOP	Units	LOD		
ACM Type		U	2192		N/A	-	-
Asbestos Identification		U	2192		N/A	No Asbestos Detected	No Asbestos Detected
Moisture		N	2030	%	0.020	13	20
Soil Colour		N	2040		N/A	Brown	Brown
Other Material		N	2040		N/A	Stones, Roots and Wood	None
Soil Texture		N	2040		N/A	Loam	Clay
pH at 20C		M	2010		4.0	8.1	8.2
Boron (Hot Water Soluble)		M	2120	mg/kg	0.40	0.54	< 0.40
Cyanide (Complex)		M	2300	mg/kg	0.50	< 0.50	< 0.50
Cyanide (Free)		M	2300	mg/kg	0.50	< 0.50	< 0.50
Cyanide (Total)		M	2300	mg/kg	0.50	< 0.50	< 0.50
Arsenic		M	2455	mg/kg	0.5	7.0	23
Beryllium		U	2455	mg/kg	0.5	< 0.5	1.1
Cadmium		M	2455	mg/kg	0.10	0.12	< 0.10
Chromium		M	2455	mg/kg	0.5	13	24
Copper		M	2455	mg/kg	0.50	9.0	25
Mercury		M	2455	mg/kg	0.05	< 0.05	< 0.05
Nickel		M	2455	mg/kg	0.50	7.9	26
Lead		M	2455	mg/kg	0.50	28	23
Selenium		M	2455	mg/kg	0.25	0.36	0.59
Vanadium		U	2455	mg/kg	0.5	19	21
Zinc		M	2455	mg/kg	0.50	50	51
Chromium (Hexavalent)		N	2490	mg/kg	0.50	< 0.50	< 0.50
Organic Matter		M	2625	%	0.40	2.2	0.65
TPH >C5-C6	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0
TPH >C6-C7	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0
TPH >C7-C8	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0
TPH >C8-C10	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0
TPH >C10-C12	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0
TPH >C12-C16	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0
TPH >C16-C21	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0
TPH >C21-C35	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0
Total TPH >C5-C35		N	2670	mg/kg	10	< 10	< 10

Results - Soil

Project: STW6679 Saint Hill Road

Client: Soiltechnics Limited		Chemtest Job No.:				24-32750	24-32750
Quotation No.:		Chemtest Sample ID.:				1878502	1878503
Order No.: POR020068		Client Sample Ref.:				2	2
		Client Sample ID.:				TP01-0.5-2	TP12-0.5-2
		Sample Location:				TP01	TP12
		Sample Type:				SOIL	SOIL
		Top Depth (m):				0.50	0.50
		Date Sampled:				02-Oct-2024	04-Oct-2024
		Time Sampled:				15:10	0:00
		Asbestos Lab:				DURHAM	DURHAM
Determinand	HWOL Code	Accred.	SOP	Units	LOD		
Naphthalene		M	2800	mg/kg	0.10	< 0.10	< 0.10
Acenaphthylene		N	2800	mg/kg	0.10	< 0.10	< 0.10
Acenaphthene		M	2800	mg/kg	0.10	< 0.10	< 0.10
Fluorene		M	2800	mg/kg	0.10	< 0.10	< 0.10
Phenanthrene		M	2800	mg/kg	0.10	0.14	< 0.10
Anthracene		M	2800	mg/kg	0.10	< 0.10	< 0.10
Fluoranthene		M	2800	mg/kg	0.10	0.32	< 0.10
Pyrene		M	2800	mg/kg	0.10	0.29	< 0.10
Benzo[a]anthracene		M	2800	mg/kg	0.10	0.21	< 0.10
Chrysene		M	2800	mg/kg	0.10	0.23	< 0.10
Benzo[b]fluoranthene		M	2800	mg/kg	0.10	0.36	< 0.10
Benzo[k]fluoranthene		M	2800	mg/kg	0.10	0.10	< 0.10
Benzo[a]pyrene		M	2800	mg/kg	0.10	0.28	< 0.10
Indeno(1,2,3-c,d)Pyrene		M	2800	mg/kg	0.10	0.26	< 0.10
Dibenz(a,h)Anthracene		N	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene		M	2800	mg/kg	0.10	0.28	< 0.10
Total Of 16 PAH's		N	2800	mg/kg	2.0	2.5	< 2.0
Total Phenols		M	2920	mg/kg	0.10	< 0.10	< 0.10

Chemtest Job No.: 24-32750
Chemtest Sample ID.: 1878496
Client Sample Ref.: 1
Sample Location: COMP01
Client Sample ID.: COMP01-0.0-1
Top Depth (m): 0.00
Bottom Depth (m):
Date Sampled: 01-Oct-2024
Time Sampled:

Parameter	Units	Multipurpose Range			Result	Compliant with Multipurpose Range? (Y/N)	Compliant with Specific Purpose Range? (Y/N)		
Texture							Acid	Low F	Calc.
Clay content (Sub Contracted)	%				13				
Silt content (Sub Contracted)	%				29				
Sand content (Sub Contracted)	%				58				
Soil texture class		See Attached Chart			Sandy Loam	YES			
Mass Loss on Ignition									
Clay 5-20%		3.0-20			3.9	YES	YES	YES	YES
Clay 20-35%		5.0-20							
Stone Content	% m/m								
>2mm (Sub Contracted)		0-30			35	NO			
>20mm (Sub Contracted)		0-10			3.5	YES			
>50mm (Sub Contracted)		0			< 100	YES			
Soil pH value		5.5-8.5			8.0	YES	NO	YES	YES
Carbonate (Calcareous only)	%				1.2				YES
Electrical Conductivity	µS/cm	If >3300 do ESP			2600	YES			
Available Nutrient Content									
Nitrogen %		>0.15			0.25	YES	YES		YES
Extractable phosphorus	mg/l	16-140			14	NO	NO	YES	NO
Extractable potassium	mg/l	121-1500			110	NO	NO		NO
Extractable magnesium	mg/l	51-600			70	YES	YES		YES
Carbon : Nitrogen Ratio		<20:1			9.1/1	YES	YES	YES	YES
Exchangeable sodium	%	<15			2.8				
Available Calcium	mg/l				3000				
Available Sodium	mg/l				110				
Phytotoxic Contaminants (by soil pH)		< 6.0	6.0-7.0	> 7.0					
Zinc (Nitric Acid extract)	mg/kg	<200	<200	<300	77	YES			
Copper (Nitric Acid extract)	mg/kg	<100	<135	<200	26	YES			
Nickel (Nitric Acid extract)	mg/kg	<60	<75	<110	14	YES			
Visible Contaminants	% mm								
>2mm		<0.5			0.000	YES			
..... of which plastics		<0.25			0.000	YES			
..... man-made sharps		zero in 1kg			0.000	YES			

Results - Topsoil Report

BS3882:2015

Chemtest Job No.: 24-32750

Chemtest Sample ID.: 1878497

Client Sample Ref.: 1

Sample Location: COMP02

Client Sample ID.: COMP02-0.0-1

Top Depth (m): 0.00

Bottom Depth (m):

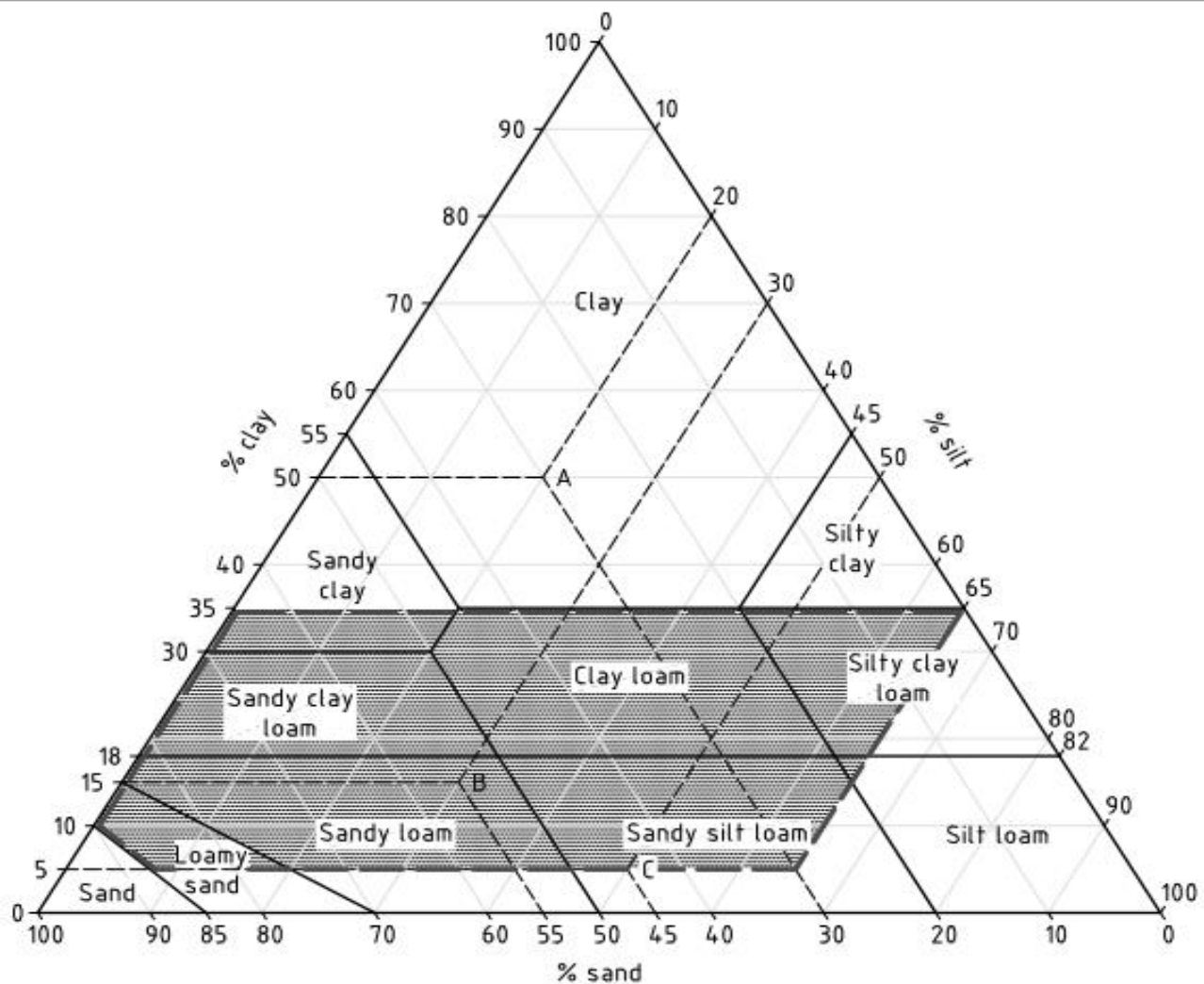
Date Sampled: 01-Oct-2024

Time Sampled:

Parameter	Units	Multipurpose Range	Result	Compliant with Multipurpose Range? (Y/N)	Compliant with Specific Purpose Range? (Y/N)		
Texture					Acid	Low F	Calc.
Clay content (Sub Contracted)	%		15				
Silt content (Sub Contracted)	%		50				
Sand content (Sub Contracted)	%		35				
Soil texture class		See Attached Chart	Sandy Silt Loam	YES			
Mass Loss on Ignition							
Clay 5-20%		3.0-20	5.2	YES	YES	YES	YES
Clay 20-35%		5.0-20					
Stone Content	% m/m						
>2mm (Sub Contracted)		0-30	15	YES			
>20mm (Sub Contracted)		0-10	< 100	YES			
>50mm (Sub Contracted)		0	< 100	YES			
Soil pH value		5.5-8.5	8.0	YES	NO	YES	YES
Carbonate (Calcareous only)	%		3.6				YES
Electrical Conductivity	µS/cm	If >3300 do ESP	2300	YES			
Available Nutrient Content							
Nitrogen %		>0.15	0.43	YES	YES		YES
Extractable phosphorus	mg/l	16-140	6.1	NO	NO	YES	NO
Extractable potassium	mg/l	121-1500	86	NO	NO		NO
Extractable magnesium	mg/l	51-600	94	YES	YES		YES
Carbon : Nitrogen Ratio		<20:1	7.0/1	YES	YES	YES	YES
Exchangeable sodium	%	<15	2.3				
Available Calcium	mg/l		3500				
Available Sodium	mg/l		99				
Phytotoxic Contaminants (by soil pH)		< 6.0 6.0-7.0 > 7.0					
Zinc (Nitric Acid extract)	mg/kg	<200 <200 <300	45	YES			
Copper (Nitric Acid extract)	mg/kg	<100 <135 <200	15	YES			
Nickel (Nitric Acid extract)	mg/kg	<60 <75 <110	9.3	YES			
Visible Contaminants	% mm						
>2mm		<0.5	0.000	YES			
..... of which plastics		<0.25	0.000	YES			
..... man-made sharps		zero in 1kg	0.000	YES			

Chemtest Job No.: 24-32750
Chemtest Sample ID.: 1878498
Client Sample Ref.: 1
Sample Location: COMP03
Client Sample ID.: COMP03-0.0-1
Top Depth (m): 0.00
Bottom Depth (m):
Date Sampled: 01-Oct-2024
Time Sampled:

Parameter	Units	Multipurpose Range	Result	Compliant with Multipurpose Range? (Y/N)	Compliant with Specific Purpose Range? (Y/N)		
Texture					Acid	Low F	Calc.
Clay content (Sub Contracted)	%		16				
Silt content (Sub Contracted)	%		65				
Sand content (Sub Contracted)	%		19				
Soil texture class		See Attached Chart	Silt Loam	YES			
Mass Loss on Ignition							
Clay 5-20%		3.0-20	3.5	YES	YES	YES	YES
Clay 20-35%		5.0-20					
Stone Content	% m/m						
>2mm (Sub Contracted)		0-30	9.9	YES			
>20mm (Sub Contracted)		0-10	< 100	YES			
>50mm (Sub Contracted)		0	< 100	YES			
Soil pH value		5.5-8.5	7.9	YES	NO	YES	YES
Carbonate (Calcareous only)	%		< 0.10				NO
Electrical Conductivity	µS/cm	If >3300 do ESP	2100	YES			
Available Nutrient Content							
Nitrogen %		>0.15	0.18	YES	YES		YES
Extractable phosphorus	mg/l	16-140	3.7	NO	NO	YES	NO
Extractable potassium	mg/l	121-1500	92	NO	NO		NO
Extractable magnesium	mg/l	51-600	120	YES	YES		YES
Carbon : Nitrogen Ratio		<20:1	11.4/1	YES	YES	YES	YES
Exchangeable sodium	%	<15	2.3				
Available Calcium	mg/l		3100				
Available Sodium	mg/l		91				
Phytotoxic Contaminants (by soil pH)		< 6.06.0-7.0> 7.0					
Zinc (Nitric Acid extract)	mg/kg	<200<200<300	36	YES			
Copper (Nitric Acid extract)	mg/kg	<100<135<200	12	YES			
Nickel (Nitric Acid extract)	mg/kg	<60<75<110	10	YES			
Visible Contaminants	% mm						
>2mm		<0.5	0.000	YES			
..... of which plastics		<0.25	0.000	YES			
..... man-made sharps		zero in 1kg	0.000	YES			

Texture Classification Chart**Key**

Area within which the texture of topsoil is required to fall

NOTE Examples of textural classification are as follows.

