The Ridgeway Primary School,
Hillbrow,
Reading,
Berkshire,
RG2 8JD

Flood Risk Assessment
& Drainage Strategy

Project Number: 03770

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Revision P02

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EXECUTIVE SUMMARY

This Flood Risk Assessment and Drainage Strategy has been prepared to support a planning application for new parking, landscaping, play equipment and boundary treatment at Ridgeway Primary School, Hillbrow, Reading, within the administrative area of Reading Borough Council. The wider project also includes refurbishment works and new extensions totalling approximately 365 square metres. The extensions do not form part of the planning application and are being considered separately through a Lawful Development Certificate; however, they have been considered within this Flood Risk Assessment to provide a comprehensive assessment of flood risk and drainage. The assessment demonstrates that flood risk and drainage considerations have been addressed in accordance with national and local planning policy.

Key findings include:

- The proposals include a reconfiguration of the school, with the existing 630 place 3FE primary school reduced to a 420 place 2FE primary school, alongside the provision of an 82 place SEN primary school. As a result, overall pupil numbers and associated foul water demand are not anticipated to increase when compared to existing conditions.
- The proposed development includes approximately 205 square metres of demolition and 365 square metres of new extension floorspace, resulting in a net increase in built floor area of approximately 160 square metres. This can be accommodated without increasing flood risk through the implementation of appropriate drainage measures.
- Ridgeway Primary School is located within Flood Zone 1 and is at low risk of flooding from rivers and the sea. The site is well removed from the River Thames and River Kennet, and there is no risk of tidal flooding.
- Environment Agency mapping confirms the site is at Very Low Risk of surface water flooding, with no mapped overland flow routes or ponding areas within the school grounds.
- The risk of flooding from foul and surface water sewers and from groundwater is considered to be low, based on available records, geological conditions and the implementation of an appropriate drainage strategy.
- Flooding from reservoirs, canals and other artificial sources is considered a residual risk, and Environment Agency mapping confirms that the site is not affected by reservoir breach inundation.
- The external works will prioritise source control through permeable paving construction with open graded crushed rock sub-base storage and infiltration to ground within areas demonstrated to have suitable infiltration potential. Historical infiltration testing undertaken in 2014 identified that infiltration is feasible within parts of the site, although infiltration suitability varies across the wider development area.
- For the building extensions and associated roof drainage, infiltration is not considered suitable due to the identified ground conditions and groundwater constraints. Surface water runoff from the new roof areas will therefore be attenuated on site and discharged at a

controlled rate of 2.5 litres per second to the public surface water sewer, subject to agreement with Thames Water.

- Surface water drainage will be designed to accommodate the 1 in 100 year rainfall event including a 45 percent allowance for climate change. Urban creep has not been applied as the site does not comprise residential curtilage areas.

Overall, the assessment concludes that the proposed development at Ridgeway Primary School is suitable in flood risk terms. Subject to the implementation of an appropriate drainage strategy, the development will not increase flood risk on site or elsewhere and is considered acceptable in accordance with the National Planning Policy Framework, Planning Practice Guidance and relevant local policy.

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1 INTRODUCTION

1.1 PURPOSE AND SCOPE OF THE ASSESSMENT

This Flood Risk Assessment and Drainage Strategy (FRA and DS) has been prepared in support of the proposed development at The Ridgeway Primary School, Hillbrow, Reading, RG2 8JD. The assessment accompanies the associated planning application and considers the potential risk of flooding to the site and the potential for the development to increase flood risk elsewhere.

The purpose of this report is to:

- assess flood risk from all relevant sources in accordance with national guidance
- demonstrate that the proposed development will be safe for its lifetime
- confirm that flood risk will not be increased elsewhere as a result of the development
- set out an appropriate surface water and foul drainage strategy where required

This report has been prepared using a proportionate approach that reflects the nature, scale and location of the proposed development, while ensuring that all relevant flood risk considerations have been explicitly assessed.

1.2 NATIONAL POLICY AND GUIDANCE FRAMEWORK

This Flood Risk Assessment has been prepared in accordance with the following national policy and guidance:

- National Planning Policy Framework, August 2026 (NPPF)
- Planning Practice Guidance Flood risk and coastal change (PPG)
- Water Framework Directive (WFD)
- Environment Agency Flood Risk Assessment Template version 1 (EA FRA Template v1) and associated guidance
- Environment Agency Flood risk assessments applying for planning permission
- Environment Agency Flood risk assessments climate change allowances

The August 2026 NPPF requirements relevant to this assessment are principally contained in policies F4 to F8. Policy F4 requires a site-specific Flood Risk Assessment for development proposals in Flood Zone 1 on sites of one hectare or more. Policies F5 to F7 address the Sequential Test, development safety and the management of residual risk. Policy F8 requires development that could affect drainage on or around the site to incorporate proportionate Sustainable Drainage Systems that control flow rates and reduce runoff volumes, provide multifunctional benefits where possible, comply with the National Standards for Sustainable Drainage Systems, and have maintenance arrangements for the anticipated lifetime of the development.

1.3 REGIONAL AND LOCAL PLANNING POLICY

Where applicable, the assessment considers regional and local flood risk policy and evidence relevant to the site, relevant borough Local Plan flood risk and drainage policies, and the Strategic Flood Risk Assessment prepared by the local planning authority.

At a local level, the assessment has had regard to the Reading Borough Local Plan and the Reading Level 2 Strategic Flood Risk Assessment 2025. These documents require development to be directed to areas at lowest risk of flooding, to be safe for its lifetime taking account of climate change, and to manage surface water runoff in accordance with the drainage hierarchy through the use of Sustainable Drainage Systems. The proposed development has been designed in accordance with these principles.

Where applicable, the assessment has also been informed by the National Sustainable Drainage Systems Standards, which set out requirements for the design, construction, operation and maintenance of Sustainable Drainage Systems. The proposed drainage strategy has been developed to align with these standards where they are in force and relevant to the application.

At a local level, relevant borough Local Plan flood risk and drainage policies have been reviewed to identify any site specific requirements or development management considerations.

The relevant Strategic Flood Risk Assessment has been reviewed to inform this assessment. The SFRA provides local evidence relating to flood risk sources, historic flooding and drainage constraints, which has been used where appropriate to supplement national datasets.

This Flood Risk Assessment and Drainage Strategy has been prepared to demonstrate compliance with the above regional and local policy requirements.

1.4 PROPORTIONATE APPROACH

The level of detail included within this Flood Risk Assessment reflects a proportionate approach, having regard to the scale and complexity of the proposed development and the level of flood risk affecting the site.

A proportionate approach does not mean that flood risk considerations are omitted. All relevant sources of flooding have been considered, including residual risks, but the depth of assessment has been tailored to reflect the level of risk identified. Where flood risk is assessed to be low or very low, this is clearly explained and supported by available evidence.

1.5 LIFETIME OF DEVELOPMENT AND CLIMATE CHANGE ALLOWANCES

In accordance with Planning Practice Guidance (PPG), the lifetime of the proposed development has been assumed as 100 years for a school building, unless otherwise stated.

Flood risk and drainage assessments have been undertaken with due regard to climate change over the lifetime of the development. The assessment considers the appropriate climate change allowances for:

- fluvial and tidal flooding where relevant

- surface water runoff and rainfall intensity
- residual flood risk associated with extreme events beyond design standards

Where drainage design is required, climate change allowances have been applied in accordance with current Environment Agency guidance and Lead Local Flood Authority (LLFA) requirements.

2 SITE AND DEVELOPMENT DESCRIPTION

2.1 SITE LOCATION AND DESCRIPTION

The application site is located at The Ridgeway Primary School, Hillbrow, Reading, RG2 8JD, with a National Grid Reference of SU 72975 70424 and corresponding What3Words location ///pull.maps.until.

The site lies within the administrative area of Reading Borough Council and is bounded by Cowsey Woodlands along its southern and western boundaries, with neighbouring residential properties located immediately beyond the northern and eastern boundaries. The surrounding area is predominantly residential in character with neighbouring properties comprising a mixture of detached and semi-detached dwellings, together with areas of open space and community facilities.

The planning application red-line boundary covers approximately 17,698 square metres (1.770 hectares). Further details regarding the site location and surrounding context are provided in Figures 1 to 3.

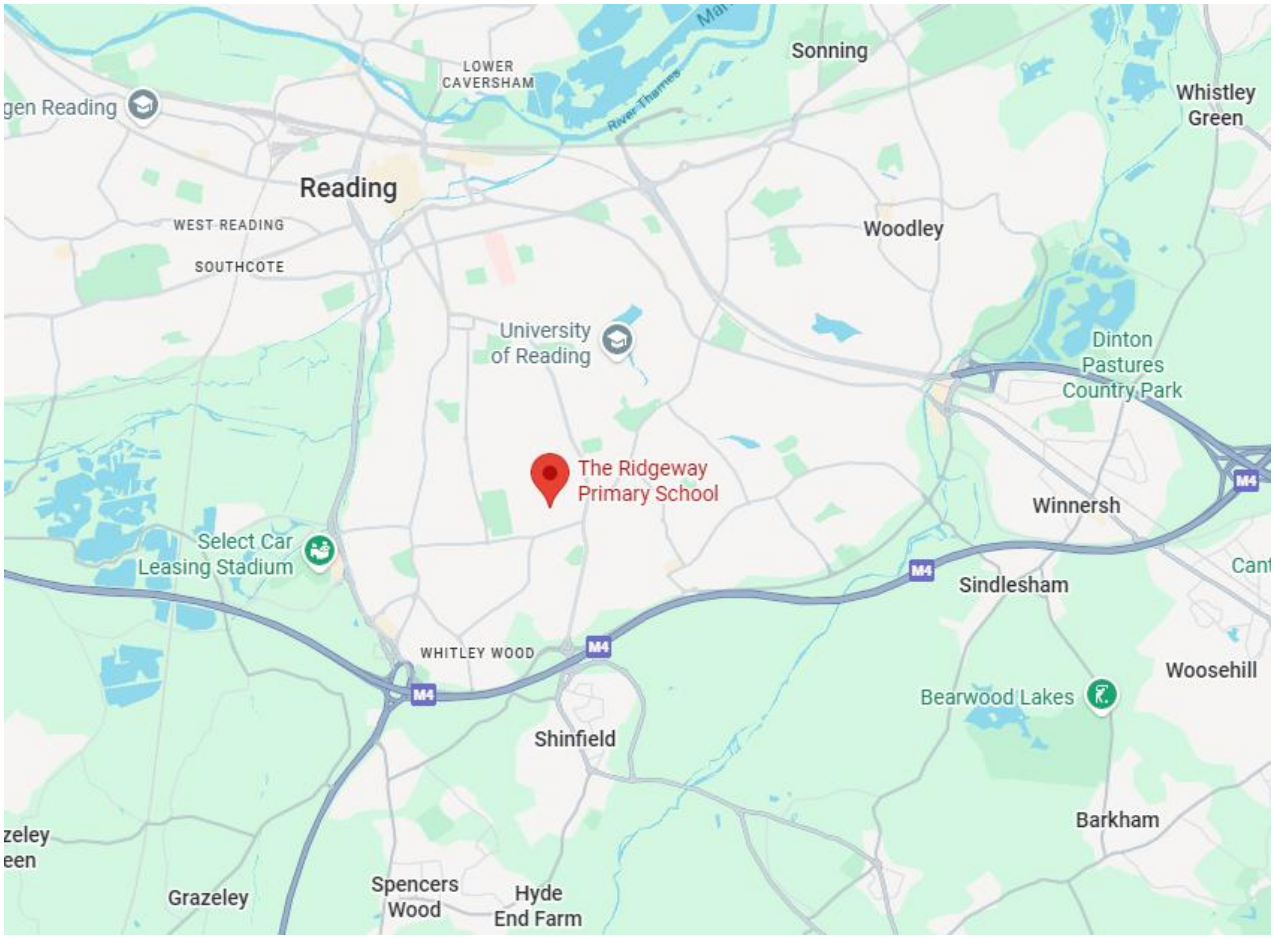


FIGURE 1 Site Location

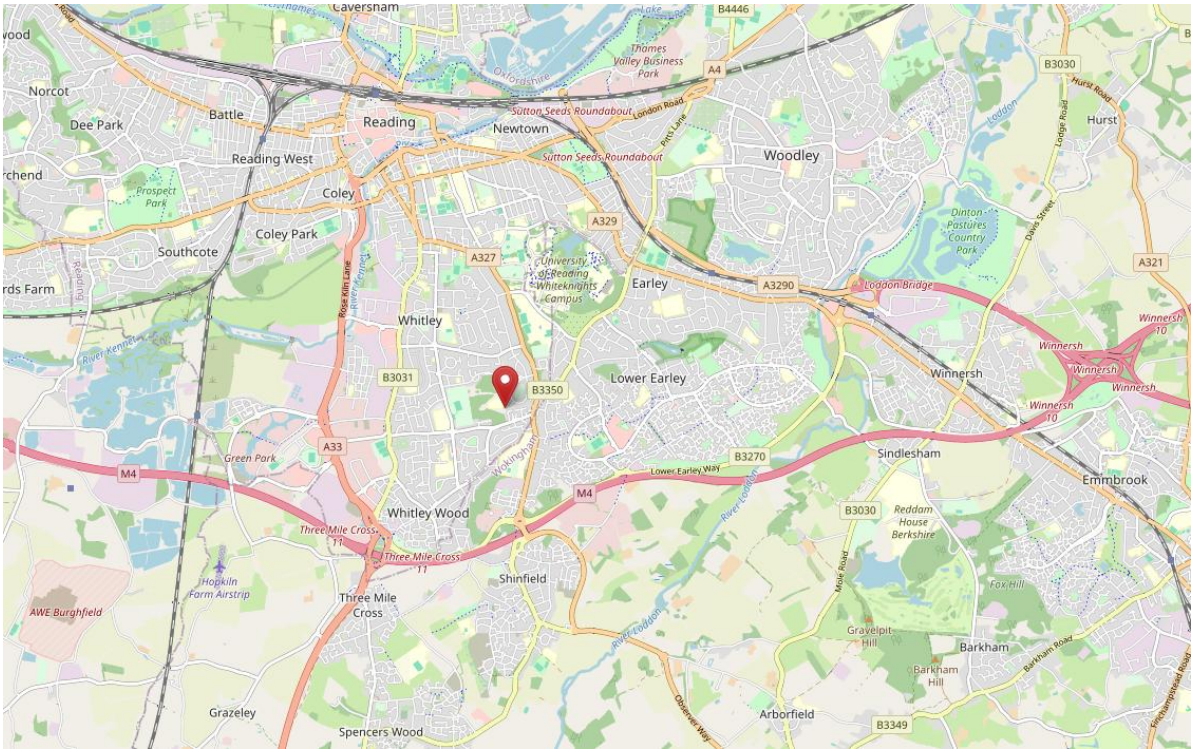


FIGURE 2 Site Location



FIGURE 3 Aerial Image of Site Location

2.2 EXISTING SITE CONDITIONS

The existing site comprises an operational primary school, including school buildings, external play areas, access roads and associated hardstanding. The current extent of impermeable and permeable surfaces is summarised as follows:

- Existing educational buildings approximately 4,012 square metres
- Hardstanding and paved areas including access roads, footpaths and play areas approximately 10,123 square metres
- Soft landscaped and permeable areas comprising the remainder of the site

There are no ordinary watercourses, drainage ditches or open channels located within or immediately adjacent to the site. Existing drainage is understood to comprise a combination of surface water drainage infrastructure serving the school buildings and external areas, with further details described in Section 5 where applicable.

There are no recorded flood defences, flood storage areas or formal flood risk management structures located on or adjacent to the site.

2.3 PROPOSED DEVELOPMENT

The proposed development at Ridgeway Primary School comprises a programme of refurbishment, new parking, landscaping and extension works to the existing school site to facilitate a new SEN school. The proposals form part of a wider initiative by Reading Borough Council to enhance educational facilities and increase capacity within existing school sites, including improved accommodation to support pupils with special educational needs.

Ridgeway Primary School currently comprises three principal building blocks, including the original single storey school building constructed in the 1920s with a basement plant room, a modular nursery extension added in the 1980s, and a two storey teaching block and sports hall constructed in 2016. The existing buildings provide a total gross internal floor area of approximately 4,012 square metres.

The proposed works include the demolition of approximately 205 square metres of existing accommodation and the construction of approximately 365 square metres of new extension floorspace, resulting in a net increase in built floor area of approximately 160 square metres.

The proposed development also includes a reconfiguration of the school's operation, with a reduction in mainstream pupil numbers and the introduction of a dedicated SEN primary school within part of the site. This change in use is not expected to result in an increase in daily occupancy or water usage when compared to the existing school arrangement.

The development will result in changes to the internal layout of the school and limited alterations to the external built footprint. External works will include localised adjustments to existing hardstanding and landscaped areas to accommodate the proposed extensions and improve site functionality. The net increase in floor area is modest in scale and does not represent a significant intensification of development across the wider site.

Any changes to impermeable areas associated with the development will be managed through an appropriate surface water drainage strategy to ensure that flood risk is not increased on site or elsewhere.

The proposals do not include development within any functional floodplain or areas at high risk of flooding. Drainage infrastructure associated with the development will be designed to manage surface water and foul flows in a controlled and sustainable manner, in accordance with relevant national and local guidance.

The submitted development proposals, including the site layout and proposed finished floor levels, form the basis of this Flood Risk Assessment and Drainage Strategy. The relevant drawings are provided in **Appendix A**.

2.4 TOPOGRAPHY

Topographical information for the site has been derived from a topographical survey undertaken in May 2025 by Sumo Services. The evidence base for site levels is provided in **Appendix B**.

Ground levels across the site range from approximately 73.80 metres Above Ordnance Datum AOD to 80.99 metres Above Ordnance Datum AOD, indicating a general fall from east towards the west. The overall variation in levels across the site is approximately 7.19 metres.

The site topography does not indicate the presence of pronounced low points or overland flow paths that would increase susceptibility to surface water ponding. The existing gradient provides positive conditions for surface water management and exceedance routing.

The existing buildings on the site have ground floor levels recorded between 79.73 metres Above Ordnance Datum AOD and 80.90 metres Above Ordnance Datum AOD.

2.5 GEOLOGY AND HYDROGEOLOGY

The geological and hydrogeological context of the site has been informed by publicly available British Geological Survey mapping together with site specific ground investigation data.

The bedrock geology underlying the site comprises the London Clay Formation, while superficial deposits are identified as River Terrace Deposits comprising sand and gravel, as illustrated in Figures 4 and 5.

Bedrock geology

The London Clay Formation typically comprises clay with subordinate silt and sand horizons, deposited during the early Eocene within a shallow marine environment. In its unweathered state, the formation generally consists of stiff to very stiff bluish grey silty clay, which may weather near the surface to a firm brown clay.

The formation commonly includes poorly laminated silty to very silty clay, locally sandy clay, with occasional sand partings and thin shell beds, particularly towards the upper and lower extents of the sequence. Thin carbonate concretions and disseminated pyrite are also characteristic features, and fissuring is common within the upper zones.

From an engineering perspective, London Clay is typically characterised by moderate to high plasticity and low intrinsic permeability. These properties indicate limited potential for infiltration. Where cohesive clay rich strata dominate, infiltration rates are generally low and surface water drainage strategies are more likely to rely on attenuation and controlled discharge rather than infiltration.

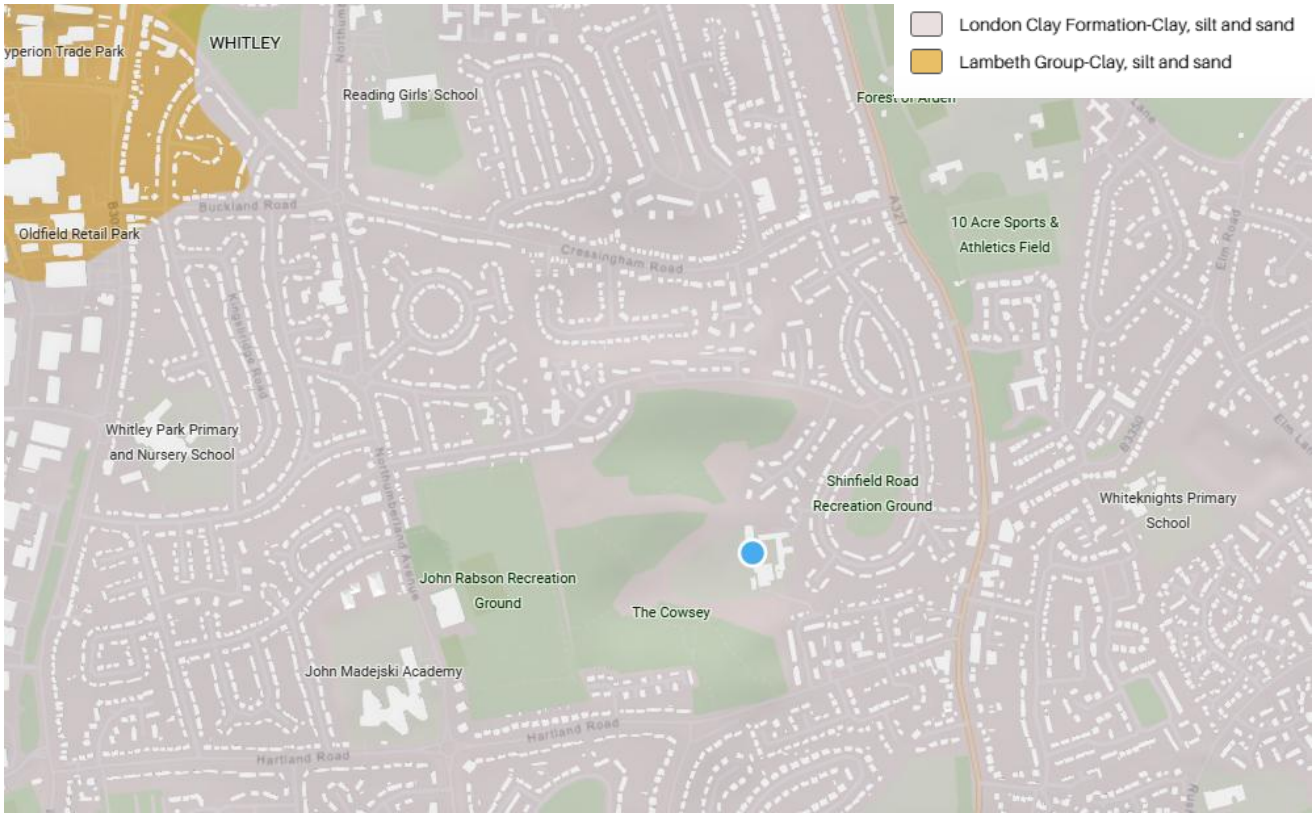
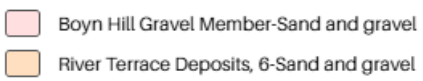


FIGURE 4 Bedrock Geology - British Geological Survey Map (www.bgs.co.uk)

Superficial geology

The superficial deposits underlying the site are identified by the British Geological Survey as River Terrace Deposits comprising sand and gravel. These deposits typically consist of sand and gravel with localised lenses of silt, clay or peat and are associated with fluvial depositional processes.

The gravel fraction predominantly comprises sub rounded to rounded flint and quartz clasts, suggesting relatively high permeability and the potential for moderate groundwater transmissivity where the deposits are laterally continuous. However, interbedded finer grained layers may locally restrict infiltration and give rise to perched groundwater conditions following prolonged rainfall.



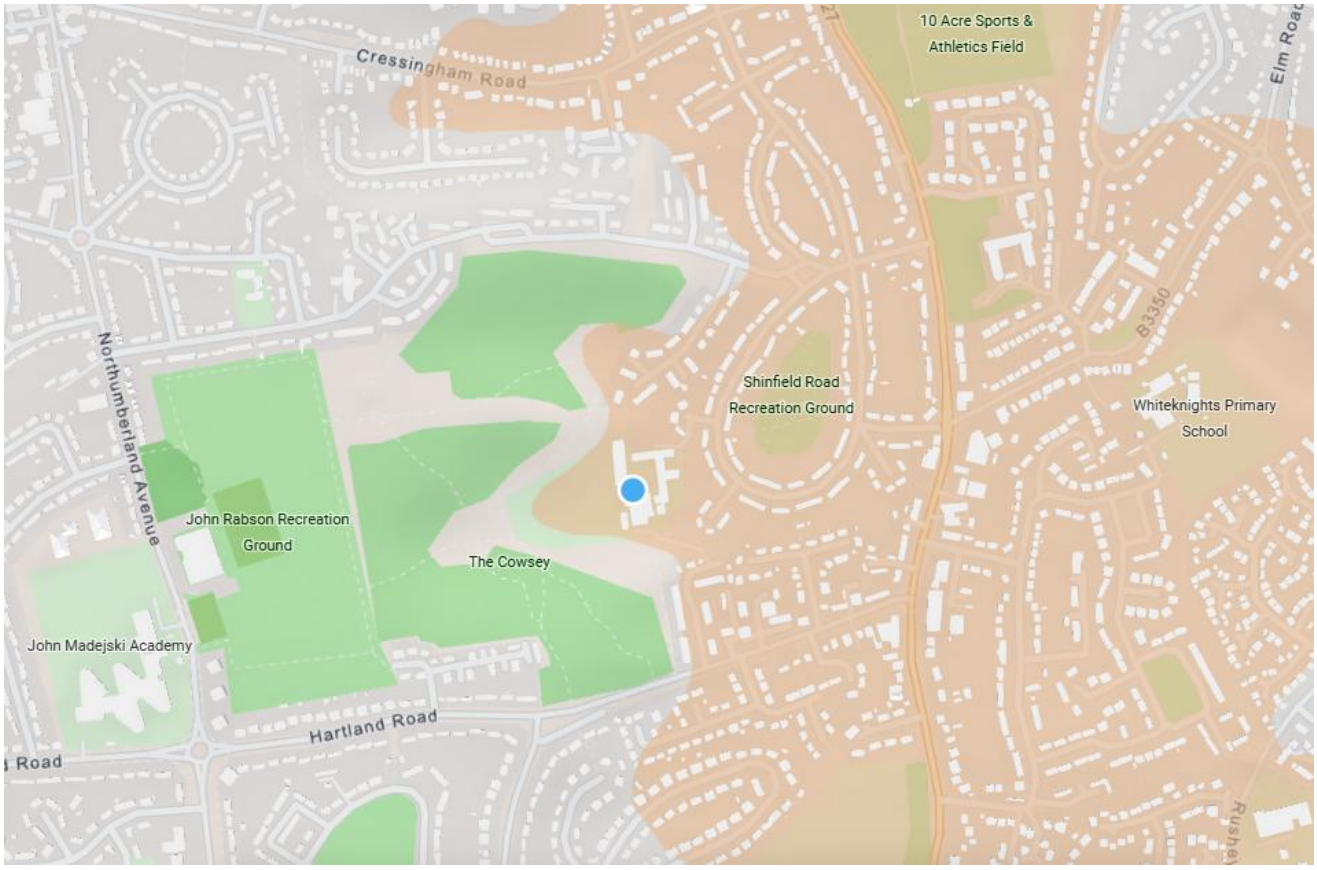


FIGURE 5 Superficial Geology - British Geological Survey Map (www.bgs.co.uk)

Engineering perspective

From an engineering perspective, the combination of River Terrace Deposits overlying the London Clay Formation may result in variable drainage behaviour across the site. Localised sand and gravel horizons may permit infiltration, while adjacent clay dominated zones are likely to restrict vertical drainage.

Recent ground investigation data confirms that infiltration is feasible within the River Terrace Deposits underlying the site. However, recorded infiltration rates vary significantly across the site due to lateral variability within the superficial deposits and groundwater levels and seasonal groundwater variation. Infiltration performance cannot therefore be assumed to be uniform, and location specific BRE 365 testing will be required at the proposed drainage feature positions to confirm representative infiltration rates and compliance with groundwater separation requirements prior to finalising detailed drainage design.

Historic borehole information

Historic borehole records available from the British Geological Survey have been reviewed to provide an indication of subsurface conditions in the vicinity of the site. The nearest available borehole record is located approximately 543 metres west of the site and is referenced as BGS borehole SU77SW139.

The recorded data indicates the following stratigraphy:

- 0–0.15m: Topsoil.
- 0.15–1.65m: Firm brown mottled, silty and sandy clay.
- 1.65–4.85m: Firm to stiff brown and silty clay.
- 4.85-15.00m: Stiff grey fissured silty clay.

The borehole was terminated at a depth of 15 metres below ground level.
This information provides useful contextual evidence of likely ground conditions but does not replace the need for site specific investigation where required.

Hydrogeological context
Regional groundwater conditions are typically associated with superficial sand and gravel deposits overlying low permeability clay strata. The underlying London Clay Formation is classified by the Environment Agency as an unproductive strata, indicating a low potential for groundwater movement at shallow depth.

The River Terrace Deposits may locally support shallow groundwater, particularly where underlain by low permeability clay, giving rise to perched groundwater conditions during prolonged wet periods.

Where below ground structures are proposed, allowance will be made for transient groundwater conditions, and appropriate waterproofing and drainage measures will be incorporated where required.

Further consideration of groundwater flood risk is provided in Section 3 of this report.

3 FLOOD RISK ASSESSMENT

In accordance with policies F4 to F8 of the August 2026 National Planning Policy Framework, this assessment considers flood risk from all sources and sets out a proportionate surface water drainage strategy for the proposed works.

Unless otherwise stated, the assessment assumes that existing flood risk management infrastructure operates as intended for the design flood event, with residual risk considered separately.

3.1 DEVELOPMENT VULNERABILITY CLASSIFICATION

In accordance with Annex F, Table 2 of the August 2026 NPPF, the proposed educational use is classified as "More Vulnerable".

The proposed development comprises primary school accommodation including special educational needs provision and is therefore classified as **More Vulnerable** development.

The Reading Level 2 SFRA confirms that vulnerability classifications and flood zone compatibility should be assessed in accordance with national guidance.

The development will be occupied on a daytime only basis, with users comprising pupils, teaching staff, support staff and visitors. No sleeping accommodation is proposed. While the site will accommodate children, including pupils with special educational needs, the nature of the development is not considered to introduce vulnerabilities that would materially alter the overall flood risk classification or suitability of the site for the proposed use.

3.2 FLOOD ZONE CLASSIFICATION

The Environment Agency Flood Map for Planning identifies areas at risk of flooding from rivers and the sea, categorised into Flood Zones based on the annual probability of flooding.

A review of the Flood Map for Planning confirms that the application site lies entirely within **Flood Zone 1**, as shown on Figure 6.

Flood Zone definitions are summarised as follows:

- Flood Zone 1 Low probability land with less than a 0.1 percent annual probability of flooding from rivers or the sea
- Flood Zone 2 Medium probability land with a 0.1 to 1 percent annual probability of river flooding or 0.1 to 0.5 percent annual probability of sea flooding
- Flood Zone 3a High probability land with a 1 percent or greater annual probability of river flooding or 0.5 percent or greater annual probability of sea flooding
- Flood Zone 3b Functional floodplain land where water has to flow or be stored in times of flood

The Reading Level 2 SFRA 2025 confirms that areas outside the River Thames and River Kennet floodplains are generally located within Flood Zone 1 and are therefore at low fluvial risk.

Reference has also been made to the Reading Level 1 and Level 2 SFRAs to confirm that the site does not lie within Flood Zone 3b Functional Floodplain.



FIGURE 6 Environment Agency Flood Zone Map

3.3 FLOOD ZONE COMPATIBILITY AND POLICY COMPLIANCE

The flood risk vulnerability and Flood Zone compatibility guidance in Annex F, Table 3 of the August 2026 NPPF confirms that "More Vulnerable" development is appropriate in Flood Zone 1.

The Reading Level 2 SFRA reproduces national compatibility tables confirming that **More Vulnerable development is appropriate within Flood Zone 1**.

Based on the identified vulnerability classification and Flood Zone location:

- The proposed development is **compatible** with the Flood Zone designation.

Although the site lies within Flood Zone 1, flood risk from all sources has been considered in accordance with NPPF policy F5. This assessment demonstrates that no built development, access or escape routes, land raising or other potentially vulnerable elements would be located within an area at risk of flooding from any source, now or in the future. The Sequential Test is therefore not required under policy F5(2)(b)(i).

3.4 LIFETIME OF DEVELOPMENT AND DESIGN FLOOD EVENTS

For the purposes of this assessment, the lifetime of the proposed development has been assumed as **100 years**, reflecting the long term and permanent nature of educational development, in accordance with Planning Practice Guidance.

Flood risk has been assessed for both current conditions and future conditions over the lifetime of the development, taking account of climate change where relevant. The design flood events considered within this assessment include:

- Fluvial flooding 1 percent annual exceedance probability event plus climate change allowance
- Tidal flooding 0.5 percent annual exceedance probability event plus climate change allowance where applicable
- Surface water flooding 3.3 percent and 1 percent annual exceedance probability events
- Residual risk associated with exceedance of design standards and blockage or failure of drainage infrastructure

3.5 FLUVIAL AND TIDAL FLOOD RISK

Fluvial flooding refers to flooding from rivers and ordinary watercourses.

The nearest main rivers to the site are the River Thames and the River Kennet, both located several kilometres to the north of the application site. There are no ordinary watercourses, drainage ditches or culverted watercourses within or immediately adjacent to the site.

The Environment Agency Main River consultation area has been reviewed. The site is located outside 20 metres of a designated Main River.

A review of the Environment Agency Flood Map for Planning and the Reading Borough Council Strategic Flood Risk Assessment confirms that the site lies outside Flood Zones 2 and 3 and is not affected by fluvial or tidal flood extents. According to the Environment Agency Flood Risk Summary, the site is classified as **Very Low Risk** of flooding from rivers and the sea for both current conditions and future projections.

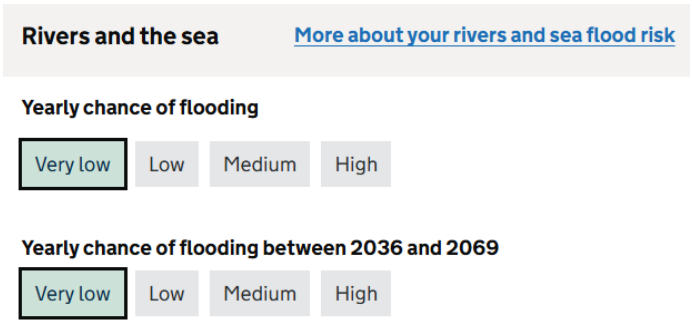


FIGURE 7 Environment Agency Rivers and Sea Flood Risk Summary

The River Thames in this location is non tidal, and tidal flooding does not present a risk to the site. As the site lies outside the fluvial and tidal floodplain, no site specific hydraulic modelling has been required. Flood depths, velocities and hazard at the site from fluvial or tidal sources are therefore considered negligible. Access and egress routes are also located outside mapped fluvial and tidal flood extents.

Climate change is expected to increase peak river flows over time. However, as the site is located outside Flood Zones 2 and 3, climate change allowances do not alter the Flood Zone classification or introduce fluvial or tidal flood risk to the site over the lifetime of the development.

Residual fluvial and tidal flood risk is limited to extremely low probability events beyond the design standard and is considered negligible.

3.6 SURFACE WATER FLOOD RISK

Surface water flooding occurs when rainfall exceeds the capacity of the drainage network or infiltration capacity of the ground, resulting in overland flow and localised ponding.

The Reading Level 2 SFRA confirms that surface water flood risk within the borough is typically localised and influenced by topography and drainage capacity.

A review of the Environment Agency Risk of Flooding from Surface Water mapping indicates that the site lies within an area classified as **Very Low Risk**, with no mapped overland flow routes or areas of ponding identified within the school grounds, as shown on Figure 8.

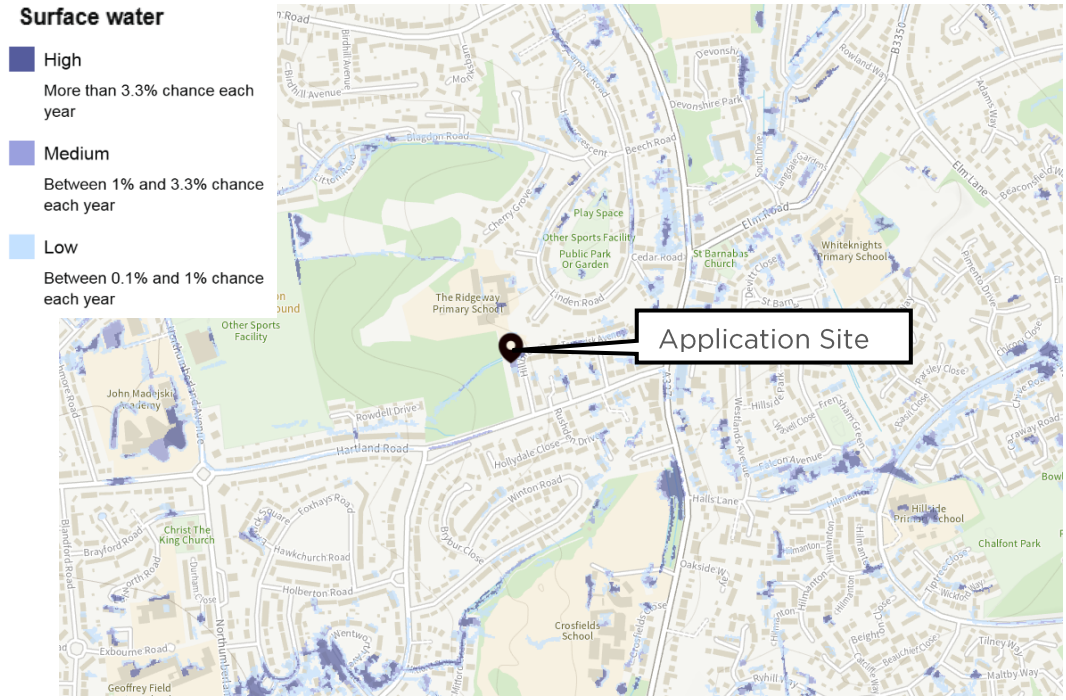


FIGURE 8 Environment Agency Pluvial Flood Risk Map

The Environment Agency Flood Risk Summary confirms that the site is also at **Very Low Risk** of surface water flooding for both current and future conditions.

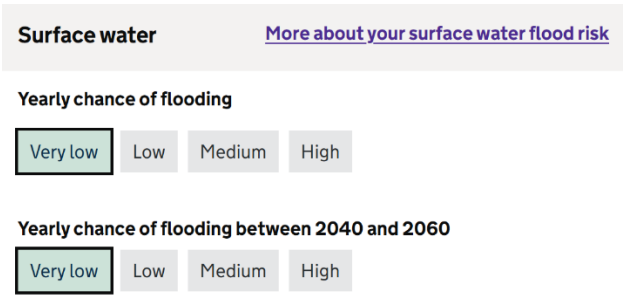


FIGURE 9 Environment Agency Surface Water Flood Risk Summary

The mapping represents a strategic assessment and does not account for site specific drainage infrastructure or detailed topography. Climate change has been taken into account through the proposed drainage strategy, which includes appropriate allowances for increased rainfall intensity.

Residual surface water flood risk may arise during events that exceed the design standard or in the event of drainage blockage or failure. This risk is managed through exceedance routing and the design of surface water drainage infrastructure, as detailed in Section 5.

3.7 SEWER FLOOD RISK

Sewer flooding can occur when the capacity of the public sewer network is exceeded during periods of intense rainfall, resulting in surcharge from manholes or internal flooding of properties.

Adopted surface water and combined sewer networks are typically designed to accommodate rainfall events up to the 1 in 30 year return period. More extreme storm events may exceed this design capacity, resulting in surcharge or temporary flooding. It is therefore important that new development incorporates appropriate on site attenuation and discharge rate restriction to avoid increasing downstream flood risk and pressure on existing infrastructure.

The site is located outside a Critical Drainage Area, as identified by the local Strategic Flood Risk Assessment.

The Environment Agency does not publish detailed or site specific sewer flood risk mapping. Sewer flood risk information is therefore limited and typically informed by a combination of Strategic Flood Risk Assessment (SFRA) data, publicly available sewer flooding incident records, and professional judgement.

A review of available Strategic Flood Risk Assessment information and sewer flooding records does not identify any recorded incidents of sewer flooding affecting the site or its immediate surroundings.

The proposed development incorporates measures to manage surface water runoff in accordance with the drainage hierarchy and will not increase foul water discharge when compared to existing conditions. Where connections to the public sewer are retained, these will continue to operate under existing arrangements.

Residual sewer flood risk may arise during extreme rainfall events that exceed the capacity of the sewer network or due to blockage or failure of sewer infrastructure. This residual risk is considered **low** and does not pose a constraint to the proposed development.

3.8 GROUNDWATER FLOOD RISK

Groundwater flooding occurs when groundwater levels rise above the ground surface or enter below ground structures, typically following prolonged periods of rainfall. Groundwater flood risk is influenced by local geology, hydrogeology, topography and seasonal groundwater behaviour.

A review of Environment Agency groundwater flood alert mapping confirms that the site is located **outside of a groundwater flood alert area**. This indicates that the site is not within an area where the Environment Agency issues groundwater flood alerts. However, this designation does not eliminate the possibility of localised groundwater emergence.

The Reading Borough Council Level 2 Strategic Flood Risk Assessment identifies groundwater flooding within the borough as generally localised and influenced by superficial deposits and low lying ground conditions. The site is not specifically identified within the SFRA as being at elevated risk of groundwater flooding.

The site is underlain by River Terrace Deposits over the London Clay Formation. The London Clay is classified as Unproductive Strata and acts as a low permeability aquiclude, limiting vertical groundwater movement. While shallow groundwater may locally occur within superficial sand and gravel deposits, no evidence of groundwater emergence at the surface has been identified in available mapping or historical records.

A site specific ground investigation and groundwater monitoring programme was undertaken in 2025. Groundwater was not observed during the initial drilling operations to depths of 4.0m below ground level. However, following installation of monitoring standpipes, groundwater levels were subsequently recorded between 1.46m and 1.60m below ground level during six rounds of monitoring between August and December 2025. No artesian conditions or evidence of groundwater emergence at ground surface were recorded.

The monitored groundwater depths indicate that groundwater is present within the superficial deposits at depth but remains significantly below ground surface levels. There is no evidence to suggest groundwater has historically reached or approached the surface within the site boundary.

Based on Environment Agency mapping, the Strategic Flood Risk Assessment, underlying geological conditions and site specific groundwater monitoring data, groundwater flood risk to the site is considered **low**.

The proposed development comprises predominantly single storey extensions with no significant below ground accommodation. Where foundations or drainage infrastructure interact with the superficial deposits, appropriate construction detailing will be incorporated to manage potential transient groundwater conditions.

Residual groundwater flood risk during exceptionally prolonged rainfall events is considered low and does not pose a constraint to the proposed development.

3.9 RESERVOIR FLOOD RISK

Reservoir flooding can occur in the event of a failure or uncontrolled release of water from a large, raised reservoir. While such events are extremely rare, they can result in rapid and deep flooding with limited warning.