- Soil A with 30% sand, 20% silt and 50% clay is in the "clay" textural class.
- Soil B with 55% sand, 30% silt and 15% clay is in the "sandy loam" textural class.
- Soil C with 45% sand, 50% silt and 5% clay is in the "sandy silt loam" textural class.

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Test Methods

SOP	Title	Parameters included	Method summary	Water Accred.
2010	pH Value of Soils	pH at 20°C	pH Meter	
2020	Electrical Conductivity	Electrical conductivity (EC) of aqueous extract or calcium sulphate solution for topsoil	Measurement of the electrical resistance of a 2:1 water/soil extract.	
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <30°C.	
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930	
2115	Total Nitrogen in Soils	Nitrogen	Determination by elemental analyser	
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES	
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry	
2260	Carbonate	Carbonate	Titration	
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.	
2400	Cations	Cations	ICP-MS	
2420	Phosphate	Phosphate	Spectrophotometry - Discrete analyser	
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.	
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.	
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.	
2620	LOI 440	LOI 440 Trommel Fines	Determination of the proportion by mass that is lost from a soil by ignition at 440°C.	
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.	
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID	
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS	
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.	

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N/E	not evaluated
<	"less than"
>	"greater than"
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Uncertainty of measurement for the determinands tested are available upon request .

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All results are expressed on a dry weight basis.

The following tests were analysed on samples 'as received' and the results subsequently corrected to a dry weight basis EPH, VPH, TPH, BTEX, VOCs, SVOCs, PCBs, Phenols.

For all other tests the samples were dried at $\leq 30^{\circ}\text{C}$ prior to analysis.

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Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt.

All water samples will be retained for 14 days from the date of receipt.

Charges may apply to extended sample storage.

Water Sample Category Key for Accreditation

- DW - Drinking Water
- GW - Ground Water
- LE - Land Leachate
- NA - Not Applicable

Report Information

PL - Prepared Leachate
PW - Processed Water
RE - Recreational Water
SA - Saline Water
SW - Surface Water
TE - Treated Effluent
TS - Treated Sewage
UL - Unspecified Liquid

Clean Up Codes

NC - No Clean Up
MC - Mathematical Clean Up
FC - Florisil Clean Up

HWOL Acronym System

HS - Headspace analysis
EH - Extractable hydrocarbons – i.e. everything extracted by the solvent
CU - Clean-up – e.g. by Florisil, silica gel
1D - GC – Single coil gas chromatography
Total - Aliphatics & Aromatics
AL - Aliphatics only
AR - Aromatic only
2D - GC-GC – Double coil gas chromatography
#1 - EH_2D_Total but with humics mathematically subtracted
#2 - EH_2D_Total but with fatty acids mathematically subtracted
+ - Operator to indicate cumulative e.g. EH+EH_Total or EH_CU+HS_Total

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com



Final Report

Report No.: 24-32754-1

Initial Date of Issue: 17-Oct-2024

Re-Issue Details:

Client Soiltechnics Limited

Client Address: 1st Floor Unit 9 Westpoint Enterprise
Park
Clarence Avenue
Trafford Park
Manchester
M17 1QS

Contact(s): Admin

Project STW6679 Saint Hill Road, East
Grinstead

Quotation No.: **Date Received:** 10-Oct-2024

Order No.: POR020068 **Date Instructed:** 10-Oct-2024

No. of Samples: 2

Turnaround (Wkdays): 7 **Results Due:** 18-Oct-2024

Date Approved: 17-Oct-2024

Approved By:

Details: David Smith, Technical Director

For details about application of accreditation to specific matrix types, please refer to the Table at the back of this report

Results - Soil

Project: STW6679 Saint Hill Road, East Grinstead

Client: Soiltechnics Limited		Chemtest Job No.:				24-32754	24-32754
Quotation No.:		Chemtest Sample ID.:				1878508	1878509
Order No.: POR020068		Client Sample Ref.:				1	1
		Client Sample ID.:				WAC02-0.0-1	WAC01-0-1
		Sample Location:				WAC02	WAC01
		Sample Type:				SOIL	SOIL
		Top Depth (m):				0.0	0.00
		Date Sampled:				01-Oct-2024	01-Oct-2024
		Time Sampled:				9:49	14:40
Determinand	HWOL Code	Accred.	SOP	Units	LOD		
Moisture		N	2030	%	0.020	13	15
Soil Colour		N	2040		N/A	Brown	Brown
Other Material		N	2040		N/A	Stones and Roots	Stones, Roots and Wood
Soil Texture		N	2040		N/A	Clay	Loam

Results - 2 Stage WAC

Project: STW6679 Saint Hill Road, East Grinstead

Chemtest Job No: 24-32754							Landfill Waste Acceptance Criteria			
Chemtest Sample ID: 1878508							Limits			
Sample Ref: 1							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample ID: WAC02-0.0-1										
Sample Location: WAC02										
Top Depth(m): 0.0										
Bottom Depth(m):										
Sampling Date: 01-Oct-2024										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	M	%				1.2	3	5	6
Loss On Ignition	2610	M	%				4.2	--	--	10
Total BTEX	2760	M	mg/kg				< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg				< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg				75	500	--	--
Total (Of 17) PAH's	2800	N	mg/kg				18	100	--	--
pH at 20C	2010	M					9.4	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.0090	--	To evaluate	To evaluate			
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg			
Arsenic	1455	U	0.0006	0.0011	0.0013	0.010	0.5	2	25	
Barium	1455	U	0.016	0.006	0.032	0.073	20	100	300	
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5	
Chromium	1455	U	0.0018	0.0007	0.0035	0.0082	0.5	10	70	
Copper	1455	U	0.0054	0.0032	0.011	0.0054	2	50	100	
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2	
Molybdenum	1455	U	0.0014	0.0015	0.0029	0.015	0.5	10	30	
Nickel	1455	U	0.0010	< 0.0005	0.0021	0.0010	0.4	10	40	
Lead	1455	U	0.0007	0.0008	0.0013	0.0078	0.5	10	50	
Antimony	1455	U	0.0010	< 0.0005	0.0020	0.0010	0.06	0.7	5	
Selenium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.1	0.5	7	
Zinc	1455	U	0.018	0.008	0.035	0.089	4	50	200	
Chloride	1220	U	2.2	< 1.0	< 10	< 10	800	15000	25000	
Fluoride	1220	U	0.51	0.44	1.0	4.5	10	150	500	
Sulphate	1220	U	14	1.4	28	27	1000	20000	50000	
Total Dissolved Solids	1020	N	150	61	300	700	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	8.0	5.9	< 50	61	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	13

Leachate Test Information	
Leachant volume 1st extract/l	0.325
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.175

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - 2 Stage WAC

Project: STW6679 Saint Hill Road, East Grinstead

Chemtest Job No: 24-32754							Landfill Waste Acceptance Criteria			
Chemtest Sample ID: 1878509							Limits			
Sample Ref: 1							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample ID: WAC01-0-1										
Sample Location: WAC01										
Top Depth(m): 0.00										
Bottom Depth(m):										
Sampling Date: 01-Oct-2024										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	M	%				1.4	3	5	6
Loss On Ignition	2610	M	%				5.6	--	--	10
Total BTEX	2760	M	mg/kg				< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg				< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg				< 10	500	--	--
Total (Of 17) PAH's	2800	N	mg/kg				< 2.0	100	--	--
pH at 20C	2010	M					7.8	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.0050	--	To evaluate	To evaluate			
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg			
Arsenic	1455	U	0.0002	0.0008	0.0004	0.0072	0.5	2	25	
Barium	1455	U	< 0.005	< 0.005	< 0.0005	< 0.0005	20	100	300	
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5	
Chromium	1455	U	< 0.0005	0.0013	< 0.0005	0.012	0.5	10	70	
Copper	1455	U	0.0038	0.0052	0.0075	0.0033	2	50	100	
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2	
Molybdenum	1455	U	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.5	10	30	
Nickel	1455	U	< 0.0005	0.0006	< 0.0005	0.0058	0.4	10	40	
Lead	1455	U	0.0006	0.0012	0.0012	0.012	0.5	10	50	
Antimony	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.06	0.7	5	
Selenium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.1	0.5	7	
Zinc	1455	U	0.020	0.015	0.039	0.16	4	50	200	
Chloride	1220	U	1.3	1.3	< 10	13	800	15000	25000	
Fluoride	1220	U	0.11	0.21	< 1.0	2.0	10	150	500	
Sulphate	1220	U	3.3	< 1.0	< 10	< 10	1000	20000	50000	
Total Dissolved Solids	1020	N	25	12	49	130	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	4.5	5.8	< 50	57	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	15

Leachate Test Information	
Leachant volume 1st extract/l	0.319
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.152

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Test Methods

SOP	Title	Parameters included	Method summary	Water Accred.
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity at 25°C and Total Dissolved Solids (TDS) in Waters	Conductivity Meter	
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.	
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).	
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation	
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.	
2010	pH Value of Soils	pH at 20°C	pH Meter	
2015	Acid Neutralisation Capacity	Acid Reserve	Titration	
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <30°C.	
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930	
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.	
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.	
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID	
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.	
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenzo[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS	
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS. Reported PCB 101 results may contain contributions from PCB 90 due to inseparable chromatography.	
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge	
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge	

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AR - Aromatic only
2D - GC-GC – Double coil gas chromatography
#1 - EH_2D_Total but with humics mathematically subtracted
#2 - EH_2D_Total but with fatty acids mathematically subtracted
+ - Operator to indicate cumulative e.g. EH+EH_Total or EH_CU+HS_Total

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Appendix K Contamination Assessment Screening

GQRA Screening

Assessments	Status	Date	Created by	Reviewed By
Acute human health risk - Soils	Not undertaken			
Chronic human health risk - Soils	Not undertaken			
Chronic human health risk - Groundwater vapour	Not undertaken			
Controlled waters risk - Surface water	Not undertaken			
Controlled waters risk - Drinking water	Not undertaken			
Controlled waters - Free phase indicator	Not undertaken			
Phytotoxicity	Not undertaken			
Ecotoxicity	Not undertaken			

Key

Assessment	Abbr.	GQRA Source (in order of preference)	Last Update
All	NGA	No guideline value available	-
Acute human health risk - Soils	AGAC	Acute Generic Assessment Criteria (SoBRA)	April 2019
	sat.	Contaminant poses a low acute risk unless the soil saturation limit is exceeded and a free oil phase is present.	April 2019
Chronic human health risk - Soils	C4SL	Category 4 Screening Levels (DEFRA)	May 2021
	S4UL	Suitable 4 Use Levels (LQM)	August 2015
	ATK	Atrisk Soil Screening Values (Atkins)	June 2017
	CL:AIRE	Generic Assessment Criteria (CL:AIRE)	Jan 2010
Chronic human health risk - Groundwater vapour	GAC _{gwvap}	Generic Assessment Criteria for Assessing Vapour Risks from Volatile Contaminants in Groundwater (SoBRA)	April 2019
Controlled waters risk - Surface water	PNEC	Predicted no effect concentration. Derived from the Metals Bioavailability Assessment Tools (M-BAT) (UK TAG)	Nov. 2013 (Cu,Ni,Mn,Zn) March 2015 (Pb)
	AA-EQS	Environmental Quality Standards AA = Annual average (Environment Agency)	August 2021
	EA	Petroleum Hydrocarbons in Groundwater: Supplementary Guidance for Hydrogeological Risk Assessment (Environment Agency)	April 2009
	MAC-EQS	Environmental Quality Standards MAC = Maximum Allowable Concentration (Environment Agency)	August 2021
Controlled waters risk - Drinking water	UK DWS	National drinking water requirements (The Water Supply (Water Quality) Regulations 2018)	June 2018
	Int. DWS	Guidelines for Drinking Water Quality (World Health Organisation)	April 2017
	WHO	Petroleum Products in Drinking Water (World Health Organisation)	June 2008
Controlled waters - Free phase indicator	USEPA	Technical Guide for Addressing Petroleum Vapor Intrusion at Leaking Underground Storage Tank Sites (US EPA)	June 2015

GQRA Screening

Assessments	Status	Date	Created by	Reviewed By
Acute human health risk - Soils	Not undertaken			
Chronic human health risk - Soils	Not undertaken			
Chronic human health risk - Groundwater vapour	Not undertaken			
Controlled waters risk - Surface water	Not undertaken			
Controlled waters risk - Drinking water	Not undertaken			
Controlled waters - Free phase indicator	Not undertaken			
Phytotoxicity	Not undertaken			
Ecotoxicity	Not undertaken			

Key

Assessment	Abbr.	GQRA Source (in order of preference)	Last Update
Controlled waters - Free phase indicator	ST	Indicative value based on 80% of aqueous solubility limit, to a minimum of 10µg/l. (Soiltechnics)	July 2021
Phytotoxicity	BSI	BS 3882 - Specification for Topsoil (u = upper limit, l = lower limit for multipurpose topsoil) (British Standards Institute)	April 2015
	SSIA	Potentially Toxic Element. Sewage Sludge in Agriculture: Code of Practice (Environment Agency)	May 2018
Ecotoxicity	SSV	Soil Screening Values. Ecological Risk Assessment Framework. (Environment Agency)	Nov. 2017

Chronic human health risk (soils)