A review of the Environment Agency Reservoir Flood Risk Map and Reading Level 2 SFRA confirms that the site does not lie within an area that could be affected by flooding in the unlikely event of a reservoir failure.

Reservoir flood risk is therefore considered negligible and does not pose a constraint to the proposed development.

3.10 CANALS AND OTHER ARTIFICIAL SOURCES OF FLOOD RISK

Artificial sources of flooding include canals, docks, retained water bodies, raised channels and other manmade structures that store or convey water.

There are no canals, docks or other artificial water bodies within or immediately adjacent to the site that could pose a flood risk.

Available mapping and strategic assessments do not identify the site as being at risk from artificial sources of flooding. Residual risk from such sources is therefore considered negligible.

3.11 COASTAL EROSION RISK IMPLICATIONS

Coastal erosion can influence flood risk in coastal and estuarine locations where the loss of land or protective features may increase exposure to tidal flooding over time.

The application site is located well inland and is not within an area identified as being at risk of coastal erosion. Coastal erosion does not influence flood risk at the site, and no further assessment is required.

3.12 INTERACTIONS OF FLOOD RISK SOURCES

Flood risk can arise from the interaction of multiple sources occurring simultaneously or sequentially, such as intense rainfall coinciding with high river levels, high tides or limited drainage capacity.

Potential interactions between flood risk sources relevant to the site include:

- surface water runoff interacting with the drainage network during periods of intense rainfall
- surface water runoff coinciding with elevated groundwater levels following prolonged rainfall

The available mapping and site specific ground investigation evidence indicate that there is no significant interaction between flood risk sources at the site. Surface water flooding represents the dominant potential risk mechanism, driven by intense rainfall events, and this is managed through the proposed drainage and exceedance strategy.

Based on the available evidence, interactions between flood risk sources do not materially increase flood risk at the site and do not pose a constraint to the proposed development.

3.13 SUMMARY OF FLOOD RISKS

This section provides a summary of the flood risk sources assessed within this Flood Risk Assessment, considering both current conditions and the future scenario over the lifetime of the development, including climate change and residual risk.

The assessment confirms that flood risk to the site is dominated by surface water, with other sources presenting a low level of risk. All relevant sources of flooding have been considered in accordance with national guidance.

A summary of the flood risk assessment is provided in Table 1 below.

Flood source	Current flood risk	Future flood risk inc. CC	Residual risk	Comments
Fluvial flooding	Very Low	Very Low	Negligible	Based on EA Flood Map for Planning and 2025 Reading Level 2 SFRA
Tidal flooding	Very Low	Very Low	Negligible	Site is inland and non-tidal
Surface water flooding	Very Low	Very Low	Low	Managed through drainage strategy

Sewer flooding	Low	Low	Low	2025 Reading Level 2 SFRA and available records
Groundwater flooding	Low	Low	Low	Based on geology boreholes and ground investigation
Reservoir flooding	None	None	Residual only	Extremely low probability event
Canals and artificial sources	Negligible	Negligible	Negligible	No artificial sources affecting site
Coastal erosion	Not applicable	Not applicable	Not applicable	Site not in coastal erosion zone

Table 1 Summary of Flood Risk to the Site

4 SEQUENTIAL TEST

NPPF policy F5 requires flood risk to be addressed through the sequential approach, taking account of all sources of flooding and the effects of climate change.

The Environment Agency Flood Map for Planning identifies the site within Flood Zone 1, which has a low probability of river or sea flooding. Flood risk from other sources has also been assessed within this report.

This assessment demonstrates that no built development, access or escape routes, land raising or other potentially vulnerable elements would be located within an area at risk of flooding from any source, now or in the future. Accordingly, the Sequential Test is not required under NPPF policy F5(2)(b)(i).

The proposed development is therefore consistent with the sequential approach set out in the August 2026 NPPF.

4.1 SEQUENTIAL APPROACH WITHIN THE SITE

As the site lies wholly within Flood Zone 1 and is not affected by fluvial or tidal flood extents, flood risk does not vary across the site.

Nevertheless, the proposed layout has been informed by an understanding of local topography and surface water flow patterns, ensuring that finished floor levels and drainage infrastructure are appropriately designed to manage residual surface water risk.

5 DRAINAGE STRATEGY

This section sets out the proposed drainage strategy for the development, with particular focus on the management of surface water runoff. The strategy has been prepared to ensure that surface water is managed in a safe and sustainable manner and that flood risk to the site and surrounding area is not increased.

This section should be read in conjunction with the flood risk assessment presented in Section 3. Where required, this section may be extracted and submitted as a standalone Drainage Strategy to support the planning application.

The surface water drainage strategy has been developed in accordance with national and local policy and guidance, including CIRIA The SuDS Manual C753 and, where applicable, the National Sustainable Drainage Systems Standards. The strategy seeks to demonstrate that the proposed drainage measures meet relevant design performance and maintenance expectations.

5.1 POLICY AND GUIDANCE CONTEXT

The drainage strategy has been prepared in accordance with the following policy and guidance:

- National Planning Policy Framework, August 2026, including policies F4 to F8
- Planning Practice Guidance Flood risk and coastal change
- Water Framework Directive (WFD)
- Local Planning Authority and Lead Local Flood Authority drainage policies
- The Non statutory technical standards for sustainable drainage systems (where applicable)
- CIRIA The SuDS Manual C753
- The National Sustainable Drainage Systems Standards

Where development is proposed in Reading, the drainage strategy has been prepared to align with typical Lead Local Flood Authority expectations.

5.2 EXISTING DRAINAGE ARRANGEMENTS

A review of available information has been undertaken to establish the existing drainage arrangements at Ridgeway Primary School. This review has included historic ground investigation reports, available drainage drawings, sewer records and CCTV survey information. Relevant records are provided in **Appendix D**.

The site is served by separate foul and surface water drainage systems.

Foul Water Drainage

The foul drainage system serves WC facilities and internal appliances within the existing school buildings. CCTV survey information confirms that foul flows are collected via gravity pipework and conveyed to an on site foul water pumping station.

Foul drainage serving the eastern side of the site is conveyed via gravity pipework to this pumping station. From this location, flows are pumped eastwards across the site before discharging from the middle of the eastern boundary. It is understood that this discharge connects to the public foul sewer operated by Thames Water within Linden Road.

In addition, a smaller foul drainage catchment serving the north eastern part of the site discharges via the northern access route and connects into the Thames Water foul water sewer located within Willow Gardens.

In the context of the proposed reconfiguration of the school and the reduction in mainstream pupil numbers, the existing foul drainage system is not expected to experience an increase in loading as a result of the development.

Surface Water Drainage

The surface water drainage system comprises a combination of gravity pipework and soakaway features serving roof areas and external hardstanding. Rainwater is collected via external downpipes at building elevations and conveyed to the below ground surface water drainage network.

The surface water drainage network is divided into three principal systems.

One system serving the north eastern part of the site discharges via the northern access route and connects into the Thames Water surface water sewer located within Willow Gardens.

The majority of surface water runoff across the site is directed to an existing soakaway located within the grassed area to the north of the asphalt sports pitch. This soakaway forms part of the wider surface water drainage network serving roof areas and external hardstanding.

CCTV survey information confirms the presence, general connectivity and condition of the surface water drainage system. However, the detailed construction depth and hydraulic performance of the soakaway features have not yet been verified.

Condition and Remedial Works

CCTV survey information has identified a small number of defects within the existing foul and surface water drainage systems. These comprise minor structural and maintenance-related issues which will be addressed through remedial works as part of the proposed development.

There are no recorded incidents of internal or external flooding associated with the existing drainage systems.

5.3 DRAINAGE DESTINATION HIERARCHY

Surface water runoff has been considered in accordance with the drainage hierarchy set out within national policy, Planning Practice Guidance and local guidance adopted by Reading Borough Council.

The hierarchy prioritises:

1. infiltration to ground
2. discharge to a watercourse
3. discharge to a surface water sewer
4. discharge to a combined sewer

The drainage hierarchy has been applied to each element of the proposed works.

External works

The external works comprise new and reconfigured hardstanding areas without additional building footprint.

Ground investigation information, including historical infiltration testing undertaken in 2014, indicates that infiltration may be feasible within parts of the site underlain by superficial River Terrace Deposits. However, the results also demonstrate that infiltration potential varies across the site and may be locally constrained by cohesive strata, groundwater conditions and underlying London Clay deposits.

Infiltration to ground therefore represents the preferred drainage solution for the proposed hardstanding areas where suitable ground conditions are present. The proposed use of open graded crushed rock sub-base construction has been selected to provide distributed shallow infiltration and temporary attenuation storage within areas demonstrated to have infiltration potential.

Additional verification testing will be undertaken during detailed design to confirm local infiltration performance and groundwater separation in accordance with BRE 365 and CIRIA C753 guidance.

Where infiltration is demonstrated to be constrained by groundwater levels, soil permeability or site constraints, supplementary attenuation and controlled discharge measures will be incorporated in accordance with the drainage hierarchy.

Building extensions and roof drainage

The building works comprise extensions to the existing school buildings and associated roof drainage infrastructure.

The feasibility of infiltration for the extension roof drainage has been reviewed against the available ground investigation information contained within the Ground Investigation Report provided in Appendix C. The investigation identified cohesive clay strata associated with the London Clay Formation beneath the superficial deposits, with groundwater monitoring recording groundwater between approximately 1.46 metres and 1.60 metres below ground level. On this basis, infiltration is not considered suitable for the extension roof drainage.

Surface water runoff from the extension roof areas will therefore be attenuated on site and discharged at a controlled rate of 2.5 litres per second to the public surface water sewer, subject to agreement with Thames Water.

The proposed drainage strategy therefore follows the highest feasible option within the drainage hierarchy for each element of the works, taking account of ground conditions, groundwater levels, operational requirements and site constraints.

5.4 PROPOSED SURFACE WATER DRAINAGE STRATEGY

Previous Stage 2 assessments identified that infiltration may be locally possible within the superficial River Terrace Deposits, but that feasibility could be constrained by groundwater conditions and the presence of underlying London Clay.

Subsequent review of CCTV survey data confirms the presence, general connectivity and condition of the existing surface water drainage network, including soakaway infrastructure within the site. The proposed surface water drainage strategy has been developed with reference to the available ground investigation information, groundwater monitoring data and historical infiltration testing.

The proposed surface water drainage strategy addresses the external works and the building extensions as follows.

External works

The external works comprise new and reconfigured hardstanding areas together with the partial demolition of an existing building. No additional building footprint is introduced by these works.

Surface water runoff from new hardstanding areas will be managed through permeable paving construction incorporating open graded crushed rock sub base storage and infiltration to ground within areas demonstrated to have suitable infiltration potential.

Historical ground investigation and infiltration testing undertaken in 2014 identified variable infiltration characteristics across the site, with some locations exhibiting suitable infiltration performance within superficial deposits. The proposed drainage strategy has therefore been developed to utilise infiltration where feasible whilst recognising that infiltration suitability may vary across the site.

The permeable paving construction will provide both source control and attenuation storage within the underlying open graded sub base prior to infiltration to ground. This approach accords with the SuDS hierarchy and CIRIA C753 guidance by providing distributed surface water management close to source.

Further targeted infiltration testing will be undertaken during detailed design to confirm final infiltration rates, storage requirements and any localised areas requiring alternative drainage measures.

Where localised areas are identified during detailed design as being unsuitable for infiltration due to groundwater constraints, soil permeability or site specific constraints, supplementary attenuation and controlled discharge measures will be incorporated as required in accordance with the drainage hierarchy.

Building extensions and roof drainage

The building works comprise extensions to the existing school buildings and associated roof drainage.

The drainage strategy for the extension roof drainage has been developed with reference to the Ground Investigation Report provided in Appendix C. The investigation identified cohesive clay strata associated with the London Clay Formation beneath the superficial deposits, together with monitored groundwater levels between approximately 1.46 m and 1.60 m below ground level.

On this basis, infiltration is not considered suitable for the proposed extension roof drainage strategy.

Surface water runoff from the extension roof areas will therefore be attenuated on site and discharged at a controlled rate of 2.5 litres per second to the public surface water sewer, subject to agreement with Thames Water. Attenuation storage will be provided through below-ground cellular storage infrastructure and associated flow control devices as indicated on the proposed drainage drawings.

Surface water drainage will be designed to accommodate the 1 in 100 year rainfall event including a 45 percent allowance for climate change. Any existing surface water drainage infrastructure affected by the proposed works will be diverted or upgraded as necessary. A schedule of defects identified through CCTV survey will be addressed through remedial works where feasible.

All new drainage infrastructure will be designed in accordance with Building Regulations Approved Document H, Lead Local Flood Authority and Environment Agency guidance, CIRIA SuDS Manual C753, and Thames Water connection requirements.

The overall design intent is to deliver a robust and future resilient drainage system that integrates with existing infrastructure, manages surface water safely during extreme rainfall events, and minimises

long term maintenance liabilities. Further details of the proposed drainage arrangement, hydraulic calculations and supporting drainage drawings are provided in **Appendix E** and Section 5.5.

5.5 EXISTING AND PROPOSED RUNOFF VOLUMES AND FLOW RATES

The existing surface water drainage arrangement at the site comprises discharge to soakaway features and connection to the wider surface water drainage network.

The proposed drainage strategy seeks to manage surface water runoff in accordance with the drainage hierarchy, prioritising infiltration to ground where feasible and appropriate.

External works

Surface water runoff from the new hardstanding areas will be managed through permeable paving construction incorporating open graded crushed rock sub-base storage and infiltration to ground.

Historical infiltration testing undertaken in 2014 demonstrated that infiltration is feasible within parts of the site, although infiltration suitability is variable across the wider development area. The proposed drainage design has therefore been developed to utilise infiltration within areas identified as suitable for shallow infiltration techniques.

Hydraulic assessment will determine the required storage volume within the permeable pavement sub-base to accommodate the 1 in 100 year rainfall event including a 45 percent allowance for climate change. Final storage volumes and infiltration performance will be confirmed through detailed design and verification testing.

Where localised areas are identified as unsuitable for infiltration, supplementary attenuation and controlled discharge measures will be incorporated where necessary.

Building extensions and roof drainage

Surface water runoff from the new extension roof areas will be attenuated on site and discharged at a controlled rate of 2.5 litres per second to the public surface water sewer, subject to agreement with Thames Water.

Attenuation storage will be provided through below ground cellular storage infrastructure and associated flow control devices as indicated on the proposed drainage drawings in Appendix E.

Hydraulic modelling has been undertaken to determine the required attenuation storage volumes for the 1 in 100 year rainfall event including a 45 percent allowance for climate change.

Surface water drainage will be designed to ensure that post development runoff does not increase flood risk on site or elsewhere.

5.6 CLIMATE CHANGE ALLOWANCE AND RUNOFF VOLUMES

The climate change allowance and runoff assessment have been applied to the relevant external works and extension roof drainage catchments.

The drainage system has been designed to accommodate the one in one hundred year rainfall event plus the 45% climate change allowance, in accordance with current Environment Agency guidance and Lead Local Flood Authority requirements at the time of submission.

Rainfall inputs have been derived using FEH22 rainfall data, with the climate change allowance category selected to reflect the nature and lifetime of the proposed development.

Urban creep allowance has not been applied as the proposed development does not comprise residential curtilage areas. The site will remain under controlled operational management as an educational facility, and incremental increases in impermeable area are not anticipated.

The proposed drainage strategy has been supported by detailed drainage calculations, including assessment of critical storm duration and storage requirements. These calculations are provided in **Appendix E**.

5.7 EXCEEDANCE ROUTING

Exceedance refers to rainfall events that exceed the design standard of the drainage system, including events greater than the one in one hundred year rainfall event plus climate change, or scenarios where drainage components become blocked or fail.

Storm design exceedance has been considered as part of the drainage strategy to ensure that overland flows are managed safely and directed away from buildings and vulnerable areas.

The drainage strategy incorporates exceedance routing to ensure that overland flow paths are directed away from buildings and towards areas where water can be safely stored without causing damage or risk to people.

Exceedance routing across the site has been considered and is illustrated on the drawings provided in Appendix F.

The management of residual exceedance risk is addressed further in Section 7.

5.8 WATER QUALITY TREATMENT

Surface water runoff will be managed in accordance with the Sustainable Drainage Systems treatment train principles set out within CIRIA The SuDS Manual C753, ensuring that appropriate water quality treatment is provided prior to discharge.

The potential pollution risks associated with the proposed development have been assessed having regard to the anticipated land use and activities on site. In accordance with CIRIA guidance, pollution hazard indices have been assigned to relevant land uses and mitigation indices have been used to inform the level of treatment required.

C753 Part E Chapter 26 describes risks posed by surface water runoff to the receiving environment as a function of:

- Pollution hazard at a particular site (i.e. the pollution source).
- The effectiveness of SuDS treatment components in reducing levels of pollutants to environmentally acceptable levels.
- The sensitivity of the receiving environment.

The recommended approach for water quality risk management is set out in Table 26.1 of the SuDS Manual. In accordance with this guidance, the Simple Index Approach has been adopted for this site.

TABLE 26.1 Approaches to water quality risk management

Design method	Hazard characterisation	Risk reduction	
		For surface water	For groundwater
Simple index approach	Simple pollution hazard indices based on land use (eg **Table 26.2** or equivalent)	Simple SuDS hazard mitigation indices (eg **Table 26.3** or equivalent)	Simple SuDS hazard mitigation indices (eg **Table 26.4** or equivalent)
Risk screening[1]	Factors characterising traffic density and extent of infiltration likely to occur (eg **Table 26.5** or equivalent)	N/A	Factors characterising unsaturated soil depth and type, and predominant flow type through the soils (eg **Table 26.5** or equivalent)
Detailed risk assessment	Site specific information used to define likely pollutants and their significance	More detailed, component specific performance information used to demonstrate that the proposed SuDS components reduce the hazard to acceptable levels	
Process-based treatment modelling	Time series rainfall used with generic pollution characteristics to determine statistical distributions of likely concentrations and loadings in the runoff	Models that represent the treatment processes in the proposed SuDS components give estimates of reductions in event mean discharge concentrations and total annual load reductions delivered by the system	

Note

1 Risk assessment may be required as a result of the risk screening process.

Table 26.2 of the SuDS Manual provides pollution hazard indices for different land uses. For the proposed development at Ridgeway Primary School, the surface water drainage system will receive runoff from the following impermeable surfaces:

- Roofs - impermeable surface.
- Access Road and Parking - impermeable surface.

To deliver adequate treatment, the selected SuDS components should have a total pollution mitigation index for each contaminant type that equals or exceeds the pollution hazard index for each contaminant type. Therefore, the following will have to be achieved for the surface running off the site.

Total SuDS mitigation index >=pollution hazard index

Pollution Hazard Indices are given for different land uses in Table 26.2 of the SuDS manual.

TABLE 26.2 Pollution hazard indices for different land use classifications

Land use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydro-carbons
Residential roofs	Very low	0.2	0.2	0.05
Other roofs (typically commercial/ industrial roofs)	Low	0.3	0.2 (up to 0.8 where there is potential for metals to leach from the roof)	0.05
Individual property driveways, residential car parks, low traffic roads (eg cul de sacs, homezones and general access roads) and non-residential car parking with infrequent change (eg schools, offices) ie < 300 traffic movements/day	Low	0.5	0.4	0.4
Commercial yard and delivery areas, non-residential car parking with frequent change (eg hospitals, retail), all roads except low traffic roads and trunk roads/motorways[1]	Medium	0.7	0.6	0.7
Sites with heavy pollution (eg haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured; industrial sites; trunk roads and motorways[1]	High	0.8[2]	0.8[2]	0.9[2]

From Table 26.2 the following information is tabulated in Table 2.

Land Use	Destination of Runoff	Pollution Hazard Level	Total Suspended Solids	Metals	Hydrocarbons
Other Roofs	Groundwater	Low	0.3	0.2	0.05
Car park & playground	Groundwater	Low	0.5	0.4	0.4

TABLE 2: Pollution Hazard Index and Destination of Runoff for the Proposed Site

To deliver adequate water quality treatment, the selected SuDS components must provide a pollution mitigation index for each contaminant that equals or exceeds the corresponding pollution hazard index.

Mitigation indices for SuDS components discharging to groundwater are provided in Table 26.4 of the SuDS Manual. For Ridgeway Primary School, water quality treatment will be provided through a treatment train comprising permeable paving source control measures and attenuation components appropriate to the proposed drainage destinations.

TABLE 26.4 Indicative SuDS mitigation indices for discharges to groundwater

Characteristics of the material overlying the proposed infiltration surface, through which the runoff percolates[1]	TSS	Metals	Hydrocarbons
A layer of dense vegetation underlain by a soil with good contaminant attenuation potential[2] of at least 300 mm in depth[3]	0.6[4]	0.5	0.6
A soil with good contaminant attenuation potential[2] of at least 300 mm in depth[3]	0.4[4]	0.3	0.3
Infiltration trench (where a suitable depth of filtration material is included that provides treatment, ie graded gravel with sufficient smaller particles but not single size coarse aggregate such as 20 mm gravel) underlain by a soil with good contaminant attenuation potential[2] of at least 300 mm in depth[3]	0.4[4]	0.4	0.4
Constructed permeable pavement (where a suitable filtration layer is included that provides treatment, and including a geotextile at the base separating the foundation from the subgrade) underlain by a soil with good contaminant attenuation potential[2] of at least 300 mm in depth[3]	0.7	0.6	0.7
Bioretention underlain by a soil with good contaminant attenuation potential[2] of at least 300 mm in depth[3]	0.8[4]	0.8	0.8
Proprietary treatment systems[5, 6]	These must demonstrate that they can address each of the contaminant types to acceptable levels for inflow concentrations relevant to the contributing drainage area.		

SuDS mitigation indexes are tabulated in Table 3 as follows:

			Mitigation Indices			
Runoff Source	**Destination of Runoff**	**Mitigation Index Source**	**Type of SuDS Component**	**Total Suspended Solids (TSS)**	**Metals**	**Hydrocarbons**
Other Roofs	Groundwater	Table 26.4	Proprietary Treatment System	0.8	0.8	0.8
Car park & playground	Groundwater	Table 26.4	Permeable pavement	0.7	0.6	0.7

TABLE 3: SuDS Mitigation Index

The proposed drainage strategy provides sufficient treatment to meet or exceed the required mitigation indices for the site, demonstrating that surface water runoff will be appropriately treated prior to discharge.

The site is located outside a Groundwater Source Protection Zone.

Overall, the proposed combination of SuDS measures provides an appropriate level of water quality treatment for the site and accords with the principles set out within CIRIA C753.

The drainage strategy has also been developed having regard to the objectives of the Water Framework Directive, ensuring that surface water management does not result in deterioration of receiving water body status.

5.9 PROPOSED FOUL WATER DRAINAGE

Foul water generated by the proposed development will discharge to the public foul sewer operated by Thames Water, subject to agreement with the relevant sewerage undertaker.

The existing foul drainage system comprises gravity pipework conveying flows from the western part of the site to an on site foul water pumping station. From this location, flows are pumped eastwards via a rising main before discharging to a gravity manhole near the eastern boundary. From that point, foul flows leave the site by gravity and connect to the public foul sewer within Linden Road.

A smaller foul drainage catchment serving the north eastern part of the site discharges directly by gravity to the Thames Water foul sewer located within Willow Gardens.

The proposed foul water drainage arrangements for the refurbishment works and building extensions are set out below.

Refurbishment and external works

The reconfiguration works include new toilet facilities and the introduction of a new bin store.

New foul drainage connections will, where practicable, connect into existing on site foul drainage infrastructure. Where existing infrastructure cannot be utilised, new gravity drainage runs and inspection chambers will be installed and connected into the existing foul drainage network.

The works also include a small local pumped connection serving the proposed bin store, discharging to the existing foul drainage system at an appropriate downstream connection point.

The proposed works will continue to utilise the existing on site pumping station and established off site foul sewer connection points.

Building extensions

The building works comprise extensions to the existing school buildings.

Foul water generated by the proposed extensions will be conveyed via gravity drainage and connected into the existing on site foul drainage network upstream of the existing pumping station, unless detailed design identifies a more suitable connection point.

No new off site foul sewer connections are proposed as part of the development.

Capacity and Loading

The proposed development comprises a reconfiguration of the school accommodation, reducing the existing 630 place 3FE primary school to a 420 place 2FE primary school, together with the provision of an 82 place special educational needs primary school.

On this basis, the proposed development is not anticipated to result in a significant increase in foul water discharge when compared with the existing site operation.

The existing foul drainage infrastructure is therefore considered capable of accommodating the proposed development, subject to detailed design verification and agreement with Thames Water.

Any existing foul drainage infrastructure affected by the proposed building works will be diverted as necessary. A schedule of defects identified through CCTV survey will be addressed through remedial works.

The proposed foul water drainage strategy will not increase discharge rates to the receiving sewer network and is not anticipated to give rise to any increased flood risk on site or elsewhere.

Foul and surface water drainage systems will remain separate.

5.10 FUTURE MAINTENANCE

The proposed drainage system has been designed to facilitate safe operation inspection and maintenance in accordance with good practice and the principles set out within the National Sustainable Drainage Systems Standards.

The owner of the property will be responsible for the maintenance of the drainage system and a preliminary maintenance document for the system is within **Appendix G**.

It is the owner's responsibility to maintain the system to prevent the increase in the risk of flooding on and off site as a result of system failure.

6 MANAGING AND MITIGATING FLOOD RISK

This section describes the measures incorporated into the proposed development to manage and mitigate flood risk. The measures have been informed by the flood risk assessment presented in Section 3 and the drainage strategy set out in Section 5.

The approach reflects the principles of avoiding controlling mitigating and managing flood risk and ensures that the development will be safe for its lifetime and will not increase flood risk elsewhere.

6.1 SUDS HIERARCHY OF SYSTEMS AND JUSTIFICATION OF USAGE

The surface water drainage strategy has been developed in accordance with the principles set out within the National Planning Policy Framework and CIRIA The SuDS Manual C753, which promotes the management of surface water as close to source as possible and prioritises surface based and multi functional drainage systems over buried or piped solutions where reasonably practicable.

In accordance with CIRIA C753, the drainage strategy has considered the following hierarchy of SuDS approaches:

- source control measures to manage runoff at or close to its point of origin
- site control measures to manage runoff across the development site
- regional control measures where appropriate to manage runoff at a wider scale

The SuDS hierarchy has been applied to each element of the proposed works.

External works

The external works comprise new hardstanding areas with no additional building footprint.

Priority has been given to source control through infiltration-based measures. New hardstanding areas will incorporate permeable paving construction with underlying open graded crushed rock sub-base storage to provide both temporary attenuation storage and infiltration to ground.

Historical infiltration testing undertaken in 2014 identified that infiltration is feasible within parts of the site, although infiltration potential varies across the wider development area. The proposed drainage strategy has therefore been developed to utilise shallow infiltration techniques within areas identified as suitable for infiltration.

Where permeable surfacing is proposed, rainfall will infiltrate directly through the surface layer into the underlying sub base. The permeable pavement construction therefore provides both source control and distributed attenuation storage in accordance with the SuDS hierarchy.

Where localised areas are identified during detailed design as unsuitable for infiltration due to groundwater conditions, soil permeability or site specific constraints, supplementary attenuation and controlled discharge measures will be incorporated where necessary.

Building extensions and roof drainage

The building works comprise extensions to the existing school buildings and associated roof drainage.

The drainage strategy for the extension roof drainage has been developed with reference to the Ground Investigation Report provided in Appendix C. The investigation identified cohesive clay strata associated with the London Clay Formation together with shallow groundwater conditions across the site.

On this basis, infiltration is not considered suitable for the proposed extension roof drainage strategy.

Surface water runoff from new roof areas will therefore be attenuated on site and discharged at a controlled rate to the public surface water sewer. Attenuation storage will be provided through below ground cellular storage infrastructure and associated flow control devices as indicated on the proposed drainage drawings.

The selection of underground attenuation components reflects the operational constraints of the existing school site, available external space, safeguarding requirements and the identified ground conditions. Such systems are proposed only where higher order SuDS measures cannot be delivered effectively, in accordance with CIRIA C753 principles.

Overall, the proposed SuDS strategy represents the highest feasible application of the hierarchy for the proposed works and provides a sustainable and proportionate solution for the site.

6.2 FINISHED FLOOR LEVELS AND SITE LEVELS

Finished floor levels for the proposed development have been set with regard to the assessed flood risk at the site.

The application site lies entirely within Flood Zone 1 and is not affected by fluvial or tidal flood risk. Environment Agency Risk of Flooding from Surface Water mapping indicates that the site is at Very Low Risk of surface water flooding, with no significant ponding areas identified within the proposed development footprint.

In the absence of fluvial or tidal flood risk and given the Very Low classification for surface water flooding, no specific flood level constraint applies to the setting of finished floor levels.

Nevertheless, finished floor levels for the proposed extensions will be set above adjacent external ground levels and designed to provide positive drainage away from building perimeters. Threshold

levels will incorporate appropriate step ups or drainage detailing to prevent ingress of surface water during intense rainfall events.

Proposed site levels will ensure that surface water runoff is directed away from buildings and towards areas where water can be safely conveyed, infiltrated or stored during exceedance events. The site layout and drainage strategy have been developed to avoid creating localised low points adjacent to structures.

Given monitored groundwater levels at approximately 1.46 m to 1.60 m below ground level, no groundwater related constraints influence finished floor level design. No below ground accommodation is proposed.

Overall, the proposed finished floor and site levels are considered appropriate having regard to the assessed flood risk and will ensure the development remains safe over its lifetime.

6.3 FLOOD FLOW ROUTES AND CONVEYANCE

The site lies within Flood Zone 1 and is not affected by fluvial or tidal floodplain extents. As such, there are no mapped floodplain flow routes or conveyance corridors within the site that require safeguarding.

The site topography slopes generally from east towards the west, providing natural overland flow pathways across external areas. The proposed development layout maintains this general fall and does not introduce built form that would obstruct existing surface water flow paths.

In the event that the drainage system is exceeded during rainfall events greater than the design standard, surface water will follow topographic gradients across external hardstanding and landscaped areas. Site levels have been designed to direct exceedance flows away from building entrances and occupied spaces and towards areas where water can be safely conveyed or temporarily stored without risk to people or property.

The proposed infiltration and attenuation measures incorporated within the drainage strategy provide additional storage capacity, reducing the likelihood of uncontrolled overland flow. Where required, localised level design will ensure that any exceedance flows are routed away from sensitive receptors and do not increase flood risk to adjacent land.

As the site is not located within the functional floodplain and no floodplain storage is displaced, the proposed development will not obstruct flood conveyance or result in any increase in flood risk elsewhere.

6.4 RISK TO PEOPLE

The assessment confirms that flood risk to people associated with the proposed development is **low**.

The site lies within Flood Zone 1 and is not affected by fluvial or tidal flood risk. Environment Agency Risk of Flooding from Surface Water mapping indicates that the site is at Very Low Risk of surface water flooding, with no significant ponding areas identified within the proposed development footprint.

The primary potential flood mechanism is localised surface water runoff during intense rainfall events. Such events would be associated with shallow, temporary overland flow rather than deep or fast flowing floodwater.

No significant flood depths, velocities or hazard to people are anticipated at the site under design or extreme event scenarios. The drainage strategy incorporates infiltration and attenuation measures to manage runoff and reduce the likelihood of uncontrolled surface water accumulation.

The proposed development therefore does not introduce unacceptable risk to occupants, staff or visitors over its lifetime.

Safe access and egress arrangements are addressed further in Section 7.

6.5 RISK TO PROPERTY AND BUILDINGS

The proposed development incorporates measures to minimise the risk of damage to buildings during extreme rainfall events.

The site lies within Flood Zone 1 and is not affected by fluvial or tidal flood risk. Environment Agency mapping indicates a Very Low Risk of surface water flooding within the development footprint. As such, no specific flood resistance measures are required to address river or tidal flood risk.

Finished floor levels will be set above adjacent external ground levels and external levels will be designed to promote positive drainage away from building perimeters. The surface water drainage strategy incorporates infiltration and, where required, attenuation measures to manage runoff in accordance with current guidance.

No below ground accommodation is proposed and no structures are located within areas of predicted flood depth. Groundwater monitoring has confirmed that groundwater levels remain well below finished floor levels and do not present a constraint to building design.

Standard good practice construction detailing will be adopted, including appropriate service entry sealing and robust external drainage design, to minimise the potential for water ingress during extreme rainfall events.

On this basis, the risk of flood related damage to buildings is considered **low**.

6.6 RISK TO ESSENTIAL SERVICES

The location of essential services including electricity supply, telecommunications infrastructure and building services plant has been considered with regard to the assessed flood risk at the site.
The site lies within Flood Zone 1 and is not affected by fluvial or tidal flood risk. Environment Agency mapping indicates a Very Low Risk of surface water flooding within the development footprint. No areas of significant flood depth have been identified.

All essential services associated with the proposed extensions will be located at ground floor level or above and will be positioned above adjacent external ground levels. No critical plant or infrastructure is proposed below ground level.

The site layout avoids placing vulnerable infrastructure within areas susceptible to localised surface water ponding. The drainage strategy incorporates infiltration and, where required, attenuation measures to reduce the likelihood of uncontrolled surface water accumulation during extreme rainfall events.

Standard good practice design measures will be adopted to ensure that service entries and external connections are appropriately sealed and protected.

On this basis, the risk to essential services from flooding is considered **low**.

6.7 FLOODPLAIN STORAGE AND COMPENSATION

The application site lies entirely within Flood Zone 1 and is not located within the fluvial floodplain or the functional floodplain.

No fluvial flood storage areas are present within the site and the proposed development does not encroach into land identified as Flood Zone 2, Flood Zone 3a or Flood Zone 3b.

As the development is not located within the floodplain, there will be no loss of floodplain storage and no displacement of floodwater.

Floodplain storage compensation is therefore not required.

7 MANAGING RESIDUAL RISK AND EMERGENCY PLANNING

Residual flood risk refers to the risk that remains after all mitigation and management measures have been taken into account. This can arise from events that exceed the design standard, the failure or blockage of drainage infrastructure, or from very low probability events such as reservoir failure.

This section considers how residual flood risk has been managed and how the safety of occupants is ensured during extreme events.

7.1 SAFE ACCESS AND EGRESS

Safe access and egress to and from the site has been assessed with reference to the flood risk sources identified in Section 3.

The site lies entirely within Flood Zone 1 and is not affected by fluvial or tidal flood extents. There are no mapped flood zones affecting the site access points or surrounding highway network.

Environment Agency Risk of Flooding from Surface Water mapping indicates a Very Low Risk of surface water flooding across the site and along access routes. No significant flood depths or hazardous flow conditions are anticipated.

In the unlikely event of intense rainfall, any localised surface water ponding would be shallow and temporary in nature and would not pose a risk to life.

On this basis, safe access and egress arrangements are considered appropriate for the proposed development over its lifetime.

7.2 FLOOD WARNING AND RESPONSE

The site lies within Flood Zone 1 and is not located within an Environment Agency Flood Alert or Flood Warning area.

As the site is not at risk of fluvial or tidal flooding, no formal flood warning service applies.

The only credible flood mechanism is localised surface water runoff during intense rainfall. The proposed drainage and exceedance routing strategy has been designed to manage such events safely.

Emergency response would be managed through existing school safeguarding procedures and Reading Borough Council emergency planning arrangements.

7.3 EVACUATION AND EMERGENCY PLANNING

The site lies entirely within Flood Zone 1 and is not affected by fluvial or tidal flood risk. No Environment Agency Flood Warning or Flood Alert service applies to the site.

The only credible flood mechanism is localised surface water runoff during intense rainfall events. Such events are typically short duration and highly localised in nature.

In the unlikely event of extreme rainfall resulting in temporary surface water ponding, occupants would be able to evacuate the site using existing access routes. Emergency response would be supported by established school safeguarding procedures and Reading Borough Council emergency planning arrangements.

Having regard to the scale of the development and the low level of flood risk affecting the site, a site specific Flood Emergency Plan is not required.

7.4 RESIDUAL RISK MANAGEMENT

Residual flood risk relates to flooding that may occur as a result of events exceeding the design standard of the drainage system, blockage of drainage infrastructure or other unforeseen circumstances.

The primary flood mechanism at the site is localised surface water runoff during intense rainfall events. Residual risk has been managed through:

- setting finished floor levels above adjacent external ground levels
- positive site grading to direct runoff away from buildings
- incorporation of infiltration and, where required, attenuation measures within the drainage strategy
- provision of exceedance routing across external areas
- separation of foul and surface water systems

The site is located within Flood Zone 1 and is not affected by fluvial or tidal flood risk. No floodplain storage is displaced and no increase in runoff to third party land will occur.

Based on the assessment, residual flood risk does not pose a constraint to the proposed development and can be managed safely over the lifetime of the development.

7.5 BETTERMENT AND WIDER FLOOD RISK BENEFITS

The proposed development provides betterment in terms of surface water management when compared to existing conditions.

The existing drainage system relies in part on soakaway infrastructure of unconfirmed capacity and condition. The proposed development includes:

- targeted BRE 365 infiltration testing to confirm performance
- improved source control through open graded crushed rock sub base construction
- formalised exceedance routing design
- remediation of identified drainage defects
- separation and retention of dedicated foul and surface water systems

Where infiltration is demonstrated to be feasible, surface water will continue to be managed on site. Where controlled discharge is required, runoff rates will be restricted in accordance with the drainage hierarchy and Lead Local Flood Authority requirements.

These measures represent an improvement over existing drainage arrangements and contribute to maintaining or reducing flood risk both on site and within the surrounding area.

8 SUMMARY AND CONCLUSIONS

8.1 SUMMARY

This Flood Risk Assessment and Drainage Strategy has been prepared to support a planning application for new parking, landscaping, play equipment and boundary treatment at Ridgeway Primary School, Hillbrow, Reading, within the administrative area of Reading Borough Council. The wider project also includes refurbishment works and new extensions totalling approximately 365 square metres. The extensions do not form part of the planning application and are being considered separately through a Lawful Development Certificate; however, they have been considered within this assessment.

The assessment has considered the risk of flooding to the site from all relevant sources, including fluvial, tidal, surface water, sewer, groundwater, reservoir and other artificial sources, together with the potential effects of climate change over the lifetime of the development.

The key outcomes of the assessment are summarised below:

- The site is located within Flood Zone 1 and the proposed development is compatible with its Flood Zone location.
- Flood risk from rivers and the sea is assessed as low and does not pose a constraint to the proposed development.
- Surface water flooding represents a low source of flood risk and has been assessed using Environment Agency mapping and managed through the proposed drainage strategy.
- Flood risk from sewers, groundwater, reservoirs and other artificial sources is assessed as low.
- Residual flood risk associated with exceedance events and infrastructure failure has been considered and can be managed safely through the proposed design and mitigation measures.

The site is underlain by River Terrace Deposits overlying the London Clay Formation. Groundwater monitoring undertaken in 2025 recorded groundwater levels between approximately 1.46 metres and 1.60 metres below ground level. These findings have informed the drainage strategy and the consideration of infiltration based Sustainable Drainage Systems.

The proposed development comprises a reconfiguration of the existing 630 place three form entry primary school to a 420 place two form entry primary school, together with the provision of an 82 place special educational needs primary school. Overall pupil numbers and associated foul water demand are not anticipated to increase when compared to existing conditions.

The external works will prioritise source control through permeable paving construction with open graded crushed rock sub-base storage and infiltration to ground within areas demonstrated to have suitable infiltration potential. Historical infiltration testing undertaken in 2014 identified that infiltration is

feasible within parts of the site, although infiltration suitability varies across the wider development area.

For the building extensions and associated roof drainage, infiltration is not considered suitable due to the identified ground conditions and groundwater constraints. Surface water runoff from the new roof areas will therefore be attenuated on site and discharged at a controlled rate of 2.5 litres per second to the public surface water sewer, subject to agreement with Thames Water.

Surface water drainage will be designed to accommodate the 1 in 100 year rainfall event including a 45 percent allowance for climate change. Exceedance routing has been incorporated to ensure that flows during extreme rainfall events are directed safely away from buildings and towards appropriate areas of storage or conveyance.

The proposed foul water drainage strategy will utilise the existing on site foul drainage infrastructure, which conveys flows via gravity and a pumping station to the public foul sewer operated by Thames Water. No new off site foul sewer connections are proposed.

The proposed drainage strategy has been developed in accordance with national and local policy and follows the drainage hierarchy. The strategy ensures that surface water runoff is managed sustainably and that flood risk is not increased elsewhere.

On the basis of the assessment undertaken, the site is suitable for the proposed development from a flood risk and drainage perspective.

8.2 CONCLUSIONS

This Flood Risk Assessment and Drainage Strategy demonstrates that the proposed development can be delivered safely and sustainably from a flood risk and drainage perspective.

The assessment confirms that:

- the site is located entirely within Flood Zone 1 and is at low risk of flooding from rivers and the sea
- surface water flooding represents a low risk and is appropriately managed through the proposed drainage strategy
- flood risk from groundwater, sewers, reservoirs and other artificial sources is low
- flood risk to people, property and essential infrastructure has been appropriately assessed and managed
- the development will not increase flood risk elsewhere
- appropriate mitigation and management measures are incorporated within the design, including permeable paving source control measures, infiltration based drainage where feasible, attenuation storage systems, exceedance routing and sustainable drainage measures

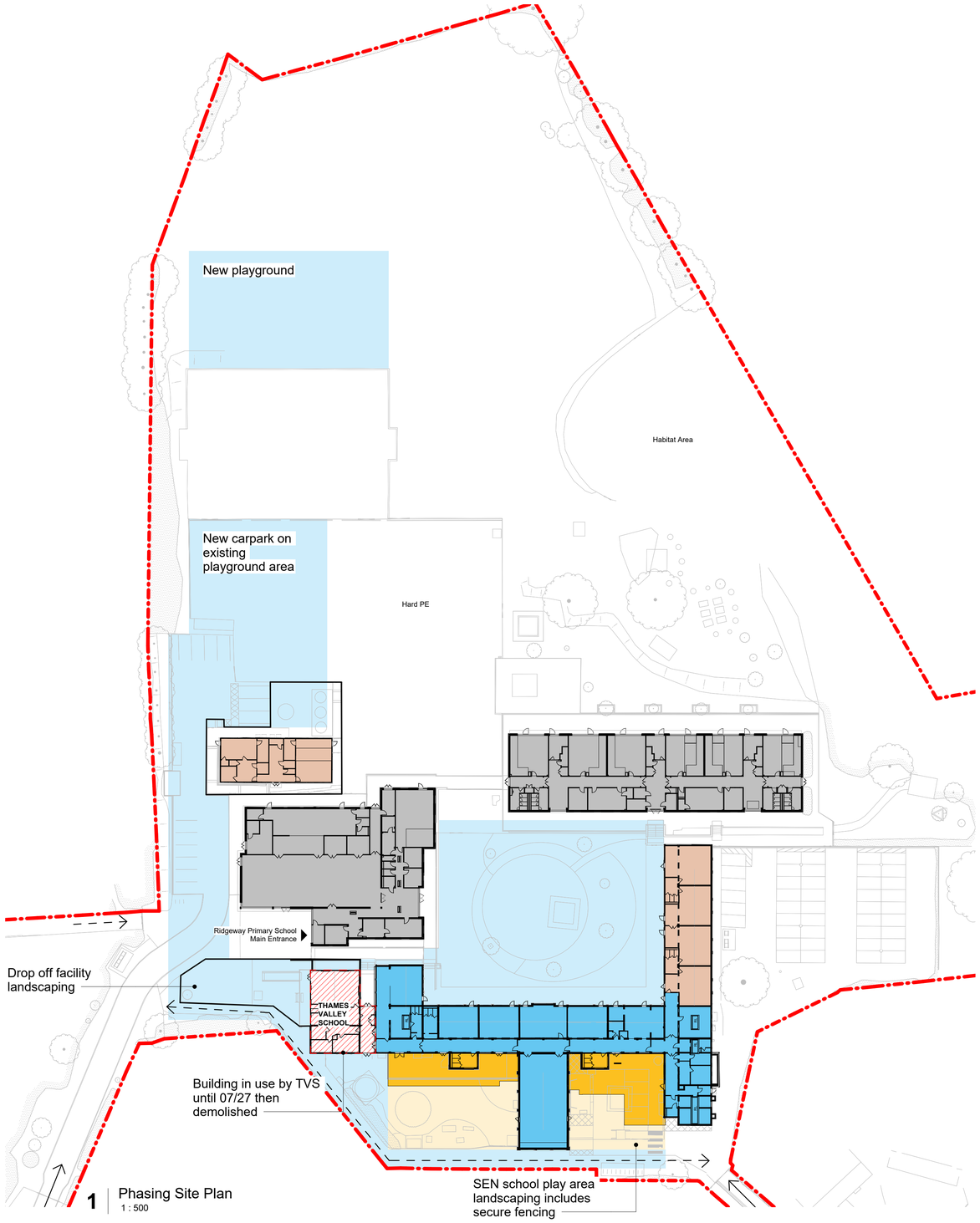
- where possible, the development provides betterment in terms of surface water management through improved source control, targeted use of infiltration techniques within suitable areas of the site, and remediation of existing drainage defects
- foul water demand is not anticipated to increase when compared to existing conditions

On this basis, it is concluded that the proposed development is acceptable from a flood risk and drainage perspective and complies with national, regional and local planning policy.

9 APPENDIX A

Site Plan

NOTE: ALL AREAS ARE APPROXIMATE FOR DIAGRAMMATIC PURPOSES ONLY



1 Phasing Site Plan
1 : 500

A1

SCALE
1:500

0 2 5 10 20 25m

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NOTES:

DO NOT SCALE. USE FIGURED DIMENSIONS ONLY.

All dimensions to be checked on site.
Drawing to be read in conjunction with all relevent Architectural, Interiors, Structural, M&E, Drainage/ Public Health, Landscape and Civils drawings and specifcations. Any discrepancies between consultant's drawings to be reported to the Architect before any work commences.
The Contractor's attention is drawn to the Health & Safety matters identified in the Health & Safety plan as being potentially hazardous.
These items should not be considered as a full and final list.

The Work Package Contractor's normal Health & Safety obligations still apply when undertaking constructional operations both on and off site.

Ayre Chamberlain Gaunt take no responsibility for the location of legal boundaries indicated on this drawing and advise a separate drawing to be completed by specialist surveyor in order to establish exact boundaries.
DWG files provided for information only. Refer to PDF record.

The copyright of this drawing is held by Ayre Chamberlain Gaunt Ltd. Not to be used for any purpose without consent.

KEY:

- Indicative Site Boundary
- Demolition in July 2027
- Externals to suit Phase 1A
- Externals to suit Phase 1B
- Phase 1A Refurbishment (Possession Spring 2027 - Handover August 2027)
- Phase 1B Extensions (Possession Spring 2027 - Handover December 2027)
- Phase 1C Refurbishment (Possession July 2027 - Handover August 2027)
- Outside of the scope of works

PROGRAMME:
ON SITE SPRING 2027
COMPLETE 12/2027

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AYRE CHAMBERLAIN GAUNT

PROJECT
Reading SEN Schools
The Ridgeway Primary School - Hillbrow, Reading, RG2 8JD

DRAWING TITLE
Proposed Phasing Site Plan

REV.	DATE	DESCRIPTION
P2	14.08.26	Revised Stage 3+ Issue
P1	17.07.26	Stage 3+ Issue for Costing

DRWN	CHKD BY	APPD BY
AKG	GP	TH

DRAWING NO.
project code - originator - volume - level - type - role - number
RDW-ACG-XX-00-DR-A-1053

STAGE	SUITABILITY	
RIBA stage	code	description
3+	S4	SUITABLE FOR STAGE APPROVAL

2 Proposed Basement Plan
1 : 200



1 Proposed Ground Floor Plan
1 : 200

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Ayre Chamberlain Gaunt

A1

SCALE
1 : 200
0 1 2 5 10m

NOTES:

DO NOT SCALE. USE FIGURED DIMENSIONS ONLY.

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KEY:

- Existing
- Proposed
- Main Entrance

NOTES:

Works relate to Buildings A & D only. The buildings referred to as Buildings B & C are out of scope.

Refer to the Landscape Architect's Information for proposed external works.

Refer to the Structural Engineer's Information for structural and civils proposals.

Refer to the MEP Consultant's Information for mechanical and electrical proposals.

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AYRE CHAMBERLAIN GAUNT

PROJECT
Reading SEN Schools
The Ridgeway Primary School - Hillbrow, Reading, RG2 8JD

DRAWING TITLE
Proposed Ground Floor Plan

REV.	DATE	DESCRIPTION
P16	14.08.26	Revised Stage 3+ Issue
P15	17.07.26	Stage 3+ Issue for Costing
P14	16.07.26	Issued for Coordination
P13	13.07.26	Issued for Coordination
P12	10.07.26	Issued for Coordination
P11	26.06.26	Issued for Coordination
P10	12.06.26	Issued for Coordination
P9	11.06.26	Issued for Coordination
P8	14.04.26	RIBA Stage 3 Issue
P7	08.04.26	Issued for Coordination
P6	31.03.26	Issued for Coordination
P5	25.03.26	Issued for Coordination
P4	11.03.26	Issued for Coordination

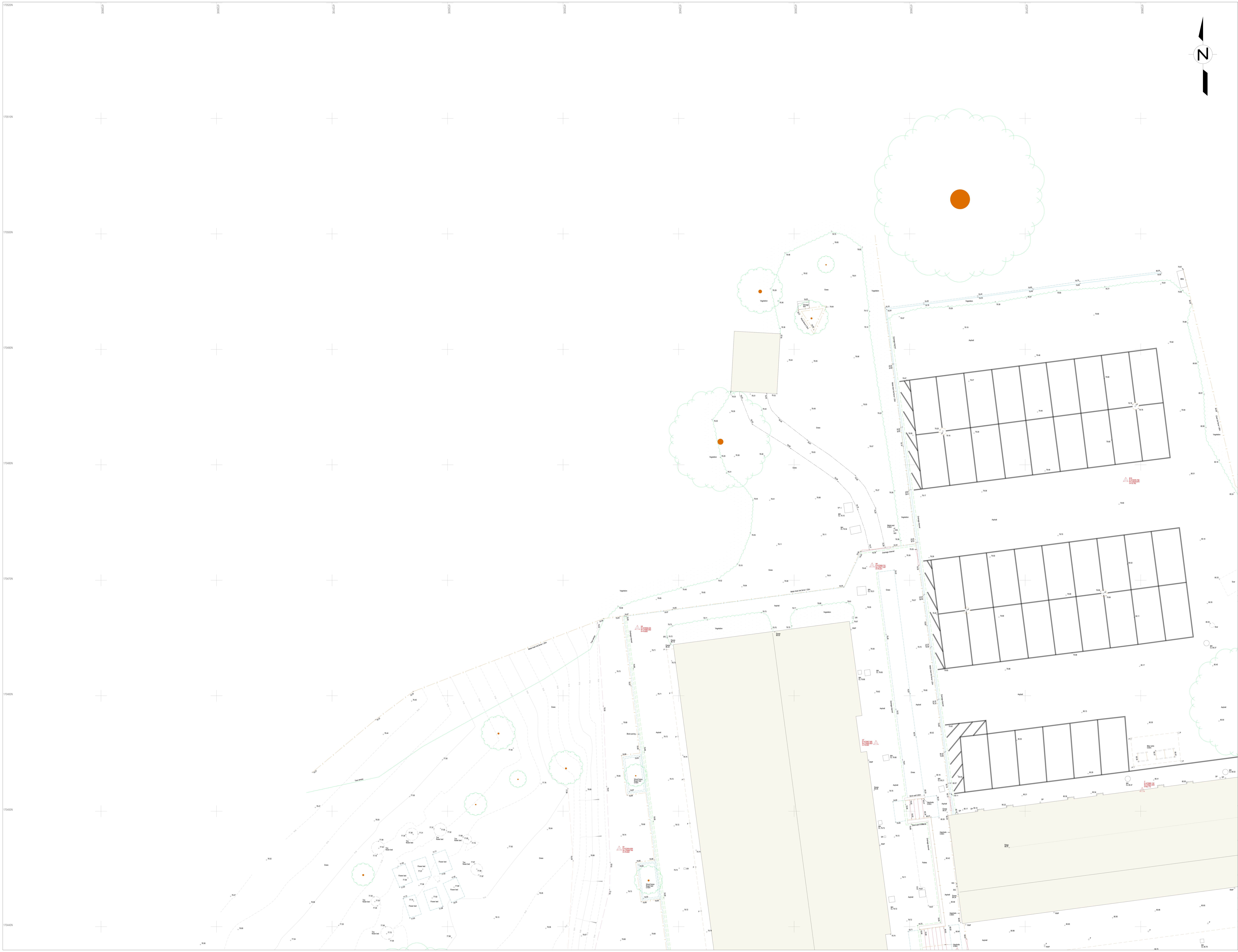
DRWN BY	CHKD BY	APPD BY
AKG	GP	TH

DRAWING NO.
project code - originator - volume - level - type - role - number
RDW-ACG-ZZ-00-DR-A-2205

STAGE	SUITABILITY	
RIBA stage	code	description
3+	S4	SUITABLE FOR STAGE APPROVAL

10 APPENDIX B

Topographic Survey by SUMO Services Ltd Land Surveys



UTILITY LEGEND

BT	British Telecom	G	Gas Pipe
CATV	Cable Television	GPR	Unknown GPR Target
CCTV	Closed Circuit Television	GPR	Possible Service (PAS only)
C	Unidentified Telecoms	HP	Heating Pipes
DR	Unidentified Drainage	HV	High Voltage Cable
CW	Combined Water	MS	Multiple Service Route
FW	Foul Water	O	Oil Pipeline
SW	Storm Water	SL	Street Lighting
ER	Earth	TC	Traffic Controls
E	Electric Cable	U	Unknown Service
ED	Empty Duct	UC	Unknown Cable
FO	Fibre Optic	UP	Unknown Pipeline
FM	Fire Hydrant Main	W	Water Main
FUEL	Fuel Pipeline		

Assumed Route Service highlighted yellow (Example BT) — BT

AREA	Contracted Survey Area	UTS	Unable to Survey
AREA	Previous Survey Area	UTT	Unable to Trace (Service)
AREA	GPR Data Collection Area	UVI	Unable to Visually Inspect (Within Cover)
(0.60d)	Depth to Top of Service	WL	Water Level (Within Cover)
(~0.60d)	Approximate Depth to Top of Service	B	Unable to Trace (Due to Blockage)
(NDA)	No Depth Attainable	F	Unable to Trace Further
IL 10.00	Invert Level (Drainage)	E	End of Trace
PE	Polyethylene Pipe Material	U	Unable to Trace
UTL	Unable to Lift (Cover)	C	Unable to Trace (Capped Port)

Anomalous Ground — Unable to Survey

PAS128 SURVEYS

(0.65d B2P) 0.65d = Depth in metres, B2 = Quality Level, P = Post processed GPR

Key to Quality Levels

Quality Level	Definition
D	Undefined (Stats, desktop records search)
B4	Suspected to exist, not detected by GPR or EML
B3	Horizontal position located by one technique only
B2	Horizontal and vertical position located by one technique only
B1	Horizontal and vertical position located by multiple techniques
A	Horizontal and vertical position verified visually of the service

ABBREVIATIONS

ACU	Air Conditioning Unit	FL	Flood Light	SIG	Service in Ground
BB	Belisha Beacon	GV	Gas Valve	SP	Sign Post
B	Bollard	GU	Gully	SC	Stop Cock
BH	Borehole	IC	Inspection Chamber	SV	Sluice Valve
CAB	Cabinet	LB	Lighting Bollard	TP	Telegraph Pole
CL	Cover Level	LP	Lamp Post	TL	Traffic Light
CPS	Concrete Paving Slabs	LIG	Light in Ground	TM	Ticket Machine
CTV	Cable Television	MH	Manhole Cover	VP	Vent Pipe
EVCP	Charging Point	MKR	Marker Post	UV	Unknown Valve
DP	Down Pipe	PB	Post Box	WP	Waste Pipe
EP	Electric Pole	PM	Phone Mast	WM	Water Meter
ER	Earth Rod	P	Post	WV	Water Valve
FFL	Finished Floor Level	RE	Rodding Eye		
FP	Feeder Pillar	RS	Road Sign		
FH	Fire Hydrant	RWP	Rain Water Pipe		

TOPOGRAPHIC LEGEND

Building	Embankment Slope (Bottom / Top)
Bank Bottom	Fence
Bank Top	Heras Fence (/HF/)
Canopy	Kerb Channel
Concrete	Kerb Top
Cover with Chamber Extents	Levels (+ 10.00)
Crash Barrier	Overhead Service
Drainage Channel	Tree
Drop Kerb	Wall
Edge Detail	

GENERAL NOTES

Irrespective of the information provided by a utility survey and statutory plans, excavation work should be undertaken with extreme caution and in accordance with HSE Guidelines - HSG47 Avoiding Danger from Underground Services

Utilities may continue outside of the survey area. Any paint marks outside of the area are for investigative purposes only and may not represent the full extent of the sub-surface utilities.

Where logic indicates a utility exists but which cannot be positively confirmed with the technology, an assumed route (ASR) is recorded. All assumed service routes (ASR) have been highlighted with a background yellow colour for visual enhancement.

GPR is utilised across the site in all accessible areas where ground conditions, obstructions allow. Areas of dense vegetation, unclear areas, marsh land, steep banks etc. will not be covered by GPR.

Vertical & Horizontal Position - Vertical position (depth) is indicative to the top of the utility/feature and should not be taken as exact, as this could be the surround to the service rather than the service itself. Where depth information from the technology is unclear, depth is not shown.

Warranty

This drawing does not provide an absolute representation of the sub-surface. Utilities have been detected using non-invasive technologies only and the performance can be adversely affected by ground, weather and site conditions outside of SUMO's control, therefore, some utilities may be undetectable. While SUMO uses reasonable endeavours to detect all utilities, it does not warrant that 100% detection will be achieved and that approximate depth penetration of the technologies SUMO uses will not be greater than two metres.

Sheet Layout

	Sheet 01	Sheet 02
Sheet 03	Sheet 04	Sheet 05
Sheet 06	Sheet 07	Sheet 08

Rev	Notes	Drawn	Date

Notes: Survey is referenced to OS Grid and Level Datum.

Building lines are from total station data, updated lines will be added when scan data completed.

SUMO Services Ltd
8 Hayward Business Centre
New Lane
Havant
Hampshire
PO9 2NL

TEL:0845 456 1104

www.sumoservices.com

Title: Topographic Survey

Client: Ayre Chamberlain Gaunt

Project: Ridgeway Primary School, Hillbrow, Reading

Date:	10/05/25	Postcode:	RG2 8JD
Surveyed:	PC, DW, PS, CE, HL	Scale:	1:100 (A0 Sheet)
Drawn:	LC		
Checked:	PC, DW, PS, CE, HL		
Job No: SUMO-20918		Sheet: 01	Rev:



UTILITY LEGEND

Code	Service	Code	Service
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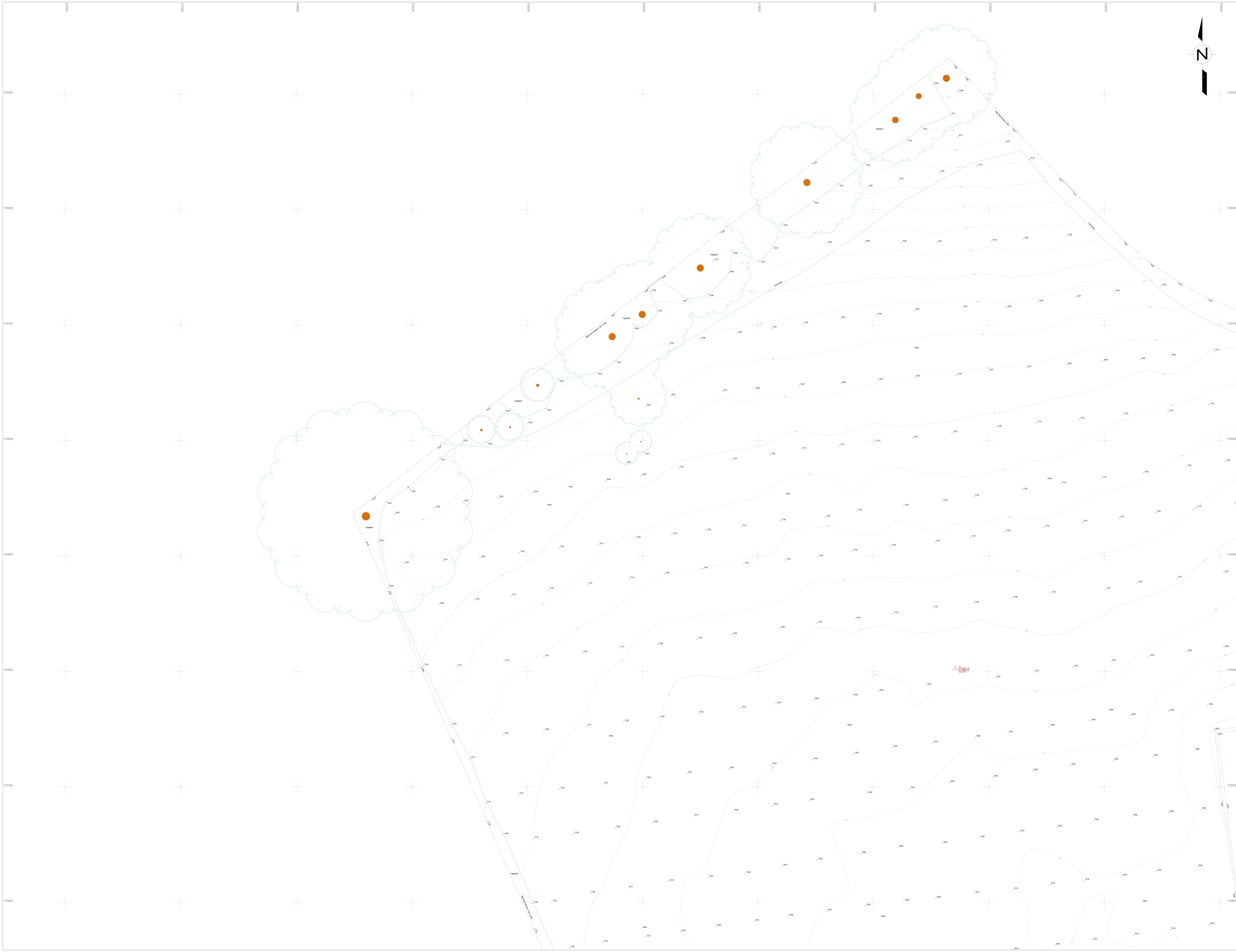
www.sumoservices.com

Title: Topographic Survey

Client: Ayre Chamberlain Gaunt

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Job No: SUMO-20918		Sheet: 02	Rev:



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CCTV	Closed Circuit Television	GPR	Possible Service (PAS only)
C	Unidentified Telecoms	HP	Heating Pipes
DR	Unidentified Drainage	HV	High Voltage Cable
CW	Combined Water	MS	Multiple Service Route
FW	Foul Water	O	Oil Pipeline
SW	Storm Water	SL	Street Lighting
ER	Earth	TC	Traffic Controls
E	Electric Cable	U	Unknown Service
ED	Empty Duct	UC	Unknown Cable
FO	Fibre Optic	UP	Unknown Pipeline
FM	Fire Hydrant Main	W	Water Main
FUEL	Fuel Pipeline		

Assumed Route Service highlighted yellow (Example BT) — BT

AREA	Contracted Survey Area	UTS	Unable to Survey
AREA	Previous Survey Area	UTT	Unable to Trace (Service)
AREA	GPR Data Collection Area	UVI	Unable to Visually Inspect (Within Cover)
(0.60d)	Depth to Top of Service	WL	Water Level (Within Cover)
(~0.60d)	Approximate Depth to Top of Service	B	Unable to Trace (Due to Blockage)
(NDA)	No Depth Attainable	F	Unable to Trace Further
IL 10.00	Invert Level (Drainage)	E	End of Trace
PE	Polyethylene Pipe Material	U	Unable to Trace
UTL	Unable to Lift (Cover)	C	Unable to Trace (Capped Port)

Anomalous Ground — Unable to Survey

PAS128 SURVEYS

(0.65d B2P) 0.65d = Depth in metres, B2 = Quality Level, P = Post processed GPR

Key to Quality Levels	
Quality Level	Definition
D	Undefined (Stats, desktop records search)
B4	Suspected to exist, not detected by GPR or EML
B3	Horizontal position located by one technique only
B2	Horizontal and vertical position located by one technique only
B1	Horizontal and vertical position located by multiple techniques
A	Horizontal and vertical position verified visually of the service

ABBREVIATIONS

ACU	Air Conditioning Unit	FL	Flood Light	SIG	Service in Ground
BB	Belisha Beacon	GV	Gas Valve	SP	Sign Post
B	Bollard	GU	Gully	SC	Stop Cock
BH	Borehole	IC	Inspection Chamber	SV	Sluice Valve
CAB	Cabinet	LB	Lighting Bollard	TP	Telegraph Pole
CL	Cover Level	LP	Lamp Post	TL	Traffic Light
CPS	Concrete Paving Slabs	LIG	Light in Ground	TM	Ticket Machine
CTV	Cable Television	MH	Manhole Cover	VP	Vent Pipe
EVCP	Charging Point	MKR	Marker Post	UV	Unknown Valve
DP	Down Pipe	PB	Post Box	WP	Waste Pipe
EP	Electric Pole	PM	Phone Mast	WM	Water Meter
ER	Earth Rod	P	Post	WV	Water Valve
FFL	Finished Floor Level	RE	Rodding Eye		
FP	Feeder Pillar	RS	Road Sign		
FH	Fire Hydrant	RWP	Rain Water Pipe		

TOPOGRAPHIC LEGEND

Building	Embankment Slope (Bottom / Top)
Bank Bottom	Fence
Bank Top	Heras Fence (/HF/)
Canopy	Kerb Channel
Concrete	Kerb Top
Cover with Chamber Extents	Levels (+ 10.00)
Crash Barrier	Overhead Service
Drainage Channel	Tree
Drop Kerb	Wall
Edge Detail	

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Sheet 03	Sheet 04	Sheet 05
Sheet 06	Sheet 07	Sheet 08

Rev	Notes	Drawn	Date

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TEL:0845 456 1104

www.sumoservices.com

Title: Topographic Survey

Client: Ayre Chamberlain Gaunt

Project: Ridgeway Primary School, Hillbrow, Reading

Date:	10/05/25	Postcode:	RG2 8JD
Surveyed:	PC, DW, PS, CE, HL	Scale:	1:100 (A0 Sheet)
Drawn:	LC		
Checked:	PC, DW, PS, CE, HL		
Job No: SUMO-20918		Sheet: 03	Rev:



UTILITY LEGEND

Code	Service	Code	Service
BT	British Telecom	G	Gas Pipe
CATV	Cable Television	GPR	Unknown GPR Target
CCTV	Closed Circuit Television	GPR	Possible Service (PAS only)
C	Unidentified Telecoms	HP	Heating Pipes
DR	Unidentified Drainage	HV	High Voltage Cable
CW	Combined Water	MS	Multiple Service Route
FW	Foul Water	O	Oil Pipeline
SW	Storm Water	SL	Street Lighting
ER	Earth	TC	Traffic Controls
E	Electric Cable	U	Unknown Service
ED	Empty Duct	UC	Unknown Cable
FO	Fibre Optic	UP	Unknown Pipeline
FM	Fire Hydrant Main	W	Water Main
FUEL	Fuel Pipeline		

Assumed Route Service highlighted yellow (Example BT) — BT

AREA	Contracted Survey Area	UTS	Unable to Survey
AREA	Previous Survey Area	UTT	Unable to Trace (Service)
AREA	GPR Data Collection Area	UVI	Unable to Visually Inspect (Within Cover)
(0.60d)	Depth to Top of Service	WL	Water Level (Within Cover)
(~0.60d)	Approximate Depth to Top of Service	B	Unable to Trace (Due to Blockage)
(NDA)	No Depth Attainable	F	Unable to Trace Further
IL 10.00	Invert Level (Drainage)	E	End of Trace
PE	Polyethylene Pipe Material	U	Unable to Trace
UTL	Unable to Lift (Cover)	C	Unable to Trace (Capped Port)

Anomalous Ground — Unable to Survey

PAS128 SURVEYS

(0.65d B2P) 0.65d = Depth in metres, B2 = Quality Level, P = Post processed GPR

Key to Quality Levels	
Quality Level	Definition
D	Undefined (Stats, desktop records search)
B4	Suspected to exist, not detected by GPR or EML
B3	Horizontal position located by one technique only
B2	Horizontal and vertical position located by one technique only
B1	Horizontal and vertical position located by multiple techniques
A	Horizontal and vertical position verified visually of the service

ABBREVIATIONS

ACU	Air Conditioning Unit	FL	Flood Light	SIG	Service in Ground
BB	Belisha Beacon	GV	Gas Valve	SP	Sign Post
B	Bollard	GU	Gully	SC	Stop Cock
BH	Borehole	IC	Inspection Chamber	SV	Sluice Valve
CAB	Cabinet	LB	Lighting Bollard	TP	Telegraph Pole
CL	Cover Level	LP	Lamp Post	TL	Traffic Light
CPS	Concrete Paving Slabs	LIG	Light in Ground	TM	Ticket Machine
CTV	Cable Television	MH	Manhole Cover	VP	Vent Pipe
EVCP	Charging Point	MKR	Marker Post	UV	Unknown Valve
DP	Down Pipe	PB	Post Box	WP	Waste Pipe
EP	Electric Pole	PM	Phone Mast	WM	Water Meter
ER	Earth Rod	P	Post	WV	Water Valve
FFL	Finished Floor Level	RE	Rodding Eye		
FP	Feeder Pillar	RS	Road Sign		
FH	Fire Hydrant	RWP	Rain Water Pipe		

TOPOGRAPHIC LEGEND

Building, Bank Bottom, Bank Top, Canopy, Concrete, Cover with Chamber Extents, Crash Barrier, Drainage Channel, Drop Kerb, Edge Detail, Embankment Slope (Bottom / Top), Fence, Heras Fence (/HF/), Kerb Channel, Kerb Top, Levels (+ 10.00), Overhead Service, Tree, Wall

GENERAL NOTES

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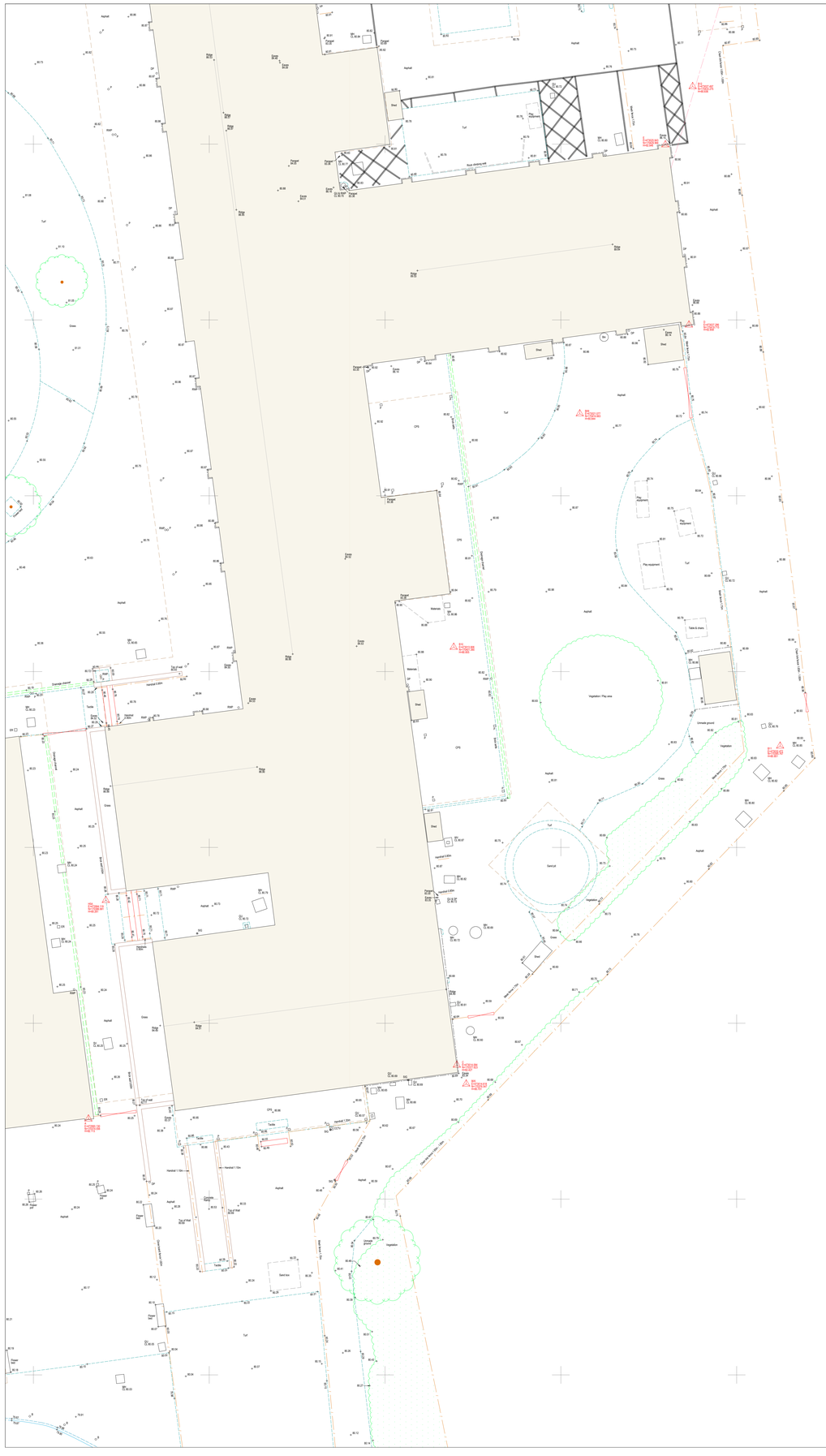
www.sumoservices.com

Title: Topographic Survey

Client: Ayre Chamberlain Gaunt

Project: Ridgeway Primary School, Hillbrow, Reading

Date:	10/05/25	Postcode:	RG2 8JD
Surveyed:	PC, DW, PS, CE, HL	Scale: 1:100 (A0 Sheet)	
Drawn:	LC		
Checked:	PC, DW, PS, CE, HL		
Job No: SUMO-20918		Sheet: 04	Rev:



UTILITY LEGEND

BT	British Telecom	GP	Gas Pipe
CATV	Cable Television	UKPG	Unknown GPR Target
CCTV	Closed Circuit Television	GPR	Possible Service (PAS only)
UD	Unidentified Duct	HP	High Pressure Gas
OS	Unclassified Drainage	HV	Heritage Cable
CW	Combined Water	MS	Multiple Service Route
FW	Foul Water	OL	Oil Pipeline
SW	Storm Water	SL	Street Lighting
E	Earth	TC	Traffic Controls
E	Electric Cable	U	Unknown Service
ED	Empty Duct	UC	Unknown Cable
FO	Fibre Optic	UP	Unknown Pipeline
FM	Fire Hydrant Main	W	Water Main
FUEL	Fuel Pipeline		

Assumed Route Service highlighted yellow (Example BT)

AREA	Contracted Survey Area	UTS	Unable to Survey
AREA	Previous Survey Area	UTT	Unable to Trace (Service)
AREA	GPR Data Collection Area	UVT	Unable to Visually Inspect (Within Cover)
(0.60)	Depth to Top of Service	WL	Water Level (Within Cover)
(+0.60)	Approximate Depth to Top of Service	UD	Unable to Trace (Due to Blockage)
(NDA)	No Depth Attainable	UL	Unable to Trace Further
4.70.00	Invert Level (Drainage)	EoT	End of Trace
PE	Polyethylene Pipe Material	UTC	Unable to Trace
UTL	Unable to Lift (Cover)	TCP	Unable to Trace (Capped Port)

Anomalous Ground

Unable to Survey

PAS128 SURVEYS

(0.60d BZP) 0.60d = Depth in metres, BZ = Quality Level, P = Post processed GPR

Key to Quality Levels
Quality Level / Definition
D — Undefined (Safe, desktop records search)
B4 — Suspected to exist, not detected by GPR or EML
B3 — Horizontal position located by one technique only
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ABBREVIATIONS

ACU	Air Conditioning Unit	FL	Fixed Light	SIG	Service in Ground
BB	Bolsha Beacon	GV	Gas Valve	SP	Sign Post
B	Bollard	GU	Gully	SC	Stop Cock
BH	Borehole	IC	Inspection Chamber	SV	Stuice Valve
CAB	Cabinet	LB	Lighting Bollard	TP	Telegraph Pole
CL	Cover Level	LP	Lamp Post	TL	Traffic Light
CPS	Concrete Paving Slabs	LIG	Light in Ground	TM	Ticket Machine
CTV	Cable Television	MH	Manhole Cover	VP	Vent Pipe
EVCP	Charging Point	MKR	Marker Post	UV	Unknown Valve
DP	Down Pipe	PB	Post Box	WP	Waste Pipe
EP	Electric Pole	PM	Phone Mast	WM	Water Meter
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FFL	Finished Floor Level	RE	Rodding Eye		
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FH	Fire Hydrant	RWP	Rain Water Pipe		

TOPOGRAPHIC LEGEND

Building	Embankment Slope		
Bank Bottom	Fence		
Bank Top	Heras Fence		
Canopy	Kerb Channel		
Concrete	Kerb Top		
Cover with Chamber Extents	Levels	+ 10.00	
Crash Barrier	Overhead Service		
Drainage Channel	Tree		
Drop Kerb	Wall		
Edge Detail			

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Title:

Topographic Survey

Client:

Ayre Chamberlain Gaunt

Project:

Ridgeway Primary School, Hillbrow, Reading

Date:	10/05/25	Postcode:	RG2 8JD
Surveyed:	PC, DW, PS, CE, HL	Scale:	1:100 (A0 Sheet)
Drawn:	LC		
Checked:	PC, DW, PS, CE, HL		
Job No: SUMO-20918		Sheet: 05	Rev:



UTILITY LEGEND

BT	British Telecom	G	Gas Pipe
CATV	Cable Television	GPR	Unknown GPR Target
CCTV	Closed Circuit Television	GPR	Possible Service (PAS only)
C	Unidentified Telecoms	HP	Heating Pipes
DR	Unidentified Drainage	HV	High Voltage Cable
CW	Combined Water	MS	Multiple Service Route
FW	Foul Water	O	Oil Pipeline
SW	Storm Water	SL	Street Lighting
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FO	Fibre Optic	UP	Unknown Pipeline
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Assumed Route Service highlighted yellow (Example BT) BT

AREA	Contracted Survey Area	UTS	Unable to Survey
AREA	Previous Survey Area	UTT	Unable to Trace (Service)
AREA	GPR Data Collection Area	UVI	Unable to Visually Inspect (Within Cover)
(0.60d)	Depth to Top of Service	WL	Water Level (Within Cover)
(~0.60d)	Approximate Depth to Top of Service	B	Unable to Trace (Due to Blockage)
(NDA)	No Depth Attainable	F	Unable to Trace Further
IL 10.00	Invert Level (Drainage)	E	End of Trace
PE	Polyethylene Pipe Material	U	Unable to Trace
UTL	Unable to Lift (Cover)	C	Unable to Trace (Capped Port)

Anomalous Ground — Unable to Survey

PAS128 SURVEYS

(0.65d B2P) 0.65d = Depth in metres, B2 = Quality Level, P = Post processed GPR

Key to Quality Levels	
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D	Undefined (Stats, desktop records search)
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ABBREVIATIONS

ACU	Air Conditioning Unit	FL	Flood Light	SIG	Service in Ground
BB	Belisha Beacon	GV	Gas Valve	SP	Sign Post
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FFL	Finished Floor Level	RE	Rodding Eye		
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TOPOGRAPHIC LEGEND

Building	Embankment Slope
Bank Bottom	Fence
Bank Top	Heras Fence
Canopy	Kerb Channel
Concrete	Kerb Top
Cover with Chamber Extents	Levels 10.00
Crash Barrier	Overhead Service
Drainage Channel	Tree
Drop Kerb	Wall
Edge Detail	

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Title: Topographic Survey

Client: Ayre Chamberlain Gaunt

Project: Ridgeway Primary School, Hillbrow, Reading

Date:	10/05/25	Postcode:	RG2 8JD
Surveyed:	PC, DW, PS, CE, HL	Scale: 1:100 (A0 Sheet)	
Drawn:	LC		
Checked:	PC, DW, PS, CE, HL		
Job No: SUMO-20918		Sheet: 06	Rev:



UTILITY LEGEND

BT	British Telecom	G	Gas Pipe
CATV	Cable Television	GPR	Unknown GPR Target
CCTV	Closed Circuit Television	GPR	Possible Service (PAS only)
C	Unidentified Telecoms	HP	Heating Pipes
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Assumed Route Service highlighted yellow (Example BT) — BT

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IL 10.00	Invert Level (Drainage)	E	End of Trace
PE	Polyethylene Pipe Material	U	Unable to Trace
UTL	Unable to Lift (Cover)	C	Unable to Trace (Capped Port)

Anomalous Ground — Unable to Survey

PAS128 SURVEYS

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Bank Bottom	Fence
Bank Top	Heras Fence
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Cover with Chamber Extents	Levels (+ 10.00)
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Title:

Topographic Survey

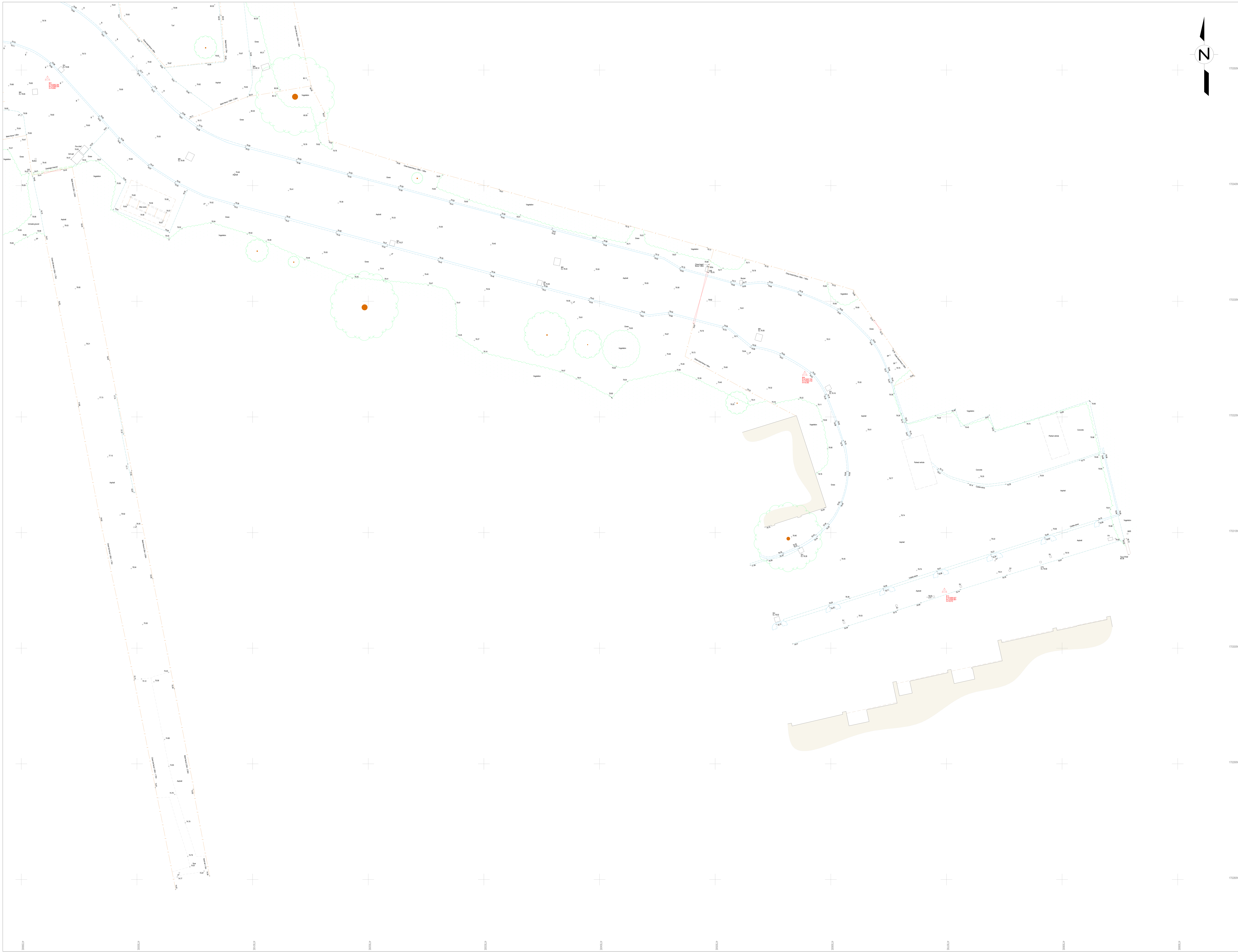
Client:

Ayre Chamberlain Gaunt

Project:

Ridgeway Primary School, Hillbrow, Reading

Date:	10/05/25	Postcode:	RG2 8JD
Surveyed:	PC, DW, PS, CE, HL	Scale: 1:100 (A0 Sheet)	
Drawn:	LC		
Checked:	PC, DW, PS, CE, HL		
Job No: SUMO-20918		Sheet: 07	Rev:



UTILITY LEGEND

BT	British Telecom	G	Gas Pipe
CATV	Cable Television	GPR	Unknown GPR Target
CCTV	Closed Circuit Television	GPR	Possible Service (PAS only)
C	Unidentified Telecoms	HP	Heating Pipes
DR	Unidentified Drainage	HV	High Voltage Cable
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Assumed Route Service highlighted yellow (Example BT)		BT	

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AREA	Previous Survey Area	UTT	Unable to Trace (Service)
AREA	GPR Data Collection Area	UVI	Unable to Visually Inspect (Within Cover)
(0.60d)	Depth to Top of Service	WL	Water Level (Within Cover)
(~0.60d)	Approximate Depth to Top of Service	B	Unable to Trace (Due to Blockage)
(NDA)	No Depth Attainable	F	Unable to Trace Further
IL 10.00	Invert Level (Drainage)	E	End of Trace
PE	Polyethylene Pipe Material	U	Unable to Trace
UTL	Unable to Lift (Cover)	C	Unable to Trace (Capped Port)

Anomalous Ground — Unable to Survey

PAS128 SURVEYS

(0.65d B2P) 0.65d = Depth in metres, B2 = Quality Level, P = Post processed GPR

Key to Quality Levels	
Quality Level	Definition
D	Undefined (Stats, desktop records search)
B4	Suspected to exist, not detected by GPR or EML
B3	Horizontal position located by one technique only
B2	Horizontal and vertical position located by one technique only
B1	Horizontal and vertical position located by multiple techniques
A	Horizontal and vertical position verified visually of the service

ABBREVIATIONS

ACU	Air Conditioning Unit	FL	Flood Light	SIG	Service in Ground
BB	Belisha Beacon	GV	Gas Valve	SP	Sign Post
B	Bollard	GU	Gully	SC	Stop Cock
BH	Borehole	IC	Inspection Chamber	SV	Sluice Valve
CAB	Cabinet	LB	Lighting Bollard	TP	Telegraph Pole
CL	Cover Level	LP	Lamp Post	TL	Traffic Light
CPS	Concrete Paving Slabs	LIG	Light in Ground	TM	Ticket Machine
CTV	Cable Television	MH	Manhole Cover	VP	Vent Pipe
EVCP	Charging Point	MKR	Marker Post	UV	Unknown Valve
DP	Down Pipe	PB	Post Box	WP	Waste Pipe
EP	Electric Pole	PM	Phone Mast	WM	Water Meter
ER	Earth Rod	P	Post	WV	Water Valve
FFL	Finished Floor Level	RE	Rodding Eye		
FP	Feeder Pillar	RS	Road Sign		
FH	Fire Hydrant	RWP	Rain Water Pipe		

TOPOGRAPHIC LEGEND

Building	Embankment Slope (Bottom / Top)
Bank Bottom	Fence
Bank Top	Heras Fence /HF/
Canopy	Kerb Channel
Concrete	Kerb Top
Cover with Chamber Extents	Levels + 10.00
Crash Barrier	Overhead Service
Drainage Channel	Tree
Drop Kerb	Wall
Edge Detail	

GENERAL NOTES

Irrespective of the information provided by a utility survey and statutory plans, excavation work should be undertaken with extreme caution and in accordance with HSE Guidelines - HSG47 Avoiding Danger from Underground Services

Utilities may continue outside of the survey area. Any paint marks outside of the area are for investigative purposes only and may not represent the full extent of the sub-surface utilities.