Scenario							
End user	Current and proposed site user						
Receptor	POS (Park)						
SOM	1.00%						
GAC Preference	C4SLs over S4ULs						
Unspeciated TPH GAC	Worst-case aliphatic/aromatic						
Contaminant	Guideline source	Guideline value (mg/kg)	Max value (mg/kg)	Location	HP03	HP05	HP09
				Depth (m)	0.05	0.05	0.05
				Date	01/10/24	01/10/24	024-10-01T13:4
Inorganics - Metals							
Arsenic	C4SL	170	23		11	6.9	8.5
Beryllium	S4UL	63	1.1		< 0.5	< 0.5	0.6
Boron	S4UL	46000	0.89		0.7	0.89	0.66
Cadmium	C4SL	880	0.3		< 0.10	0.16	0.3
Chromium (III)	S4UL	33000	24		17	15	21
Chromium (VI)	C4SL	250	<LoD		< 0.50	< 0.50	< 0.50
Copper	S4UL	44000	31		31	22	28
Cyanide - Free	-	-	<LoD		< 0.50	< 0.50	< 0.50
Lead	C4SL	1300	66		66	60	60
Mercury	S4UL	240	0.15		0.15	0.08	0.1
Nickel	S4UL	800	26		15	12	17
Selenium	S4UL	1800	0.61		0.34	0.42	0.61
Vanadium	S4UL	5000	27		27	18	26
Zinc	S4UL	170000	100		100	66	100
Inorganics - Asbestos							
Asbestos Type	N/A				-	-	-
Asbestos Screen	N/A				No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Inorganics - Soil Parameters							
Organic matter	N/A				3.6	2.9	3.6
Organics - PAH & Phenol							
Acenaphthene	S4UL	29000	0.35		0.22	< 0.10	0.35
Acenaphthylene	S4UL	29000	0.48		< 0.10	< 0.10	0.48
Anthracene	S4UL	150000	1.2		0.25	0.28	1.2
Benzo(a)anthracene	S4UL	49	4.5		0.72	1.6	4.5
Benzo(a)pyrene	C4SL	21	6		0.73	2.3	6
Benzo(b)fluoranthene	S4UL	13	6.5		1.2	2.7	6.5
Benzo(ghi)perylene	S4UL	1400	3.3		0.51	1.4	3.3
Benzo(k)fluoranthene	S4UL	370	2.5		0.39	0.94	2.5
Chrysene	S4UL	93	4.5		0.72	1.6	4.5
Dibenz(a,h)anthracene	S4UL	1.1	0.73		0.25	0.31	0.73
Fluoranthene	S4UL	6300	8.9		1.1	2.9	8.9
Fluorene	S4UL	20000	0.39		0.17	< 0.10	0.39
Indeno(1,2,3-cd)pyrene	S4UL	150	3.8		0.62	1.6	3.8
Naphthalene	C4SL	800	2.5		2.5	0.14	0.33
Phenanthrene	S4UL	6200	3.6		1	0.85	3.6
Phenol	S4UL	440	<LoD		< 0.10	< 0.10	< 0.10
Pyrene	S4UL	15000	7.5		0.86	2.5	7.5
Organics - Banded TPH (unspeciated)							
EC >5-EC6 (unspeciated)	S4UL	76000	<LoD				
EC >6-EC7 (unspeciated)	S4UL	76000	<LoD				
EC >7-EC8 (unspeciated)	S4UL	87000	<LoD				
EC >08-EC10 (unspeciated)	S4UL	7200	<LoD				
EC >10-EC12 (unspeciated)	S4UL	9200	<LoD				
EC >12-EC16 (unspeciated)	S4UL	10000	<LoD				
EC >16-EC21 (unspeciated)	S4UL	7600	25				
EC >21-EC35 (unspeciated)	S4UL	7800	55				

Appendix L Waste Characterisation Analysis

Waste Classification Assessment Summary

Waste population	Made Ground
Hazard assessment	Non-hazardous waste
List of waste code	17-05-04
List of waste description	Soil and stones other than those mentioned in 17-05-03

Hazard property	Assessment
HP1 - Explosive	Not hazardous by HP1
HP2 - Oxidising	Not hazardous by HP2
HP3 - Flammable	Not hazardous by HP3
HP4 - Irritant	Not hazardous by HP4
HP5 - STOT & aspiration toxicity	Not hazardous by HP5
HP6 - Acute toxicity	Not hazardous by HP6
HP7 - Carcinogenic	Not hazardous by HP7
HP8 - Corrosive	Not hazardous by HP8
HP9 - Infectious	Not hazardous by HP9
HP10 - Toxic for reproduction	Not hazardous by HP10
HP11 - Mutagenic	Not hazardous by HP11
HP12 - Release of an acute toxic gas	Not hazardous by HP12
HP13 - Sensitising	Not hazardous by HP13
HP14 - Ecotoxic	Not hazardous by HP14

Waste acceptance

Parameter	Inert waste landfill	Stable non-reactive hazardous waste in a non-hazardous landfill cell (SNRHW)	Hazardous waste landfill	Location	WAC02	WAC01
				Depth (m)	0.00	0.00
				Date	2024-10-01T09:49	2024-10-01T14:40
Parameters determined on the waste						
Total organic carbon	3	5	6		1.2	1.4
Loss on ignition			10		4.2	5.6
BTEX	6				< 0.010	< 0.010
PCBs (7 congeners)	1				< 0.10	< 0.10
Mineral oil	500				75	< 10
PAH (17 congeners)	100				18	< 2.0
pH		6			9.4	7.8
Acid neutralisation capacity (pH 6)		To be evaluated	To be evaluated		0.009	0.005
Limit values (mg kg ⁻¹) for compliance test using BN 12457-3 at L/S 10 l						
Arsenic	0.5	2	25		0.01	0.0072
Barium	20	100	300		0.073	< 0.0005
Cadmium	0.04	1	5		< 0.00011	< 0.00011
Chromium (III)	0.5	10	70		0.0082	0.012
Copper	2	50	100		0.0054	0.0033
Mercury	0.01	0.2	2		< 0.00005	< 0.00005
Molybdenum	0.5	10	30		0.015	< 0.0002
Nickel	0.4	10	40		0.001	0.0058
Lead	0.5	10	50		0.0078	0.012
Antimony	0.06	0.7	5		0.001	< 0.0005
Selenium	0.1	0.5	7		< 0.0005	< 0.0005
Zinc	4	50	200		0.089	0.16
Chloride	800	15,000	25,000		< 10	13
Fluoride	10	150	500		4.5	2
Sulphate	1,000	20,000	50,000		27	< 10
Total dissolved solids	4,000	60,000	100,000		700	130
Phenol	1				< 0.50	< 0.50
Dissolved organic carbon	500	800	1000		61	57
Classifications						
Waste classification					Non-hazardous	Non-hazardous
Landfill type					Inert	Inert

- Key Notes:**
- 1) The values for total dissolved solids (TDS) can be used alternatively to the values for sulphate and chloride.
- 2) Soils with TOC values over the limit value may still be accepted provided the DOC value falls are below it's respective limit value.
- 3) In a hazardous waste, either the TOC or LOI must be used.
- 4) Where Notes 1, 2, and 3 can apply, the waste contractor or landfill operator should be contacted to determine acceptance.

Appendix M Utility Service Plans

Overview map of worksite

1

2

3

4

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Contact Us
SGN Safety Admin Team:
0800 912 1722
Email:
plantlocation@sgn.co.uk

Low Pressure Mains		Digsite:		Area:	
Medium Pressure Mains		Line:			
Intermediate Pressure Mains		IAs			
High Pressure Mains		GTs			
H100 Assets		SSSIs			
Some Examples Of Plant Items					
Valve		Syphon		Depth of Cover	
				Diameter Change	
				Material Change	



This information is given as a guide only and its accuracy cannot be guaranteed.



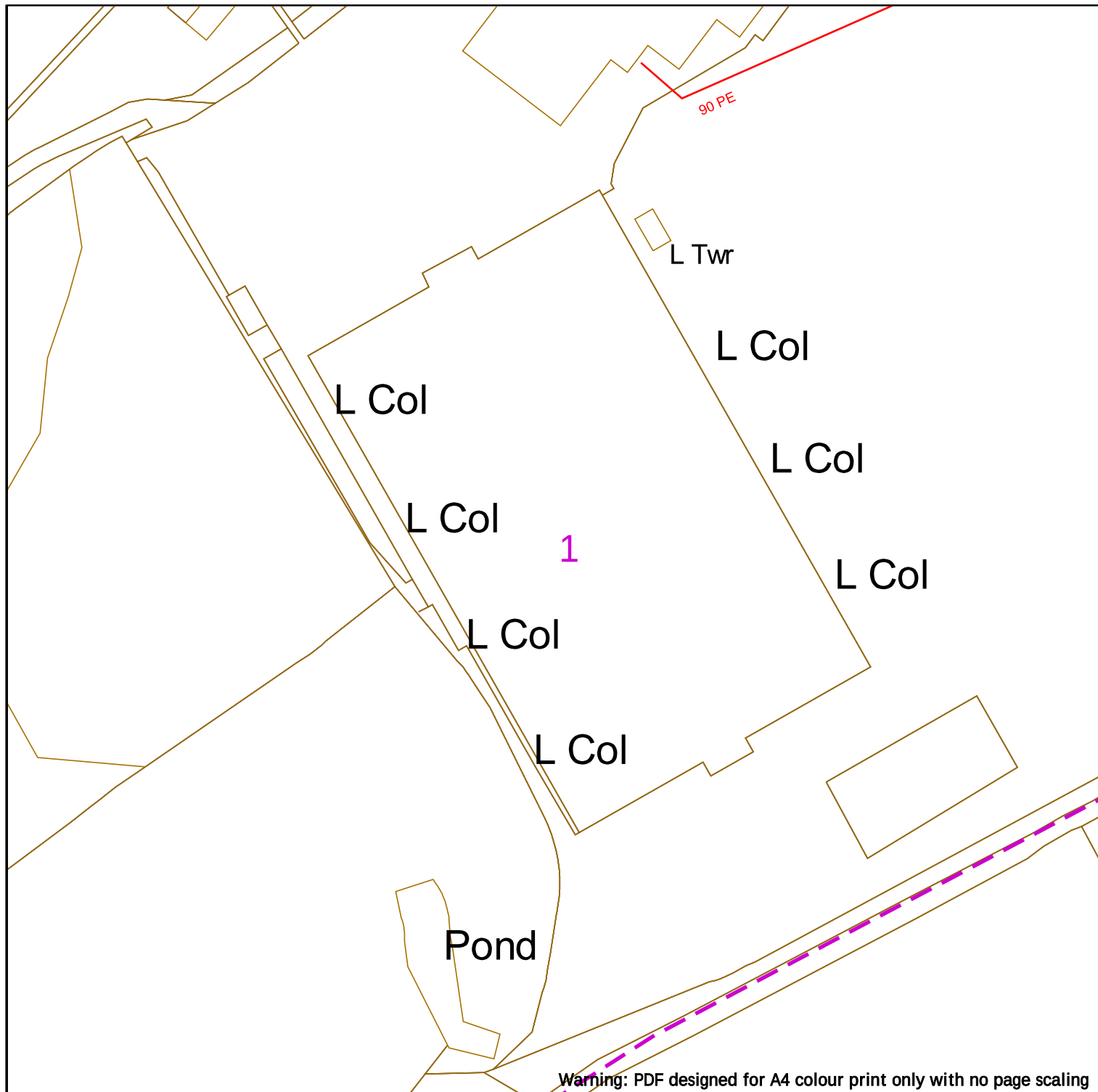
This plan shows the location of those pipes owned by Scotia Gas Networks (SGN) by virtue of being a licensed Gas Transporter (GT). Gas pipes owned by other GTs or third parties may also be present in this area but are not shown on this plan. Information with regard to such pipes should be obtained from the relevant owners. No warranties are given with regard to the accuracy of the information shown on this plan. Service pipes, valves, siphons, sub-connections etc. are not shown but their presence should be anticipated. You should be aware that a small percentage of our pipes/assets may be undergoing review and will temporarily be highlighted in yellow. If your proposed works are close to one of these pipes, you should contact the SGN Safety Admin Team on 0800 912 1722 for advice. No liability of any kind whatsoever is accepted by SGN or its agents, servants or sub-contractors for any error or omission contained herein. Safe digging practices, in accordance with HS (G)47, must be used to verify and establish the actual position of mains, pipes, services and other apparatus on site before any mechanical plant is used. It is your responsibility to ensure that plant location information is provided to all persons (whether direct labour or sub-contractors) working for you on or near gas apparatus. Information included on this plan should not be referred to beyond a period of 28 days from the date of issue.

Report damage immediately – KEEP EVERYONE AWAY FROM THE AREA
0800 111 999

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Date Requested: 20/09/2024
Job Reference: 34797511
Site Location: 537950 136074
Requested by: Miss Lauren Wenham
Your Scheme/Reference: STW6679

Scale: 1:2050 (When plotted at A4)



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H100 Assets					
Some Examples Of Plant Items					
Valve		Syphon		Depth of Cover	
				Diameter Change	
				Material Change	



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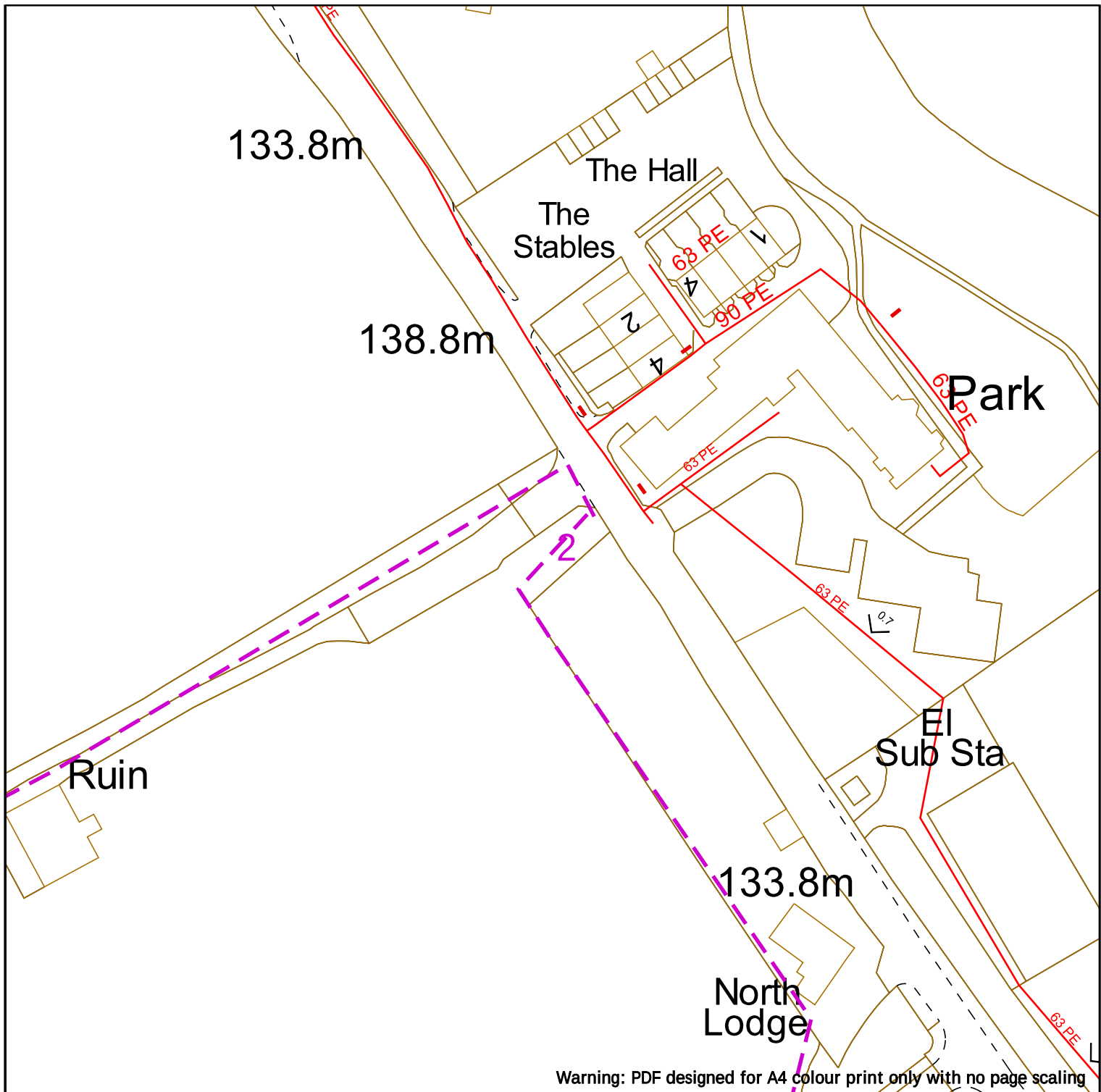


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Valve		Syphon		Depth of Cover	
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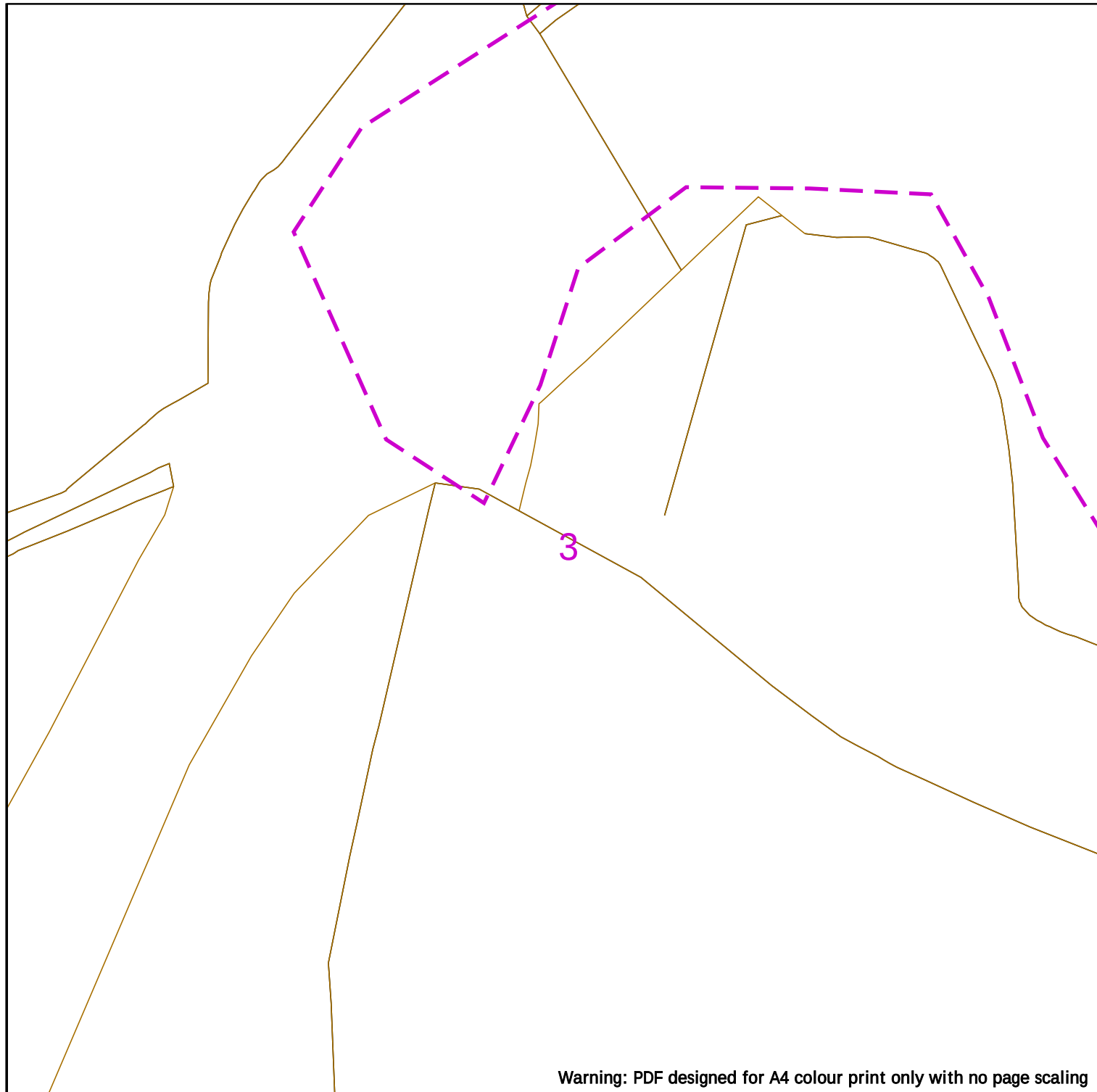


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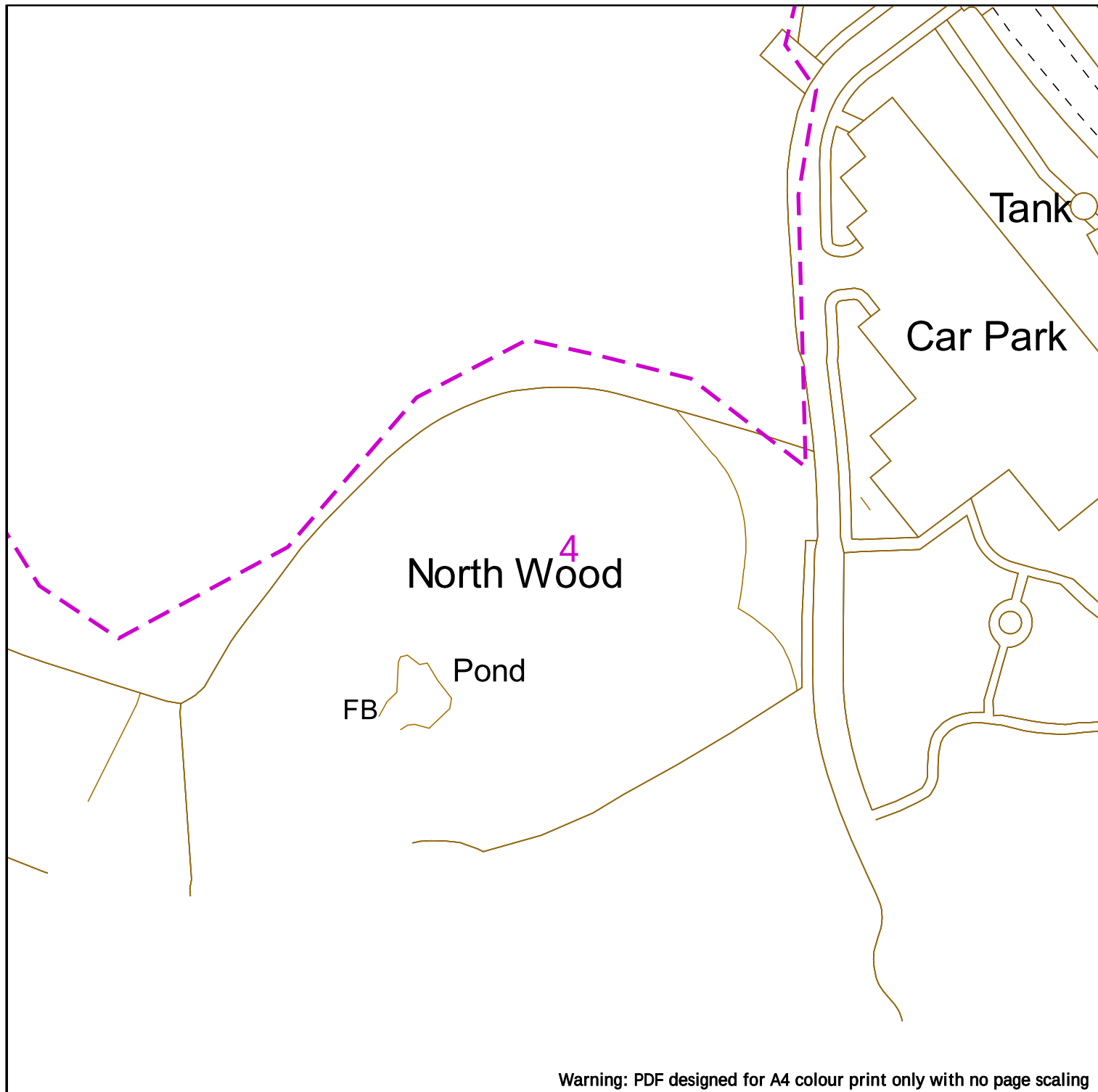
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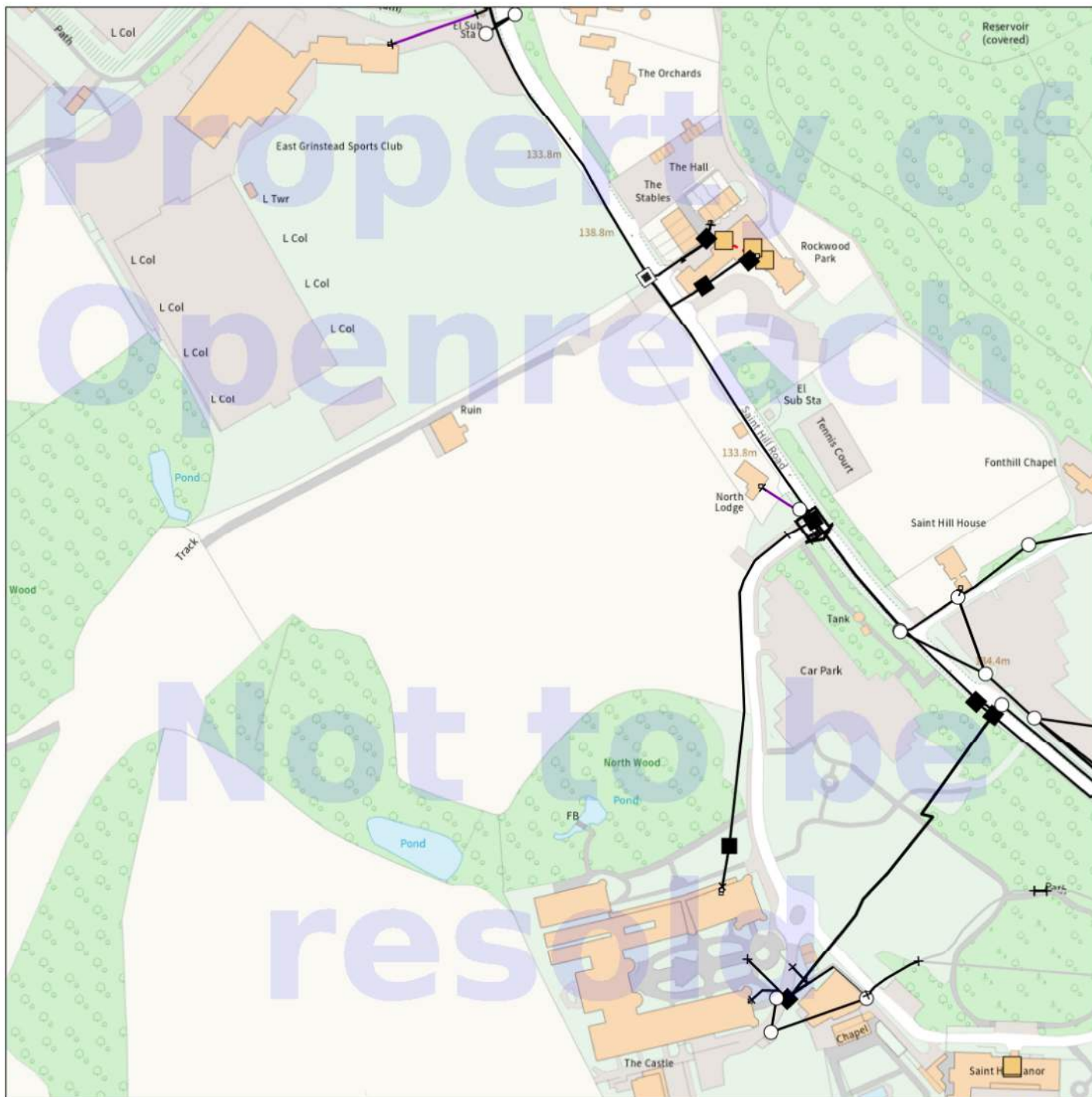
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Maps on Demand Plant Information Reply



IMPORTANT WARNING

Information regarding the location of BT apparatus is given for your assistance and is intended for general guidance only. No guarantee is given of its accuracy. It should not be relied upon in the event of excavations or other works being made near to BT apparatus which may exist at various depths and may deviate from the marked route.

openreach

CLICK BEFORE YOU DIG

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email cbyd@openreach.co.uk

ADVANCE NOTICE REQUIRED
(Office hours: Monday - Friday 08.00 to 17.00)
www.openreach.co.uk/cbyd

Accidents happen

If you do damage any Openreach equipment please let us know by calling 0800 023 2023 (opt 1 + opt 1) and we can get it fixed ASAP

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KEY TO BT SYMBOLS

	Planned	Live	Change Of State	+	Hatchings	
PCP			Split Coupling		Built	
Pole			Duct Tee		Planned	
Box			Building		Inferred	
Manhole			Kiosk		Duct	
Cabinet			Other proposed plant is shown using dashed lines. BT Symbols not listed above may be disregarded. Existing BT Plant may not be recorded. Information valid at time of preparation. Maps are only valid for 90 days after the date of publication.			
	Pending Add	In Place	Pending Remove	Not In Use		
Power Cable						
Power Duct				N/A		