Where logic indicates a utility exists but which cannot be positively confirmed with the technology, an assumed route (ASR) is recorded. All assumed service routes (ASR) have been highlighted with a background yellow colour for visual enhancement.

GPR is utilised across the site in all accessible areas where ground conditions, obstructions allow. Areas of dense vegetation, unclear areas, marsh land, steep banks etc. will not be covered by GPR.

Vertical & Horizontal Position - Vertical position (depth) is indicative to the top of the utility/feature and should not be taken as exact, as this could be the surround to the service rather than the service itself. Where depth information from the technology is unclear, depth is not shown.

Warranty
This drawing does not provide an absolute representation of the sub-surface. Utilities have been detected using non-invasive technologies only and the performance can be adversely affected by ground, weather and site conditions outside of SUMO's control, therefore, some utilities may be undetectable. While SUMO uses reasonable endeavours to detect all utilities, it does not warrant that 100% detection will be achieved and that approximate depth penetration of the technologies SUMO uses will not be greater than two metres.

Sheet Layout

	Sheet 01	Sheet 02
Sheet 03	Sheet 04	Sheet 05
Sheet 06	Sheet 07	**Sheet 08**

Rev	Notes	Drawn	Date

Notes: Survey is referenced to OS Grid and Level Datum.

Building lines are from total station data, updated lines will be added when scan data completed.

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Title: Topographic Survey

Client: Ayre Chamberlain Gaunt

Project: Ridgeway Primary School, Hillbrow, Reading

Date:	10/05/25	Postcode:	RG2 8JD
Surveyed:	PC, DW, PS, CE, HL	Scale: 1:100 (A0 Sheet)	
Drawn:	LC		
Checked:	PC, DW, PS, CE, HL		
Job No: SUMO-20918		Sheet: 08	Rev:

11 APPENDIX C

Report 22055/MIR Rev 1.0	Main Investigation Report by Soils Limited
S05-E-01-05-01_2014	Soil Investigation Report by Resource & Environmental Consultants Ltd

Section 1 Introduction

1.1 Objective of Investigation

The Client commissioned Soils Limited to undertake an intrusive ground investigation and to prepare a Main Investigation Report to supply the Client and their designers with information regarding ground conditions, to assist in preparing a foundation scheme for development that was appropriate to the settings present on the site.

The investigation was to be made by means of in-situ testing and geotechnical laboratory testing undertaken on soil samples taken from the exploratory holes. In addition, soil samples were to be taken for chemical laboratory testing to enable recommendations for the safe redevelopment of the site and the protection of site workers, end-users and the public from any contamination identified as dictated by the Conceptual Site Model (CSM) in the Preliminary Investigation Report undertaken for the site by Soils Limited (Report ref: PIR, September 2025) and the Revised Conceptual Site Model presented in Appendix D.1.

1.2 Site Description

The site comprised a primary school including multiple one to two-storey buildings with either flat or pitched roofs to the east side of the site, while car parks were noted located to the north and south borders.

The areas around existing buildings, car parks, footpaths and sports ground were mainly hardstanding and tarmac covered. The west of the site was grass covered, and some soft landscaping was noted in the centre of the site. Mature trees lined along all inside boundaries of the site.

The site sloped slightly down to the west at a gradient of circa 2˚ with the surrounding area noted to slope down to the west at a gradient of circa 2˚ to 6˚.

Within a radius of 250m, the surrounding areas were mainly residential houses with private gardens and woodlands.

The site location plan and the area of proposed development/site investigation is given in Figure 1. An aerial photograph of the area of proposed development/site investigation and its close environs have been included in Figure 2.

1.3 Proposed Development

The proposal comprised of the following:

- Internal modifications to the existing buildings
- An addition adjacent to the existing hall to the east (single storey)
- A new entrance extension (single storey) following demolition of the existing building to the south
- A classroom extension to the west (single storey)

- A toilet block extension to the west (single storey)
- Alterations to the existing foul and surface water drainage system

The proposal is to include limited areas of soft landscaping in the vicinity of the proposed new build/extensions in the form of communal open spaces comprising hedges and small trees.

In compiling this report reliance was placed on Stage 2 Structural & Civil Engineering Report (ref: 03770 Rev P1) dated 31st July 2025 by Marbas and the landscape plan by Terrafirma dated 5th September 2025 (ref: RDW-TFC- XX-XX-DR- L- 1001). The recommendations provided within this report are made exclusively in relation to the scheme outlined above and must not be applied to any other scheme without further consultation with Soils Limited. Soils Limited must be notified about any change or deviation from the scheme outlined.

Development plans provided by the Client are presented in Appendix F.

1.4 Anticipated Geology

The 1:50,000 BGS Geology map showed the site to be situated on the London Clay Formation bedrock, with overlying superficial River Terrace Deposits.

1.4.1 Superficial – River Terrace Deposits

The rivers of the south-east of England, including the River Thames and its tributaries, have been subject to at least three changes of level since Pleistocene times. One result has been the formation of a complex series of River Terrace Deposits. These terraces represent ancient floodplain deposits that became isolated as the river cut downwards to lower levels. The composition of the River Terrace Deposits varies greatly, depending on the source material available in the river's catchment. Deposits generally consist of sand and gravel of roughly bedded flint or chert commonly in a matrix of silt and clay.

1.4.2 Bedrock – London Clay Formation

The London Clay Formation comprises stiff grey fissured clay, weathering to brown near surface. Concretions of argillaceous limestone in nodular form (Claystones) occur throughout the formation. Crystals of gypsum (Selenite) are often found within the weathered part of the London Clay, and precautions against sulphate attack to concrete are sometimes required.

The upper boundary member of the London Clay Formation is known as the Claygate Member and marks the transition between the deep water, predominantly clay environment and succeeding shallow-water, sand environment of the Bagshot Formation.

The lower boundary is generally marked by a thin bed of well-rounded flint gravel and/or a glauconitic horizon. The formation overlies the Harwich Formation or where the Harwich Formation is absent the Lambeth Group.

Section 2 Site Works

2.1 Proposed Project Works

The proposed intrusive investigation was designed to provide information on the ground conditions and to aid the design of foundations for the proposed development. The intended investigation, as outlined within the Soils Limited quotation (Q30161 Rev 3 dated 25th July 2025), was to comprise the following items:

- Service clearance via Cable Avoidance Tool (CAT) and Signal Generator (Genny) with 1m deep hand dug pits at trial hole locations
- 4No (up to) 4m deep windowless sampler boreholes
- 4No (up to) 8m deep dynamic probe DPSH
- 1No combined groundwater/ground gas monitoring well with gas taps and flush surface cover
- 3No falling head tests in boreholes
- 5No hand excavated trial pits to expose existing foundations
- 1No post site works round of groundwater and ground gas monitoring

2.1.1 Actual Project Works

The actual project works were undertaken between 12th and 13th August 2025, with subsequent sample logging, laboratory testing, monitoring, and reporting. The actual works comprised:

- Service clearance via CAT and Genny with 1m deep hand dug pits at trial hole locations
- 4No 4m deep windowless sampler boreholes (WS1-WS4)
- 4No 8m deep dynamic probe DPSH (DP1-DP4)
- 1No combined groundwater/ground gas monitoring well in WS1 with gas taps and flush surface cover
- 3No falling head tests in boreholes WS1-WS2 and WS4
- 6No hand excavated trial pits to expose existing foundations (FE1-FE5 and FE5A)
- 1No post site works round of groundwater and ground gas monitoring

One windowless sampler borehole (WS1) was backfilled with gravel and bentonite following the installation of a monitoring well, the remaining boreholes and trial pits were backfilled with arising's.

Following completion of site works, soil cores were logged and sub sampled so that samples could be sent to the laboratory for both contamination and geotechnical testing.

2.2 Ground Conditions

On the 13th August 2025 six trial pits (FE1-FE5 and FE5A) were hand-excavated to a maximum depth of 1.30m bgl for foundation exposure purposes. It must be mentioned that trial pit FE5 was terminated to 0.30m bgl due to a concrete obstruction recorded at this depth, therefore and additional trial pit, FE5A, was hand-excavated in the immediate

vicinity.

On the 13th August 2025, four windowless sampler boreholes (WS1 – WS4) were drilled, using Premier Compact Series 110 drilling rig, to a depth of 4.00m below ground level (bgl) at locations given by the Client. Four super heavy dynamic probes, (DP1 – DP4) were driven prior and adjacent to their corresponding windowless sampler borehole to a depth of 8.00m bgl.

Falling head soakage tests were conducted within boreholes WS1-WS2 and WS4, as agreed with the client.

A standpipe was installed within borehole WS1 to allow for monitoring of both groundwater and ground gas post-drilling on 1no occasion as agreed with the client.

The maximum depths of exploratory holes have been included in Table 2.1.

All exploratory holes were selected by the client and where altered were agreed with the client prior to the drilling/excavating.

Table 2.1 Final Depth of Exploratory Holes

Exploratory Hole	Depth (m bgl)	Exploratory Hole	Depth (m bgl)
WS1 (w)	4.00	DP1	8.00
WS2	4.00	DP2	8.00
WS3	4.00	DP3	8.00
WS4	4.00	DP4	8.00
FE1	1.20	FE2	1.15
FE3	1.20	FE4	1.30
FE5	0.30[I]	FE5A	1.05

Note(s): [W] - well installation. The depths given taken from the ground level on-site at the time of investigation.
[I] Trial Hole terminated due to concrete obstructions

The approximate exploratory hole locations are shown on Figure 3.

The soil conditions encountered were recorded and soil sampling commensurate with the purposes of the investigation was carried out. The depths given on the exploratory hole logs and quoted in this report were measured from ground level.

The soils encountered from immediately below ground surface have been described in the following manner. Where the soil incorporated an organic content such as either decomposing leaf litter or roots or has been identified as part of the in-situ weathering profile, it has been described as Topsoil both on the logs and within this report. Where man has clearly either placed the soil, or the composition altered, with say greater than an estimated 5% of a non-natural constituent, it has been referred to as Made Ground both on the log and within this report.

For more complete information about the soils encountered within the general area of the site reference must be made to the detailed records given within Appendix B, but for the

purposes of discussion, the succession of conditions encountered in the exploratory holes in descending order can be summarised as:

Made Ground/(MG)
River Terrace Deposits (RTD)
London Clay Formation (LC)

The ground conditions encountered in the exploratory holes are summarised in Table 2.2.

Table 2.2 Ground Conditions

Strata	Depth Encountered (m bgl)		Typical Thickness (m)	Typical Description
	Top	Bottom		
MG	GL	0.70 – 1.20[3]	0.40 (where proved)	Soft brown and grey slightly sandy, gravelly CLAY or coarse brown SAND/sandy GRAVEL. Gravel is angular to sub-angular fine to coarse flint, brick and tarmac. Rare rootlets
RTD	0.70 – 1.20[3]	2.00 – 2.50	1.80	Soft becoming very stiff with depth blueish grey mottled orange and brown sandy CLAY. Occasional sub-angular to sub-rounded, fine to coarse flint gravel. Rare rootlets were noted. Yellowish brown mottled brownish grey and orangish brown slightly clayey gravelly SAND/clayey SAND AND GRAVEL. Sand is predominantly medium. Gravel is angular to sub-rounded, fine to coarse flint.
LC	2.30	>4.00[1] [>8.00[2]]	Not proven[3]	Stiff to very stiff brown becoming greyish brown with depth mottled orange and grey, slightly sandy, silty CLAY. Sand is fine. Occasional decayed rootlets. Recovered as slightly laminated and fissured

Note(s): [1] Final depth of windowless borehole [2] Final depth of dynamic probe, ground conditions inferred below 4.00m bgl. [3] Base of strata not encountered. The depths given in this table are taken from the ground level on-site at the time of investigation.

2.3 Ground Conditions Encountered in Exploratory Holes

The ground conditions encountered in exploratory holes have been described below in descending order. The engineering logs are presented in Appendix B.1.

2.3.1 Made Ground

Soils described as Made Ground were encountered in each of the ten (10No.) exploratory holes from ground level to depths ranging between 0.20 (FE1) and 0.70m bgl (WS2), where proved; Made Ground was encountered to the full depth of FE2-FE3 and FE5A reaching a maximum depth of 1.20m bgl (FE3), therefore could extend to greater depth at these locations.

The Made Ground typically comprised a band of tarmacadam / asphalt from surface approximately 0.10m – 0.25m thick over either:

- Soft brown and grey slightly sandy, gravelly CLAY. Gravel is angular to sub-angular fine to coarse flint, brick and tarmac. Rare rootlets were noted.

  or

- Coarse brown SAND/sandy GRAVEL. Frequent sub-angular to subrounded fine to coarse flint, brick, and tarmac gravel.

The established depth of Made Ground found at each exploratory hole location have been included in Table 2.3.

Table 2.3 Established Depth of Made Ground

Exploratory Hole	Depth (m bgl)
WS1	0.40
WS2	0.70
WS3	0.25
WS4	0.55
FE1	0.20
FE2	1.15[1]
FE3	1.20[1]
FE4	0.20
FE5	0.30
FE5A	1.05[1]

Note(s): [1] Final depth of exploratory hole, MG could extend to greater depth

2.3.2 River Terrace Deposits

Soils described on the logs as River Terrace Deposits were found directly beneath the Made Ground in each of the four (4No.) windowless sampler boreholes to depths ranging between 2.00 (WS1) and 2.50 (WS4) and in two (2No.) out of the six (6No.) trial pits for their full depth of 1.20m (FE1) and 1.30m bgl (FE4).

The soils of the River Terrace Deposits comprised a mixture of:

- Soft becoming very stiff with depth blueish grey mottled orange and brown sandy CLAY. Occasional sub-angular to sub-rounded, fine to coarse flint gravel. Rare rootlets were noted.

- Yellowish brown mottled brownish grey and orangish brown slightly clayey gravelly SAND/clayey SAND AND GRAVEL. Sand is predominantly medium. Gravel is angular to sub-rounded, fine to coarse flint.

The established depth of the River Terrace Deposits found at each exploratory hole location have been included in Table 2.4.

Table 2.4 Established Depth of River Terrace Deposits

Exploratory Hole	Depth (m bgl)
WS1	2.00
WS2	2.20
WS3	2.30
WS4	2.50
FE1	1.20[1]
FE2	Not recorded
FE3	Not recorded
FE4	1.30[1]
FE5	Not recorded
FE5A	Not recorded

Note(s): [1] Final depth of exploratory hole, RTD could extend to greater depth

2.3.3 London Clay Formation

The London Clay Formation was found directly beneath the River Terrace Deposits in the windowless sampler boreholes only for their full depth of 4.00m bgl and inferred in the dynamic probe locations for their full depth of 8.00m bgl.

The soils of the London Clay Formation comprised stiff to very stiff brown becoming greyish brown with depth mottled orange and grey, slightly sandy, silty CLAY, recovered as slightly laminated and fissured. Sand was fine. Occasional decayed rootlets were noted.

The established depth of London Clay Formation found at each exploratory hole location have been included in Table 2.5.

Table 2.5 Established Depth of London Clay Formation

Exploratory Hole	Depth (m bgl)
WS1/DP1	4.00[1]/8.00[2]
WS2/DP2	4.00[1]/8.00[2]
WS3/DP3	4.00[1]/8.00[2]
WS4/DP4	4.00[1]/8.00[2]
FE1	Not recorded
FE2	Not recorded
FE3	Not recorded
FE4	Not recorded
FE5	Not recorded
FE5A	Not recorded

Note(s): [1] Final depth of exploratory hole.
[2] Inferred in the dynamic probe

2.4 Roots

Roots were encountered in each of the windowless sampler boreholes and in two (2No.) of the six (6No.) trial pits at depths ranging between 1.00m in FE3 and 3.90m bgl in WS2 (decayed). The established depth of root penetration found at the exploratory hole locations has been included in Table 2.6.

Table 2.6 Established Depth of Root Penetration

Exploratory Hole	Depth (m bgl)
WS1	3.70 (rare, decayed)
WS2	3.90 (frequent, decayed)
WS3	3.60 (frequent, decayed)
WS4	3.90 (rare, decayed)
FE1	No roots recorded
FE2	1.10 (live)
FE3	1.00 (live)
FE4	No roots recorded
FE5	No roots recorded
FE5A	No roots recorded

Note(s):

Roots may be found to greater depth at other locations on the site particularly close to trees and/or trees that have been removed both within the site and its close environs.

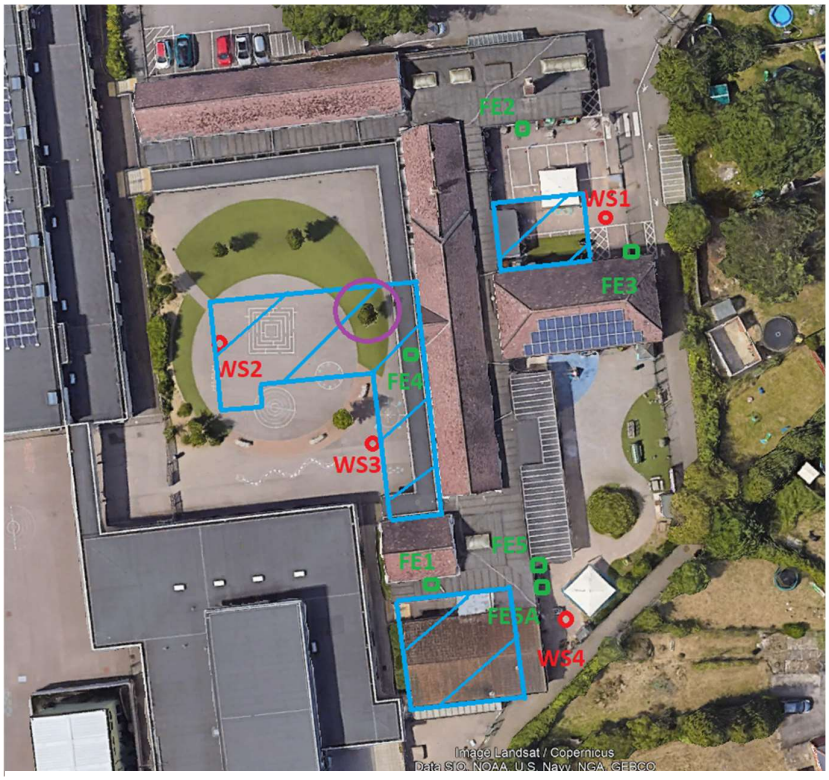
It must be emphasised that the probability of determining the maximum depth of roots from a narrow diameter borehole is low. A direct observation such as from within a trial pit is necessary to gain a better indication of the maximum root depth.

As discussed in Section 1.2, the west of the site was grass covered and some soft landscaping was noted in the centre of the site, mature trees lined along all inside boundaries of the site.

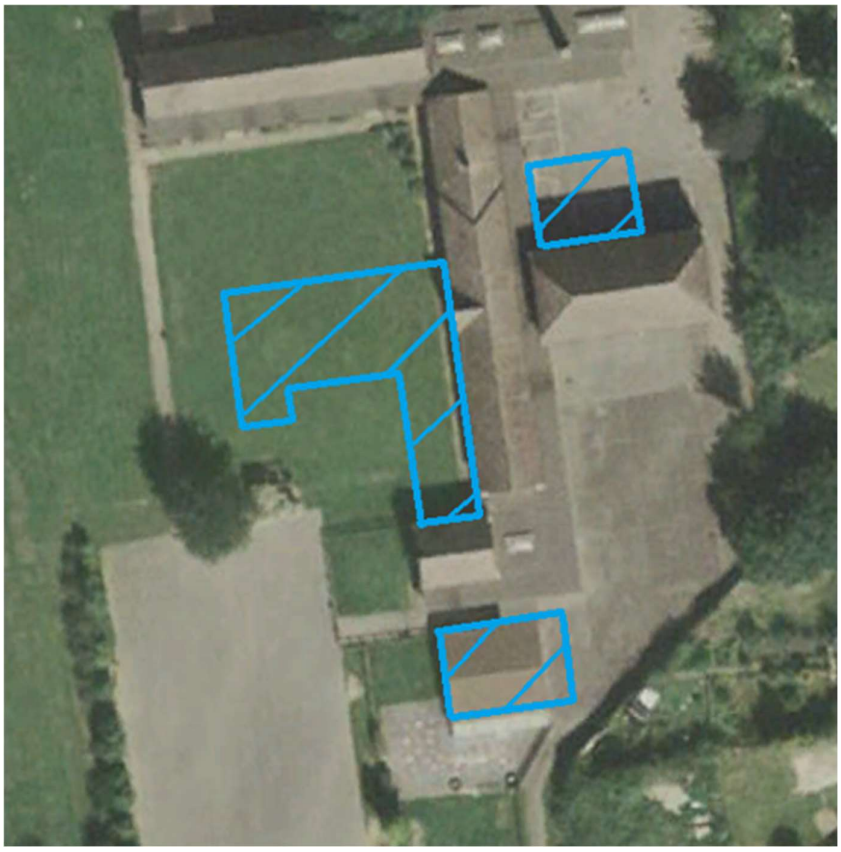
More specifically, at the eastern portion of the site, where the proposed development is to take place and this ground investigation was undertaken, no grass covered areas or vegetation/trees were noted within the proposed footprint, excluding a single semi-mature tree within an area covered in astroturf to the west of the proposed development, as shown on Aerial Photo 1.

Based on Google Earth aerial photos between 2017 and 2025 the area of the proposed development remained relatively unchanged and was in alignment with the findings of the walkover. Between 2003 and 2014 the western portion of the proposed development was noted to be covered in grass, however no trees were noted in the area, as show on Aerial Photo 2.

In the absence of any mature trees or semi-mature trees (excluding the single semi-mature tree within an area covered in astroturf) within or in the immediate vicinity of the proposed development footprint, the presence of roots at depth in the windowless sampler boreholes was considered to be historic, which was further established by the intrusive investigation that classified the roots as “decayed” as presented in Table 2.6. The “frequent” presence within WS2-WS3 could be associated with the fact that both locations were drilled within an area that was grass-covered between 2003 and 2014.



Aerial Photo 1: 2025 map showing proposed development (in blue) with single semi-mature tree shown (in purple) within astroturf area; no changes between 2017-2025 according to Google Earth



Aerial Photo 2: 2004 map showing proposed development (in blue) with western portion covered in grass; no significant changes between 2004-2014 according to Google Earth

2.5 Groundwater

Groundwater was not encountered within any of the exploratory holes during drilling of the windowless sampler boreholes or the excavation of the trial pits, however, the speed of drilling may have masked any groundwater strikes in the windowless sampler boreholes.

The investigation included 1No. groundwater monitoring visit post-works, from a well installed in WS1, during which groundwater was recorded at a depth of 1.47m bgl, possibly perched within the relatively permeable granular bands of the River Terrace Deposits found at this depth, as presented in Table 2.7.

Table 2.7 Groundwater Records/Monitoring

Exploratory Hole	Well Depth (m bgl)	Depth to Water (m bgl)	
		13/08/2025 (during works)	20/08/2025 (Monitoring)
WS1	4.00	Not recorded	1.47
WS2	-	Not recorded	-
WS3	-	Not recorded	-
WS4	-	Not recorded	-
FE1	-	Not recorded	-
FE2	-	Not recorded	-
FE3	-	Not recorded	-
FE4	-	Not recorded	-
FE5	-	Not recorded	-
FE5A	-	Not recorded	-

Note(s):

Changes in groundwater level occur for a number of reasons including seasonal effects and variations in drainage. The investigation and monitoring were conducted in August 2025, when groundwater levels should be approaching their annual minimum (lowest) elevation that typically occurs around September, whilst the annual maximum (highest), takes place around March.

Groundwater equilibrium conditions may only be conclusively established, if a series of observations are made via groundwater monitoring wells.

2.6 Foundation Exposures

On the 13th August 2025 six trial pits (FE1-FE5 and FE5A) were hand-excavated to a maximum depth of 1.30m bgl for foundation exposure purposes.

A summary of each trial pit is presented in Table 2.8. with full details and photographic evidence of each foundation exposures presented in Appendix B.1 and B.2.

Section 4 Engineering Appraisal

4.1 Established Ground Conditions

An engineering appraisal of the soil types encountered during the site investigation and likely to be encountered during the redevelopment of this site is presented. Soil descriptions are based on analysis of disturbed samples taken from the exploratory holes.

4.1.1 Made Ground

Soils described as Made Ground were encountered in each of the ten (10No.) exploratory holes from ground level to depths ranging between 0.20 (FE1) and 0.70m bgl (WS2), where proved; Made Ground was found for the full depth of FE2-FE3 and FE5A reaching a maximum depth of 1.20m bgl (FE3), therefore could extend to greater depth at these locations.

Foundations must not be placed on non-engineered fill unless such use can be justified on the basis of a thorough ground investigation and detailed design. Foundations must be taken through any Topsoil and/or Made Ground and either into, or onto a suitable underlying natural stratum of adequate bearing characteristics.

4.1.2 River Terrace Deposits

Soils described on the logs as River Terrace Deposits were found directly beneath the Made Ground in each of the four (4No.) windowless sampler boreholes to depths ranging between 2.00 (WS1) and 2.50 (WS4) and in two (2No.) out of the six (6No.) trial pits for their full depth of 1.20m (FE1) and 1.30m bgl (FE4).

Soils of the River Terrace Deposits are generally granular soils and as such are expected to display moderate to high bearing capacities with low to moderate settlement characteristics. The soils of the River Terrace Deposits underlying the site, though a mixture of granular and cohesive bands could be considered as a suitable foundation stratum, considering the light-weight type of the proposed development (single storey) characterised by sufficient bearing pressures.

4.1.3 London Clay Formation

The London Clay Formation was found directly beneath the River Terrace Deposits in the windowless sampler boreholes to their full depth of 4.00m bgl and inferred in the dynamic probe locations for their full depth of 8.00m bgl.

Soils of the London Clay Formation are overconsolidated, predominantly cohesive soils and are expected to display a moderate bearing capacity, with moderate settlement characteristics. The soils of the London Clay Formation were considered as a suitable foundation layer for the proposed development using either shallow or deep foundations.

4.1.4 Guidance on Shrinkable Soils

The ground conditions were established as River Terrace Deposits, with a typical thickness of 1.80m, overlying the bedrock of London Clay Formation.

The volume change potential for each natural strata was established and presented in Table 4.1.

Table 4.1 Established Volume Change Potential by Strata

Strata	Volume Change Potential		Established Lower Boundary (m bgl)
	BRE	NHBC	
RTD (cohesive)	Medium	Medium	2.30
RTD (granular)	None	None	2.50
LC	Medium	Medium	4.00+

Any foundations through the cohesive soils of the River Terrace Deposits or the London Clay Formation **must** be designed in accordance with BRE and NHBC guidance **medium** volume change potential.

The granular bands of the River Terrace Deposits as expected were proven to not have a volume change potential. However, given the variation in thickness and deposition of the River Terrace Deposits, with their granular bands in places limited to 0.45m in thickness, it was considered that a BRE and NHBC guidance **medium** volume change potential **must** be generally adopted for the River Terrace Deposits.

4.1.5 Groundwater

Groundwater was not encountered within any of the exploratory holes during drilling of the windowless sampler boreholes or the excavation of the trial pits; however, the speed of drilling may have masked any groundwater strikes in the windowless sampler boreholes.

Groundwater was only encountered during the groundwater monitoring within the well installed in WS1 at a depth of 1.47m bgl on 20th August 2025, which was believed to be perched water within the relatively permeable granular bands of the River Terrace Deposits.

Should shallow foundations be adopted and subject to the proposed foundation depth and the thickness of the granular bands of the River Terrace Deposits, it is likely that water ingress during the foundation trenches could result in instability, therefore requiring dewatering prior to their excavation to mitigate the relevant impact.

The construction of a piled foundation would require further investigation; given the ground conditions inferred in the dynamic probes, the investigation should comprise boreholes using a cable percussive rig to greater depth circa 12m-15m bgl.

Guidance on the design of a working platform for piling rigs can be provided by Soils Limited in accordance with the BRE "Working platform for tracked plant, 2004" documentation.

5.2 Subsurface Concrete

The sulphate and pH tests carried out in accordance with BRE Special Digest 1, 2005, 'Concrete in Aggressive Ground', established the site concrete classifications for each stratum as presented in Table 5.2.

Table 5.2 Concrete Classification

Stratum	Design Sulphate Class	ACEC Class
RTD	DS-1	AC-1
LC	DS-1	AC-1

Concrete to be placed in contact with soil or groundwater must be designed in accordance with the recommendations of Building Research Establishment Special Digest 1 2005, *'Concrete in Aggressive Ground'* taking into account any possible exposure of potentially pyrite bearing natural ground and the pH of the soils.

Should a pile solution be adopted then additional testing would be recommended to ensure appropriate concrete classification at depth.

5.3 Excavations

Shallow (<1m) excavations in the Made Ground and River Terrace Deposits are likely to be marginally stable in the short term at best.

Deeper excavations taken into the River Terrace Deposits or the London Clay Formation are likely to be unstable and require support. Unsupported earth faces formed during excavation may be liable to collapse without warning and suitable safety precautions must therefore be taken to ensure that such earth faces are adequately supported or battered back to a safe angle of repose.

Excavations beneath the groundwater table as encountered in the River Terrace Deposits are likely to be unstable and dewatering of foundation trenches would be necessary.

Section 6 Pavements

6.1 Pavements

Any soft spots at formation level, within the Made Ground or the underlying River Terrace Deposits, must be dug out and replaced with a suitably compacted granular fill. Prior to construction the formation level should be proof rolled.

Due to the presence of gravelly bands with the Made Ground, it is likely to be frost susceptible.

Granular soils of the River Terrace Deposits are regarded as **non-frost-susceptible** as the percentage material passing the 0.074 mm sieve was <10% apart from a marginal exceedance (11%) in one out of three samples tested.

Cohesive soils of the River Terrace Deposits and the London Clay Formation were noted to have plasticity index >20%, therefore and in accordance with Road Research Laboratory LR90, are generally expected to be **non-frost-susceptible**.

The overall thickness of the pavement will be dictated by the frost susceptibly of the sub-grade.

Section 8 Qualitative Risk Assessment

8.1 Assessment Criteria

The assessment criteria used to determine risks to human health are derived and explained within Appendix D.3.

8.2 Representative Contamination Criteria - Soil

The proposal is to include limited areas of soft landscaping in the vicinity of the proposed new build/extensions in the form of communal open spaces comprising hedges and small trees.

In compiling this report reliance was placed on Stage 2 Structural & Civil Engineering Report (ref: 03770 Rev P1) dated 31st July 2025 by Marbas. The recommendations provided within this report are made exclusively in relation to the scheme outlined above and must not be applied to any other scheme without further consultation with Soils Limited. Soils Limited must be notified about any change or deviation from the scheme outlined.

Based on the proposed development, and adopting a **conservative** approach, the results of the chemical analysis have been compared against generic assessment criteria (GAC) for a '***Residential without home grown produce***' end use, as presented in SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination December 2014 (C4SL), derived for the protection of human health. Where this document has not published screening values for determinants, GACs derived for the same end use have been adopted from the following published guidance; DEFRA Soil Guideline Values (SGV) and LQM/CIEH/Suitable 4 Use Level (S4UL).

To assess the potential toxicity of organic determinants (Petroleum Hydrocarbons and Polyaromatic Hydrocarbons) to the human health, soils samples were analysed for Soil Organic Matter (SOM). The selected samples analysed recorded, SOM values of between 0.7% and 4.4%. For each soil sample tested, the resultant SOM allowed for the correct comparison to be made with the appropriate guideline value for each organic determinants analysed.

8.2.1 Risk Assessment – Made Ground

Table 8.1 outlines the sample that have exceeded their relevant assessment criteria. The full laboratory report is presented in Appendix D.2.

Table 8.1 Summary of GAC Exceedances – Made Ground

Location	Depth (m bgl)	Contaminant	Concentration	Guidance Level
None	None	None	-	-

Note(s): Units mg/kg

The risk assessment has established no pollutant linkages in relation to human health from any elevated determinant concentrations within the Made Ground across the site.

8.3 Asbestos

The test certificate for each sample submitted for contamination analysis during this investigation includes the results of an Asbestos Screen. In each case 'Not detected' was reported.

This finding does not obviate the risk of asbestos being present on the site and the Client must seek advice from qualified and competent asbestos specialist during and prior to undertaking works to ensure compliance with appropriate legislation and guidance.

8.4 Risk to Controlled Waters

According to the Preliminary Investigation Report undertaken by Soils Limited (report ref: 22053/PIR September 2025), no Groundwater Source Protection Zones or abstractions points were located within a 1000m radius from the site.

The site was noted to be situated on a Secondary A Aquifer associated with the superficial River Terrace Deposits. However, the intrusive investigation revealed that the relatively permeable granular bands of the River Terrace Deposits that are considered capable of retaining water were limited in places to thicknesses reaching 0.45m. These were further interbedded with low-permeable cohesive bands of the River Terrace Deposits and underlain by the impermeable cohesive soils of the bedrock of the London Clay Formation (Unproductive Strata) at depth.

The vertical extent of the Secondary A Aquifer was therefore expected to be relatively constrained, in alignment with the groundwater monitoring records, which revealed what appeared to be perched water within the relatively permeable bands of the River Terrace Deposits at a depth of 1.47m bgl.

The hypothesis of relatively low environmental sensibility of the underlying aquifer was reinforced by the lack of any significant sources of contamination identified on site and the fact that none out of 3no samples of the Made Ground was noted to be impacted.

Conclusively, there is not considered to be any significant risk to groundwater or controlled waters and no further assessment deemed necessary at this time. Nonetheless, to minimise any leaching potential of possible contaminants, the time period during redevelopment that the site will be open and exposed to rainfall must be kept to a minimum.

8.5 Risk from Ground Gas Ingression

Very minor potential sources of ground gas were identified on site within the CSM of the Preliminary Investigation Report undertaken by Soils Limited (report ref: 22053/PIR September 2025) that comprised:

- Possible PAHs/TPHs from car park



Figure 1 – Site Location Map

N

Job Number 22053	**Project** Ridgeway Primary School, Hillbrow, Reading, Berkshire RG2 8JD
Client Ayre Chamberlain Gaunt Ltd	**Date** September 2025

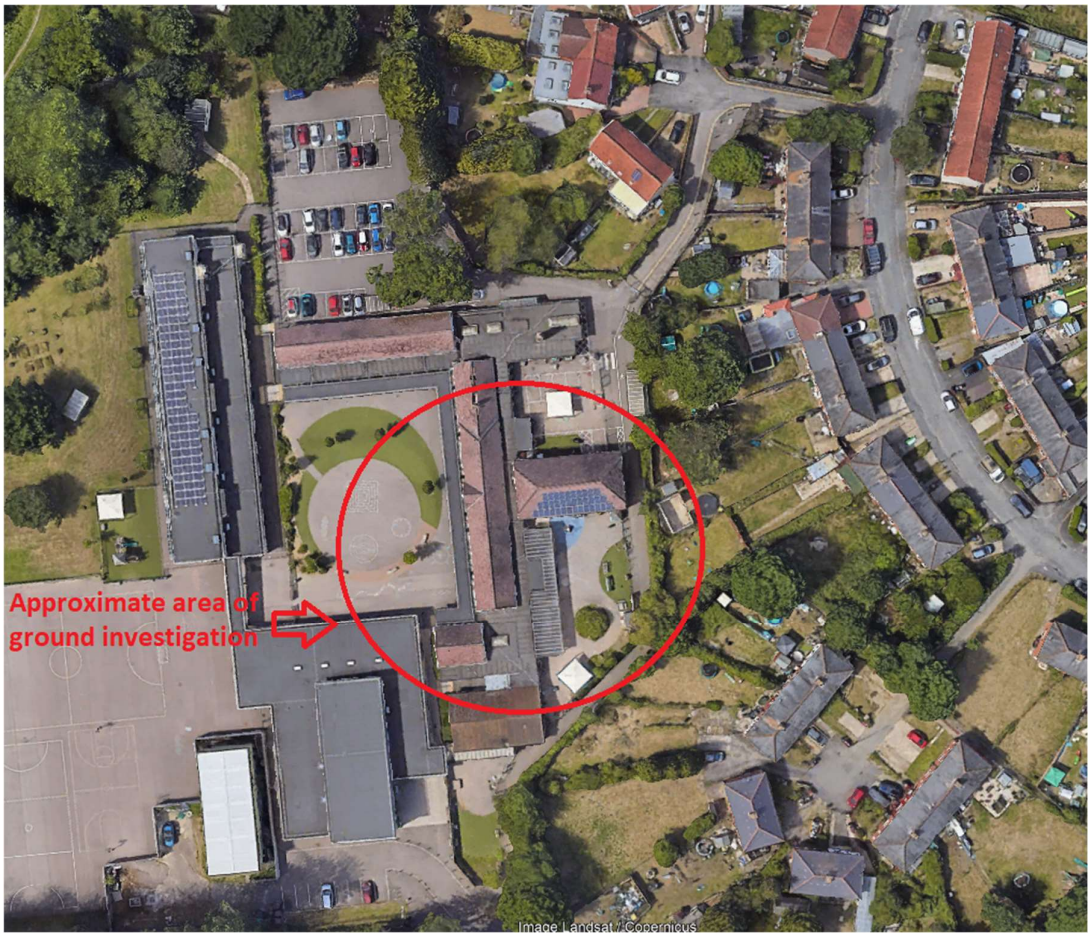
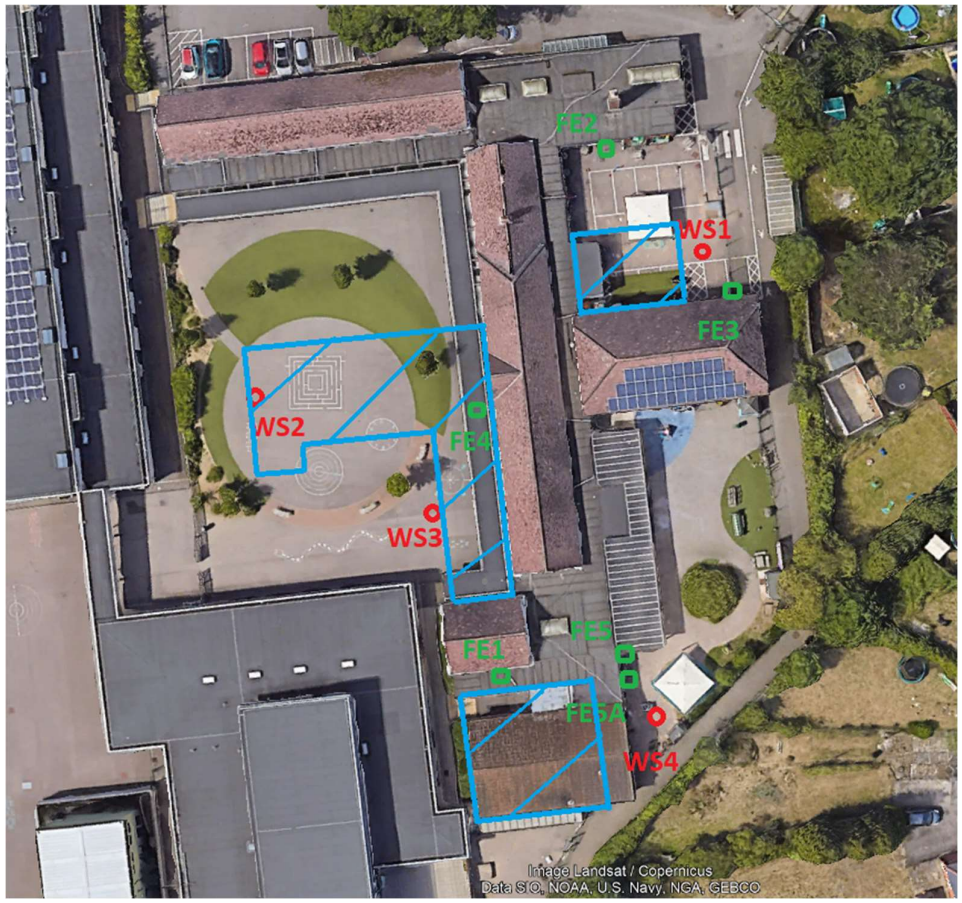


Figure 2 – Aerial Photograph

Job Number 22053	**Project** Ridgeway Primary School, Hillbrow, Reading, Berkshire RG2 8JD
Client Ayre Chamberlain Gaunt Ltd	**Date** September 2025



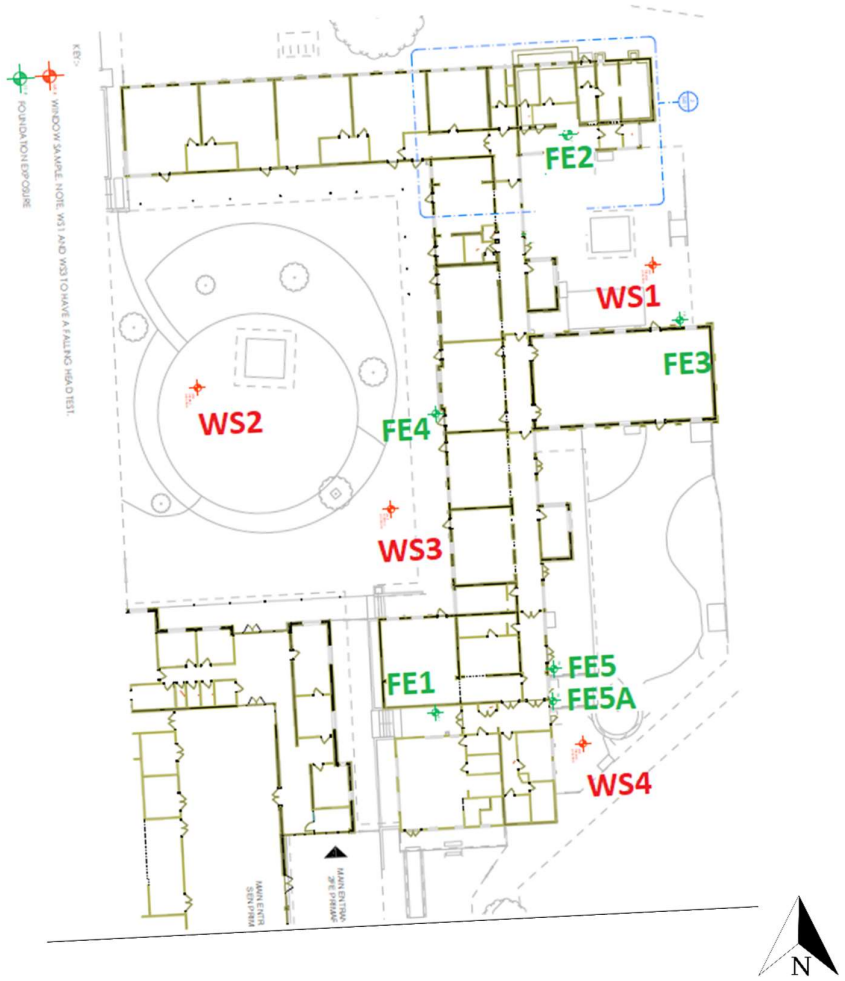


Figure 3 – Exploratory Hole Plans

Job Number 22053	**Project** Ridgeway Primary School, Hillbrow, Reading, Berkshire RG2 8JD
Client Ayre Chamberlain Gaunt Ltd	**Date** September 2025

Window Sampler

WS1

Sheet 1 of 1

Hole Type	Easting	Northing	Ground Level (m)	Scale
WS				1:50

Project Name	Project No.	Start Date	End Date
Ridgeway	22053		

Client
Ayre Chamberlain Gaunt Ltd.