BT Ref : AZD13139Q

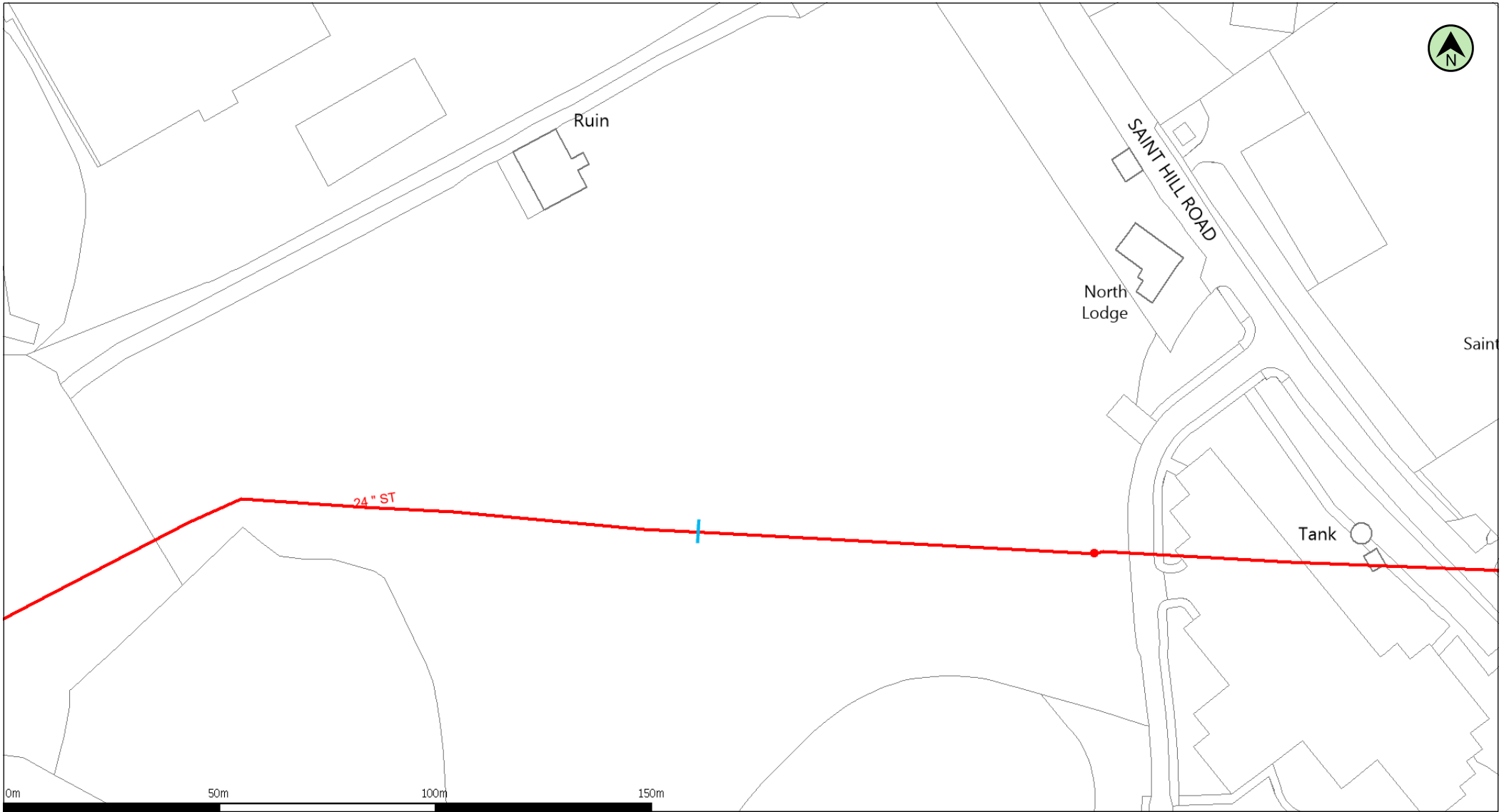
Map Reference : (centre) TQ3802636120

Easting/Northing : (centre) 538026,136120

Scale : 1:500

Issued : 20/09/2024 13:13:43

WARNING: IF PLANNED WORKS FALL INSIDE HATCHED AREA IT IS ESSENTIAL BEFORE PROCEEDING THAT YOU CONTACT THE NATIONAL NOTICE HANDLING CENTRE. PLEASE SEND E-MAIL TO: nnhc@openreach.co.uk

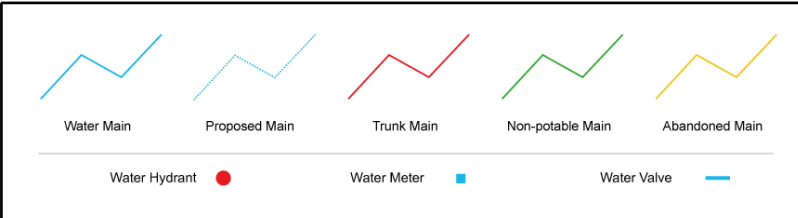


(c) Crown copyright and database rights 2024 Ordnance Survey 100031673 Date: 20/09/24 Scale: 1:1250 Map Centre: 538026,136120 Data updated: 22/08/24 Our Ref: 1574552 - 1 Clean Water Plan A4
Powered by digdat

The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility in the event of inaccuracy. The actual positions should be determined on site. This plan is produced by Southern Water Services Ltd (c) Crown copyright and database rights 2024 Ordnance Survey 100031673. This map is to be used for the purposes of viewing the location of Southern Water plant only. Any other uses of the map data or further copies is not permitted.

WARNING: BAC pipes are constructed of Bonded Asbestos Cement.

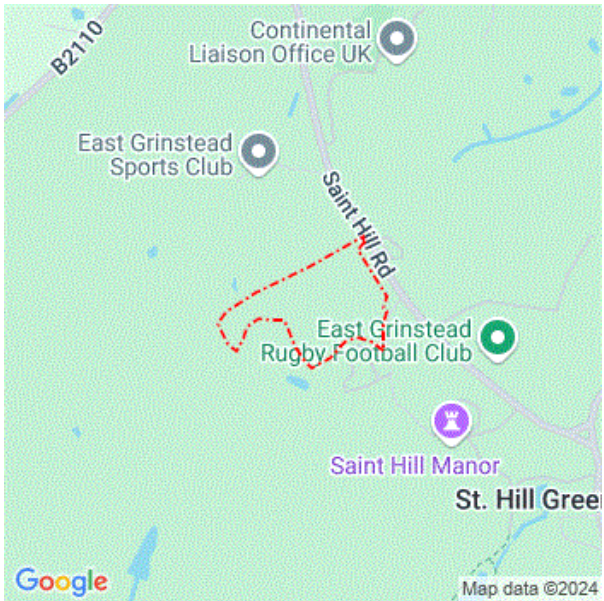
WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement.



admin@soiltechnics.net
STW6679



Enquirer			
Name	Miss Lauren Wenham	Phone	01604 781877
Company	Soiltechnics Ltd	Mobile	Not Supplied
Address	Cedar Barn White Lodge Walgrave NTH NN6 9PY		
Email	admin@soiltechnics.net		

Enquiry Details		Site Map
Enquiry type	Planned Works	
Work category	Development Projects	
Work type	Piling	
Work type buffer*	150 metres	
Start date	21/09/2024	
End date	22/09/2024	
Scheme/Reference	STW6679	
Search location	XY= 537965, 136265	
Confirmed location	00 51	
Site size	0 metres square	
Site Contact Name	Sophie Heald	
Site Phone No.	07881956918	
Description of Works	x2 Rotary boreholes to 10m and 15m depth, machine dug trial pits and windowless sampler boreholes.	
* The WORK TYPE BUFFER is a distance added to your search area based on the Work type you have chosen.		Please note that the above map only displays the location of the proposed work site and will not display any of the Members' pipes and cables. It is imperative that this area accurately reflects the proposed work site.

Affected LSBUD members

(LSBUD Members who have assets registered on LSBUD within the vicinity of your search area.)

Do not proceed until all Members listed below have confirmed that your works can continue.

Asset Owner	Phone/Email	Emergency Only	Status
SGN	08009121722	0800111999	Await response
UK Power Networks	08000565866	08000565866	Await response

Status explanation

Await Response means that the asset owner will contact you. This is typically by sending the plan response but they may ask for further information before being able to do so, particularly if any payments or authorisations are required.

Email Additional Info means that the asset owner needs further information about your works to assess your enquiry before providing a response. Please provide any details you have available including plans, method statements etc. if available.

Important notices

It is very important that you correctly understand what the service does and the procedures in order for you to work safely. Please refer to the LSBUD Support Page (www.lsbud.co.uk/lineasearchbeforeudig-support) for further guidance.

This information includes how to provide additional information to the LSBUD Members who request it to provide a response to your enquiry.

Validity and search criteria. The results of this enquiry are based on the confirmed information you entered and are valid only as at the date and time of the enquiry. It is your responsibility to ensure that the Enquiry Details are correct, and LineasearchbeforeUdig (LSBUD) accepts no responsibility for any errors or omissions in the Enquiry Details or any consequences thereof. LSBUD Members update their asset information on a regular basis so you are advised to consider this when undertaking any works. It is your responsibility to choose the period of time after which you need to resubmit any enquiry but the maximum time (after which your enquiry will no longer be dealt with by the LSBUD Helpdesk and LSBUD Members) is 28 days. If any details of the enquiry change, particularly including, but not limited to, the location of the work, then a further enquiry must be made.

Terms and Conditions. Please note that this enquiry is subject always to our standard terms and conditions available at www.lsbud.co.uk ("Terms of Use") and the disclaimer at the end of this document. Please note that in the event of any conflict or ambiguity between the terms of this Enquiry Confirmation and the Terms of Use, the Terms of Use shall take precedence.

List of not affected LSBUD members

(LSBUD Members who do not have assets registered on the LSBUD service within the vicinity of your search area.)

AllPoints Fibre	Angus Energy	AWE Pipeline
B & D Energy Limited	Balfour Beatty Investments Limited	BOC Limited (A Member of the Linde Group)
Box Broadband	BP Exploration Operating Company Limited	BPA
Cadent Gas	Cambridge Water	Cambridgeshire County Council Climate Change and Energy Services
CATS Pipeline c/o Wood Group PSN	Cemex	Centrica Storage Ltd
CNG Services Ltd	Concept Solutions People Ltd	ConocoPhillips (UK) Teesside Operator Ltd
D.S.Smith	Diamond Transmission Corporation	DIO (MOD Live Pipelines)
Drax Power Limited	E.ON UK CHP Limited	EDF Energy Renewables Ltd
EET Fuels	EirGrid	Eleclink Limited
Electricity North West Limited	Energy Assets Networks	ENI & Himor c/o Penspen Ltd
EnQuest NNS Limited	EP Langage Limited	ESB CCGT Power station (Carrington Gas Pipeline)
ESP Utilities Group	Esso Petroleum Company Limited	euNetworks Fiber UK Ltd
EXA Infrastructure	Exolum Pipeline System	Fulcrum Electricity Assets Limited
Fulcrum Pipelines Limited	G.Network Communication Ltd c/o JSM Group Ltd	Gamma
Gas Networks Ireland (UK)	Gateshead Energy Company	Gigaclear Ltd
Greenlink Interconnector Ltd	Harbour Energy	Heathrow Airport LTD
Humbly Grove Energy	IGas Energy	INEOS FPS Pipelines
INEOS Manufacturing (Scotland and TSEP)	INOVYN ChlorVinyls Limited	INOVYN Enterprises Limited
Intergen (Coryton Energy or Spalding Energy)	Kensa Utilities	Last Mile
Mainline Pipelines Limited	Manchester Jetline Limited	Manx Cable Company
Marchwood Power Ltd (Gas Pipeline)	Melbourn Solar Limited	MUA Group Limited
National Gas Transmission	National Grid Electricity Distribution	National Grid Electricity Transmission
National Grid Ventures	Neos Networks	Northern Gas Networks Limited
Northumbrian Water Group	NPower CHP Pipelines	NTT Global Data Centers EMEA UK Ltd
NYnet Ltd	Ogi	Oikos Storage Limited
Ørsted	Palm Paper Ltd	Perenco UK Limited (Purbeck Southampton Pipeline)
Petroineos	Phillips 66	Portsmouth Water
Premier Transmission Ltd (SNIP)	Redundant Pipelines - LPDA	RWE - Great Yarmouth Pipeline (Bacton to Great Yarmouth Power Station)
RWEnpower (Little Barford and South Haven)	SABIC UK Petrochemicals	SAS Utility Services Ltd
Scottish and Southern Electricity Networks	Scottish Power Generation	Seabank Power Ltd
SES Water	Shell	Shell NOP

South Staffs Water	SP Energy Networks	Spring Fibre Limited
Squire Energy Networks	SSE Generation Ltd	SSE Transmission
SSE Utility Solutions Limited	Storengy	Tata Communications (c/o JSM Construction Ltd)
TfL – London Underground HV Cables (Road Side Cables)	toob Limited	Total Colnbrook Pipelines
Total Finaline Pipelines	Transmission Capital	Trojan Energy Limited
Uniper UK Ltd	University of Cambridge Granta Backbone Network	Vattenfall
Veolia ES SELCHP Limited	Veolia ES Sheffield Ltd	Voneus Limited
VPI Power Limited	Wales and West Utilities	Welsh Power
West of Duddon Sands Transmission Ltd	West Sussex OpenNetwork (Cooperative National Infrastructure)	Westminster City Council
Zayo Group UK Ltd c/o JSM Group Ltd		

Non-LSBUD members (Asset owners not registered on LSBUD)

(The following Non-LSBUD Members may have assets in your search area. It is **YOUR RESPONSIBILITY** to contact them before proceeding.

Please be aware this list is not exhaustive and it is your responsibility to identify and contact all asset owners within your search area.)

Asset Owner	Preferred contact method	Phone	Status
Bring Energy	nrsua@bringenergy.com	0800 130 3600	Not Notified
BT	https://www.swns.bt.com/pls/mbe/welcome.home	08000232023	Not Notified
CityFibre	asset.team@cityfibre.com	033 3150 7282	Not Notified
Colt	plantenquiries@catelecomuk.com	01227768427	Not Notified
GTC	https://pe.gtc-uk.co.uk/PlantEnqMembership	01359240363	Not Notified
Lumen Technologies	plantenquiries@ocugroup.com	02087314613	Not Notified
Mobile Broadband Network Limited	mbnl.plant.enquiries@turntown.com	01212 621 100	Not Notified
Sky UK Limited	nrsua@sky.uk	02070323234	Not Notified
Sota	sota.plantenquiries@ocugroup.com		Not Notified
South East Water	water.maps@southeastwater.co.uk	0333 000 0059	Not Notified
Southern Water	www.digdat.co.uk	08452700212	Not Notified
Utility assets Ltd	assetrecords@utilityassets.co.uk		Not Notified
Verizon Business	osp-team@uk.verizonbusiness.com	01293611736	Not Notified
Virgin Media	http://www.digdat.co.uk	08708883116	Not Notified
Vodafone	osm.enquiries@atkinsglobal.com	01454662881	Not Notified

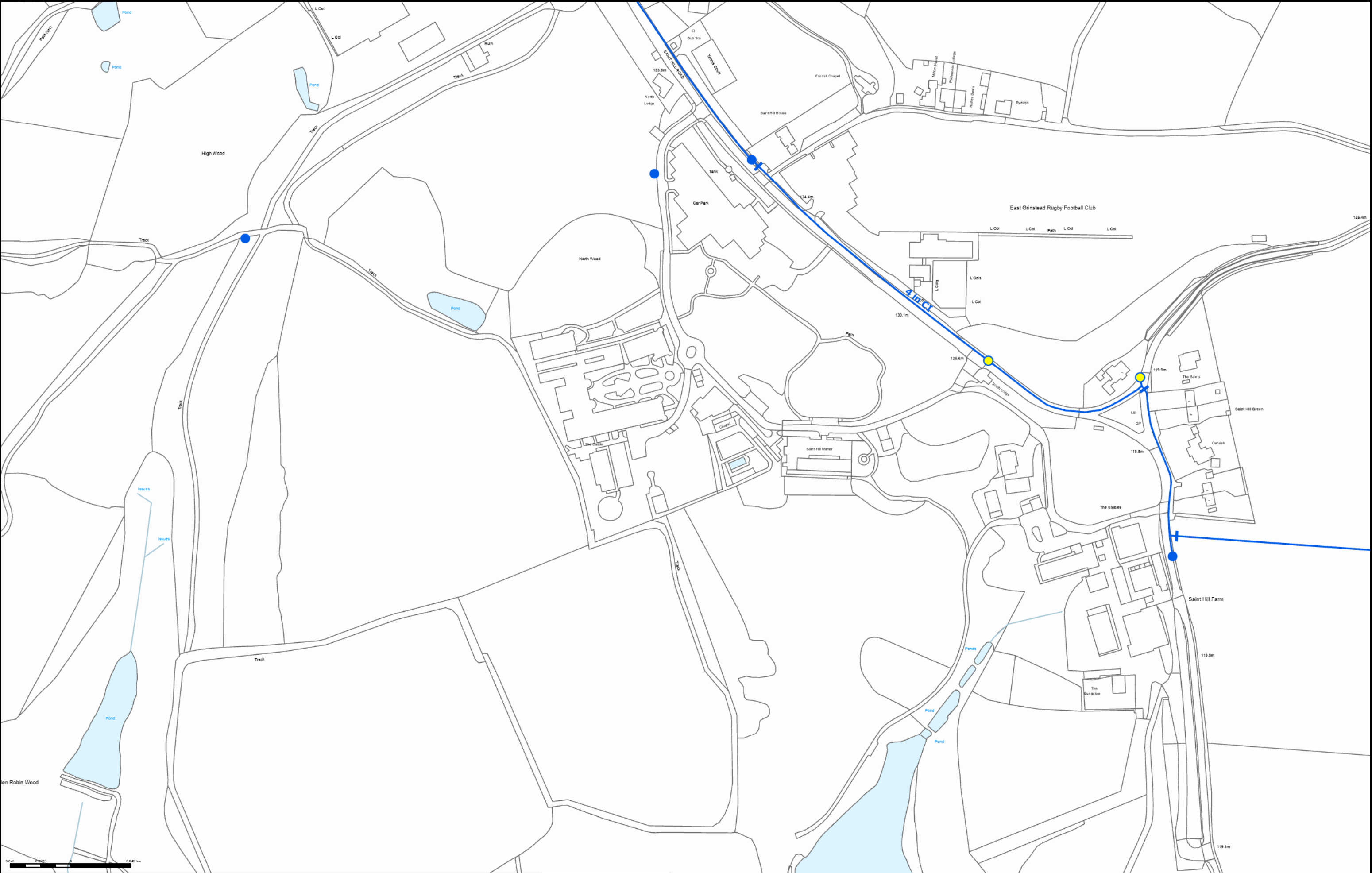
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Map Symbols

VALVE OPEN	VALVE CLOSED	GOVERNOR	END CLOSURE	SYPHON	REDUCER	TEE
TEST POINT	CATHODIC PROTECTION	GENERAL REFERENCE	FLOW MEASURE	DIP POINT	MONO ETHYLENE GLYCOL	OILING POINT
FLOW STOP	PRESSURE MEASUREMENT	STAND PIPE	OFFICIAL MINISTRY RECORD	PURGE POINT	GAS CONDITIONER	DRAIN POINT
					LP MAINS	
SKETCH BUBBLE	DEPTH OF COVER	METER	MATERIAL CHANGE		MP MAINS	
					IP MAINS	
					LHP MAINS	
					HISTORY DATA	
					SSSI	
PIG TRAP	CROSSOVER CONNECTION	CHANGE OF DIAMETER	PIPE JOINT		CONTACT ZONE	
						LTS



Drawing Title: STW6679

Valve

Washout

Fire Hydrant

■ Meter

▶ Pressure Valve

◆ Air Valve

— Distribution Main

- - - Abandoned Main

— Company Boundary

Reference:

Plot Date: 27/09/2024

Grid Reference: 538,135.1223 135,857.8177

Scale: 1:2,500

south east water

(Water Maps)

Rocfort Road

Shodland, Kent

ME6 5AH

Telephone: 0333 000 0058 (Option 5)

Email: water.maps@southeastwater.co.uk

Website: www.southeastwater.co.uk

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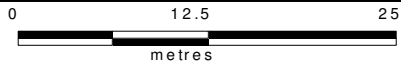
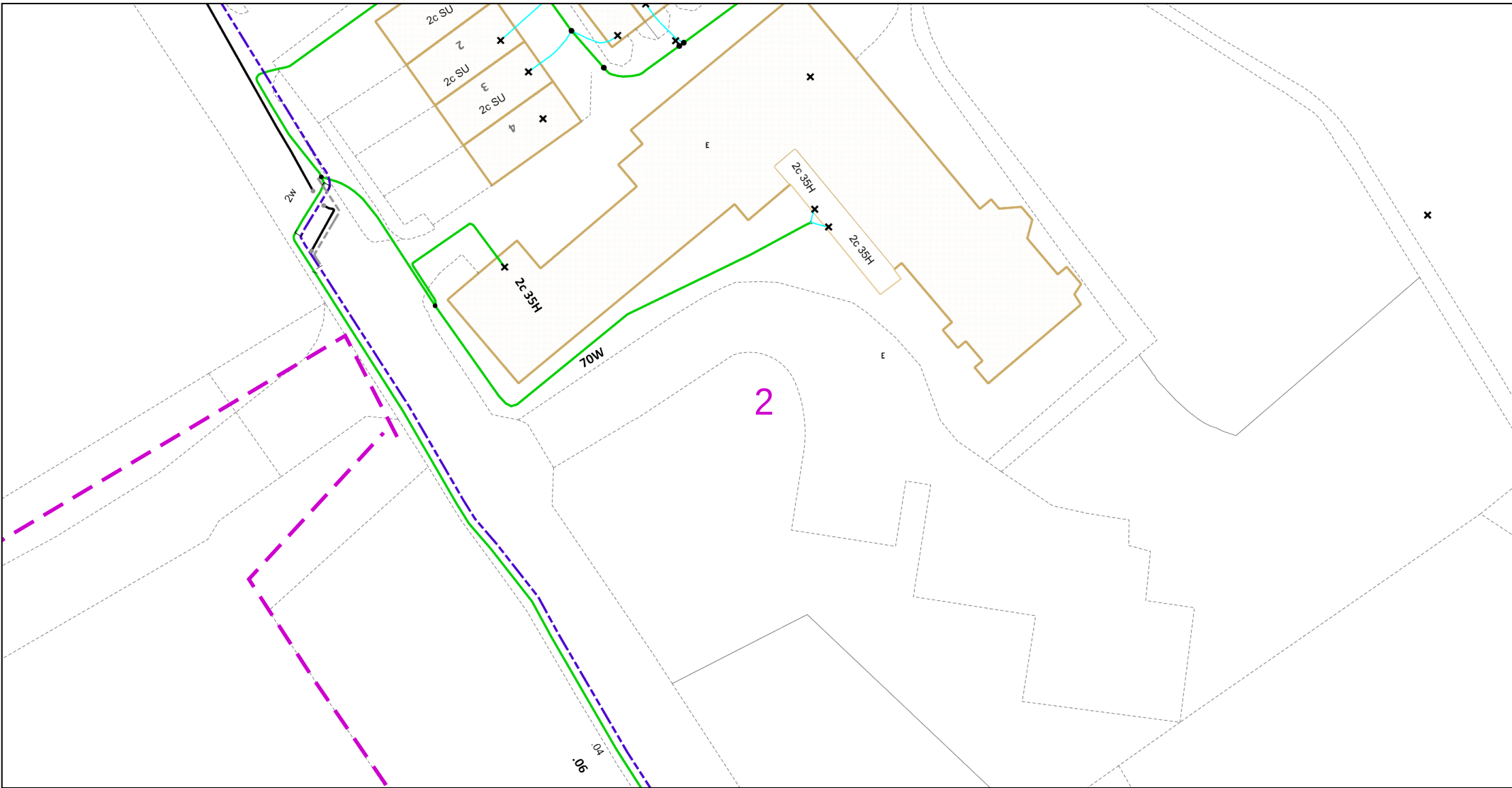


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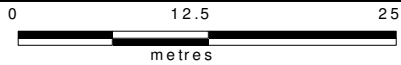
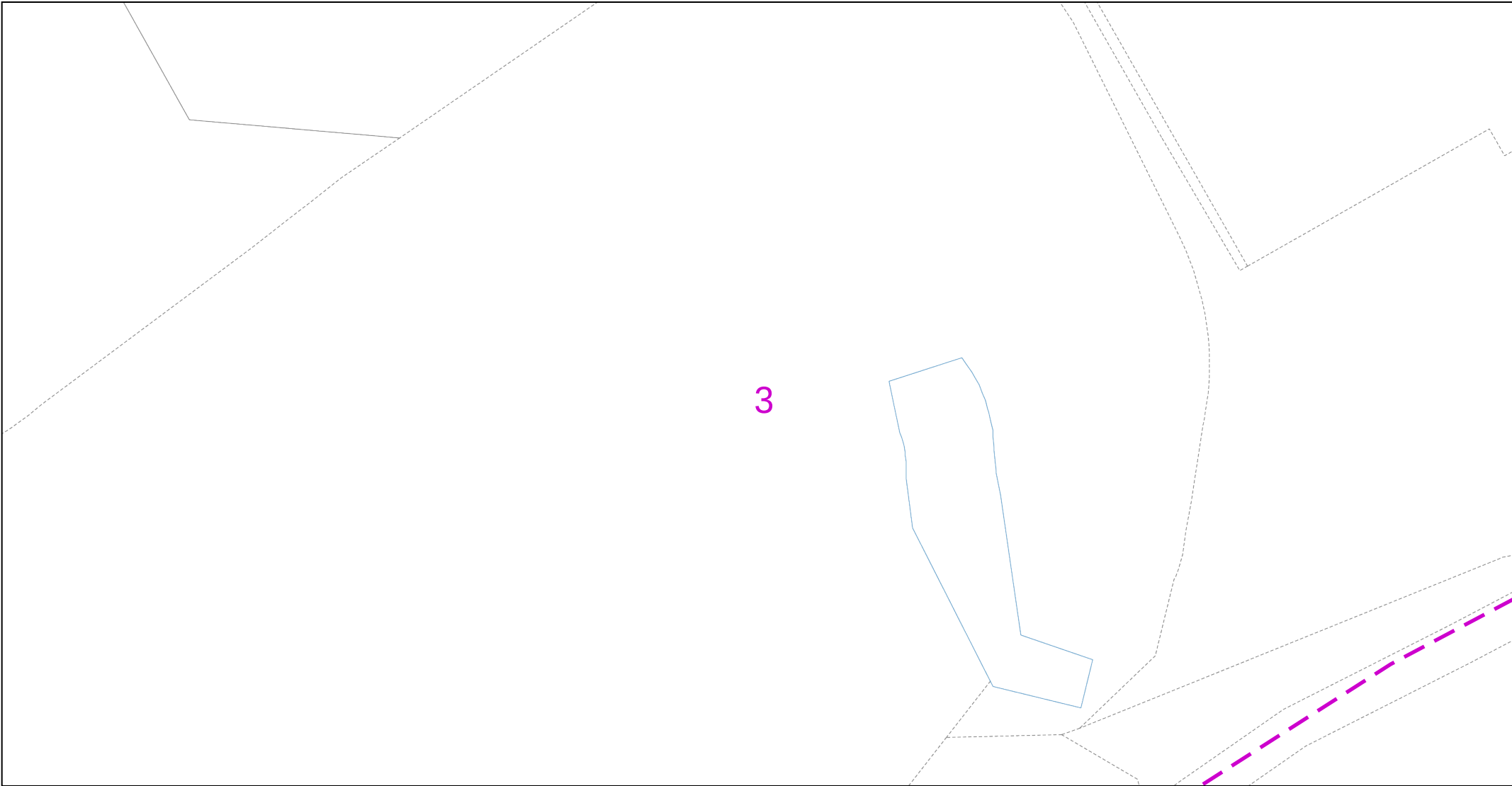


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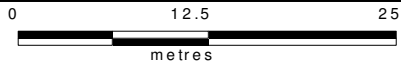
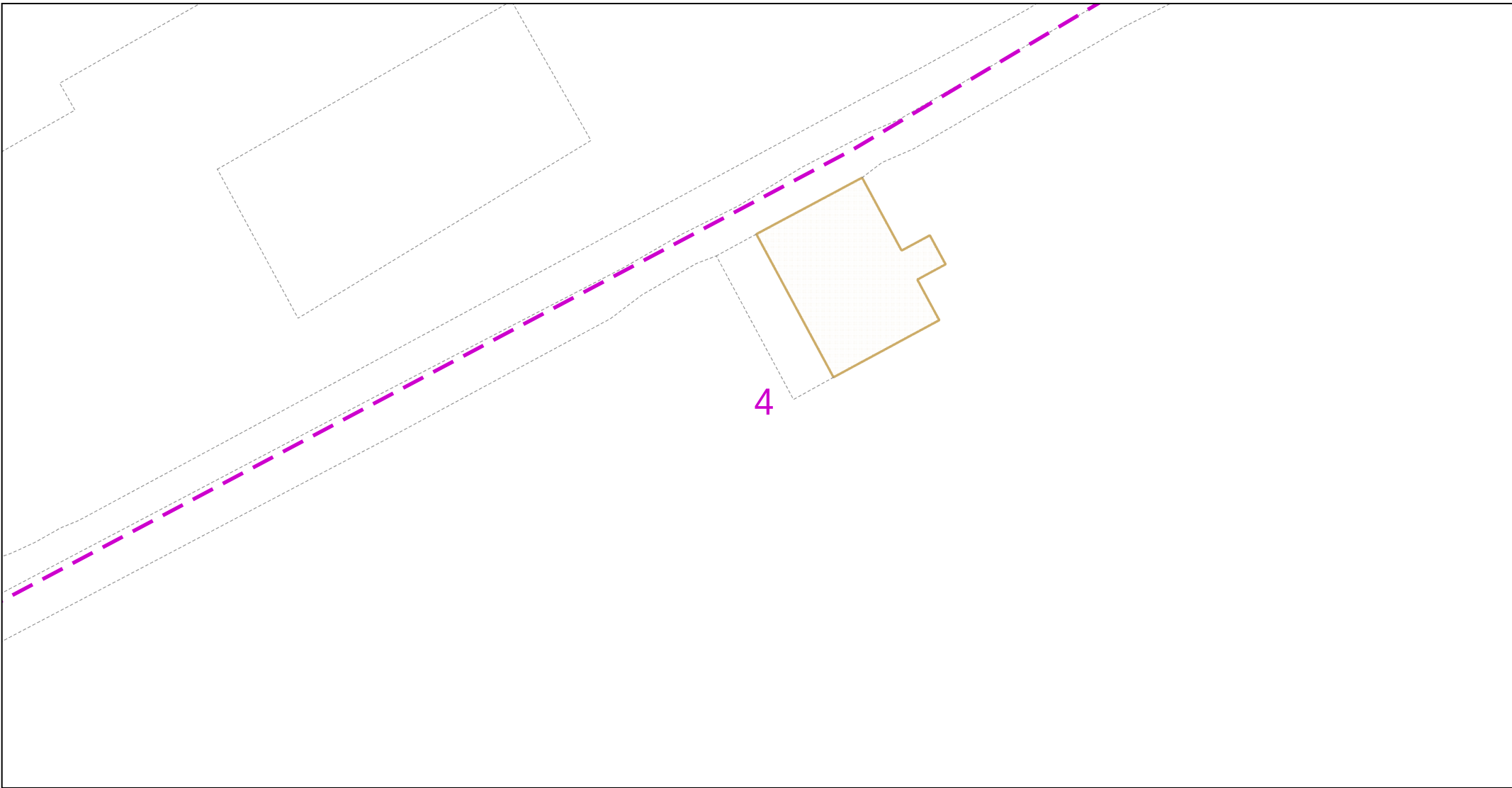