Consultant
NS

Contractor

Inst/ Backfill	Water Levels	Samples and Tests: Depth (m)	Type/ Ref	Results	Level (m)	Depth (thickness) (m)	Strata: Legend	Description
						(0.15) 0.15		TARMAC/CONCRETE
		0.20	D			(0.25) 0.40		Clayey SAND. Sand is coarse. Frequent sub-angular to sub-rounded, fine to coarse flint, brick and concrete gravel. MADE GROUND.
		0.50 0.50	D ES			(0.40) 0.80		Soft blueish grey mottled orange and brown sandy CLAY. Occasional sub-angular to sub-rounded, fine to coarse flint gravel. Rare rootlets.RIVER TERRACE DEPOSITS
		1.00	D			(0.40) 1.20		Soft blueish grey mottled orange and brown sandy CLAY. Frequent sub-angular to sub-rounded, fine to coarse flint gravel. Rare rootlets. RIVER TERRACE DEPOSITS
		1.30	D			(0.40) 1.60		Yellowish brown mottled brown, clayey SAND AND GRAVEL. Sand is predominantly medium. Gravel is angular to well rounded, fine to coarse flint. Occasional sub-angular flint cobbles. Occasional very sandy clay lenses. RIVER TERRACE DEPOSITS
		1.70	D			(0.20) 1.80		Greyish brown mottled grey and yellowish brown slightly clayey slightly gravelly SAND. Sand is predominantly medium. Gravel is angular to sub-rounded, fine to medium flint. RIVER TERRACE DEPOSITS
		1.90	D			(0.20) 2.00		Yellowish brown mottled brown, clayey SAND AND GRAVEL. Sand is predominantly medium. Gravel is angular to well rounded, fine to coarse flint. RIVER TERRACE DEPOSITS
		2.10	D			(2.00) 4.00		Stiff brown becoming greyish brown with depth mottled orange and grey, slightly sandy, silty CLAY. Sand is fine. Occasional decayed rootlets. Recovered as slightly laminated and fissured. LONDON CLAY FORMATION
		2.60	D					*Orange mottled grey and brown weathered band. (2.00 - 2.15m)*
		3.10	D					*Very rare medium gravel sized calcareous nodule. (2.95m)*
		3.60	D					*Occasional coarse sand sized selenite crystals. (3.80 - 4.00m)*
								End of Borehole at 4.00m

Remarks
Decayed rootlets observed to 3.70m bgl. No groundwater recorded.

Method, Plant, Stability, Dimensions
0.00 - 4.00m

Logger

Created using Pebble Geo

soils LIMITED

Window Sampler

WS2

Sheet 1 of 1

Hole Type	Easting	Northing	Ground Level (m)	Scale
WS				1:50

Project Name	Project No.	Start Date	End Date
Ridgeway	22053		

Client
Ayre Chamberlain Gaunt Ltd.

Consultant
NS

Contractor

Inst/ Backfill	Water Levels	Samples and Tests: Depth (m)	Type/ Ref	Results	Level (m)	Depth (thickness) (m)	Strata: Legend	Description
						(0.08) 0.08		TARMAC
		0.20	D			(0.22) 0.30		Coarse brown SAND. Frequent sub-angular to subrounded fine to coarse flint, brick, and tarmac gravel. MADE GROUND.
		0.50	D			(0.40) 0.70		Soft brown slightly gravelly, sandy CLAY. Gravel is sub-angular to subrounded, fine to coarse flint with rare concrete, tarmac and brick. Possibly re-worked. MADE GROUND.
		0.50	ES			(0.40) 1.10		Orangish brown becoming dark brown, slightly clayey gravelly SAND. Gravel is subangular to sub-rounded, fine to coarse flint. RIVER TERRACE DEPOSITS
		1.00	D			(0.60) 1.70		Multi-coloured clayey SAND AND GRAVEL. Gravel is angular to well rounded, fine to coarse flint. Occasional sandy gravelly clay lenses. RIVER TERRACE DEPOSITS
		1.20	D			(0.50) 2.20		Stiff multicoloured slightly gravelly, very sandy CLAY. Gravel is angular to well rounded, fine to coarse flint. Irregular lower boundary. RIVER TERRACE DEPOSITS
		1.50	D					Stiff greyish brown mottled orange and grey, slightly sandy, silty CLAY. Sand is fine. Frequent decayed rootlets. Recovered as slightly laminated and fissured. Grey and orange mottling reduces with depth. LONDON CLAY FORMATION
		1.80	D			(1.80)		*Decayed rootlets very frequent to 2.70m bgl, becoming rare. (2.70m)*
		2.30	D					*Coarse gravel sized calcareous mudstone nodule. (3.50m)*
		2.80	D					
		3.30	D					
		3.80	D			4.00		*End of Borehole at 4.00m*

Remarks
Decayed rootlets observed to 3.90m bgl. No groundwater recorded.

Method, Plant, Stability, Dimensions
0.00 - 4.00m

Logger

Created using Pebble Geo

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Window Sampler

WS3

Sheet 1 of 1

Hole Type	Easting	Northing	Ground Level (m)	Scale
WS				1:50

Project Name	Project No.	Start Date	End Date
Ridgeway	22053		

Client
Ayre Chamberlain Gaunt Ltd.

Consultant
NS

Contractor

Inst/ Backfill	Water Levels	Samples and Tests: Depth (m)	Type/ Ref	Results	Level (m)	Depth (thickness) (m)	Strata: Legend	Description
						(0.10) 0.10		TARMAC
		0.20	D			(0.15) 0.25		Coarse greyish brown SAND. Frequent fine to coarse subrounded to subangular flint brick tarmac gravel. MADE GROUND
		0.50	D			(0.45) 0.70		Coarse orange brown SAND. Frequent fine to coarse subrounded to subangular flint gravel. RIVER TERRACE DEPOSITS
		1.00	D			(0.30) 1.00		Soft very sandy mottled orange grey and brown CLAY. Occasional fine to coarse subrounded to subangular flint gravel. RIVER TERRACE DEPOSITS
		1.10	D			(0.45) 1.45		Greyish brown mottled grey and yellowish brown slightly clayey slightly gravelly SAND. Sand is predominantly medium. Gravel is angular to sub-rounded, fine to coarse flint. Fines increase with depth. Irregular lower boundary. RIVER TERRACE DEPOSITS
		1.60	D			(0.85) 2.30		*Becomes very gravelly. (1.20 - 1.35m)*
		2.10	D			(1.70) 4.00		Very stiff brown mottled orangish brown and grey, slightly gravelly, slightly sandy CLAY. Sand is predominantly fine. Gravel is sub-angular to well rounded, fine to coarse flint. Frequent decayed rootlets. RIVER TERRACE DEPOSITS
		2.40	D					Very stiff greyish brown mottled orange and grey, slightly sandy, silty CLAY. Sand is fine. Frequent decayed rootlets. Recovered as slightly laminated and fissured. Grey and orange mottling reduces with depth. LONDON CLAY FORMATION
		2.90	D					*Decayed rootlets very frequent to 2.50m bgl, becoming rare. (2.50m)*
		3.40	D					*Coarse gravel sized broken mudstone nodule. (2.50 - 2.55m)*
		3.90	D					*End of Borehole at 4.00m*

Remarks
Decayed rootlets observed to 3.60m bgl. No groundwater recorded.

Method, Plant, Stability, Dimensions
0.00 - 4.00m

Logger

Created using Pebble Geo

soils LIMITED

Window Sampler

WS4

Sheet 1 of 1

Hole Type	Easting	Northing	Ground Level (m)	Scale
WS				1:50

Project Name	Project No.	Start Date	End Date
Ridgeway	22053		

Client
Ayre Chamberlain Gaunt Ltd.

Consultant
NS

Contractor

Inst/ Backfill	Water Levels	Samples and Tests: Depth (m)	Type/ Ref	Results	Level (m)	Depth (thickness) (m)	Strata: Legend	Description
						(0.25) 0.25		TARMAC/CONCRETE
		0.20	D			(0.30) 0.55		Red mottled multicoloured, slightly sandy, clayey GRAVEL. Gravel is angular to sub-angular, fine to coarse brick, flint, concrete and clinker. Occasional clay lenses. MADE GROUND.
		0.50 0.50	D ES			(0.50) 1.05		Yellowish brown slightly silty, gravelly SAND. Gravel is angular to sub-rounded, fine to coarser flint. RIVER TERRACE DEPOSITS
		1.00	D			(0.25) 1.30		Firm to stiff orangish brown mottled multicoloured, slightly gravelly very sandy CLAY. Gravel is angular to sub-rounded, fine to coarse flint. RIVER TERRACE DEPOSITS
		1.20	D			(0.35) 1.65		Multi-coloured clayey SAND AND GRAVEL. Gravel is angular to well rounded, fine to coarse flint. Occasional sandy gravelly clay lenses. RIVER TERRACE DEPOSITS
		1.70	D			(0.45) 2.10		Yellowish brown mottled brownish grey and orangish brown slightly clayey gravelly SAND. Sand is predominantly medium. Gravel is angular to sub-rounded, fine to coarse flint. RIVER TERRACE DEPOSITS
		2.20	D			(0.40) 2.50		Multicoloured clayey gravelly SAND. Gravel is angular to sub-rounded, fine to coarse flint. Frequent sandy clay lenses. RIVER TERRACE DEPOSITS
		2.60	D			(1.50) 4.00		Stiff greyish brown mottled orange and grey, slightly sandy, silty CLAY. Sand is fine to medium and features in occasional fine inclusions. Occasional decayed rootlets. Recovered as slightly laminated and fissured. LONDON CLAY FORMATION
		3.10	D					*Broken mudstone cobble. (3.35 - 3.45m)*
		3.60	D					*End of Borehole at 4.00m*

Remarks
Decayed rootlets observed to 3.90m bgl. No groundwater recorded.

Method, Plant, Stability, Dimensions
0.00 - 4.00m

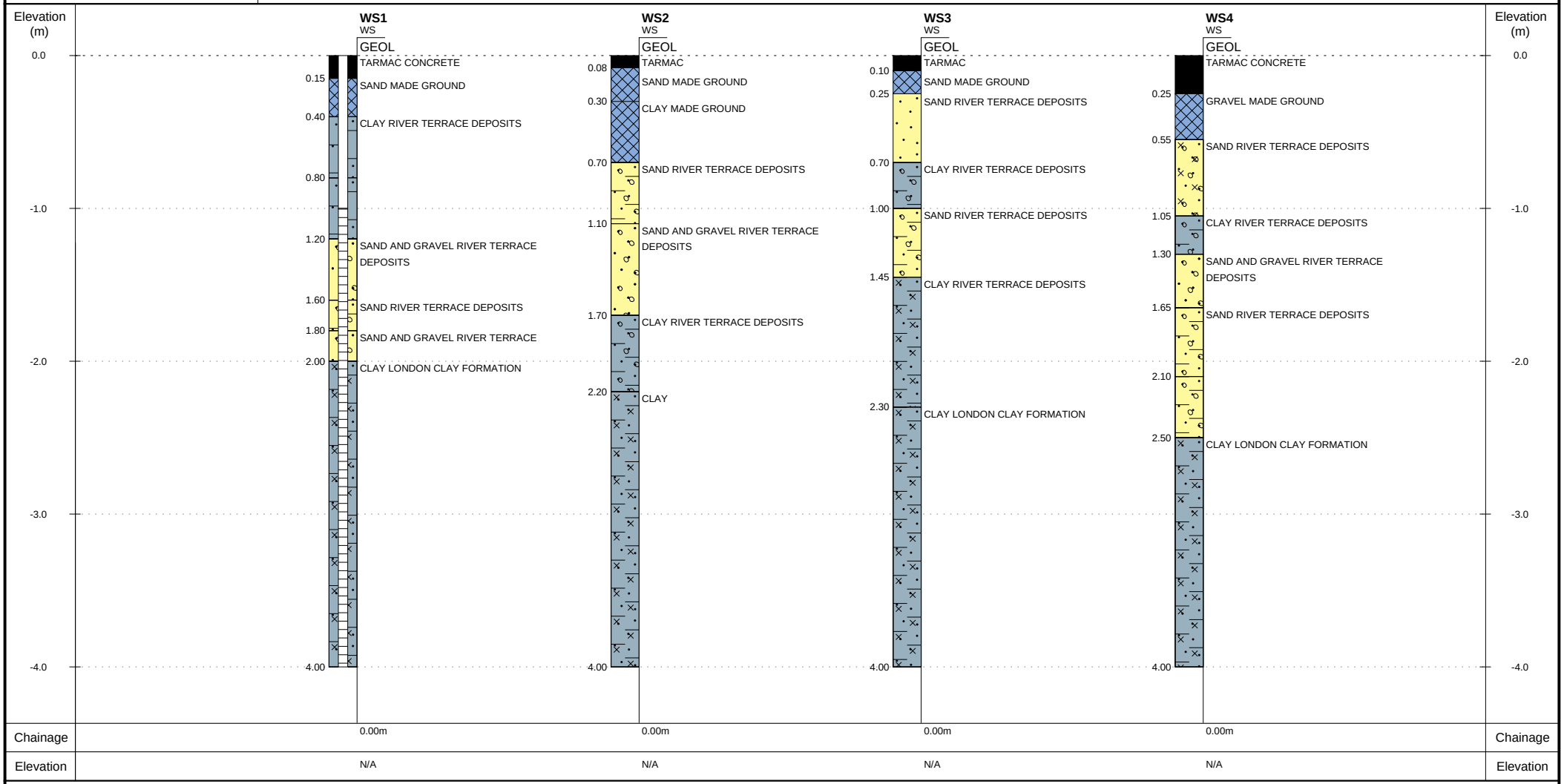
Logger

soils LIMITED

Cross-Section

Project Name	Project No.	Vertical Scale	Horizontal Scale
Ridgeway	22053	1:37	NOT SCALED

Client	Consultant	Contractor
Ayre Chamberlain Gaunt Ltd.	NS	



MADE GROUND | BITUMINOUS MAT. | CLAY | SAND | SAND AND GRAVEL

WATER LEVELS

REST

STRIKE

Created using Pebble Geo

soils LIMITED

Dynamic Probe

DP1

Sheet 1 of 1

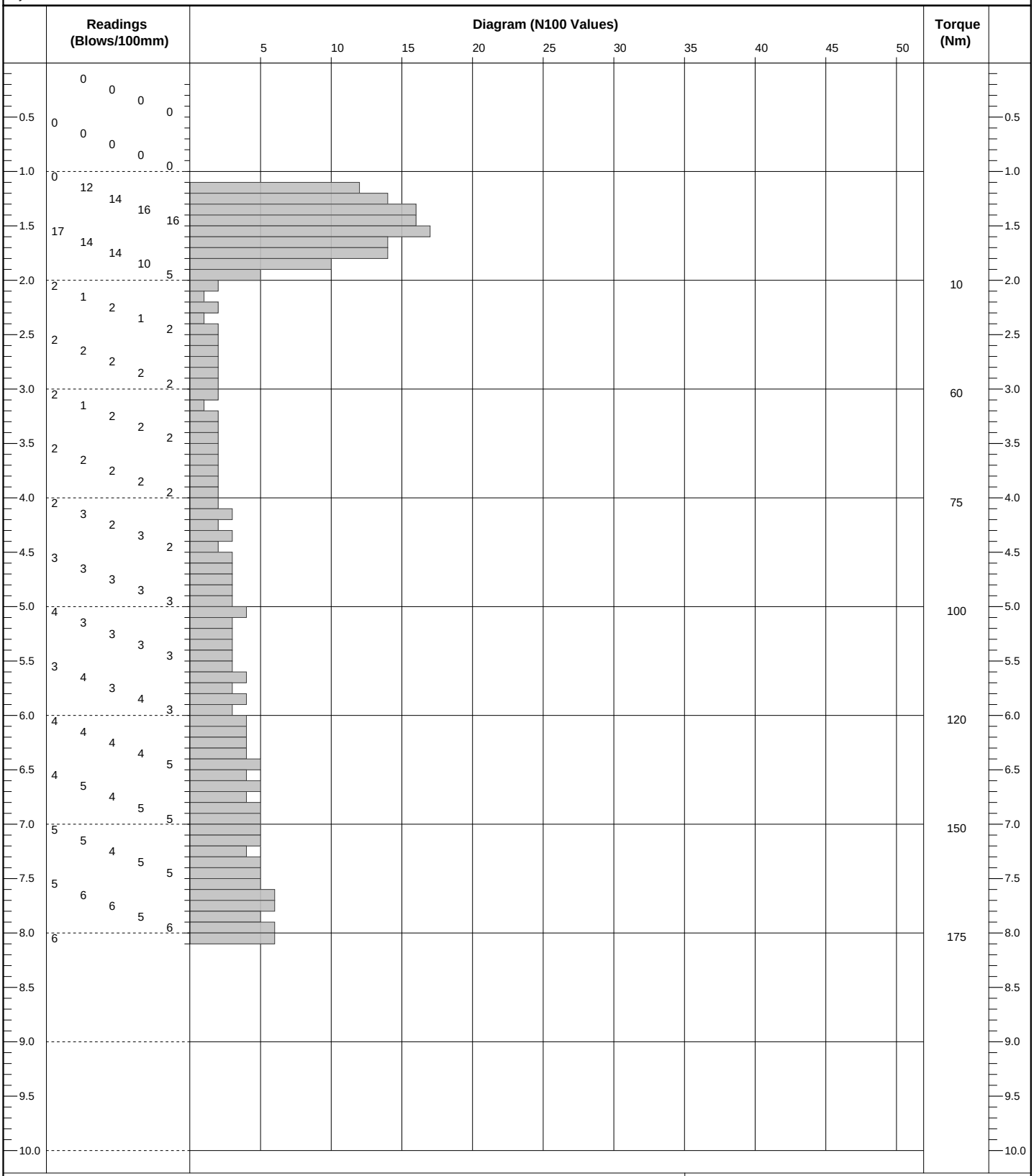
Probe Type	Easting	Northing	Ground Level (m)	Scale
DPSH				1:50

Project Name	Project No.	Start Date	End Date
Ridgeway	22053		

Client
Ayre Chamberlain Gaunt Ltd.

Consultant
NS

Contractor



Remarks
Type of rig Premier 1 - Energy Ratio = 90.32%

Method, Plant
0.00 - 8.00m

Logger

Hammer Weight (kg)	63.5
Hammer Drop (mm)	760
Cone Diameter (mm)	52
Cone Angle	
Rod Diameter (mm)	
Damper	

soils LIMITED

Dynamic Probe

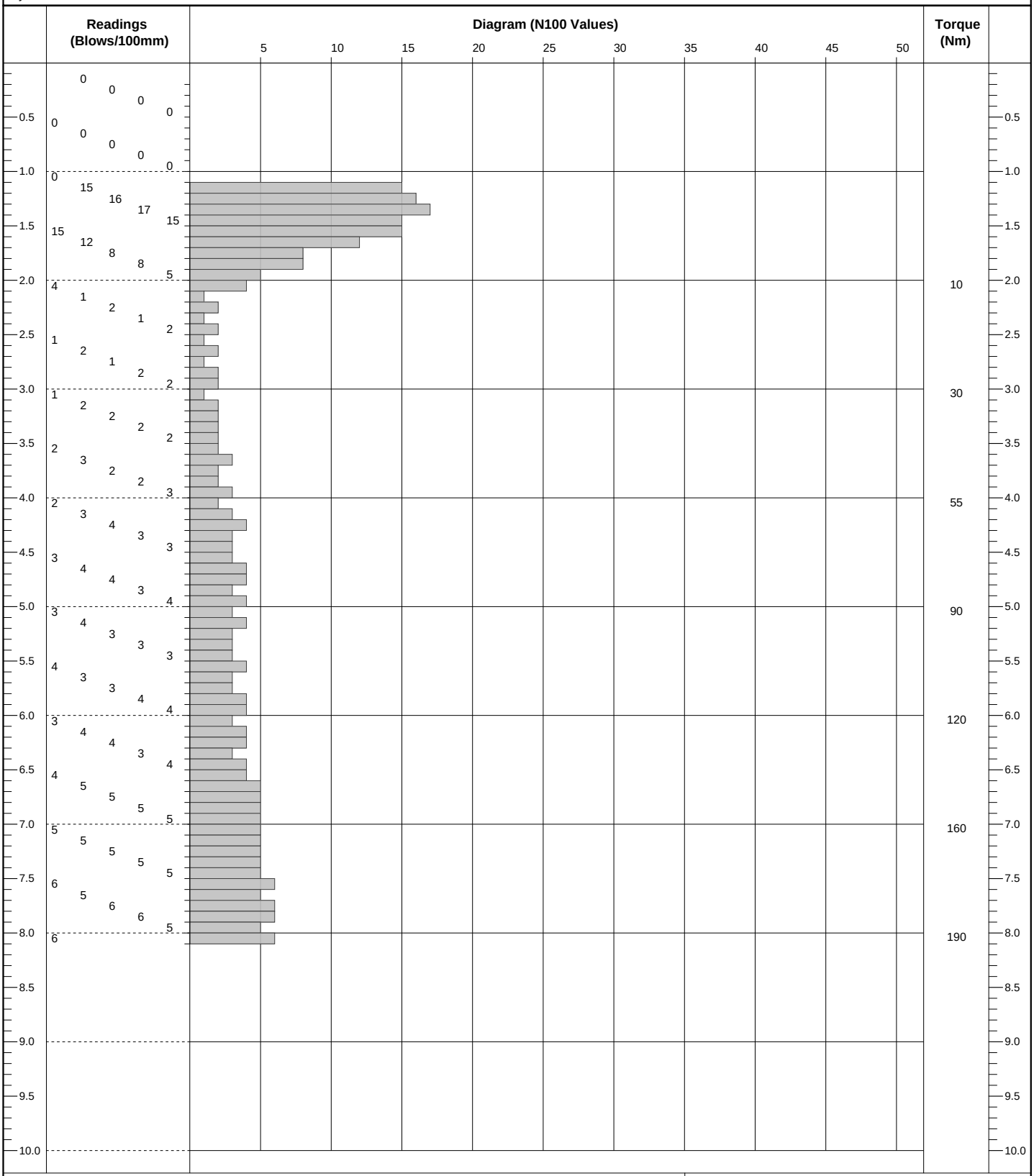
DP2

Sheet 1 of 1

Probe Type	Easting	Northing	Ground Level (m)	Scale
DPSH				1:50

Project Name	Project No.	Start Date	End Date
Ridgeway	22053		

Client	Consultant	Contractor
Ayre Chamberlain Gaunt Ltd.	NS	



Remarks

Type of rig Premier 1 - Energy Ratio = 90.32%

Method, Plant **Logger**

0.00 - 8.00m

Hammer Weight (kg)	63.5
Hammer Drop (mm)	760
Cone Diameter (mm)	52
Cone Angle	
Rod Diameter (mm)	
Damper	

soils LIMITED

Dynamic Probe

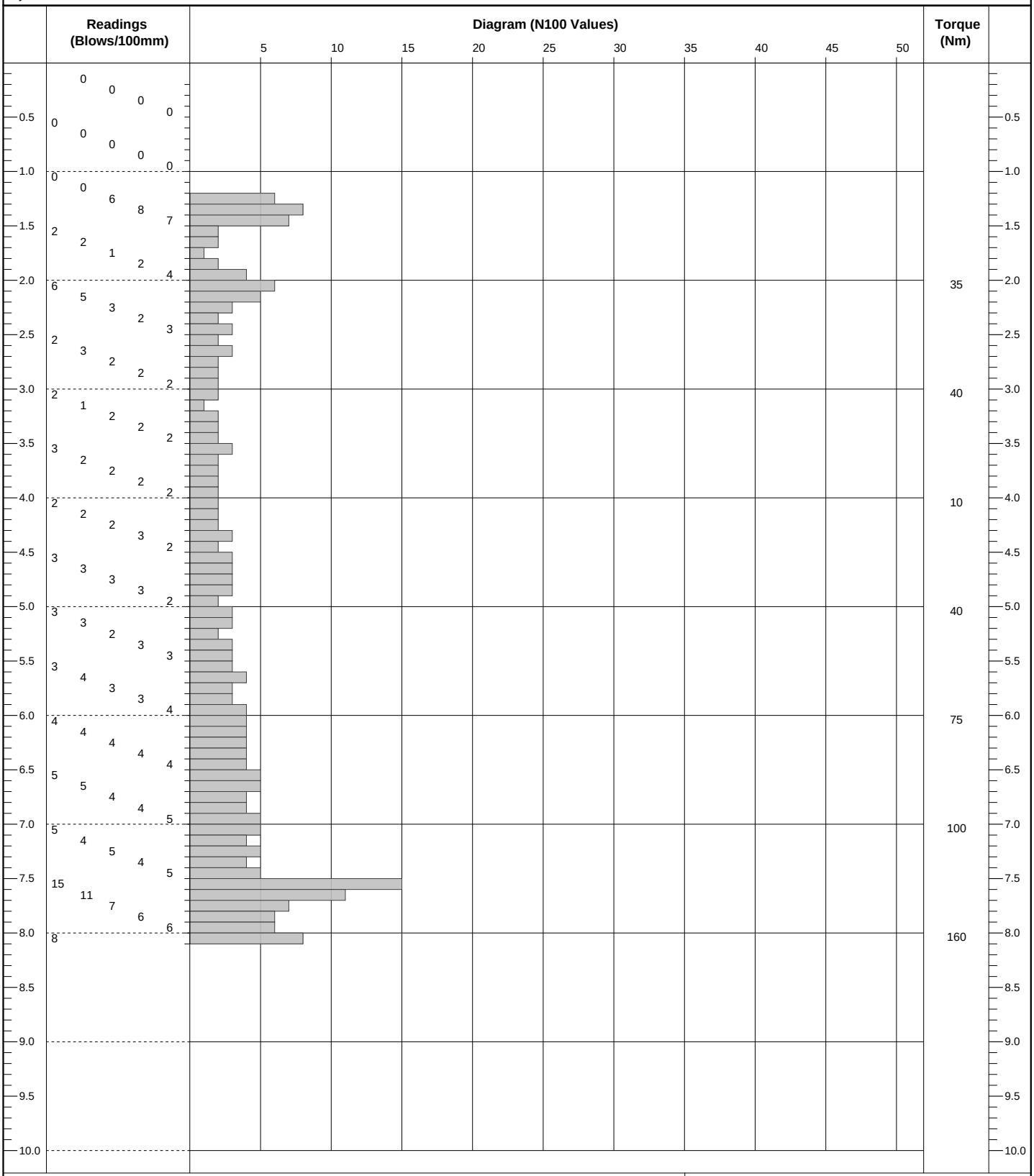
DP3

Sheet 1 of 1

Probe Type	Easting	Northing	Ground Level (m)	Scale
DPSH				1:50

Project Name	Project No.	Start Date	End Date
Ridgeway	22053		

Client	Consultant	Contractor
Ayre Chamberlain Gaunt Ltd.	NS	



Remarks

Type of rig Premier 1 - Energy Ratio = 90.32%

Method, Plant **Logger**

0.00 - 8.00m

Hammer Weight (kg)	63.5
Hammer Drop (mm)	760
Cone Diameter (mm)	52
Cone Angle	
Rod Diameter (mm)	
Damper	

soils LIMITED

Dynamic Probe

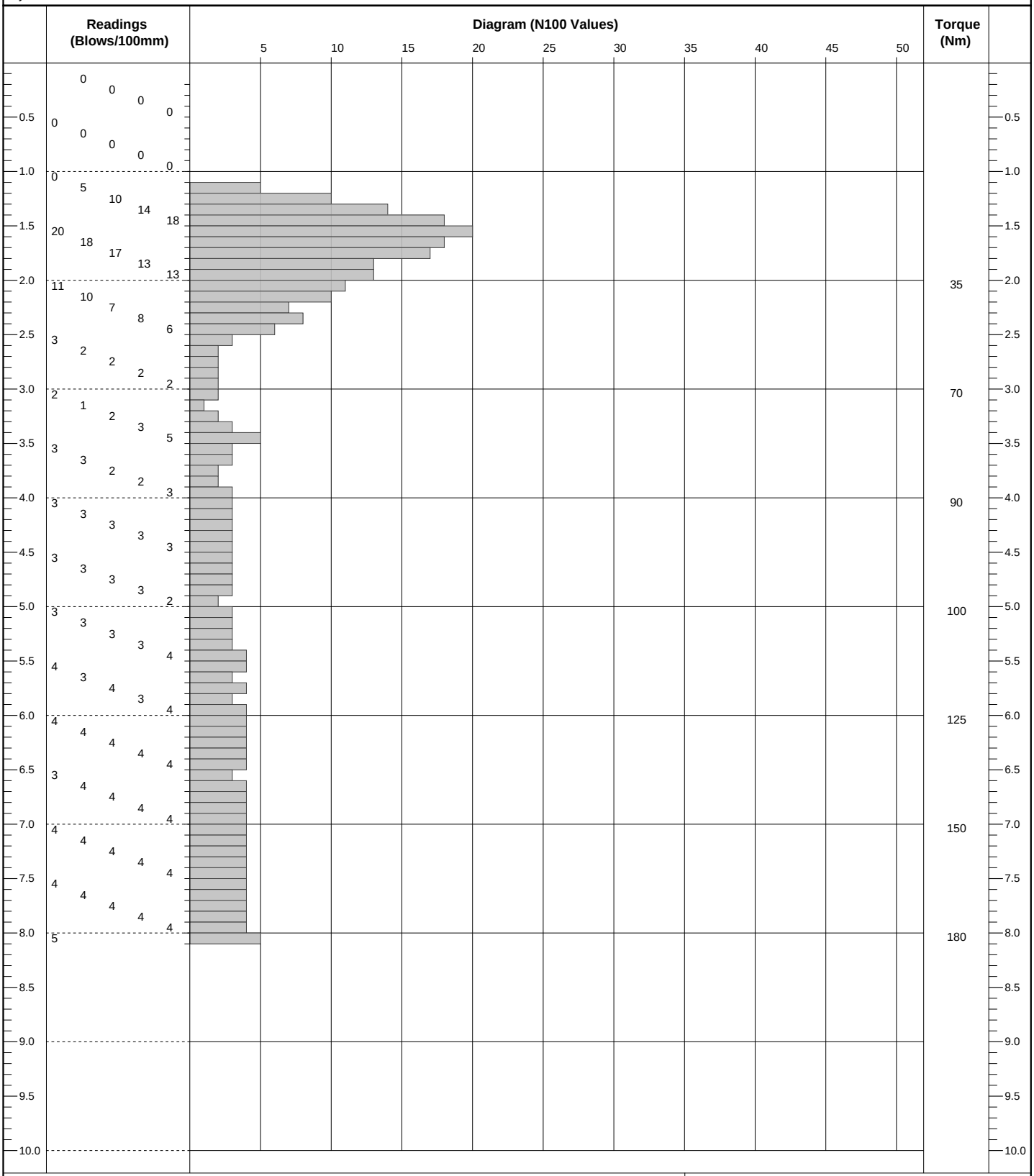
DP4

Sheet 1 of 1

Probe Type	Easting	Northing	Ground Level (m)	Scale
DPSH				1:50

Project Name	Project No.	Start Date	End Date
Ridgeway	22053		

Client	Consultant	Contractor
Ayre Chamberlain Gaunt Ltd.	NS	



Remarks

Type of rig Premier 1 - Energy Ratio = 90.32%

Method, Plant **Logger**

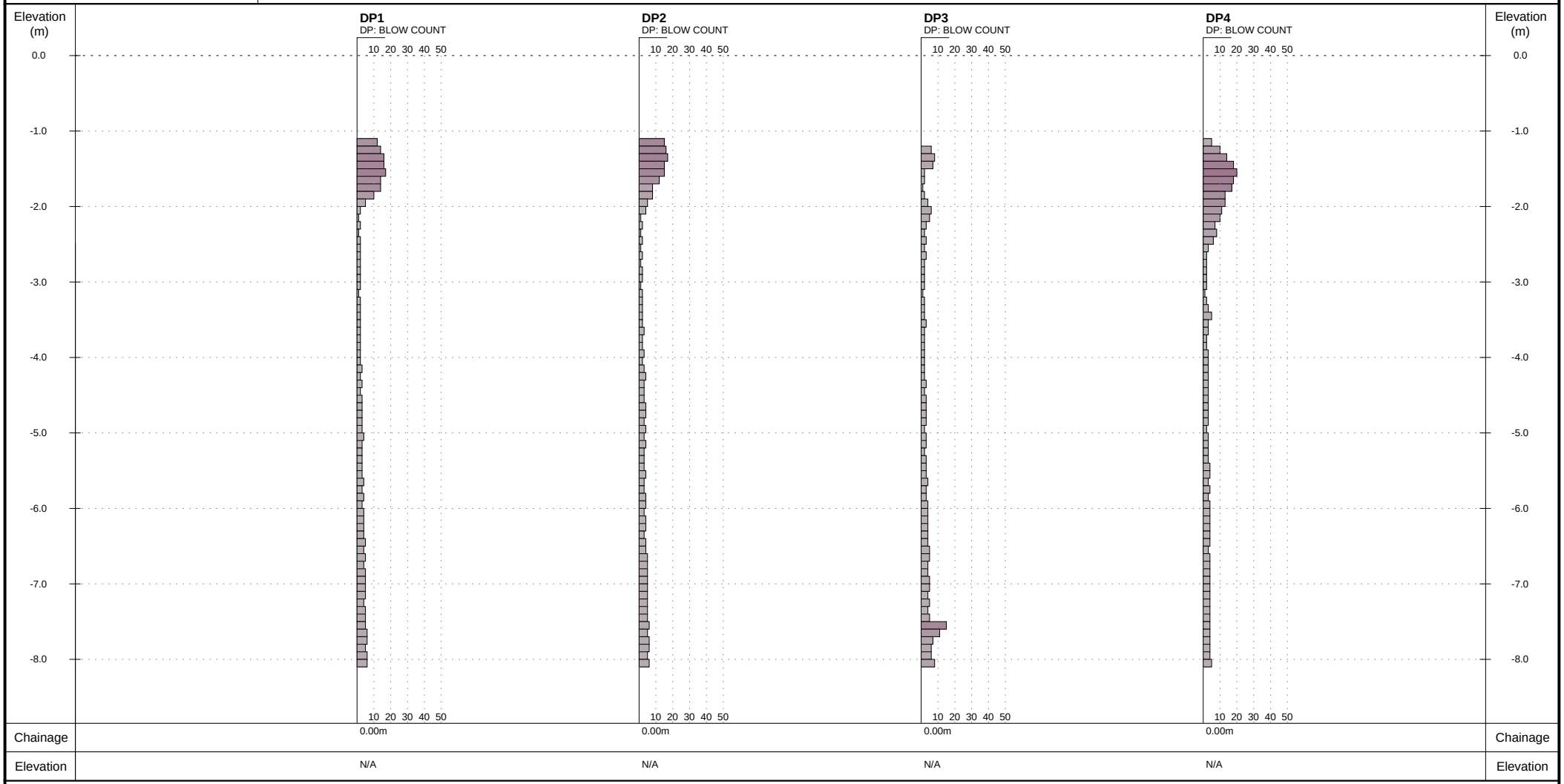
0.00 - 8.00m

Hammer Weight (kg)	63.5
Hammer Drop (mm)	760
Cone Diameter (mm)	52
Cone Angle	
Rod Diameter (mm)	
Damper	

Cross-Section

Project Name	Project No.	Vertical Scale	Horizontal Scale
Ridgeway	22053	1:74	NOT SCALED

Client	Consultant	Contractor
Ayre Chamberlain Gaunt Ltd.	NS	



WATER LEVELS

REST

STRIKE

Created using Pebble Geo

Trial Pit

FE1

Sheet 1 of 1

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP				1:25

Project Name	Project No.	Start Date	End Date
Ridgeway	22053		

Client
Ayre Chamberlain Gaunt Ltd.

Consultant
NS

Contractor

Inst/ Backfill	Water Levels	Samples and Tests: Depth (m)	Type/ Ref	Results	Level (m)	Depth (thickness) (m)	Strata: Legend	Description
						(0.10)		TARMAC
						0.10		
		0.20	D			(0.10) 0.20		Brown clayey SAND AND GRAVEL. Gravel is angular to rounded fine to coarse brick, flint tarmac. MADE GROUND
		0.50	D			(1.00)		Soft brown sandy gravelly CLAY. Gravel is angular to rounded fine to medium flint RIVER TERRACE DEPOSITS
		1.00	D			1.20		*End of Trial Pit at 1.20m*

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0

Remarks
No roots recorded. No groundwater encountered

Method, Plant, Stability, Dimensions
0.00 - 1.20m

Logger

soils LIMITED

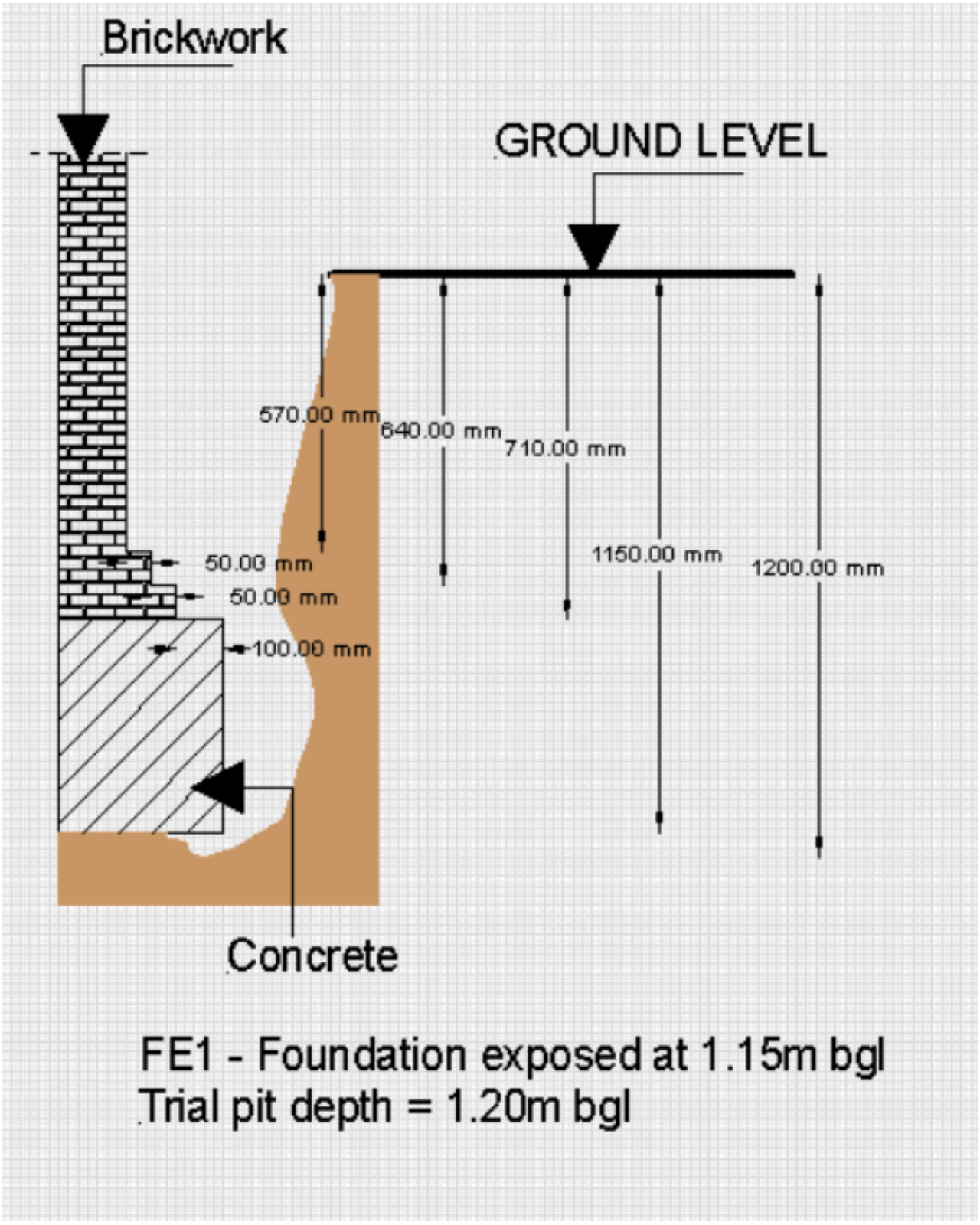
Trial Pit

FE1
PHOTO PAGE

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP				1:25

Project Name		Project No.	Start Date	End Date
Ridgeway		22053		

Client	Consultant	Contractor
Ayre Chamberlain Gaunt Ltd.	NS	



Remarks
No roots recorded. No groundwater encountered

Method, Plant, Stability, Dimensions
0.00 - 1.20m

Logger

Trial Pit

FE2

Sheet 1 of 1

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP				1:25

Project Name	Project No.	Start Date	End Date
Ridgeway	22053		

Client
Ayre Chamberlain Gaunt Ltd.

Consultant
NS

Contractor

Inst/ Backfill	Water Levels	Samples and Tests: Depth (m)	Type/ Ref	Results	Level (m)	Depth (thickness) (m)	Strata: Legend	Description
						(0.15) 0.15		TARMAC
		0.20	D					Soft brown and grey slightly sandy, gravelly CLAY. Gravel is angular to sub-angular fine to coarse flint, brick and tarmac. Rare rootlets. MADE GROUND
		0.50	D			(1.00)		
		1.00	D			1.15		*End of Trial Pit at 1.15m*

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0

Remarks
Maximum root depth 1.1m bgl. No groundwater encountered

Method, Plant, Stability, Dimensions
0.00 - 1.15m

Logger

soils LIMITED

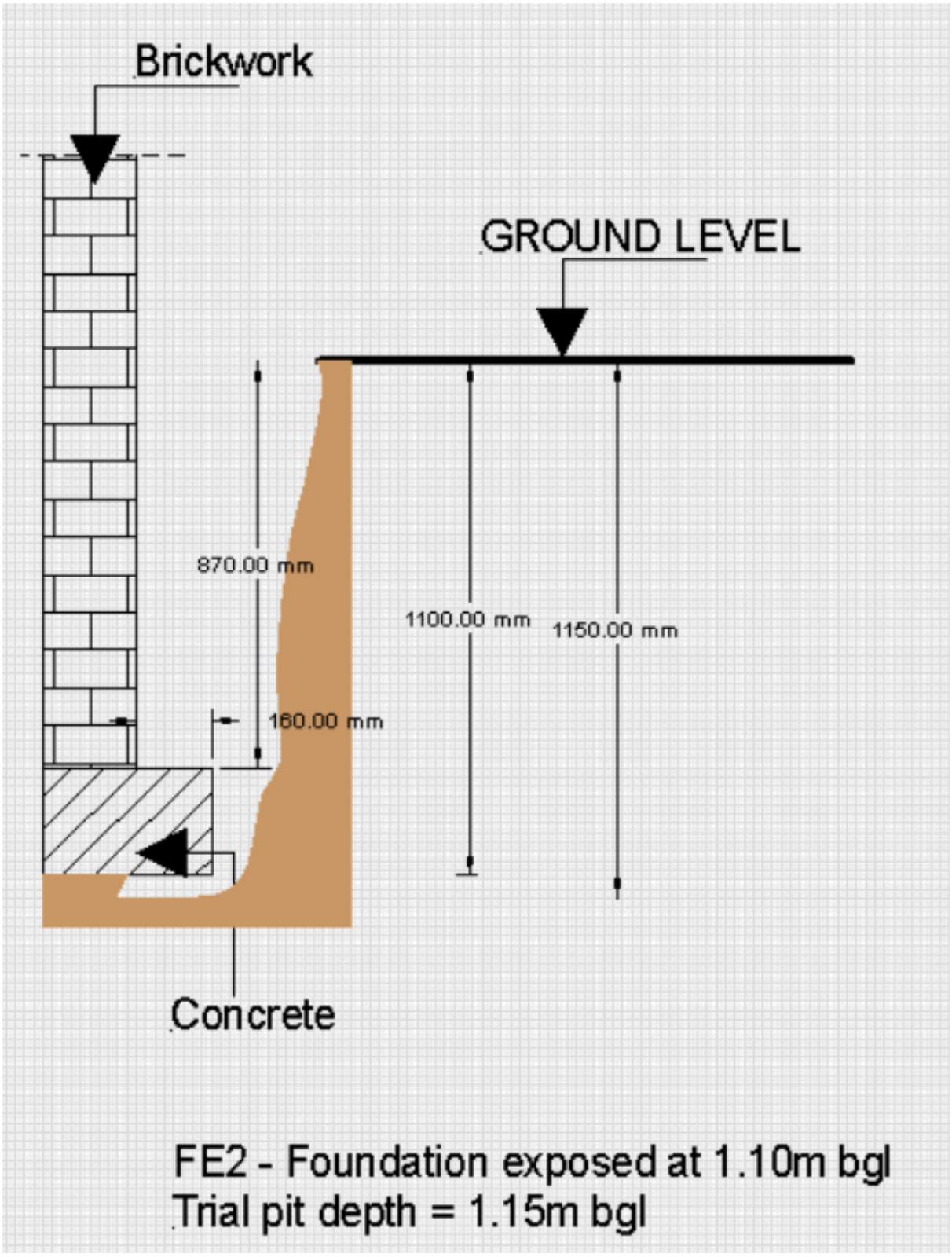
Trial Pit

FE2
PHOTO PAGE

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP				1:25

Project Name	Project No.	Start Date	End Date
Ridgeway	22053		

Client	Consultant	Contractor
Ayre Chamberlain Gaunt Ltd.	NS	



Remarks
Maximum root depth 1.1m bgl. No groundwater encountered

Method, Plant, Stability, Dimensions
0.00 - 1.15m

Logger

soils LIMITED

Trial Pit

FE3

Sheet 1 of 1

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP				1:25

Project Name	Project No.	Start Date	End Date
Ridgeway	22053		

Client
Ayre Chamberlain Gaunt Ltd.

Consultant
NS

Contractor

Inst/ Backfill	Water Levels	Samples and Tests: Depth (m)	Type/ Ref	Results	Level (m)	Depth (thickness) (m)	Strata: Legend	Description
						(0.15) 0.15		TARMAC
		0.20	D					Soft brown and grey slightly sandy, gravelly CLAY. Gravel is angular to sub-angular fine to coarse flint, brick and tarmac. Rare rootlets. MADE GROUND
		0.50	D			(1.05)		
		1.00	D			1.20		*End of Trial Pit at 1.20m*

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0

Remarks
Maximum root depth 1.0m bgl. No groundwater encountered

Method, Plant, Stability, Dimensions
0.00 - 1.20m

Logger

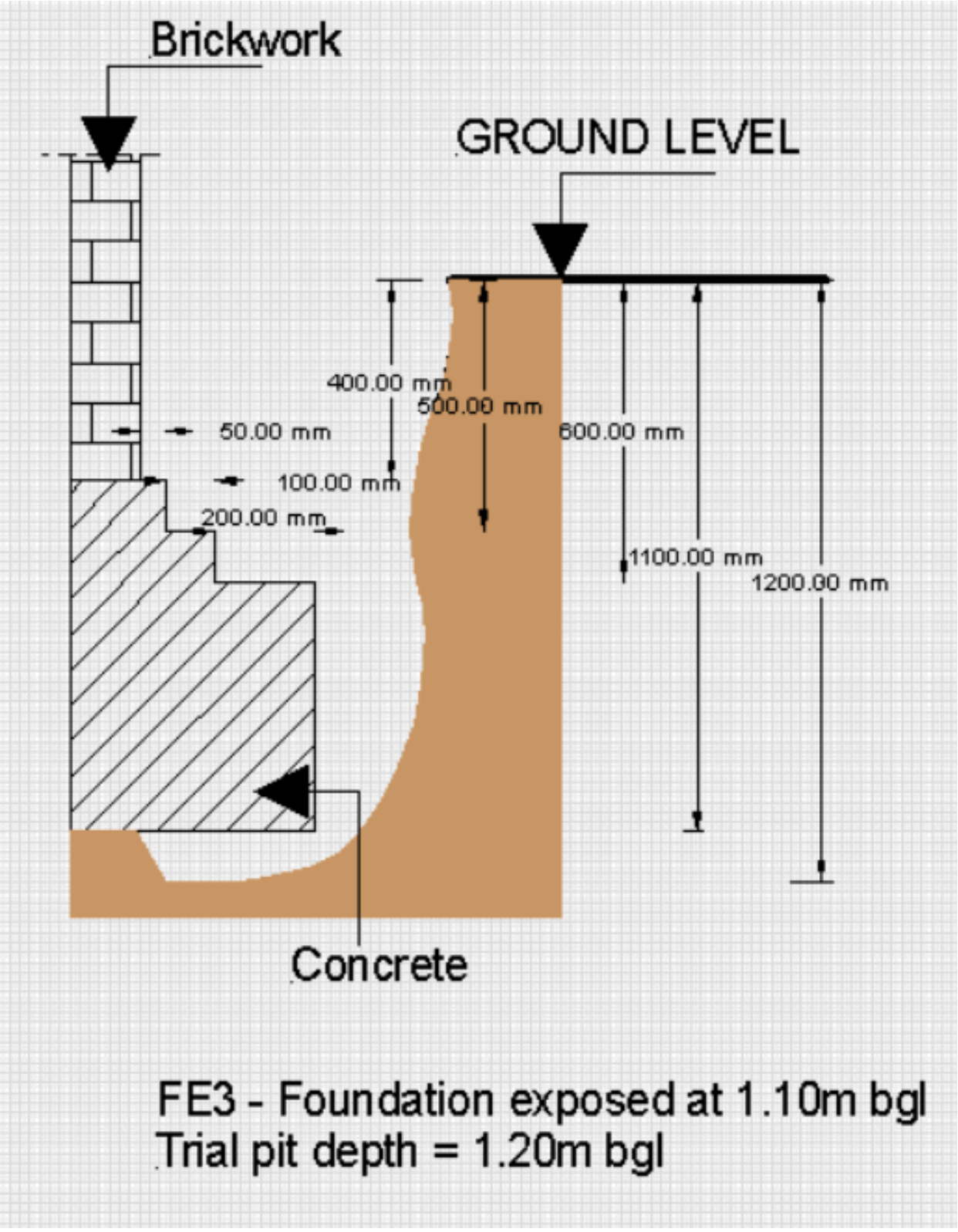
Trial Pit

FE3
PHOTO PAGE

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP				1:25

Project Name		Project No.	Start Date	End Date
Ridgeway		22053		

Client	Consultant	Contractor
Ayre Chamberlain Gaunt Ltd.	NS	



Remarks
Maximum root depth 1.0m bgl. No groundwater encountered

Method, Plant, Stability, Dimensions
0.00 - 1.20m

Logger

soils LIMITED

Trial Pit

FE4

Sheet 1 of 1

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP				1:25

Project Name	Project No.	Start Date	End Date
Ridgeway	22053		

Client
Ayre Chamberlain Gaunt Ltd.

Consultant
NS

Contractor

Inst/ Backfill	Water Levels	Samples and Tests: Depth (m)	Samples and Tests: Type/ Ref	Samples and Tests: Results	Level (m)	Depth (thickness) (m)	Strata: Legend	Strata: Description
						(0.10) 0.10		TARMAC
		0.20	D			(0.10) 0.20		Brown clayey SAND AND GRAVEL. Gravel is angular to rounded fine to coarse brick, flint tarmac. MADE GROUND
		0.50	D			(0.70)		Soft brown sandy gravelly CLAY. Gravel is angular to rounded fine to medium flint. RIVER TERRACE DEPOSITS
		1.00	D			0.90 (0.40)		Orange slightly clayey, slightly gravelly SAND. Gravel is angular to rounded fine to medium flint. RIVER TERRACE DEPOSITS
						1.30		*End of Trial Pit at 1.30m*

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0

Remarks
No roots recorded. No groundwater encountered

Method, Plant, Stability, Dimensions
0.00 - 1.30m

Logger

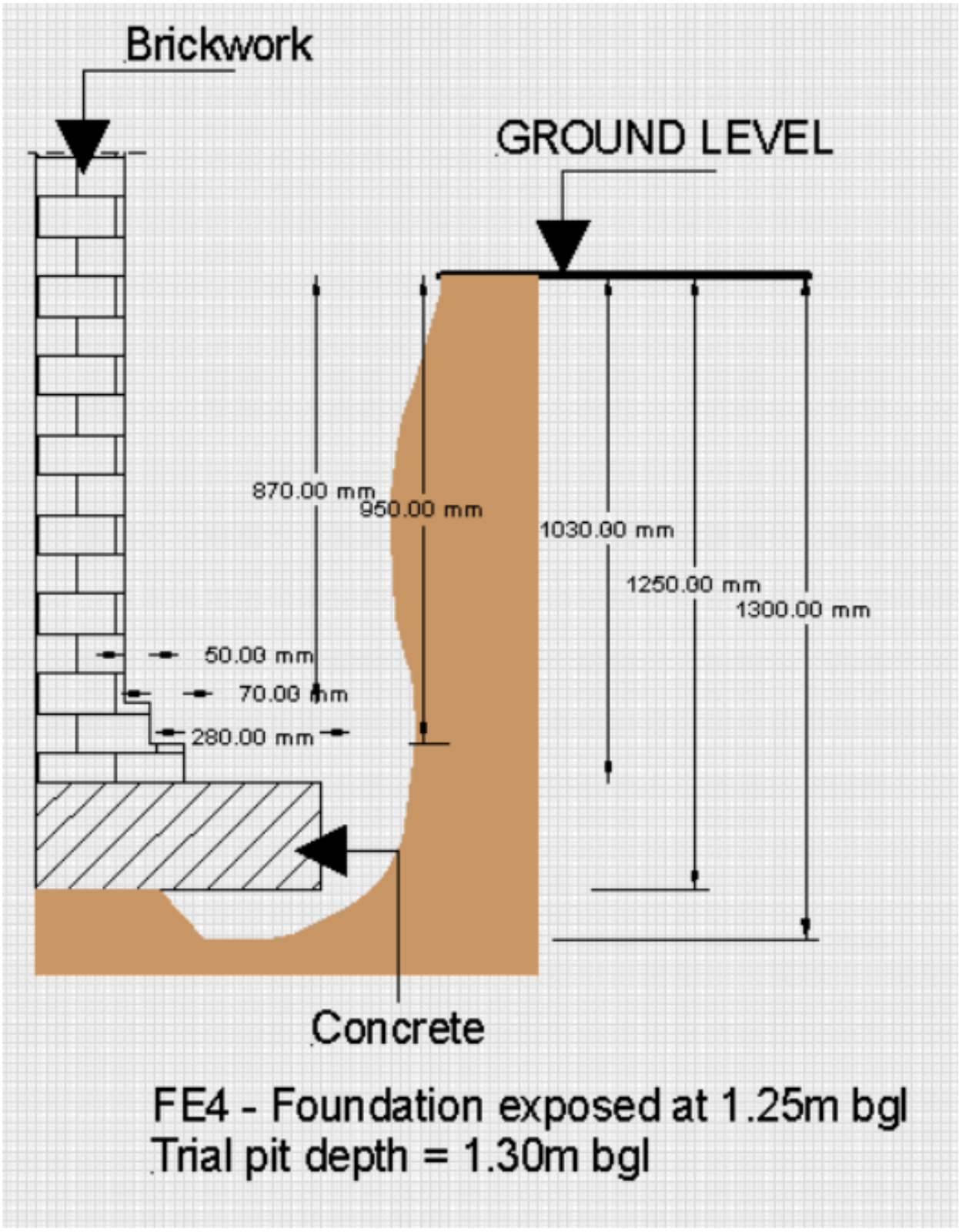
Trial Pit

FE4
PHOTO PAGE

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP				1:25

Project Name		Project No.	Start Date	End Date
Ridgeway		22053		

Client	Consultant	Contractor
Ayre Chamberlain Gaunt Ltd.	NS	



Remarks
No roots recorded. No groundwater encountered

Method, Plant, Stability, Dimensions
0.00 - 1.30m

Logger

soils LIMITED

Trial Pit

FE5

Sheet 1 of 1

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP				1:25

Project Name	Project No.	Start Date	End Date
Ridgeway	22053		

Client
Ayre Chamberlain Gaunt Ltd.

Consultant
NS

Contractor

Inst/ Backfill	Water Levels	Samples and Tests: Depth (m)	Samples and Tests: Type/ Ref	Samples and Tests: Results	Level (m)	Depth (thickness) (m)	Strata: Legend	Strata: Description
		0.20	D			(0.05) 0.05		PAVING
						(0.05) 0.10		SHARP SAND
						(0.05) 0.15		CONCRETE
						(0.03) 0.18		Dark brown, sandy, gravelly SILT. Gravel is angular to sub-angular fine to medium flint and concrete. MADE GROUND
						(0.12) 0.30		CONCRETE
								End of Trial Pit at 0.30m

0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0

Remarks
No roots recorded. No groundwater encountered. Unable to break out concrete, location terminated and moved to nearby FE5A along the wall

Method, Plant, Stability, Dimensions
0.00 - 0.30m

Logger

soils LIMITED

Trial Pit

FE5A

Sheet 1 of 1

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP				1:25

Project Name	Project No.	Start Date	End Date
Ridgeway	22053		

Client
Ayre Chamberlain Gaunt Ltd.

Consultant
NS

Contractor

Inst/ Backfill	Water Levels	Samples and Tests: Depth (m)	Samples and Tests: Type/ Ref	Samples and Tests: Results	Level (m)	Depth (thickness) (m)	Strata: Legend	Strata: Description
		0.20	D			(0.23) 0.23		TARMAC
		0.50	D			(0.82)		Brown clayey SAND AND GRAVEL. Gravel is angular to rounded fine to coarse brick, flint tarmac. MADE GROUND
		1.00	D			1.05		*End of Trial Pit at 1.05m*

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0

Remarks
No roots recorded. No groundwater encountered. Disused drainage pipe diameter approx 100m at a depth of 0.3m pipe noted. Pipe noted to be completely filled with silt.

Method, Plant, Stability, Dimensions
0.00 - 1.05m

Logger

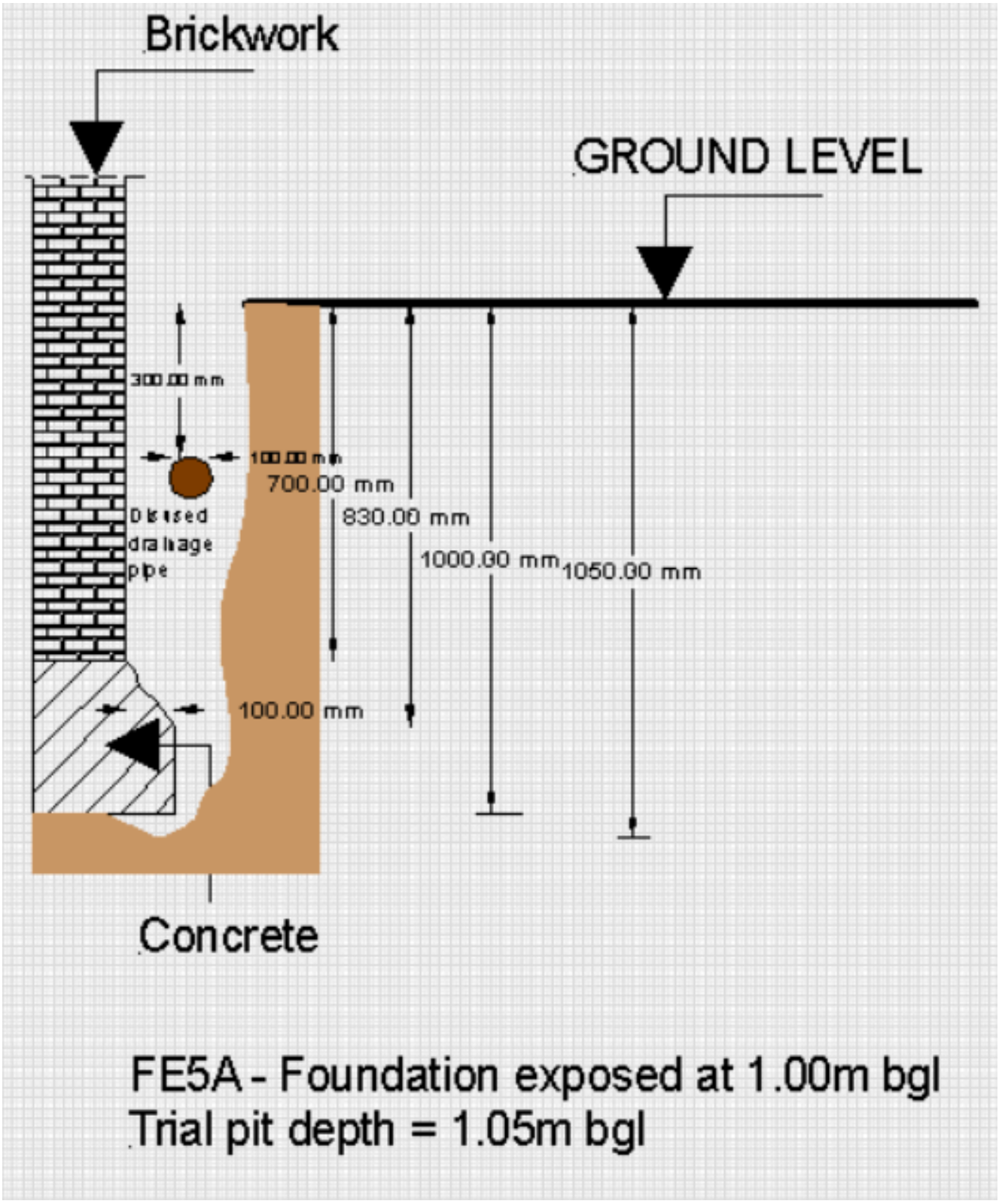
Trial Pit

FE5A
PHOTO PAGE

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP				1:25

Project Name		Project No.	Start Date	End Date
Ridgeway		22053		

Client	Consultant	Contractor
Ayre Chamberlain Gaunt Ltd.	NS	



Remarks
No roots recorded. No groundwater encountered. Disused drainage pipe diameter approx 100m at a depth of 0.3m pipe noted. Pipe noted to be completely filled with silt.

Method, Plant, Stability, Dimensions
0.00 - 1.05m

Logger

REC
Resource & Environmental Consultants Ltd

National Consultancy, Locally Delivered

GEO-ENVIRONMENTAL SITE INVESTIGATION
THE RIDGEWAY SCHOOL
READING

REC REFERENCE: 20715 V1.1 FINAL

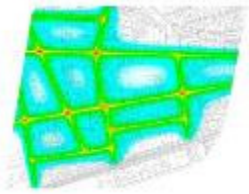
REPORT PREPARED FOR: HAMPSHIRE COUNTY COUNCIL
CAPITAL HOUSE – FIRST FLOOR
48-52 ANDOVER ROAD
WINCHESTER
SO23 7BH

JULY 2014

Hampshire County Council









QUALITY ASSURANCE

Issue/revision	Issue 1	Revision 1	Revision 2
Remarks	DRAFT	Final	
Date	June 2014	July 2014	
Prepared by	D. Hull	D. Hull	
Qualifications	BSc (Hons) MSc FGS	BSc (Hons) MSc FGS	
Signature			
Checked by	P. Hird	P. Hird	
Qualifications	BSc (Hons) MSc FGS	BSc (Hons) MSc FGS	
Signature			
Authorised by	T. Mitchell	T. Mitchell	
Qualifications	BSc (Hons) FGS	BSc (Hons) FGS	
Signature			
Project number	20715	20715	

EXECUTIVE SUMMARY

Site Address	The Ridgeway Primary School, Willow Gardens, Reading, RG2 7EL
National Grid Reference	472933,170402, Land Ranger SU729704
Site Area	2.03ha approximately

Conceptual Site Model

The initial conceptual site model has identified that made ground associated within the current development of the site is the only source of contamination which has the potential to present a risk to the identified receptors.

Site Investigation

Investigation Findings	Made Ground – general fine grained	Maximum thickness 0.80m
	Natural Strata – comprising River Terrace Deposits Formation overlying London Clay Formation	Unproven thickness to base of intrusive locations at 5.00m bgl.
	Sulphate Class (natural)	DS2,AC-1s to DS-4 / AC-3s
	Plasticity (natural)	Intermediate to high
	Volume Change (natural)	Medium to high
	Consistency (natural)	Firm to Stiff
	Permeability (natural)	8.08×10^{-5} 1.31×10^{-5}
	CBR	3%
	Groundwater	0.50m – 0.85m (seepages only)

Geotechnical Assessment

Medium to high strength clay was encountered at a maximum depth of circa 0.60mbgl within the northern sector of the site which deepened to circa 1.40 and 2.05 within the central and southern sectors of the site. As such strip foundations could be adopted for the proposed scheme bearing onto this stratum.

NHBC Chapter 4.2 Building Near Trees recommends a minimum founding depth of >1.0mbgl in the absence of any existing or proposed tree planting.

Given the relatively poor permeability and predominantly fine grained nature of the London Clay Formation, it is unlikely that soakaways could be adopted for the proposed scheme.

Revised Conceptual Site Model

The Human Heath and controlled waters risk assessment has not identified any concentrations that are considered to present a significant risk to the identified receptors.

Recommendations

It is considered that the site is suitable for the intended use without the requirement for remediation works.

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1.0 INTRODUCTION

1.1 Background

Resource and Environmental Consultants (REC) Ltd have been commissioned by the Engineering Consultancy Geotechnics Department at Hampshire County Council (HCC) to undertake a Phase II Intrusive Investigation at the site of the Ridgeway Primary School, Reading.

Details of the proposed scope of works were provided by HCC in their works estimate reference The Ridgeway Primary School Estimate.xls received on 10 April 2014 and confirmed in REC's Fee Proposal (ref. 20715/1405191/L1). Information relating to the proposed works was also provided in the following documentation:

- The Ridgeway Site Investigation Mark Up Plan (ref. The Ridgeway SI Layout Plan, July 2013).

All acronyms used within this report are defined in the Glossary presented in Appendix II.

1.2 Proposed Development

It is understood that the proposed development will comprise the construction of a new extension to the existing Primary school. The works will comprise the removal of existing temporary classrooms to the south of the site, and additional development to the existing building structure to the north west of the site. Single storey buildings are proposed to the west of the existing building footprint, with an additional area of hard standing to form a playground over part of the existing school field.

1.3 Objectives

The objectives of the geo-environmental investigation are to:

- Review historical plans, geology, hydrogeology, site sensitivity, flood-plain issues, mining records and any local authority information available in order to complete a Desk Study in line with Environment Agency (EA) document Model Procedures for the Management of Contaminated Land (Contaminated Land Report 11 (CLR11));
- Undertake a preliminary stage of sampling and analysis to provide an overview of environmental issues identified;
- Assess the implications of any potential environmental risks, liabilities and development constraints associated with the site in relation to the future use of the site and in relation to off-site receptors; and
- Provide recommendations regarding future works required.

1.4 Limitations

The limitations of this report are presented in Appendix I.

1.5 Confidentiality

REC has prepared this report solely for the use of the Client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed.

Should any third party wish to use or rely upon the contents of the report, written approval must be sought from REC; a charge may be levied against such approval.

2.0 SITE SETTING

2.1 Site Details

Site Address	The Ridgeway Primary School, Willow Gardens, Reading, RG2 7EL
National Grid Reference	472933,170402, Land Ranger SU729704
Site Area	2.70ha approximately

All acronyms used within this report are defined in the Glossary presented in Appendix II.

A site layout plan is presented in Appendix III.

2.2 Site Description

The site currently comprises the Ridgeway Primary School with the main access from Willow Gardens, a side road off Linden Road to the north east. Existing buildings on site primarily comprised of single story brick built construction with jointed tiled roofs. The original school buildings were observed towards the eastern boundary of the site, surrounded by tarmaced hard standing to the east and north. A more recent additional single story, inverted 'T' shaped building was identified north west of the original building structure, it was understood that the newer building operated as a canteen. A rectangular single story temporary cabin was identified south west of the main building, which was understood to comprise two classrooms.

The areas surrounding the school building comprised of soft standing recreational and asphalt hardstanding with the asphalt hard standing forming footpaths around the school and a large playing area to the south of the school building. Mature and semi mature tree were noted along the northern and western areas of the site.

It is understood that the school is provided by all major service from Willow Gardens.

A selection of site photographs is presented within Appendix IV.

Hazardous Materials Storage

No Above Ground Storage tanks (AST) or Underground Storage Tanks (USTs) were observed at the site.

Polychlorinated Biphenyls (PCBs)

No equipment that may potentially contain PCBs was observed at the site.

Waste Storage

No potentially hazardous waste streams are generated at the site.

Asbestos Containing Materials (ACM)

A potential ACM roofed structure, which was understood to comprise the school canteen was noted within the northern sector and it is possible given the age of this structure and the main school building that further ACMs was utilised during their construction, and it is therefore recommended that an asbestos survey is undertaken prior to any

demolition/construction works.

Drainage Issues

A formal drainage survey has not been completed, however surface water and foul water drainage was identified on site which appear to drain in the direction of Willow Gardens (to the north east) which is consistent with the Utility plans provided by Thames Water.

2.3 Surrounding Area

The surrounding land uses are summarised below:

Direction	Land Use
North	Immediately to the north east of the site is an area of residential housing. To the north adjacent to the residential housing lies open woodland.
East	Immediately to the east of the site is an area of residential housing.
South	Immediately to the south east of the site is an area of residential housing. Woodland is present predominantly along the southern boundary.
West	Immediately to the west of the site is an area of open woodland, with residential housing beyond.

3.0 SITE HISTORY

3.1 On-Site Historical Development

A review of historical mapping pertinent to the site is summarised in Table 3.1 below. A selection of historical mapping is included as Appendix V.

Table 3.1 Summary of on site Historical Land Uses

Map Edition	Historical Land Use	
	On site	Off site
1877	The site comprised open fields, with one hedgerow traversing northwest to southeast near the eastern border of the site.	No significant potentially contaminative off site land uses were observed on historic maps.
1899	No significant change in land use observed on historic maps.	Two residential dwellings were observed approximately 120m south of the subject site.
1911	No significant change in land use observed on historic maps.	No significant potentially contaminative off site land uses were observed on historic maps.
1936	Three buildings of the existing Ridgeway Primary school were observed towards the eastern boundary of the site. One small roughly rectangular building with an east to west orientation, one small square shaped building located near the eastern boundary of the site and a large roughly 'T' shaped building that forms the main school building.	Large scale residential development has occurred off the eastern site boundary. Allotment gardens were observed approximately 20m north of the subject site.
1958	The current footprint for The Ridgeway Primary School was observed. This comprises of three additional buildings in the north east of the site (two rectangular, one 'T' shaped) and an embankment was observed to the west of the existing building.	No significant potentially contaminative off site land uses were observed on historic maps.
1965	No significant change in land use observed on historic maps.	No significant potentially contaminative off site land uses were observed on historic maps.
1972 -1975	One smaller rectangular building was observed directly south of the main school building. No other significant change in land use observed.	The allotment gardens were no longer observed on historic maps. No other potentially contaminative off site land uses were observed on historic maps.
1991 -1993	No significant change in land use observed on historic maps.	Residential properties located in place of the Allotment gardens located north of the site boundary..
2012	The two northernmost buildings and the southernmost building of the school were no longer observed on historic maps.	No significant potentially contaminative off site land uses were observed on historic maps.

3.2 Off-Site Historical Development

A review of potentially contaminative uses identified on historical Ordnance Survey maps within a 250m radius of the site is summarised below in Table 3.2.

Table 3.2 Summary of Potentially Contaminative Off-Site Historical Land Uses

Surrounding Feature	Distance	Dates	Direction
Electricity Substation	~122m	*Pre 1972-1975 – Pre* 2012	South East

3.3 Planning History

REC has undertaken a review of on-line planning records held by Reading Borough Council however no environmentally pertinent information was available.

4.0 ENVIRONMENTAL SETTING

4.1 Geology & Hydrogeology

The British Geological Survey map for the site indicates that the area is underlain by the following geological sequence:

Geological Unit	Classification	Description	Aquifer Classification
River Terrace Deposits	Superficial	Sand and gravel	Secondary (A) Aquifer
London Clay Formation	Bedrock	Clay, silt and sand.	Unproductive Strata

The Groundsure report indicates there are no surface water or groundwater abstractions within a 1km radius of the site.

Based on the local topography and location of surface watercourses it is considered likely that shallow groundwater, if present, will flow in a south westerly direction.

The Environment agency website shows that the site is not within a groundwater Source Protection Zone.

4.2 Geotechnical Data

Geotechnical Data presented within the Groundsure Report identifies the following ground conditions:

Hazard	Designation
Shrink-Swell Clay	Low
Landslides	Very Low
Ground Dissolution	Null
Compressible Ground	Negligible
Collapsible Deposits	Very Low
Running Sand	Very Low

4.3 Hydrology

The Groundsure report indicates that there are six surface water features within a 250m radius of the site, the closest being.

Surface Water Feature	Quality*	Distance (m)	Direction
Unnamed tertiary river	Unknown	55	South
Unnamed tertiary river	Unknown	182	North

The site is not located within a currently defined flood risk zone. No flood defences have been identified within a 250m radius of the site.

The site is not located within groundwater flooding susceptibility area.

4.4 Radon Risk Potential

The Health Protection Agency Indicative Atlas of Radon in England and Wales indicates that the site is situated in an area where less than 1% of homes are above the Action Level. BRE report BR211 – Radon Guidance on Protective Measures for New Buildings reports that no special radon protective measures are necessary in the construction of new dwellings or extensions.

4.5 Industrial Land Uses

The site is situated within a predominately residential area, and the nearest industrial land use has been identified as a shell garage approximately 360m east of the site. Three electricity substations have been identified within a 250m radius of the site. The closest has been identified 122m south east of the site.

4.6 Sensitive Land Uses

One ancient woodland site was identified within a 1km radius of the subject site, located at the Whitley Wood 721m south of the site.

4.7 Site Sensitivity Assessment

The site is considered to be located within a moderate to high sensitivity setting due to the following reasons:

- Residential properties are located in close proximity;
- The underlying superficial geology comprising high permeability strata; and,
- There are two surface watercourses within influencing distance of the site.

5.0 CONSULTATIONS

5.1 Local Authority Contaminated Land Officer

The Contaminated Land Officer (CLO) Reading Borough Council (Rebecca Moon) stated that to date, the site is not designated under Part 2A of the Environment Protection Act. Additionally, the CLO had no concerns of about potential contamination on the site after reviewing historic data for the site.

5.2 Landfill Sites

The GroundSure report identifies no active or historic landfills within a 1km radius of the site. The closest landfill was identified as Manor Farm, located 1317m west of the site and is considered active. No waste transfer sites were identified within a 1km radius of the site, with the closest relating to Select Environmental Services, located 1309m west of the subject site.

5.3 Regulatory Database

The following information has been obtained from a commercially available environmental database. The summary table only includes records not otherwise detailed in the report.

Table 5.1 Summary of Groundsure Data

	0-249m	250-500m	Details
Contaminated Land Register Entries and Notices	-	-	N/A
Authorised industrial processes (IPC/IPPC/LAPPC).	-	-	N/A
Fuel Stations Entries	-	1	Relates to an active Shell petrol station located 364m east of the subject site.
Licensed radioactive substances	-	-	N/A
Enforcements, prohibitions or prosecutions	-	2	The closest relates to Polar Dry Cleaners, located 326m to the east of the subject site which has a current permit under Part B.
Discharge Consents	-	-	N/A
Pollution Incidents	-	1	Relates to an inorganic chemical spill 403m west of the subject site. The incident was recorded on 6th September 2001, and was assigned as a category 4 impact (No impact) to land, air and water.
Consents issued under the Planning (Hazardous Substances) Act 1990	-	-	N/A
Control of Major Accident Hazard (COMAH) sites	-	-	N/A

6.0 INITIAL CONCEPTUAL SITE MODEL (CSM)

6.1 Initial CSM

In accordance with Environment Agency, CLR 11 (2004) and BSI 10175 (Code of Practice for Investigation of Potentially Contaminated Land), REC Ltd have developed an initial CSM to identify potential contamination sources, migration pathways and receptors within the study area.

6.2 Contaminant Sources

On-site Potential Sources

- Historic Made Ground associated with development;

Off-site Potential Sources

- Electricity substation 122m to south east of the site.

6.3 Potential Pathways

- Ingestion of contaminated soil;
- Dermal contact with contaminated soil;
- Inhalation of dust;
- Inhalation of fibres;
- Inhalation of vapours;
- Migration into buildings, and;
- Vertical and lateral migration.

6.4 Potential Receptors

- Future site users;
- Secondary A Aquifer; and,
- Future buildings on site.

Construction workers are not considered to be a plausible receptor as exposure will be managed through the use of appropriate PPE and hygienic working practices as required under HSE / CDM regulations. Furthermore, the length of any exposure is likely to be for a short duration.

An Initial Conceptual Site Model has been prepared for the site and is presented over page within Table 6.1.

Source	Contaminant	Potential migration pathway	Potential Receptors	Likelihood of Occurrence	Magnitude of Occurrence	Overall Risk Rating	Active/Inactive
On Site							
Made Ground associated with development	Metals (As, Cd, Cr, Pb, Hg, Se, Ni)	Ingestion of contaminated soils Plant uptake Contact with contaminated soils	Future Site Users	Likely	Medium	Moderate	**Potentially Active** -Further investigation
	Asbestos Fibres in Soil	Inhalation of fibres	Future Site Users	Likely	Medium	Moderate	**Potentially Active** -Further investigation
	Polycyclic Aromatic Hydrocarbons (PAH)	Ingestion of contaminated soils Contact with contaminated soils	Future Site Users	Likely	Medium	Moderate	**Potentially Active** -Further investigation
	Total Petroleum Hydrocarbons (PRO/DRO)	Ingestion of contaminated soils Contact with contaminated soils Migration of vapours	Future Site Users	Likely	Medium	Moderate	**Potentially Active** -Further investigation
		Vertical and lateral migration	Controlled Waters	Likely	Medium	Moderate	**Potentially Active** -Further investigation
	Ground Gas (CH_4 and CO_2)	Migration into Buildings	Future Site Users	Likely	Severe	High	**Potentially Active** - Further Investigation
Off Site							
Electricity substation (122m East)	Polychloride Biphenyl (PCB)	Lateral Migration	Future Site Users	Unlikely	Medium	Very Low Risk	**Inactive** - PCBs have a limited mobility and any contamination is likely to be localised immediately around the substation. It is therefore considered unlikely that lateral migration would affect the subject site.

7.0 SITE INVESTIGATION

7.1 Desk Study Information

Potential contamination sources have been identified from the desk study and these are listed in Table 7.1 below:

Table 7.1 Summary of Potential Contaminant Sources

Potential Source	Potential Contaminants	Potential Impact
Made Ground across the site	Metals , PAHs, asbestos & ground gas	Human Health
	Hydrocarbons	Human Health and controlled waters

7.2 Site Investigation

A ground investigation was designed based on the findings of the desk study with exploratory holes advanced to target specific potential contaminant sources summarised in Table 7.1. In addition, exploratory holes have also been advanced to provide information on baseline conditions across the site. The investigation has also been used to collect geotechnical information to assist in the design and construction of the proposed development.

7.3 Scope

Details of the proposed scope of works were provided by HCC in their works estimate reference Estimate – The Ridgeway School, Reading.xls received on 10 April 2014 and REC's Fee Proposal (ref. 20715/140519/L1). Proposed works comprised the following:

- The advancement of up to 7no. dynamic probes with window samples at the locations to a maximum depth of 5.0mbgl using a tracked Terrier type rig (or similar);
- 3no. in situ CBR's to a depth of circa 1.00mbgl using dynamic cone penetration (DCP) testing equipment. These locations will be subsequently excavated in order to determine the principal soil type and to obtain samples for subsequent remoulded laboratory CBR tests;
- 3no. hand dug foundation pits to a maximum of 1.2mbgl;
- 4no. variable head permeability test in a dynamic sample hole;
- Hand shear vane testing of fine grained soils to a depth of 1.20mbgl in order to obtain quantitative shear strength data;
- Collection of soil samples for geotechnical and contamination testing. Geotechnical sampling will be limited to bulk samples within the inspection pits at depths of approximately 0.5, 1.0 and 1.20mbgl and then small disturbed samples at depths of circa 0.5mbg;
- Backfilling of those Intrusive locations not installed as monitoring points with arisings and left level;
- 1No. Return groundwater monitoring visit with collection of groundwater samples;
- Collection of samples from all exploratory holes for subsequent geotechnical and chemical laboratory testing; and
- Backfilling of the locations with arisings.

Exploratory fieldwork was completed between 21st and 22nd May 2014. The works are summarised in Table 7.2 below:

Table 7.2 Summary of Fieldwork

Location Hole	Potential Source/Rationale	Type	Maximum Depth (m bgl)	Monitoring Wells Response Zone (mbgl)
Window Sample Holes				
WS101 to WS107	To obtain information on shallow ground conditions for assessment of shallow foundations and confirm findings of initial conceptual site model.	Window Sample Hole	5.45	1.00-.5.00 (WS101 WS104, WS105 , WS106)
CBR Tests				
CBR101 to CBR103	CBR values in the area of proposed car parking	TRL DCP	0.89	N/A
Hand Dug Foundation Pits				
HP101 to HP103	To determine the construction of the current building foundations.	Hand Dug	1.15	N/A

m bgl – metres below ground level.

The sample locations are illustrated in Figure 2 (Appendix III).

Soil samples for chemical analysis were collected at regular intervals in appropriate sampling containers. All samples were subsequently stored in cool boxes prior to submission to analytical laboratory. All samples were collected using appropriate PPE and sampling equipment that was cleaned at each sampling location. A detailed copy of REC Ltd sampling methodology, QA procedures and laboratory chain of custody forms can be provided upon request.

7.3.1 In-Situ Testing Super Heavy Dynamic Probe (DPSH)

In-situ geotechnical testing was conducted using the Super Heavy Dynamic Probe (DPSH) The results are shown in Appendix VIII.

7.3.2 In-Situ Hand Shear Vane Testing

In-situ Hand Shear Vane testing was undertaken within fine grained soils. The tests were undertaken using 19mm shear vane paddle. The results and undrained shear strengths derived from testing are presented on the Engineering Logs in Appendix VI.

7.4 Laboratory Analysis

Details of chemical and geotechnical analysis are detailed further in Section 7.4.1 and 7.4.2 below.

7.4.1 Chemical Analysis

Selected soil samples were submitted for a range of chemical analysis including WAC Testing at Scientific Analysis Laboratories Ltd (SAL) of Braintree; where the works were undertaken in accordance with their UKAS accreditation where applicable. Chemical testing results are included in Appendix VII and discussed in Section 9.