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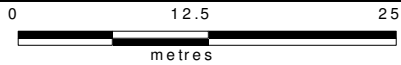
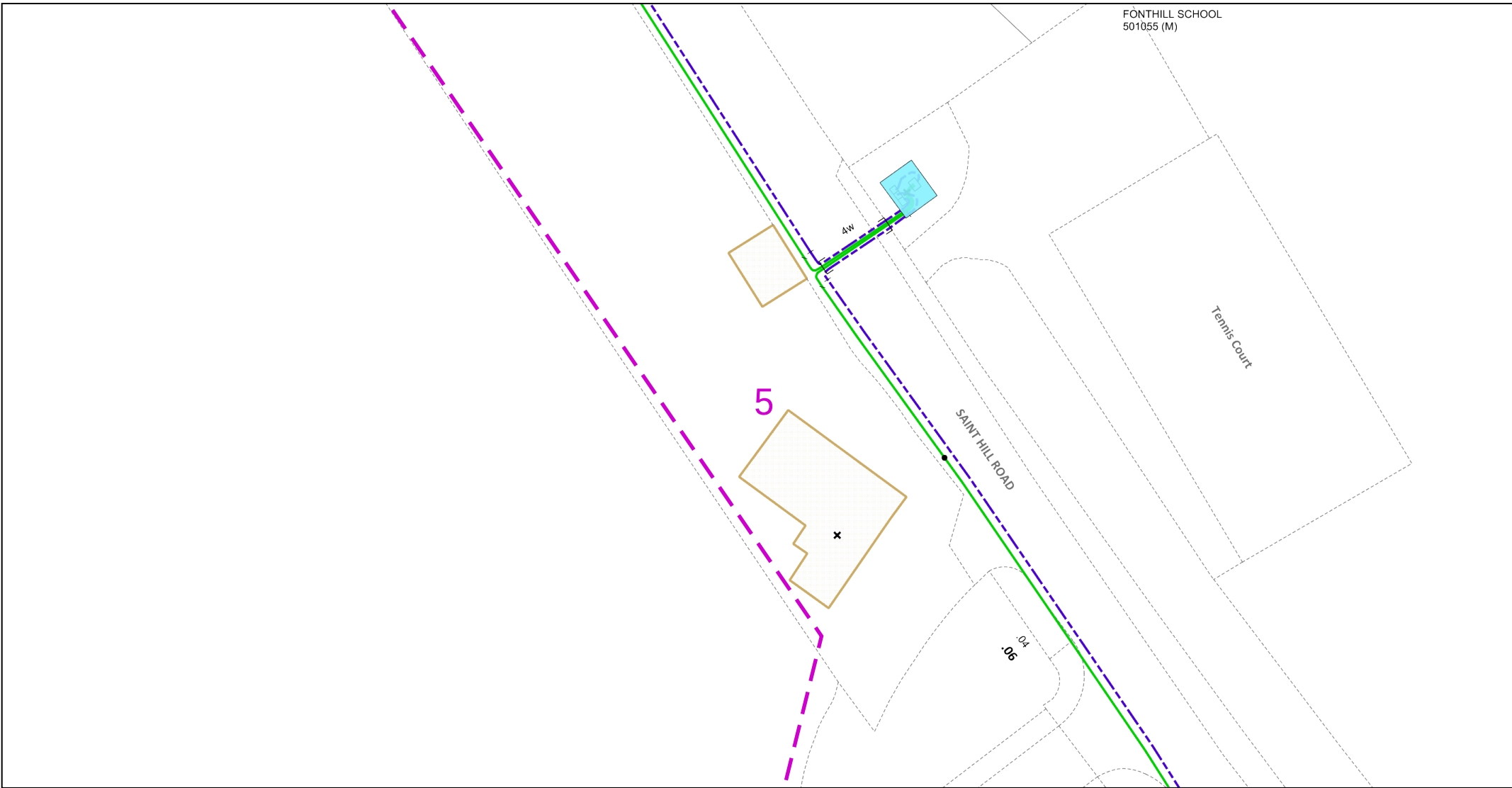


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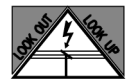
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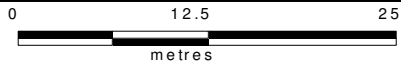
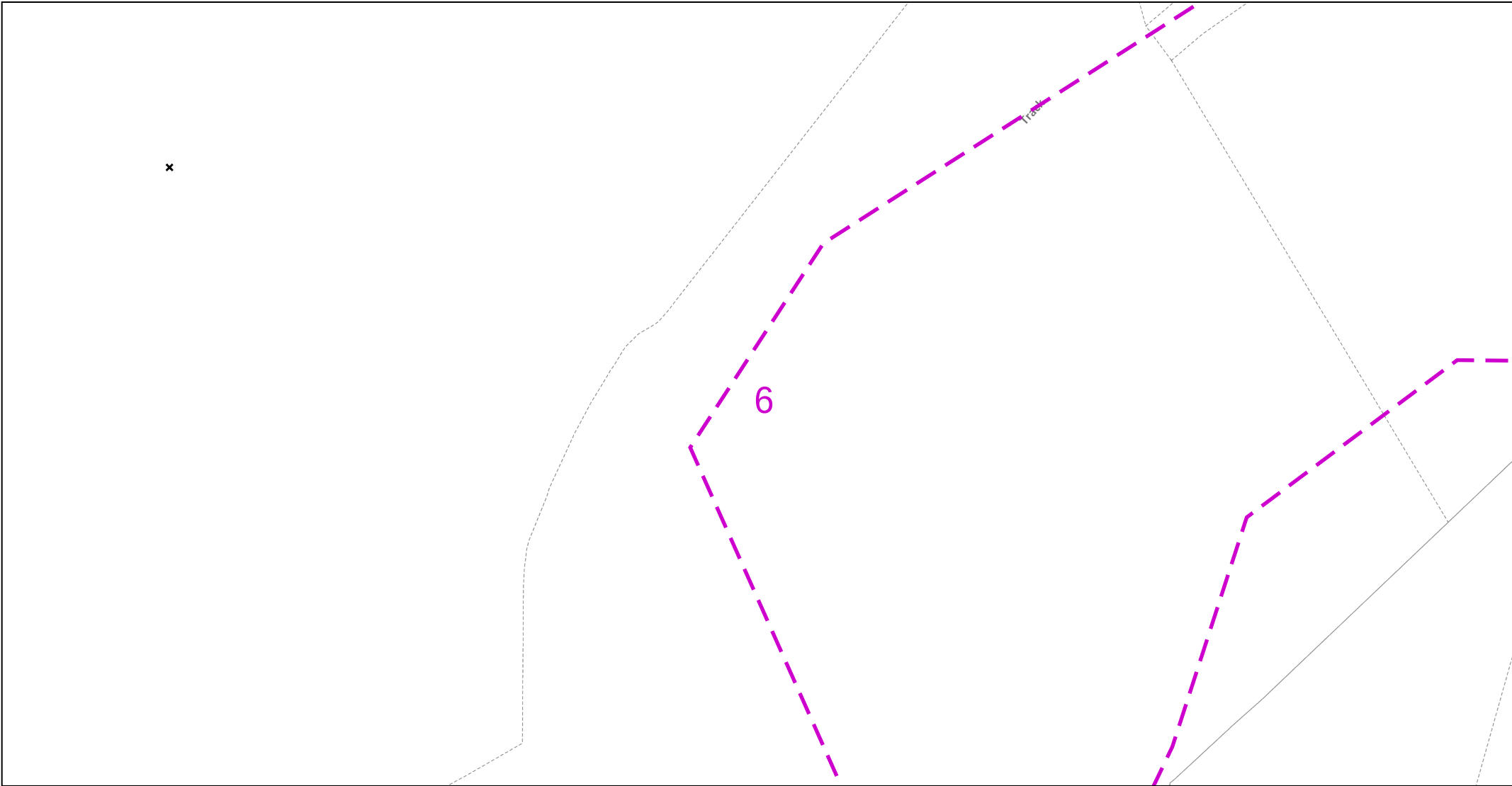


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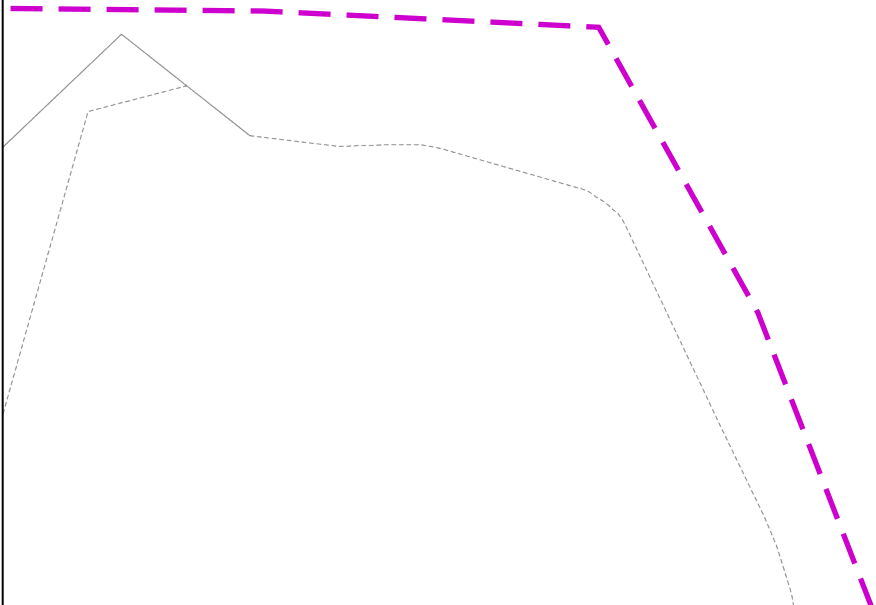


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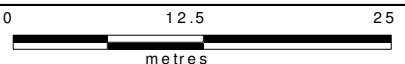


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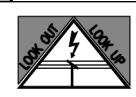
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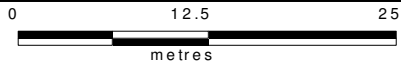
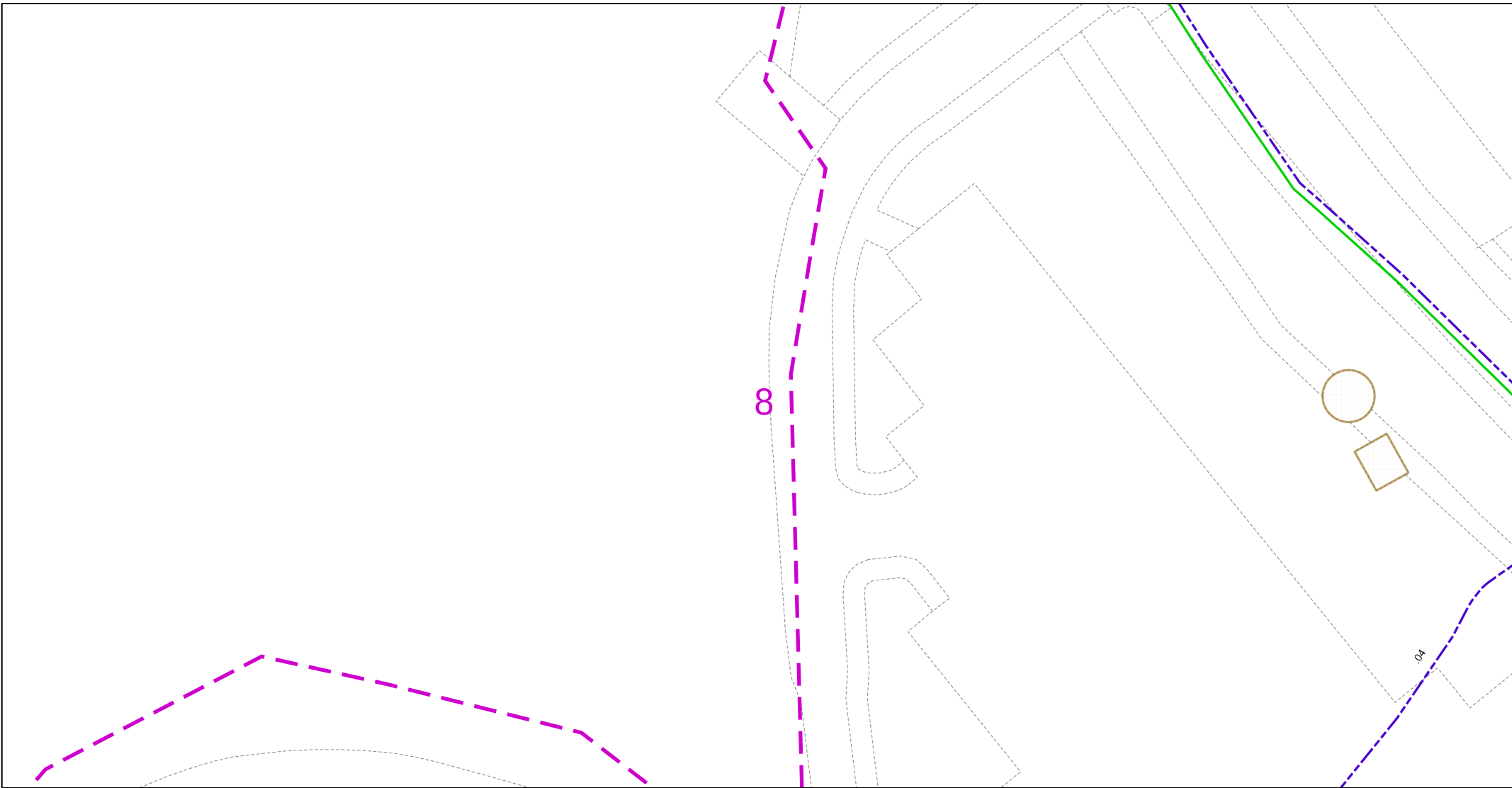