7.4.2 Geotechnical Analysis

Selected soil samples collected from a range of depths were submitted for a range of analyses to determine the geotechnical properties of the underlying soils in order to assist with providing geotechnical considerations for the proposed development.

All samples were collected using appropriate PPE and sampling equipment that was cleaned at each sampling location. A detailed copy of REC Ltd sampling methodology, QA procedures and laboratory chain of custody forms can be provided upon request.

Geotechnical testing was carried out by Professional Soil Laboratories based in Doncaster, who are UKAS accredited for a wide range of tests. All testing was carried out in accordance with BS1377:1990 Methods of Test for Soils for Civil Engineering Purposes. The tests scheduled were reflective of those allowed for and requested by HCC in the issued work package documents and are detailed in Table 7.3 below:

Table 7.3 Summary of Geotechnical Laboratory Testing

Test	Standard	No. Scheduled	No. Completed
Moisture Content	BS1377: Part 2:1990, Clause 3.2	10	10
Liquid Limit (one point method)	BS1377: Part 2:1990, Clause 4.4	10	10
Plastic Limit	BS1377: Part 2:1990, Clause 5.3	10	10
Plasticity Index	BS1377: Part 2: 1990, Clause 5.4	10	10
CBR Determination (remoulded)	BS1377 : Part 4 : 1990, Clause 7	3	3
Particle Size Density (wet)	BS1377: Part 2: 1990, Clause 9.2 and 9.3	7	7
Quick undrained triaxial	BS1377: Part 9: 1990, Clause 9	1	1
pH and 2:1 SO_4	BS1377: Part 3: 1990, Clause 3	16	16

Geotechnical testing results are presented within Appendix VIII and discussed in Section 10.

8.0 GROUND AND GROUNDWATER CONDITIONS

8.1 Ground Conditions

8.1.1 Summary of Ground Conditions

The ground investigation generally confirmed the published geology and identifies the strata set out in Table 8.1 below:

Table 8.1 Summary of Strata

Strata	Min Depth to Top of Strata (mbgl)	Max Depth to Top of Strata (mbgl)	Max Thickness (m)
Made Ground	Ground Level	Ground Level	0.80 (HP102 & WS104)
River Terrace Deposits (Superficial)	0.20 (WS107)	0.80 (HP102 & WS104)	1.70 (WS106)
London Clay Formation (Bedrock)	1.00 (HP101, HP102 & WS102)	2.05 (WS106)	Unproven in excess of 5.00m within all window sample locations.

8.1.1.1 Made Ground

Made Ground was encountered within all intrusive hand pit locations and three (3no.) window sample locations to a maximum proven depth of 0.80m bgl (WS104). This unit was predominantly coarse grained in nature, comprising brown slightly silty, gravelly sand. Gravel comprised sub rounded fine to medium flint with occasional red brick (HP101, HP103) and clinker and asphalt (HP101). Within locations HP101 and WS105 (from 0.40m bgl) the material was logged as soft brown slightly gravelly, slightly sandy clay. Additionally, a layer of asphalt was observed between 0.50m bgl and 0.60m bgl in WS105.

No olfactory or visual evidence of potential contamination was noted within this unit.

8.1.1.2 Drift Deposits

River Terrace Deposits

The River Terrace Deposits were identified on site between a depth of 0.20m (WS107) and 1.70m (WS106). The layer comprised brownish grey to orangey brown slightly silty sandy gravel and gravelly sand. A firm yellowish grey mottled orange slightly sandy slightly gravelly clay band was identified in WS101 between 0.40m bgl and 0.65m bgl. The sand was observed to be predominantly fine to medium, and the gravel was observed to be predominately of sub angular to sub rounded, fine to medium flint with frequent coarse flint.

No olfactory or visual evidence of potential contamination was noted within this unit.

8.1.1.3 Bedrock

London Clay Formation

The River Terrace Deposits were underlain directly by the London Clay Formation, which was encountered at a maximum depth of 2.05m bgl in WS106 and persisted to beyond the depth of intrusive locations at a maximum of 5.00m bgl. The unit generally comprised firm to stiff light brown mottled light orange thinly laminated CLAY, with occasional bands of dark grey mottled brown CLAY in the upper 1.10m in HP103 and between 2.30m bgl and 5.00m bgl in WS101. The formation was observed to be slightly sandy and slightly gravelly in the upper three metres, with silt throughout. The strata were observed to increase in stiffness

with depth. Selenite crystals (of a 1mm - 3mm diameter) were observed in WS102 between 2.00m bgl and 5.00m bgl.

A hard brown mudstone band, approximately 0.10m in thickness was identified within the London Clay unit within WS106 at a depth of 3.50m bgl.

No olfactory or visual evidence of potential contamination was noted within this stratum.

8.1.1.4 Obstructions and Services Encountered

Except for the mudstone band noted above, so other obstructions or services were encountered during the works.

8.1.2 In-situ Testing

Undrained shear strength values of the fine grained soils were determined using in-situ hand shear vane testing and laboratory quick undrained triaxial tests. A requirement from HCC was to undertake continuous Super Heavy Dynamic Probes (DPSH) in addition to the window sample locations. The testing was undertaken within seven locations with the test results included within Appendix VIII. The results of the in situ testing gave undrained shear strengths well below shear vane testing and identified the soils to be of low strength which did not correlate with on-site observations and hand vane testing. These have therefore been omitted from the assessment of undrained shear strength.

The results of the dynamic probe testing within the coarse grained soils of the River Terrace Deposits indicated relative densities ranging between 9 and 30, indicating loose to dense soils.

Results of the hand shear vane and laboratory triaxial testing are presented in Table 8.2 below:

Table 8.2 Summary of Undrained Shear Strength (Cu)

Hole No.	Depth (m bgl)	Material Field Description	Soil Strength	Quick Undrained Triaxial Test Results (Cu)	Undrained Shear Strength derived from hand shear vanes (kN/m^2)
WS101	0.5	RTD	Medium	N/A	56
	0.7	RTD	Medium	N/A	74
	1.2	LCF	High	N/A	103
	2	LCF	High	N/A	82
	3	LCF	High	N/A	86
	4	LCF	High	N/A	96
	5	LCF	Very High	N/A	>140
WS102	1.2	LCF	High	N/A	78
	2	LCF	High	N/A	78
	2.65	LCF	High	N/A	98
	3	LCF	High	N/A	86

Hole No.	Depth (m bgl)	Material Field Description	Soil Strength	Quick Undrained Triaxial Test Results (Cu)	Undrained Shear Strength derived from hand shear vanes (kN/m^2)
	3.7	LCF	Medium	N/A	62
	4.2	LCF	High	N/A	116
	4.5	LCF	High	N/A	122
	5	LCF	High	N/A	128
WS103	1.2	LCF	Medium	N/A	71
	1.5	LCF	High	N/A	103
	2	LCF	High	N/A	78
	2.3	LCF	High	62	80
	2.76	LCF	High	N/A	112
	3.0	LCF	High	N/A	86
	3.1	LCF	Very High	N/A	>140
	3.9	LCF	High	N/A	121
	4.1	LCF	Very High	N/A	>140
	4.9	LCF	Very High	N/A	>140
WS104	1.6	RTD	High	N/A	76
	1.9	RTD	High	N/A	119
	2.1	RTD	High	N/A	106
	2.2	LCF	High	N/A	90
	2.5	LCF	High	N/A	98
	2.8	LCF	High	N/A	96
	2.9	LCF	High	N/A	88
	3.1	LCF	Medium	N/A	60
	3.2	LCF	High	N/A	111
	3.5	LCF	High	N/A	114
	3.7	LCF	High	N/A	124
	3.9	LCF	Medium	N/A	68
	4.5	LCF	High	N/A	100
	4.7	LCF	High	N/A	102
WS105	2	LCF	Medium	N/A	46

Hole No.	Depth (m bgl)	Material Field Description	Soil Strength	Quick Undrained Triaxial Test Results (Cu)	Undrained Shear Strength derived from hand shear vanes (kN/m^2)
	3	LCF	Medium	N/A	42
	4	LCF	Medium	N/A	70
WS106	2.50	LCF	Medium	N/A	66
	3.05	LCF	Low	N/A	38
	3.5	LCF	Medium	N/A	46
	4	LCF	Medium	N/A	74
WS107	2	LCF	High	N/A	77

Key; MG – Made Ground, RTD – River Terrace deposits, LCF – London Clay Formation, N/A – Not applicable

The results above indicate a broad linear increase of undrained shear strength (Cu) and depth with the London Clay Formation which is consistent with solid geology of this type.

8.1.3 pH and Sulphate

Chemical analyses for pH and soluble sulphate content contained in Appendix VII (summarised below in Table 8.3), shows that the soils at the site to a depth of 2.00m bgl generally meet Class DS1 and DS-2, Aggressive Chemical Environment for Concrete Classification (ACEC) AC-1s in accordance with BRE Special Digest 1 (2005). The encountered soils at depths below 2.50m bgl generally meet class DS-4, AC-3s.

Calculations for total potential sulphate indicate that pyrite is unlikely to be present if the ground is disturbed.

Table 8.3 Summary of pH and Sulphate Data

Location	Depth (m)	SO_4 in 2:1 water / soil (g/l)	pH Value	Total SO_4 (%)	Total Sulphur (%)	Total Potential Sulphate	Oxidisable Sulphides (%)	DS and ACEC Class
WS101	0.70	0.13	6.4	-	-	-	-	DS-1 / AC-1s
	1.20	0.23	6.9	-	-	-	-	DS-1 / AC-1s
WS102	0.65	0.029	8.3	-	-	-	-	DS-1 / AC-1s
	1.50	0.064	7.9	-	-	-	-	DS-1 / AC-1s
	2.50	1.6	7.7	0.51	0.16	0.48	-0.03	DS-3 / AC-2s
	4.80	0.11	8.0	0.03	0.01	0.03	0	DS-1 / AC-1s
WS103	2.90	0.20	8.5	-	-	-	-	DS-1 / AC-1s
	3.50	0.59	7.9	0.14	0.05	0.15	0.01	DS-2 / AC-1s
	3.80	2.60	7.7	-	-	-	-	DS-3 / AC-2s

Location	Depth (m)	SO_4 in 2:1 water / soil (g/l)	pH Value	Total SO_4 (%)	Total Sulphur (%)	Total Potential Sulphate	Oxidisable Sulphides (%)	DS and ACEC Class
WS104	1.20	0.13	7.3	-	-	-	-	DS-1 / AC-1s
	2.50	1.8	7.7	2	0.67	2.01	0.01	DS-4 / AC-3s
WS105	1.50	0.60	7.4	-	-	-	-	DS-2 / AC-1s
	2.80	0.13	8.0	-	-	-	-	DS-1 / AC-1s
WS106	1.80	0.027	6.7	-	-	-	-	DS-1 / AC-1s
	2.00	0.037	7.5	-	-	-	-	DS-1 / AC-1s
	4.80	2.50	7.6	-	-	-	-	DS-3 / AC-2s
WS107	3.80	0.2	7.4	0.04	0.02	0.06	0.02	DS-1 / AC-1s
DCP101	GL-1.00	0.016	7.8	-	-	-	-	DS-1 / AC-1s
DCP102	GL-1.00	0.016	7.0	-	-	-	-	DS-1 / AC-1s
DCP103	GL-1.00	0.011	7.8	-	-	-	-	DS-1 / AC-1s

8.1.4 Soil Plasticity

Atterberg Limits determinations, summarised in Table 8.4 below, indicate the clay to be of high plasticity and medium to high volume change potential.

Table 8.4 Summary of Plasticity Index Test Results

Location	Depth (m)	Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Percentage passing 425µm sieve (%)	Modified Plasticity Index
WS101	0.70	25	67	27	40	97	38
WS101	1.20	25	61	26	35	97	34
WS102	1.50	25	57	24	33	100	33
WS103	2.30	28	59	26	33	100	33
WS103	2.90	31	69	29	40	97	38
WS103	3.80	27	64	27	37	94	35
WS104	1.20	12	-	NP	-	-	-
WS104	3.40	34	7	29	38	100	38
WS105	2.80	26	58	25	33	100	33
WS106	4.80	26	69	27	42	100	42

8.1.5 California Bearing Ratio (CBR) Testing

California Bearing Ratio (CBR) was measured in situ by tests using a Dynamic Cone Penetrometer (DCP) at locations CBR101, CBR102 and CBR103. The test locations were excavated following the completion of the testing and remoulded CBR tests scheduled with the geotechnical laboratory for comparison purposes. CBR results determined by both methods are presented in Table 8.5 below with the in situ tests calculated based on a number of blows and penetration between a depth of 0.40 and the full depth of the test.

Table 8.5 Results of In-situ and Laboratory CBR Testing

Test	Max Test Depth (mbgl)	Strata	In Situ CBR Result from DCP testing (%) (Test 1)	Laboratory CBR Results (%) Average of top and bottom
CBR101	0.4-0.6m	River Terrace Deposits	19	11
CBR102	0.4-0.6m	River Terrace Deposits overlying London Clay Formation	3	1
CBR103	0.4-0.6m	River Terrace Deposits	15	62

The results presented above indicate that the in-situ testing and laboratory testing are relatively consistent with a CBR of 3% achievable in good construction conditions.

8.1.6 Particle Size Distribution

Seven particle size distribution tests were undertaken on selected soil samples and the result is presented overleaf in Table 8.6.

Table 8.6 PSD Summary

Location	Depth (m)	Strata Description	Granulometric Composition (%)			
			Clay/Silt	Sand	Gravel	Cobbles
WS102	0.65	Brown slightly sandy very silty CLAY	97	3	0	0
WS104	3.40	Brown slightly sandy CLAY	94	6	0	0
WS105	1.50	Brown slightly silty very gravelly SAND	3	59	38	0
WS105	2.80	Brown slightly sandy CLAY	94	6	0	0
WS106	1.80	Brown clayey very sandy GRAVEL	13	31	56	0
WS106	2.00	Brown clayey very sandy GRAVEL	16	20	64	0

8.1.7 Foundation Pits

Three hand excavated foundation pits were carried out on site on 22/05/14, with details provided below:

HP101

A red brick wall formed the eastern elevation with the wall stepping out 155mm in three stages before founding directly on to a concrete foundation identified 620mm bgl which appeared to be poured in situ and stepped some 110mm out from the final step of the elevation. The base of the foundation was unable to be identified due to lack of space within the excavation.

HP102

A red brick wall formed the south western elevation with the wall stepping out 110mm in two stages before founding directly on to a concrete foundation 634mm bgl which stepped out from the elevation some 110mm. The foundation was observed to be a thickness of 390 mm and appeared to be poured in situ and seated upon firm to stiff CLAY.

HP103

A red brick wall formed the north western elevation with the wall stepping out 100mm in two stages before founding directly on to a concrete foundation 720mm bgl which stepped out from the elevation some 110mm. The foundation was observed to be a thickness of 380 mm and appeared to be poured in situ and seated upon firm to stiff CLAY.

8.1.8 Contamination

During site works, visual and olfactory inspection did not identify any evidence of soil contamination.

8.1.9 Soil Infiltration

In situ variable (falling) head permeability tests were undertaken within window sample locations WS101, WS104, WS105 and WS106) in order to obtain indicative information on soil infiltration.

The tests were carried out within installations that were monitored with groundwater and have therefore been recorded as permeability test results as detailed further below in Table 8.7:

Table 8.7 Soil Infiltration Results

Location	Response Zone (m bgl)	Material	Permeability Rate (m/s)
WS101	1.00 – 4.95 (Well Dry)	London Clay Formation	N/A
WS104	0.58 – 4.92	River Terrace Deposits & London Clay Formation	8.08×10^{-5}
WS105	1.42 – 4.97	London Clay Formation	1.31×10^{-5}
WS106	1.00 - 2.93 (Well Dry)	London Clay Formation	N/A

Calculated permeability rates indicated relatively low rate of poor drainage conditions. Two of the soakaway tests (WS101 and WS106) failed to generate useable data due to no drainage. The soakaway test at WS104 was undertaken as a rising head due to the presence of shallow groundwater within the River Terrace Deposits. Given the limited shallow coarse grained strata and the underlying fine grained soils encountered at the site, infiltration rates are generally considered poor and it is unlikely that soakaways could be adopted for the proposed scheme.

8.2 Groundwater Conditions

Shallow groundwater was encountered during the intrusive investigation within three of the seven window samples holes. The depth of the seepages and the depth to which groundwater rose are shown on the exploratory hole records and summarised in Table 8.8 below:

Table 8.8 Summary Groundwater Strikes

Location	Depth to strike (mbgl)	Depth to standing water (mbgl)	Unit
WS102	0.75	1.55	London Clay
WS103	0.85	Seepage	River Terrace Deposits
WS104	0.65	Seepage	Made Ground
	3.60	Seepage	Mudstone

8.3 Groundwater Monitoring

A return monitoring visit was undertaken fifteen days post site works on the 06/06/14. The monitoring indicated the presence of groundwater as follows:

Location	Depth to Groundwater
WS104	1.41
WS105	0.56
WS106	0.89

9.0 TIER 1 QUALITATIVE CONTAMINATED LAND RISK ASSESSMENT

REC has undertaken a Tier 1 qualitative risk assessment to determine if any potential contaminants within the underlying soil and groundwater pose an unacceptable level of risk to the identified receptors.

9.1 Human Health Risk Assessment

At a Tier 1 stage the long term (chronic) human health toxicity of the soil has been assessed by comparing the on-site concentrations of organic and inorganic compounds with reference values published by the EA (Contaminated Land Exposure Assessment (CLEA) Soil Guideline Values (SGV)) and where absent, Generic Assessment Criteria (GACs) published by LQM/CIEH (2nd edition).

A continuing school use is proposed, and while specific screening values are not present for this future use, REC have utilised Tier 1 Screening values for a residential end use. This is considered to be a conservative approach due to the reduced exposure period and absence of a number of pathways associated with a school use over a residential end use.

The results of this comparison have been summarised within Table 9.1 (overleaf).

At the end of March 2014, the Department for Environment and Rural Affairs (DEFRA) issued details of the outcome of a “Category 4 Screening Levels Project” which is aimed at providing a simple test for deciding when land is “suitable for use” from a human health perspective and more specifically for defining when land is definitely not contaminated land. Category 4 Screening Levels (C4SL's) were published for six substances which were selected based upon their ubiquity in contaminated land risk assessment and because they covered a range of exposure pathways and toxicological effects. C4SL's have been published for these six substances in relation to various land uses, namely residential (both with and without home-grown produce), allotments, commercial and two alternative types of Public Open Space.

The Category 4 Screening Levels (C4SL’s) in effect update the current approach to the assessment of contaminated land risk in relation to Part IIa but will also influence the assessment of land affected by contamination that is dealt with through the planning process. At some stage these new levels may replace the current SGV’s albeit that they prescribe different levels of risk. As the C4SL’s describe a higher level of risk than the current SGVs it suggests in general that higher levels of contamination may be acceptable before remediation is required. However, the risk posed by any particular substance is specific to any given site and its environmental setting and therefore dependent upon the outcome of site specific risk assessment.

For the purpose of this report REC has based the assessment on the current SGV's and associated CLEA approach, albeit that C4SL's, where published, have also been taken into account. In situations where SGV’s and/or C4SL's are exceeded and particularly where remediation measures are potentially required we recommend that the site is discussed with the Local Authority, and the Environment Agency where necessary, in order that definitive solutions can be agreed.

It should be noted that these changes do not apply to the assessment of risk to Controlled Waters.

Table 9.1 Summary of Inorganic and Hydrocarbon Toxicity Assessment for a Residential End Use

Determinand	Units	GAC [V3]	n	MC	Loc. of Ex	Pathway	Assessment
Arsenic	mg/kg	32	6	14	N/A	1	No Further Assessment
Cadmium	mg/kg	10	6	0.1	N/A	1	No Further Assessment
Lead[(ii)]	mg/kg	225	6	46	N/A	1	No Further Assessment
Mercury	mg/kg	11	6	<1.0	N/A	2	No Further Assessment
Nickel	mg/kg	130	6	15	N/A	1	No Further Assessment
Selenium	mg/kg	350	6	<3	N/A	1	No Further Assessment
Copper[(ii)]	mg/kg	2330	6	21	N/A	1	No Further Assessment
Zinc[(ii)]	mg/kg	3750	6	74	N/A	1	No Further Assessment
Naphthalene	mg/kg	1.5	6	<0.1	N/A	2	No Further Assessment
Acenaphthylene	mg/kg	170	6	<0.1	N/A	3	No Further Assessment
Acenaphthene	mg/kg	210	6	<0.1	N/A	1	No Further Assessment
Fluorene	mg/kg	160	6	<0.1	N/A	1	No Further Assessment
Phenanthrene	mg/kg	92	6	<0.1	N/A	3	No Further Assessment
Anthracene	mg/kg	2300	6	<0.1	N/A	3	No Further Assessment
Fluoranthene	mg/kg	260	6	0.3	N/A	3	No Further Assessment
Pyrene	mg/kg	560	6	0.25	N/A	3	No Further Assessment
Benzo(a)Anthracene	mg/kg	3.1	6	0.2	N/A	3	No Further Assessment
Chrysene	mg/kg	6	6	0.2	N/A	3	No Further Assessment
Benzo(b/k)Fluoranthene[(i)]	mg/kg	5.6	6	0.1	N/A	3	No Further Assessment
Benzo(a)Pyrene	mg/kg	0.83	6	0.1	N/A	3	No Further Assessment
Indeno(123-cd)Pyrene	mg/kg	3.2	6	<0.1	N/A	3	No Further Assessment
Dibenzo(a,h)Anthracene	mg/kg	0.76	6	<0.1	N/A	3	No Further Assessment
Benzo(ghi)Perylene	mg/kg	44	6	<0.1	N/A	3	No Further Assessment
TPH (C10-C40)*	mg/kg	30	6	<0.10	N/A	2	No Further Assessment

Notes
Main Exposure Pathways: 1 = Soil Ingestion, 2 = Vapour Inhalation (indoor), 3 = Dermal Contact & Ingestion, 4 = Dust Inhalation.
Abbreviations: GAC = General Assessment Criteria, n = number of samples, MC = Maximum Concentration; Loc of Ex = Location of Exceedance.
* The Tier 1 GAC for the hydrocarbon fraction is derived from the CIEH assessment for petroleum hydrocarbons Criteria Working Group (CWG) for both aliphatic and aromatic compounds. REC has utilised the most conservative Tier 1 value across the various chain lengths. The comparison of a total TPH through the lowest chain length screening value is considered to be a conservative approach and satisfactory for the protection of human health.
(i) Benzo (b) Fluoranthene (100mg/kg) Benzo (k) Fluoranthene (140mg/kg)
(ii) GAC based on human health criteria. Ecotoxicological assessment will be made using EA guidance (EPR 8.01) on soil spreading (Cu 135mg/kg, Zinc 200mg/kg, Pb 300mg/kg)

Referring to Table 9.1, the results of the direct comparison show that all soils fall below the respective screening values.

Asbestos was not detected within the six near surface soils submitted for analysis.

It is considered that the site does not present a significant risk to the identified receptors.

9.2 Controlled Waters

A Tier I risk assessment has been undertaken with concentrations of determinands compared with the relevant thresholds. These are presented in Table 9.2.

Table 9.2 Summary of Inorganic and Hydrocarbon Toxicity Assessment for Controlled Waters

Determinand	Units	EQS(V1)	Drinking Water Threshold	n	MC	No of Ex	Criteria	Assessment
Inorganics								
Arsenic	µg/l	50	10	3	2.4	-	-	No Further Assessment
Boron	µg/l	2000	1000	3	<250	-	-	No Further Assessment
Cadmium	µg/l	5	5	3	<0.01	-	-	No Further Assessment
Chromium	µg/l	2	50	3	<5	3	EQS	**Further Assessment**
Copper	µg/l	5	2000	3	4.9	-	-	No Further Assessment
Cyanide (Free)	µg/l	1	-	3	<10	-	-	No Further Assessment
Cyanide	µg/l	-	50	3	40	-	-	No Further Assessment
Lead	µg/l	4	10	3	<1.5	-	-	No Further Assessment
Mercury	µg/l	1	1	3	<0.25	-	-	No Further Assessment
Nickel	µg/l	8	20	3	25	3	3 x EQS 1 x DWS (WS106)	**Further Assessment**
Selenium	µg/l	-	10	3	11	1	1 x DWS (WS105)	**Further Assessment**
Sulphate	mg/l	400	250	3	730	-	1 x EQS (WS105) 3 x DWS	**Further Assessment**
Zinc	µg/l	30	5000	3	<1	-	-	No Further Assessment
pH	-	6-9	-	3	8.2	-	-	No Further Assessment
Organics								
PAH *	µg/l	-	0.1	3	2.1	3	DWS	**Further Assessment**
Napthalene	µg/l	10	-	3	0.09	-	-	No Further Assessment
Benzo(a)pyrene	µg/l	0.05	0.01	3	0.1	2	EQS DWS (WS105/WS106)	**Further Assessment**
benzo[b/k]fluoranthene	µg/l	0.03	-	3	0.17	2	EQS (WS105/WS106)	**Further Assessment**
benzo[g,h,i]perylene & indeno(1,2,3-cd]pyrene	µg/l	0.02	-	3	0.06	2	EQS (WS105/WS106)	**Further Assessment**
Total Petroleum Hydrocarbons##	µg/l	-	10	3	<20	3	DWS	**Further Assessment**

Notes
Solubility <0.01µg/l

1. Council Directive of 4 May 1976 on pollution caused by certain dangerous substances discharged into the aquatic environment of the Community (76/464/EEC). Official Journal of the European Communities 18.5.76 L129/23
2. The Surface Waters (Dangerous Substances) (Classification) Regulations 1989. SI 2286/89
3. The Surface Waters (Dangerous Substances) (Classification) Regulations 1992. SI 337/92
4. These represent non-statutory changes made in the 1990's which may be used by regulatory authorities. They are more conservative than the original 1985 values.
5. EC Dangerous Substances - List 1 parameters
6. EC Dangerous Substances - List 2 parameters as listed in Dangerous Substances Regulations of 1997 and 1998, and the DoE Circular 7/89
7. Circular from the Department of the Environment (7/89) and the Welsh Office (SI 16/89). 30 March 1989. Water and the Environment: The implementation of European Community Directives on pollution caused by certain dangerous substances discharged into the aquatic environment
8. The Surface Waters (Dangerous Substances) (Classification) Regulations 1997. SI 2560/97
9. The Surface Waters (Dangerous Substances) (Classification) Regulations 1998. SI 389/98
10. WHO DWS for Toluene and Ethylbenzene – odour/taste/colour (Human Health Risk)
11. Specified compounds are benzo[b]fluoranthene (CAS 205-99-2), benzo[k]fluoranthene (CAS 207-08-9), benzo[g,h,i]perylene (CAS 191-24-2) and indeno[1,2,3-c,d]pyrene (CAS 193-39-5). The parametric value applies to the sum of the concentrations of the individual compounds detected and quantified in the monitoring process.

For the purposes of the Tier 1 assessment REC have compared the laboratory test data directly to the relevant Tier 1 threshold values for the protection of controlled waters. The results of this direct comparison indicate screening values have been exceeded for the following determinands:

Chromium	**3x EQS**
Nickel	**3x EQS, 1x DWS**
Selenium	**1x DWS**
Sulphate	**1x EQS, 3x DWS**
Total PAH	**3x DWS**
Benzo(a)pyrene	**2x EQS & DWS**
Benzo[b/k]fluoranthene	**2x EQS**
Benzo[g,h,i]perylene & indeno(1,2,3-cd]pyrene	**2x EQS**
Total TPH	**3x DWS**

The concentrations detailed above represent marginal exceedences of Tier 1 screening values. This marginal exceedence coupled with the considerations below, indicates that the site does not present a significant risk to controlled waters:

- The identified concentrations are relatively low solubility and hence low mobility therefore nearby water courses are likely to be unaffected,
- Identified sulphate is likely due to selenite crystals within the London Clay and are considered background levels;
- Classification of the underlying bedrock geology (London Clay Formation) as unproductive strata, therefore DWS does not apply;
- The site is not within a Source Protection Zone;
- There are no groundwater abstractions within 1km; and,

9.3 Waste Analysis Classification

Two samples were obtained from the near surface made ground for disposal (WAC) to establish the likely waste classification of the soils on site. The results of the laboratory testing can be seen in Table 9.3 overleaf.

Table 9.3 Waste Analysis Classification Summary

Sample Location	Sample Depth (m bgl)	Classification for Disposal
WAC 1	Ground level to 0.70m	Inert

The results have provided only an anticipated Waste Classification of soil derived from values presented within the laboratory results. However, the acceptance criteria for materials are dependent on the license held by the individual landfill site. As a result waste classifications may vary between landfill sites and it is therefore recommended that the test results are provided to the intended preferred waste disposal site.

9.4 Revised Conceptual Model

Following the completion of the intrusive site investigation, chemical analysis and risk assessment it is considered that the site does not present a significant risk to the identified receptors, and as such the site is suitable for the intended use.

10.0 GEOTECHNICAL ASSESSMENT

10.1 Proposed Development

It is understood that the proposed development will comprise the construction of a new extension to the existing Primary school. The works will comprise the removal of existing temporary classrooms to the south of the site, and additional development to the existing building structure to the north west of the site. New one storey buildings are proposed to the west of the existing building footprint, with an additional area of hard standing to form a playground over part of the existing school field.

10.2 Summary of Ground Conditions

In summary, ground conditions encountered comprised Made Ground to a maximum proven depth of 0.80m bgl (HP102 and HP104), overlying a band of the River Terrace Deposits to a maximum depth of 2.05m bgl (WS106) comprising orangey brown sand and gravel. The lowermost strata was observed as predominantly firm to stiff and typically medium to high strength London Clay Formation. The final depth of the London Clay remained unproven post investigation.

Groundwater was encountered during the intrusive works as seepages only within the River Terrace Deposits at depths ranging between 0.65m bgl and 0.85m bgl and at 0.50m bgl within the Made Ground (WS105).

10.3 Foundation Conditions

General

It is considered that the Made Ground is not suitable for a founding material due to the inherent variability of the material which may give rise to unpredictable total and differential settlements.

The underlying coarse grained deposits of the River Terrace Deposits are present as varying thicknesses across the site generally getting thicker towards the south. This material could be utilised for shallow foundations, however consideration would need to be given to possible differential settlements that may arise as a result of founding within both the River Terrace Deposits and the underlying London Clay Formation.

SPT N values within the River Terrace Deposits ranged between 9 and 30, albeit these would need to be reduced by 50% given that groundwater was encountered within this stratum. Allowable bearing pressures for shallow foundations in this stratum are therefore likely be in the region of 60kN/m^2 based on a characteristic corrected SPT N value of 6.

Fine grained soils underlying the predominantly coarse grained stratum of the River Terrace Deposits typically comprised of medium to high strength clay at a maximum depth of 2.05mbgl in WS106 and as such shallow strip foundations could be adopted for the proposed scheme bearing onto this stratum.

At a depth of circa 1.0mbgl, an allowable bearing pressure of 95kN/m^2 could be achieved limiting total settlements to 25mm, based on a conservative undrained shear strength (CU) of 42kN/m^2. Foundations would need to be locally deepened where the River Terrace Deposits were encountered at their thickest.

It is recommended that with all structures, excavation depths should prove at least 150 mm into the underlying medium to high strength fine grained soils.

Atterberg Limit tests were carried out on fine grained samples from the London Clay Formation indicated soils of medium to high volume change potential. NHBC Chapter 4.2 Building Near Trees recommends a minimum founding depth of >1.0mbgl in the absence of existing or any proposed tree planting.

Groundwater seepages were encountered were encountered within the River Terrace Deposits and it is considered that excavations should be supported within this strata within this strata to prevent instability, in addition, locally deepened sections may require dewatering particularly after periods of heavy rainfall.

Given the high volume change potential of the London Clay Formation, consideration should be given to using a clay board in order to protect against lateral movement. It is recommended that advice should be sought from a suitably qualified structural engineer with regards to the design and construction of the shallow foundations.

10.4 Ground Floor Slabs

Given the proposed developed, it is likely that floor slab loads are likely to be relatively low. As such, ground bearing floor slabs could be constructed into the natural strata with the Made Ground stripped to natural soils and constructed on a sufficient thickness of coarse grained uniform fill material. Albeit, consideration should be given to the high volume change potential of the soils encountered during the investigation.

In the event that foundations are in excess of 1.50m bgl, suspended floor sabs may be required.

We would recommend that the formation base is proof rolled and soft / loose areas excavated and backfilled with the same engineered fill material.

Should the design measures detailed above not be possible for the proposed development, consideration may need to be given for adopting a suspended floor slab. Where suspended floor slabs are employed ventilation of the under floor void will be required to address condensation issues.

It is recommended that advice should be sought from a suitably qualified structural engineer with regard to the design and construction of the floor slab.

10.5 Roads and Pavements

With reference to the Highways Agency design guidance HD25/94 (Table 2.1 “Equilibrium Subgrade CBR Estimation” within Volume 7 of the Department of Transport Design Manual for Roads and Bridges) and the insitu and laboratory tests undertake, it is anticipated that design CBR values in excess of 3% could be achievable in good construction conditions.

As with good construction practice it is recommended the formation level be inspected and that any areas of soft/loose deleterious strata are replaced with an appropriately compacted coarse grained medium. Likewise, any hard spots (such as old foundations) should also be removed to guard against reflective cracking in the pavement. Proof rolling/compaction of the formation level should be carried out prior to laying the new pavement.

10.6 Soil Infiltration / Permeability

Calculated permeability rates indicated relatively low rates of drainage conditions, and given the limited shallow granular strata and the underlying fine grained soils encountered at the site it is unlikely that soakaways could be adopted for the proposed scheme.

10.7 Concrete Durability

Based upon the results of the chemical analyses summarised in Table 8.3 it is considered that subsurface concrete can be designed in accordance with Design Sulphate Class DS1 & DS-2, Aggressive Chemical Environment for Concrete Classification (ACEC) AC-1s in accordance with the recommendations provided in BRE Special Digest 1 (2005) for shallow soils. However for deeper excavations within the London Clay, concrete should be designed to DS4 AC-3s.

10.8 Excavations

Site observations indicated that excavations should be feasible within the near surface with normal machinery, albeit obstructions may need to be broken out and services re-routed. The Made Ground was variable in composition so may need to be supported.

It is recommended that where man entry into excavations deeper than 1.20m is required that either; excavations are shored or that the sides of excavations are battered to a safe angle of repose.

Excavations for structures such as roads, pavements and foundations should be protected during construction in order to avoid potentially excessive softening caused by wet weather or potential shrink and swell caused by periods of hot weather.

10.9 Construction Activity and Inspection

The following activities and inspections should be incorporated in to the site works:

- it is recommended that sufficient allowance is made for the inspection of formation and sub formations to foundations;
- Excavations where access is required should be subject to a risk assessment from a competent person and where appropriate mitigation measures such as benching back the sides or use of support systems in accordance with CIRIA 97 utilised; and
- The presence of potential contamination and mitigation measures should be addressed as part of the Construction Stage Health and Safety Plan and should include measures to design out the risks, reduce their impact and finally the use of Personnel Protective Equipment (PPE).

END OF REPORT

APPENDIX I

LIMITATIONS

1. This report and its findings should be considered in relation to the terms of reference and objectives agreed between REC Ltd and the Client as indicated in Section 1.2.

2. For the work, reliance has been placed on publicly available data obtained from the sources identified. The information is not necessarily exhaustive and further information relevant to the site may be available from other sources. When using the information it has been assumed it is correct. No attempt has been made to verify the information.

3. This report has been produced in accordance with current UK policy and legislative requirements for land and groundwater contamination which are enforced by the local authority and the Environment Agency. Liabilities associated with land contamination are complex and requires advice from legal professionals.

4. During the site walkover reasonable effort has been made to obtain an overview of the site conditions. However, during the site walkover no attempt has been made to enter areas of the site that are unsafe or present a risk to health and safety, are locked, barricaded, overgrown, or the location of the area has not be made known or accessible.

5. Access considerations, the presence of services and the activities being carried out on the site limited the locations where sampling locations could be installed and the techniques that could be used.

6. In addition to the above REC Ltd note that when investigating, or developing, potentially contaminated land it is important to recognise that sub-surface conditions may vary spatially and also with time. The absence of certain ground, ground gas, and contamination or groundwater conditions at the positions tested is not a guarantee that such conditions do not exist anywhere across the site. Due to the presence of existing buildings and structures access could not be obtained to all areas. Additional contamination may be identified following the removal of the buildings or hard standing.

7. Site sensitivity assessments have been made based on available information at the time of writing and are ultimately for the decision of the regulatory authorities.

8. Where mention has been made to the identification of Japanese Knotweed and other invasive plant species and asbestos or asbestos-containing materials this is for indicative purposes only and do not constitute or replace full and proper surveys.

9. The executive summary, conclusions and recommendations sections of the report provide an overview and guidance only and should not be specifically relied upon without considering the context of the report in full.

10. This report presents an interpretation of the geotechnical information established by excavation, observation and testing. Whilst every effort is made in interpretative reporting to assess the soil conditions over the Site it should be noted that natural strata vary from point to point and that man made deposits are subject to an even greater diversity. Groundwater conditions are dependent on seasonal and other factors. Consequently there may be conditions present not revealed by this investigation.

11. REC can not be held responsible for any use of the report or its contents for any purpose other than that for which it was prepared. The copyright in this report and other plans and documents prepared by REC is owned by them and no such plans or documents may be reproduced, published or adapted without written consent. Complete copies of this may, however, be made and distributed by the client as is expected in dealing with matters related to its commission. Should the client pass copies of the report to other parties for information, the whole report should be copied, but no professional liability or warranties shall be extended to other parties by REC in this connection without their explicit written agreement there to by REC.

12. Rather, this investigation has been undertaken to provide a preliminary characterisation of the existing sub-surface geotechnical characteristics and make up and the findings of this study are our best interpretation of the data collected, within the scope of work and agreed budget. New information, revised practices or changes in legislation may necessitate the re-interpretation of the report, in whole or in part.

13. This investigation has been undertaken to reasonably characterise existing sub-surface conditions and the findings of this study are our best interpretation of the data collected, within the scope of work and agreed budget. New information, revised practices or changes in legislation may necessitate the re-interpretation of the report, in whole or in part.