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EMERGENCY - If you damage a
cable or line
Phone 0800 783 8838 (24hrs)
URGENTLY



ALWAYS LOOK UP
BEFORE
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note GS6

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Dig Sites Area:  Line: 

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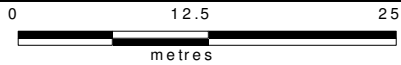
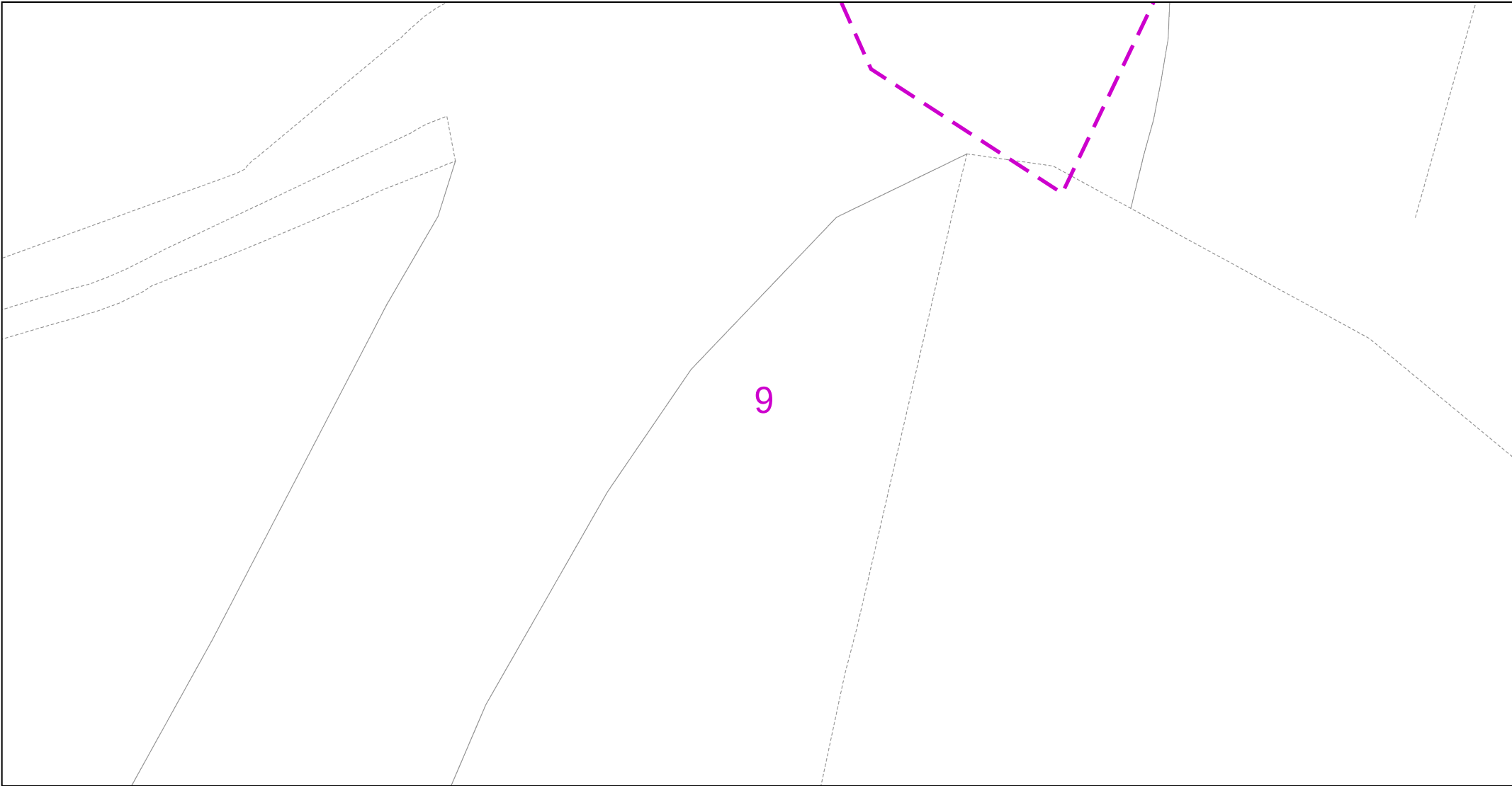
Date Requested: 20/09/2024
Job Reference: 34797511
Site Location: 537823 136012
Requested by: Miss Lauren Wenham

Your Scheme/Reference:
STW6679
Scale: 1:500 (When plotted at A4)

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5. All cables must be treated as being live unless proved otherwise by UK Power Networks.
6. The information proved must be given to all people working near UK Power Networks plant and equipment. Do not use plans more than 3 months after the issue date for excavation purposes.
7. Please be aware that electric cables/lines belonging to other owners of licensed electricity distribution systems may be present and it is your responsibility to identify their location.
8. Please be aware the Low Voltage Overhead power lines are not currently displayed for the Eastern Region via this service, if you require records on the location of these please contact our Plan Provision team directly via plans@ukpowernetworks.co.uk.

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4. This plan has been provided to you on the basis of the terms of use set out in the covering letter that accompanies this plan. If you do not accept and/or do not understand the terms of use set out in the covering letter you must not use the plan and must return it to the sender of the letter.
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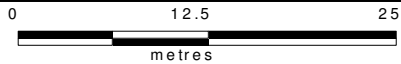
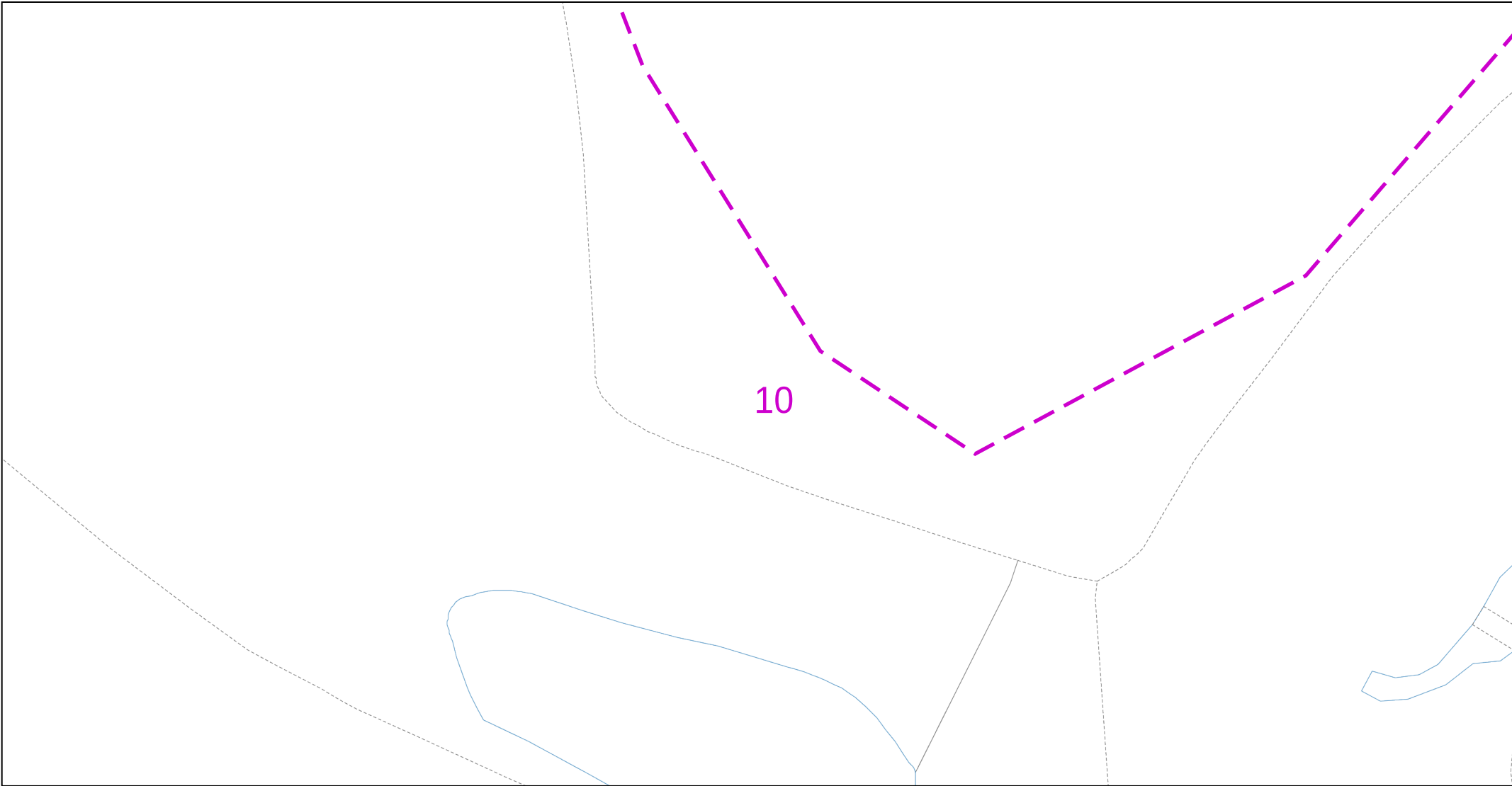


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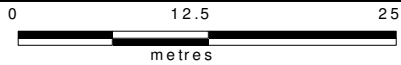
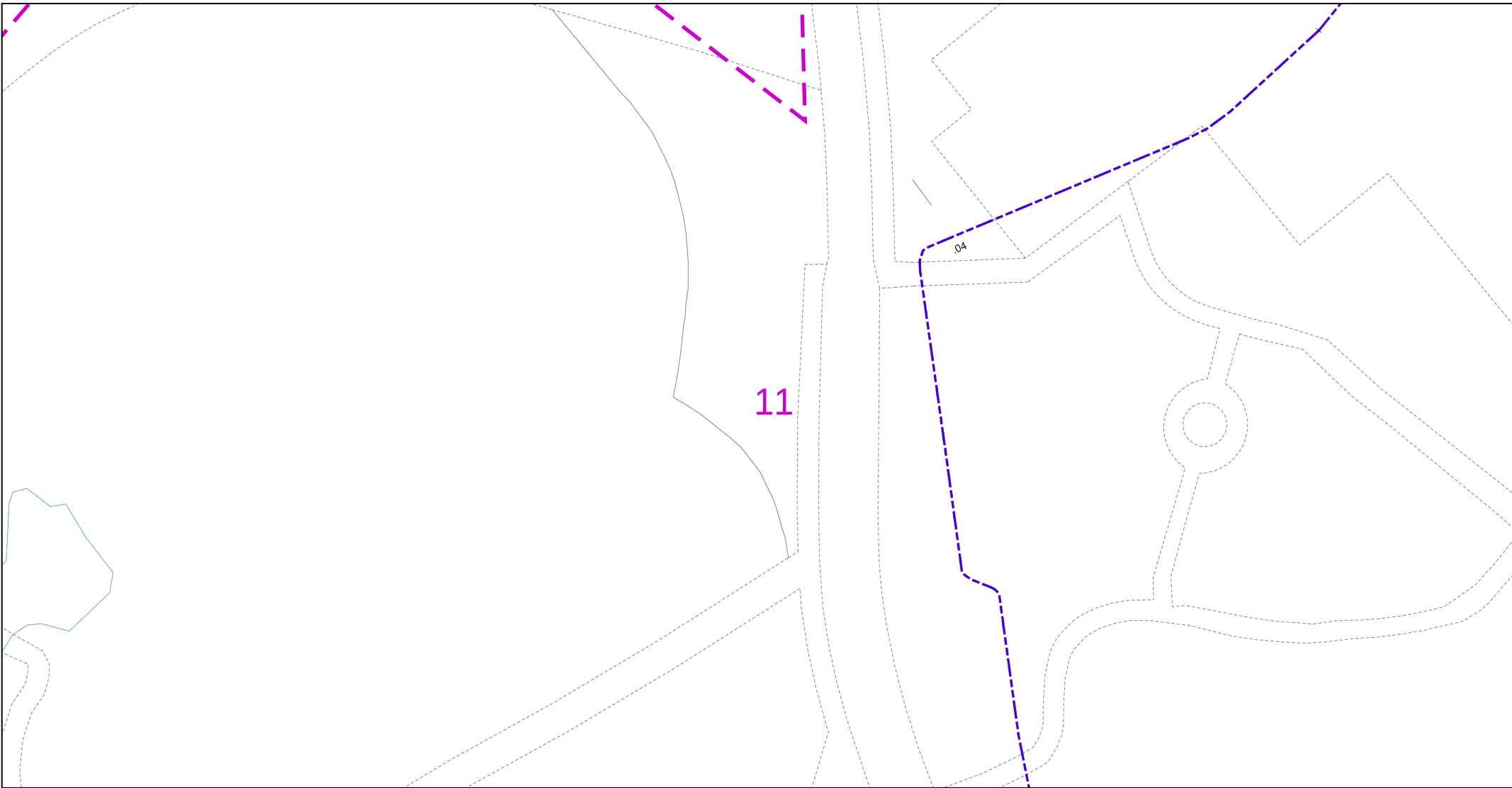
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UK Power Networks Feedback Tool

Please help UK Power Networks improve the accuracy of their network records and help make it safer for all those working around them in future.

All you need to do is:

1. Use your phone camera to scan the QR code:
2. Provide feedback on what you have found on site (good or bad)
3. Upload a photo if needed



Thank you for making the area a safer place to dig.

UK Power Networks, working with LSBUD

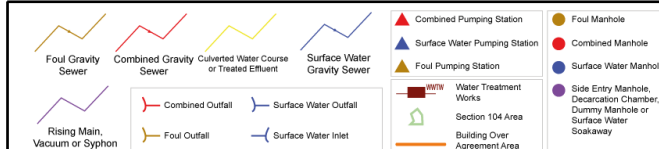


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WARNING: BAC pipes are constructed of Bonded Asbestos Cement.

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



admin@soiltechnics.net
STW6679