APPENDIX II

GLOSSARY

TERMS

AST	Above Ground Storage Tank
BGS	British Geological Survey
BSI	British Standards Institute
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CIEH	Chartered Institute of Environmental Health
CIRIA	Construction Industry Research Association
CLEA	Contaminated Land Exposure Assessment
CSM	Conceptual Site Model
DNAPL	Dense Non-Aqueous Phase Liquid (chlorinated solvents, PCB)
DWS	Drinking Water Standard
EA	Environment Agency
EQS	Environmental Quality Standard
GAC	General Assessment Criteria
GL	Ground Level
GSV	Gas Screening Value
HCV	Health Criteria Value
ICSM	Initial Conceptual Site Model
LNAPL	Light Non-Aqueous Phase Liquid (petrol, diesel, kerosene)
ND	Not Detected
LMRL	Lower Method Reporting Limit
NR	Not Recorded
PAH	Poly Aromatic Hydrocarbon
PCB	Poly-Chlorinated Biphenyl
PID	Photo Ionisation Detector
QA	Quality Assurance
SGV	Soil Guideline Value
SPH	Separate Phase Hydrocarbon
Sp.TPH (CWG)	Total Petroleum Hydrocarbon (Criteria Working Group)
SPT	Standard Penetration Test
SVOC	Semi Volatile Organic Compound
UST	Underground Storage Tank
VCCs	Vibro Concrete Columns
VOC	Volatile Organic Compound
WTE	Water Table Elevation

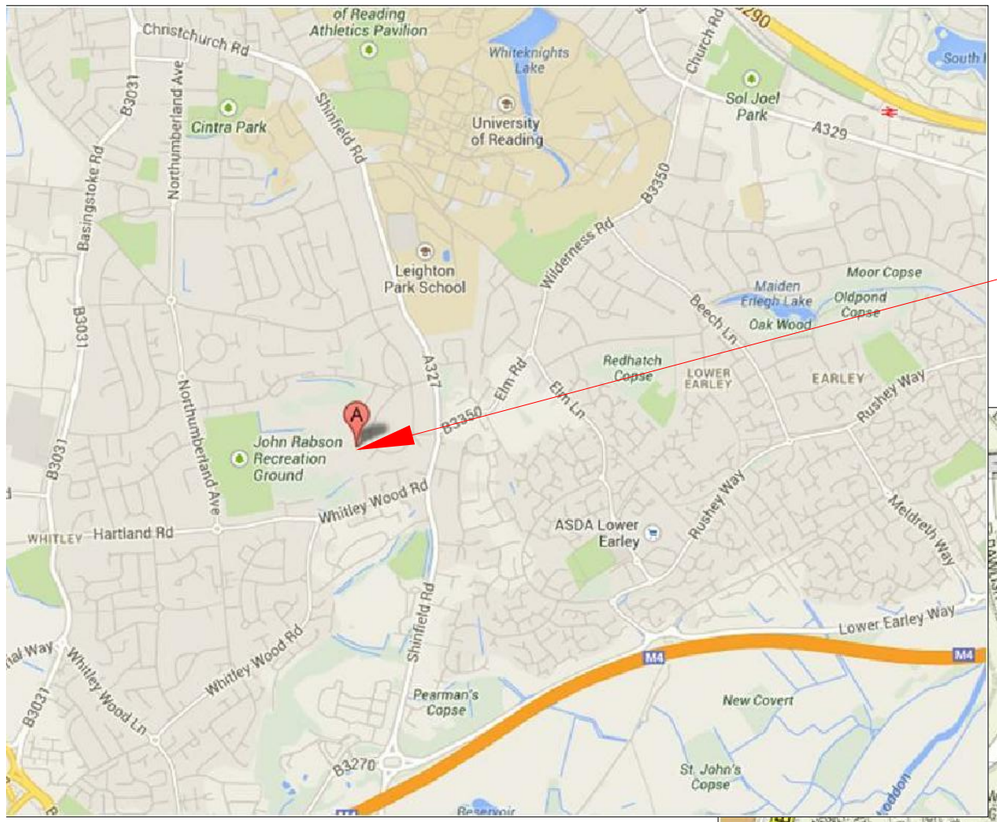
UNITS

m	Metres
km	Kilometres
%	Percent
%v/v	Percent volume in air
mb	Milli Bars (atmospheric pressure)
l/hr	Litres per hour
µg/l	Micrograms per Litre (parts per billion)
ppb	Parts Per Billion
mg/kg	Milligrams per kilogram (parts per million)
ppm	Parts Per Million
mg/m^3	Milligram per metre cubed
m bgl	Metres Below Ground Level

m bcl	Metre Below Cover Level
mAOD	Metres Above Ordnance Datum (sea level)
kN/m^2	Kilo Newtons per metre squared
µm	Micro metre

APPENDIX III

FIGURES



Site Location



Key:

Notes:

P1	R0	20-06-2014	Revision	PSS	AK
Phase	Revision	Date	Issue	Drawn	Authorised

Client: Hampshire County Council

Job No: 20715

Date: 20-06-2014

Drawing No: 001

Scale: N.T.S @ A3

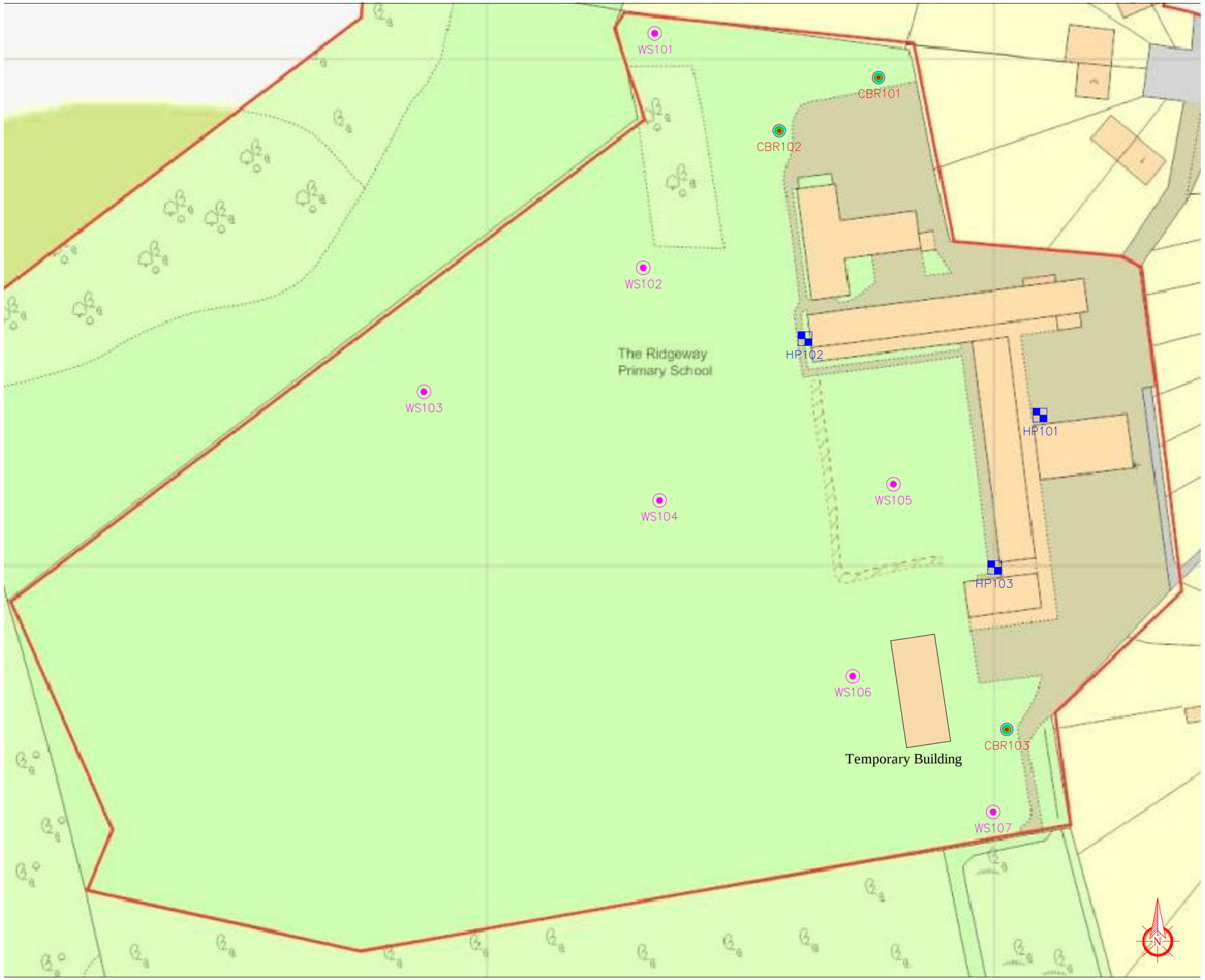
Job Title: The Ridgeway School

Drawing Title: Figure 1: Site Location Plan

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Key:

WS — Approximate Window Sample Probehole Location

HP — Approximate Hand Dug Pit Location

CBR — Approximate California Bearing Ratio Test Location

Notes:

P1	R0	20-06-2014	Revision	PSS	AK
Phase	Revision	Date	Issue	Drawn	Authorised

Client: Hampshire County Council

Job No: 20715

Date: AK-06-2014

Drawing No: 002

Scale: N.T.S @ A3

Job Title: The Ridgeway School

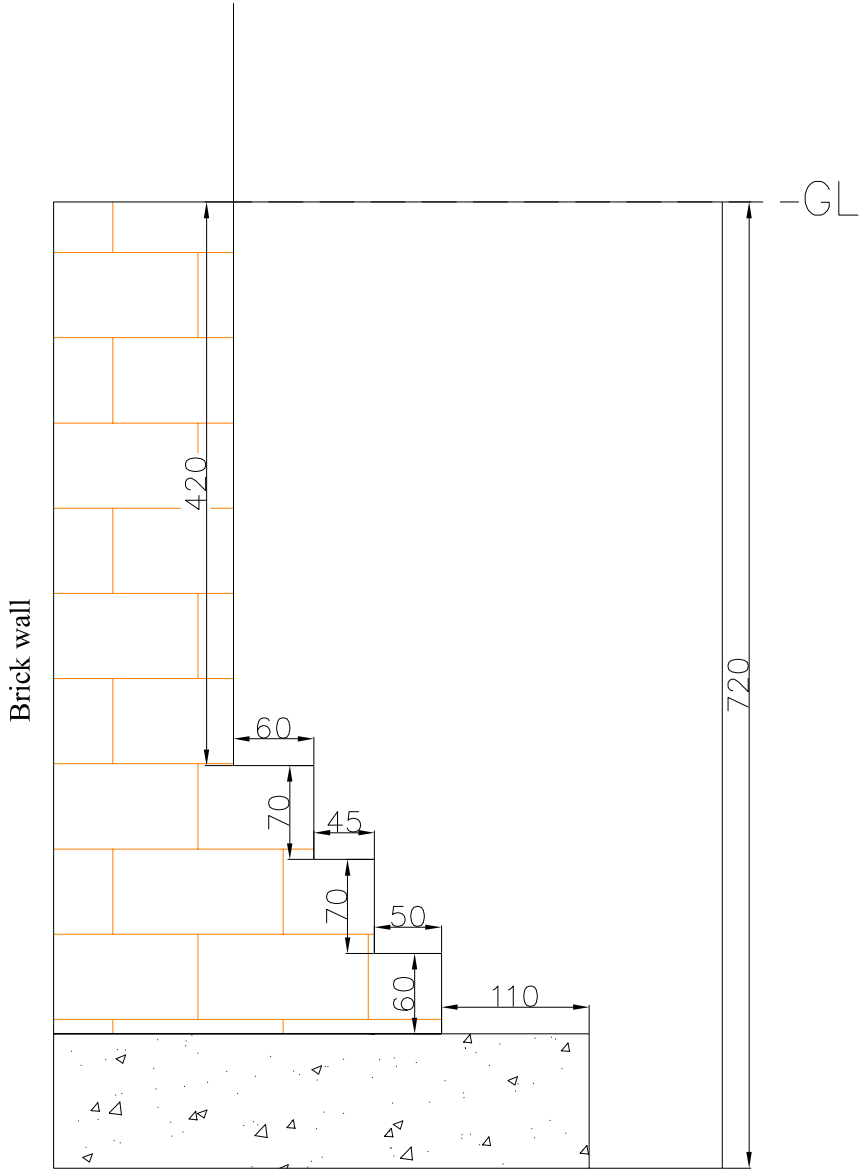
Drawing Title: Figure 2: Exploratory Hole Location Plan

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HP101



Key:

Notes:

All Measurements In Millimeters

P1	R0	17-06-2014	Revision	KD	PH
Phase	Revision	Date	Issue	Drawn	Authorised

Client: Hampshire County Council

Job No: 20715

Date: 17-06-2014

Drawing No: 003

Scale: 1:4 @ A3

Job Title: The Ridgeway School

Drawing Title: Figure 3.1 - Foundation Pit Detail (HP101)

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HP102



Key:

Notes:

All Measurements In Millimeters

P1	R0	17-06-2014	Revision	KD	PH
Phase	Revision	Date	Issue	Drawn	Authorised

Client: Hampshire County Council

Job No: 20715

Date: 17-06-2014

Drawing No: 004

Scale: 1:5 @ A3

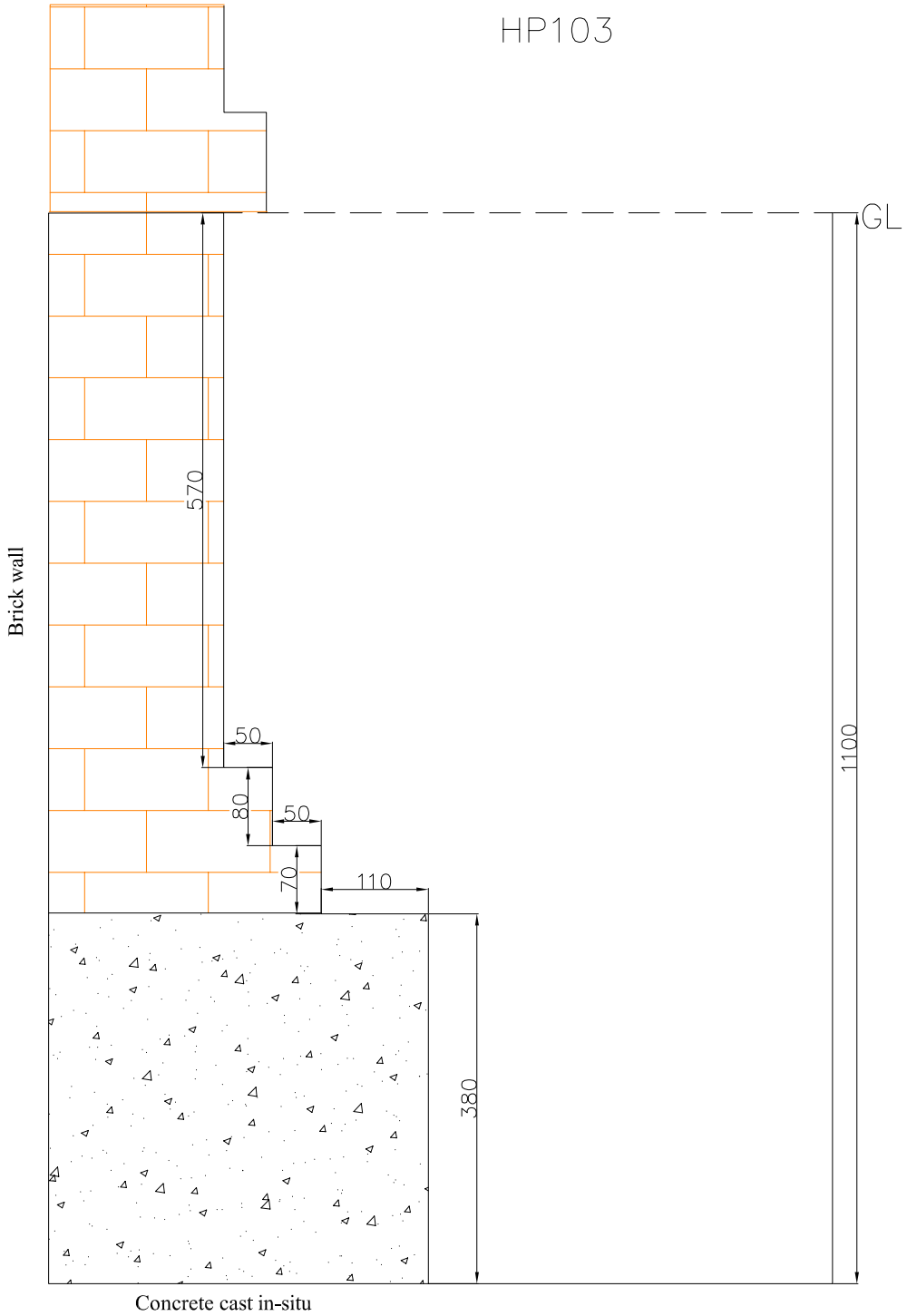
Job Title: The Ridgeway School

Drawing Title: Figure 3.2 - Foundation Pit Detail (HP102)

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Key:

Notes:

All Measurements In Millimeters

P1	R0	17-06-2014	Revision	KD	PH
Phase	Revision	Date	Issue	Drawn	Authorised

Client: Hampshire County Council

Job No: 20715

Date: 17-06-2014

Drawing No: 005

Scale: 1:5@ A3

Job Title: The Ridgeway School

Drawing Title: Figure 3.3 - Foundation Pit Detail (HP103)

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APPENDIX IV

PHOTOGRAPHS



PLATE 1 – VIEW OF THE WESTERN SIDE OF THE EXISTING TEMPORARY CLASSROOM BUILDING LOCATED NEAR THE SOUTHERN BOUNDARY OF THE SITE.



PLATE 2 – VIEW OVER PLAYGROUND ACROSS SOUTHERN AREA, WITH PROPOSED

BUILDING LOCATION ACROSS THE AREA OF SOFT LANDSCAPING.



PLATE 3 – VIEW OVER THE PLAYING FIELD TO THE WEST, WITH PROPOSED BUILDING LOCATION IN THE FOREVIEW.



PLATE 4 – VIEW OF HP101.



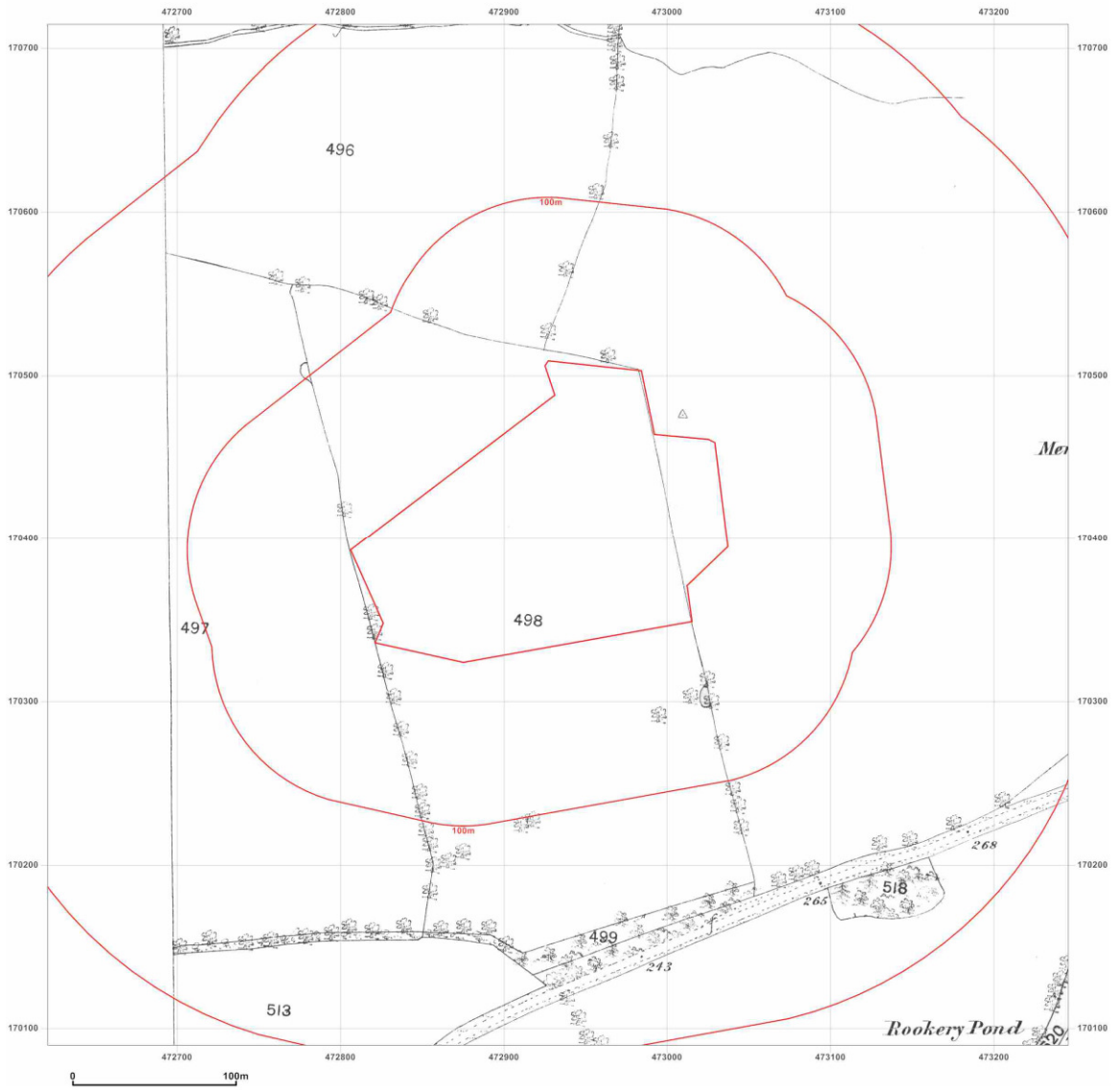
PLATE 5 – VIEW OF HP102.



PLATE 6 – VIEW OF HP103.

APPENDIX V

HISTORICAL MAPS



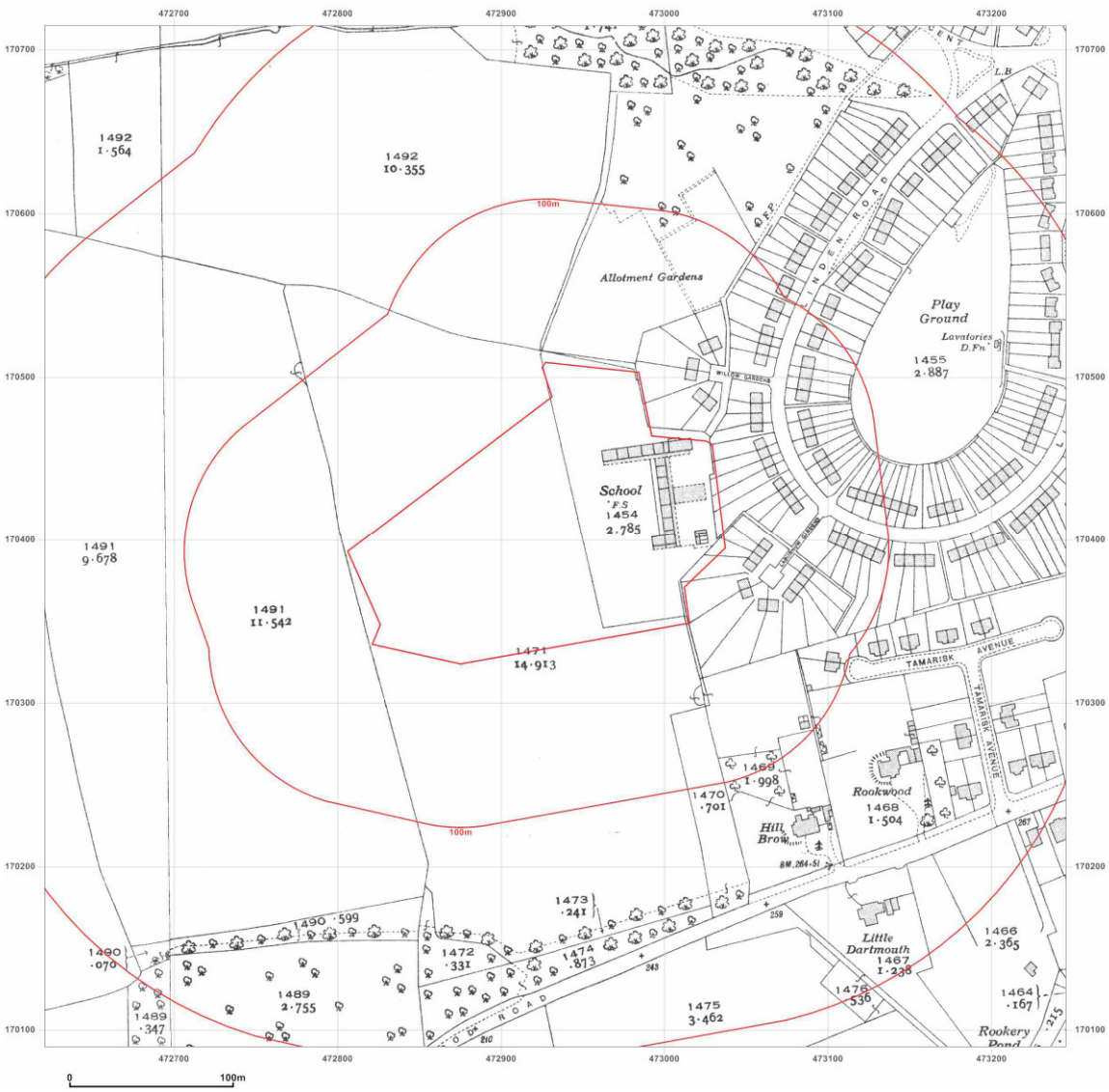
North

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Historical Map 1

Dated: 1877

Original Scale:
1:2,500



North

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Historical Map 2

Dated: 1936

Original Scale: 1:2,500



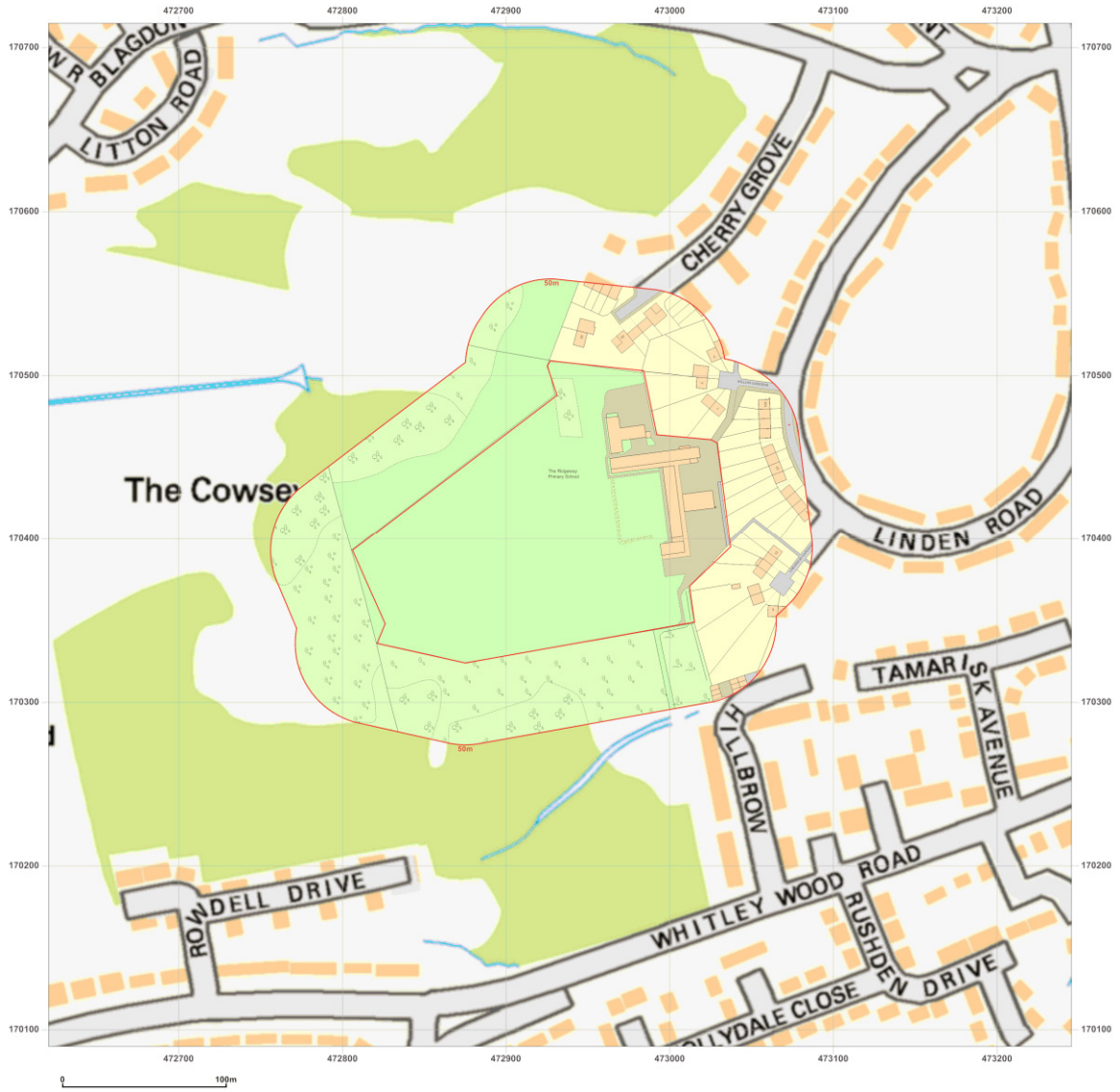
North

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Historical Map 3

Dated: 1972 - 1975

Original Scale: 1:1,250



North

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Historical Map 4

Dated: 2012

Original Scale:
1:2,500

APPENDIX VI

REC EXPLORATORY HOLE LOGS

Trial Pit Log

Trialpit No **HP101**

Sheet 1 of 1

Project Name: The Ridgeway School	Project No. 20715	Co-ords: - Level:	Date 22/05/2014
Location: Reading		Dimensions (m): 0.50 × 0.45, Depth 0.72	Scale 1:20
Client: Hampshire County Council			Logged A. King

Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
Depth	Type	Results				
			0.15			Asphalt (MADE GROUND)
						Soft brown, slightly sandy, gravelly CLAY. Sand is fine to medium. Gravel of subangular to subrounded, fine to medium and occasional coarse to cobble sized flint, brick, rare clinker and asphalt. (MADE GROUND)
			0.72			End of pit at 0.72 m

Remarks: Excavated and backfilled with arisings.

Stability: Stable

Trial Pit Log

Trialpit No **HP102**

Sheet 1 of 1

Project Name: The Ridgeway School	Project No. 20715	Co-ords: - Level:	Date 22/05/2014
Location: Reading		Dimensions (m): Depth 1.10 — 0.50 × 0.45	Scale 1:20
Client: Hampshire County Council			Logged A. King

Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
Depth	Type	Results				
			0.15			Asphalt (MADE GROUND)
						Brown, slightly silty gravelly SAND. Sand is fine to coarse. Gravel of subangular to subrounded fine to medium flint and occasional subangular medium to coarse red brick. (MADE GROUND)
			0.80			Yellowish grey SAND & GRAVEL. Sand is fine to coarse. Gravel of subangular to subrounded fine to medium and frequent coarse to cobble sized flint. (RIVER TERRACE DEPOSITS)
			1.00			Firm to stiff pale grey mottled brown and orange slightly silty CLAY. (LONDON CLAY FORMATION)
			1.10			End of pit at 1.10 m

1 2 3 4

Remarks: Excavated and backfilled with arisings.

Stability: Stable

Trial Pit Log

Trialpit No **HP103**

Sheet 1 of 1

Project Name: The Ridgeway School	Project No. 20715	Co-ords: - Level:	Date 22/05/2014
Location: Reading		Dimensions (m): Depth 1.15	Scale 1:20
Client: Hampshire County Council		0.50 × 0.45	Logged A. King

Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
Depth	Type	Results				
			0.05			Asphalt (MADE GROUND)
			0.25			Crushed brick fill of half and whole red brick. (MADE GROUND)
			0.65			Brown slightly clayey gravelly SAND. Sand is fine to coarse. Gravel of subangular to subrounded fine to medium flint. (MADE GROUND)
			0.70			Yellowish brown slightly clayey gravelly SAND. Sand is fine to coarse. Gravel of subangular to subrounded fine to medium flint. (MADE GROUND)
			1.00			Brown SAND & GRAVEL. Gravel of subangular to subrounded fine to medium and occasional coarse flint. Sand is medium to coarse. (RIVER TERRACE DEPOSITS)
			1.15			Firm brown mottled orange slightly sandy CLAY. Sand is fine to medium. (LONDON CLAY FORMATION)
						End of pit at 1.15 m

1 2 3 4

Remarks: Excavated and backfilled with arisings.

Stability: Stable

Borehole Log

REC Resource & Environmental Consultants Ltd

Borehole No. **WS101**

Sheet 1 of 1

Project Name: The Ridgeway School	Project No. 20715	Co-ords: -	Hole Type WS
Location: Reading		Level:	Scale 1:25
Client: Hampshire County Council		Dates: 21/05/2014 - 21/05/2014	Logged By A. King

Back fill / Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.05			Turf Cover (MADE GROUND)
				HVP=56	0.40			Soft greyish brown, slightly sandy, slightly gravelly CLAY. Sand is fine to medium. Gravel of subangular to subrounded fine to medium flint. Topsoil type material. (MADE GROUND)
		0.50	ES					
		0.70	ES	HVP=75	0.65			Medium strength, firm yellowish grey mottled orange, slightly gravelly, slightly sandy CLAY. Sand is fine to medium. Gravel of subangular to subrounded fine to medium flint. (RIVER TERRACE DEPOSITS)
								High strength firm to stiff, yellowish brown mottled brownish grey CLAY. Occasional subangular to subrounded fine to coarse flint gravel. (RIVER TERRACE DEPOSITS)
		1.20	ES	HVP=115	1.20			High strength stiff, brownish grey mottled yellow, slightly silty CLAY. (LONDON CLAY FORMATION)
				HVP=82				
					2.30			High strength stiff, dark grey with occasional orange mottling, slightly silty CLAY. (LONDON CLAY FORMATION)
				HVP=86				
				HVP=96				
					5.00			End of borehole at 5.00 m

1 2 3 4 5

Remarks

Dando Terrier Rig. Inspection pit to 1.20m bgl. 50mm monitoring well installed to 5.00m bgl.
No Groundwater identified.

Borehole Log

Borehole No. **WS102**

Sheet 1 of 1

Project Name: The Ridgeway School	Project No. 20715	Co-ords: -	Hole Type WS
Location: Reading		Level:	Scale 1:25
Client: Hampshire County Council		Dates: 21/05/2014 - 21/05/2014	Logged By A. King

Back fill / Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.05			Turf Cover (MADE GROUND)	
		0.50	ES					Brownish grey slightly gravelly, clayey SAND. Sand is fine to coarse. Gravel of subangular to subrounded fine to medium flint. (MADE GROUND)	
		0.65	B		0.60			Pale orangey brown SAND & GRAVEL. Sand is fine to coarse. Gravel of subangular to subrounded fine to medium and occasional coarse flint. (RIVER TERRACE DEPOSITS)	
	▼	0.70	ES						
					1.00			Firm to stiff brownish grey slightly gravelly, slightly silty CLAY. Gravel of subangular to subrounded fine to medium flint. (LONDON CLAY FORMATION)	1
				HVP=78	1.15			High strength firm to stiff brownish grey slightly silty CLAY. (LONDON CLAY FORMATION)	
		1.20	ES						
		1.50	ES						
				HVP=78	2.00			Firm to stiff brown mottled blueish grey slightly silty CLAY with occasional fine (1-2mm diameter) selenite crystals. (LONDON CLAY FORMATION)	2
		2.50	D						
				HVP=98					3
		3.50	D		3.50			Hard brown mudstone. (LONDON CLAY FORMATION)	
				HVP=62	3.60			Medium strength firm to stiff brown mottled blueish grey slightly silty CLAY with occasional fine (1-2mm diameter) selenite crystals. (LONDON CLAY FORMATION)	
					4.00			High strength very stiff brown, slightly silty CLAY. Occasional pockets of hard brown mudstone and occasional 1-3mm diameter selenite crystals throughout. (LONDON CLAY FORMATION)	4
				HVP=116					
				HVP=122					
		4.80	D						
				HVP=128	5.00			End of borehole at 5.00 m	5

Remarks

Dando Terrier Rig. Inspection pit to 1.20m bgl.

Borehole Log

Borehole No. **WS103**

Sheet 1 of 1

Project Name: The Ridgeway School	Project No. 20715	Co-ords: -	Hole Type WS
Location: Reading		Level:	Scale 1:25
Client: Hampshire County Council		Dates: 21/05/2014 - 21/05/2014	Logged By

Back fill / Well	Water Strikes	Samples and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
					0.05			Turf Cover (MADE GROUND)
					0.20			Mid to dark brown slightly gravelly, slightly silty SAND. Sand is fine to coarse. Gravel of subrounded fine to medium flint. Topsoil type material. (MADE GROUND)
		0.50	ES					
					0.60			Mid to dark brown slightly silty, gravelly SAND. Sand is fine to coarse. Gravel of subangular to subrounded fine to medium and occasional cobble sized flint. (RIVER TERRACE DEPOSITS)
		0.70	ES					
	▼				0.85			Dark brown SAND & GRAVEL. Sand is medium to coarse. Gravel of subangular to subrounded fine to medium flint. (RIVER TERRACE DEPOSITS)
					1.10			Grey, slightly clayey gravelly SAND. Sand is fine to coarse. Gravel of subangular to subrounded fine to medium flint. (RIVER TERRACE DEPOSITS)
		1.20	ES	HVP=71				Medium to high strength stiff, orangey brown mottled pale blueish grey slightly sandy CLAY. (LONDON CLAY FORMATION)
				HVP=103				
		1.80	ES					
				HVP=78	2.00			High strength, stiff brown mottled blueish grey slightly silty CLAY. (LONDON CLAY FORMATION)
				HVP=80				
		2.30	U					
				HVP=112				
		2.90	D					
				HVP=86				
		3.50	D					
		3.80	D					
				HVP=121				
		4.70	D					
				HVP=120				
					5.00			End of borehole at 5.00 m

Remarks

Dando Terrier Rig. Inspection pit to 1.20m bgl.

Borehole Log

REC Resource & Environmental Consultants Ltd

Borehole No. **WS104** Sheet 1 of 1

Project Name: The Ridgeway School	Project No. 20715	Co-ords: -	Hole Type WS
Location: Reading		Level:	Scale 1:25
Client: Hampshire County Council		Dates: 21/05/2014 - 21/05/2014	Logged By

Back fill / Well	Water Strikes	Samples and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
					0.05			Turf Cover (MADE GROUND)
					0.30			Brownish grey slightly gravelly, slightly silty SAND. Sand is fine to coarse. Gravel of subangular to subrounded fine to medium flint. (MADE GROUND)
		0.50	ES		0.50			
	▼				0.60			Brownish grey slightly silty gravelly SAND. Sand is fine to coarse. Gravel of subangular to subrounded fine to medium and occasional coarse to cobble sized flint. (MADE GROUND)
		0.70	ES		0.80			
								Black, slightly clayey gravelly SAND. Gravel of angular to subangular medium to coarse clinker and subangular to subrounded fine to medium flint. Sand comprises coarse ash. (MADE GROUND)
		1.20	ES		1.20			
					1.30			Orangey brown to grey SAND & GRAVEL. Sand is medium to coarse. Gravel is subangular to subrounded medium to coarse flint. (RIVER TERRACE DEPOSITS)
					1.40			
				HVP=76				
								Orange SAND & GRAVEL. Sand is medium to coarse. Gravel of subangular to subrounded fine to medium and frequent coarse flint. (RIVER TERRACE DEPOSITS)
		1.90	ES					
				HVP=119				
				HVP=106				
				HVP=90	2.20			Brown mottled blueish grey and orange SAND. Sand is fine to medium. (RIVER TERRACE DEPOSITS)
								Orange mottled grey SAND & GRAVEL. Sand is fine to coarse. Gravel of subangular to subrounded fine to medium flint. (RIVER TERRACE DEPOSITS)
				HVP=98				
		2.50	ES					High strength,stiff brown mottled blueish grey slightly sandy CLAY. Sand is fine to medium with content decreasing with depth. (LONDON CLAY FORMATION)
				HVP=96				
								High strength, stiff brown slightly silty CLAY. (LONDON CLAY FORMATION)
				HVP=111				
		3.40	ES					
	▼			HVP=114				
					3.60			Hard, reddish brown mudstone. (LONDON CLAY FORMATION)
				HVP=124	3.65			High strength, stiff brown slightly silty CLAY. (LONDON CLAY FORMATION)
				HVP=100				
				HVP=102				
		4.70	ES					
					5.00			End of borehole at 5.00 m

1 2 3 4 5

Remarks
Dando Terrier Rig. Inspection pit to 1.20m bgl. 50mm monitoring well to 5.00m bgl.

Borehole Log

REC Resource & Environmental Consultants Ltd

Borehole No. **WS105** Sheet 1 of 1

Project Name: The Ridgeway School	Project No. 20715	Co-ords: -	Hole Type WS
Location: Reading		Level:	Scale 1:25
Client: Hampshire County Council		Dates: 22/05/2014 - 22/05/2014	Logged By A. King

Back fill / Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.05			Turf Cover (MADE GROUND)
					0.25			Greyish brown, slightly gravelly, slightly silty SAND. Sand is fine to coarse. Gravel of subangular to subrounded fine to medium flint. (MADE GROUND)
	▼	0.40	ES		0.50			
					0.60			Firm to stiff brown, slightly gravelly, slightly sandy CLAY. Sand is fine to medium. Gravel of subangular to subrounded fine to medium flint. (MADE GROUND)
		0.70	ES					Asphalt (MADE GROUND)
								Dark brown, slightly gravelly, slightly silty SAND. Sand is fine to coarse. Gravel of subangular to subrounded fine to medium and frequent coarse flint. (RIVER TERRACE DEPOSITS)
		1.20	ES		1.20			
		1.50	D					Brown, slightly gravelly, slightly clayey SAND. Sand is fine to medium. Gravel of subangular to rounded fine to coarse flint. (RIVER TERRACE DEPOSITS)
		1.70	ES		1.70			
		2.00	D	HVP=46				Medium strength, stiff brown mottled orange slightly gravelly, slightly sandy silty CLAY. Sand is fine to medium. Gravel of subangular to rounded fine to medium flint. (LONDON CLAY FORMATION)
		2.80	D		2.80			
				HVP=42				Medium strength, stiff brown, sandy, slightly silty CLAY. Sand is fine to medium. (LONDON CLAY FORMATION)
					3.10			Medium strength, stiff brown, slightly gravelly, slightly silty CLAY. Sand is fine to medium. High strength circa 4.00m bgl (LONDON CLAY FORMATION)
		3.80	D	HVP=70				
		4.80	D					
					5.00			End of borehole at 5.00 m

1 2 3 4 5

Remarks
Dando Terrier Rig. Inspection pit tp 1.20m bgl. 50mm monitoring well installed to 5.00m bgl.

Borehole Log

Borehole No. **WS106**

Sheet 1 of 1

Project Name: The Ridgeway School	Project No. 20715	Co-ords: -	Hole Type WS
Location: Reading		Level:	Scale 1:25
Client: Hampshire County Council		Dates: 22/05/2014 - 22/05/2014	Logged By A. King

Back fill / Well	Water Strikes	Samples and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
					0.05			Turf Cover (MADE GROUND)
					0.35			Brownish grey silty SAND with rare subangular to subrounded fine to medium flint. Sand is fine to coarse. (MADE GROUND)
		0.50	ES		0.55			Brownish grey slightly clayey gravelly SAND. Sand is fine to coarse. Gravel of subangular to rounded fine to medium and occasional coarse to cobble sized flint. (RIVER TERRACE DEPOSITS)
		0.70	ES					Orangey brown slightly silty SAND & GRAVEL. Sand is fine to coarse. Gravel of subangular to subrounded fine to medium flint. (RIVER TERRACE DEPOSITS)
		1.20	ES		1.20			Light brown slightly clayey, slightly gravelly SAND. Sand is fine. Gravel of angular to subrounded fine to medium flint. (RIVER TERRACE DEPOSITS)
		1.50	D		1.40			Brown, slightly clayey gravelly SAND. Sand is fine to medium. Gravel is angular to rounded fine to coarse flint. (RIVER TERRACE DEPOSITS)
		1.80	ES		1.65			Stiff brown, slightly silty gravelly CLAY. Gravel of subangular to rounded fine ot coarse flint with occasional cobbles of rounded flint. (RIVER TERRACE DEPOSITS)
		2.00	D		1.80			Brown, slightly clayey slightly gravelly SAND. Sand is fine to medium. Gravel of subangular to subrounded fine to coarse flint. (RIVER TERRACE DEPOSITS)
				HVP=66	2.05			Medium strength, stiff brown slightly sandy, slightly silty CLAY. Sand is fine to medium. High strength circa 4.00mbgl. (LONDON CLAY FORMATION)
		2.80	D					
				HVP=38				
				HVP=46				
		3.80	D					
				HVP=72				
		4.80	D					
					5.00			End of borehole at 5.00 m

Remarks

Dando Terrier Rig. Inspection pit to 1.20m bgl. 50mm monitoring well installed to 4.00m bgl.
No Groundwater identified.

Borehole Log

Borehole No. **WS107**

Sheet 1 of 1

Project Name: The Ridgeway School	Project No. 20715	Co-ords: -	Hole Type WS
Location: Reading		Level:	Scale 1:25
Client: Hampshire County Council		Dates: 22/05/2014 - 22/05/2014	Logged By A. King

Back fill / Well	Water Strikes	Samples and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
		0.10	ES		0.05			Turf Cover (MADE GROUND)
					0.20			Brownish grey silty SAND with rare subangular to subrounded fine to medium flint. (MADE GROUND)
		0.40	ES		0.50			Brownish grey slightly clayey gravelly SAND. Sand is fine to coarse. Gravel of subangular to rounded fine to medium and occasional coarse flint. (RIVER TERRACE DEPOSITS)
		1.00	ES					Orangey brown SAND & GRAVEL. Sand is fine to coarse Gravel of subangular to subrounded fine to medium and occasional coarse flint. (RIVER TERRACE DEPOSITS)
		1.20	ES					
		1.50	D					
		1.60	ES		1.70			High strength, firm to stiff brown, slightly sandy, slightly silty CLAY. (LONDON CLAY FORMATION)
		2.00	D	HVP=77				
		2.40	B					
		2.80	D					
		3.80	D					
		4.80	D					
					5.00			End of borehole at 5.00 m

1 2 3 4 5

Remarks

Dando Terrier Rig. Inspection pit to 1.20m bgl. Backfilled with arisings.
No Groundwater identified.

INSITU PIEZOMETER PERMEABILITY TEST

See BS 5930:1999 Para. 25.4

REC Ltd

Site Name **The Ridgeway School, Reading**

Job No. **20715**

Borehole number	WS101	
Date	22/05/2014	
Was this a (R)ising or (F)alling test	F	
Diameter of borehole	0.115	[m]
Depth to top of filter	1.00	[m]
Depth to bottom of filter	4.95	[m]
Internal diameter of piezometer	0.05	[m]
Ground water level	4.95	[m]
Water level at start of test	0.70	[m]
Initial head of water (Ho)	4.25	[m]

Time lag of test (Ht/Ho = 0.37)	N/A	[mins]
Intake factor F (Case d - BS 5930:1999 page 50)	5.87	
PERMEABILITY k	N/A	[m/s]

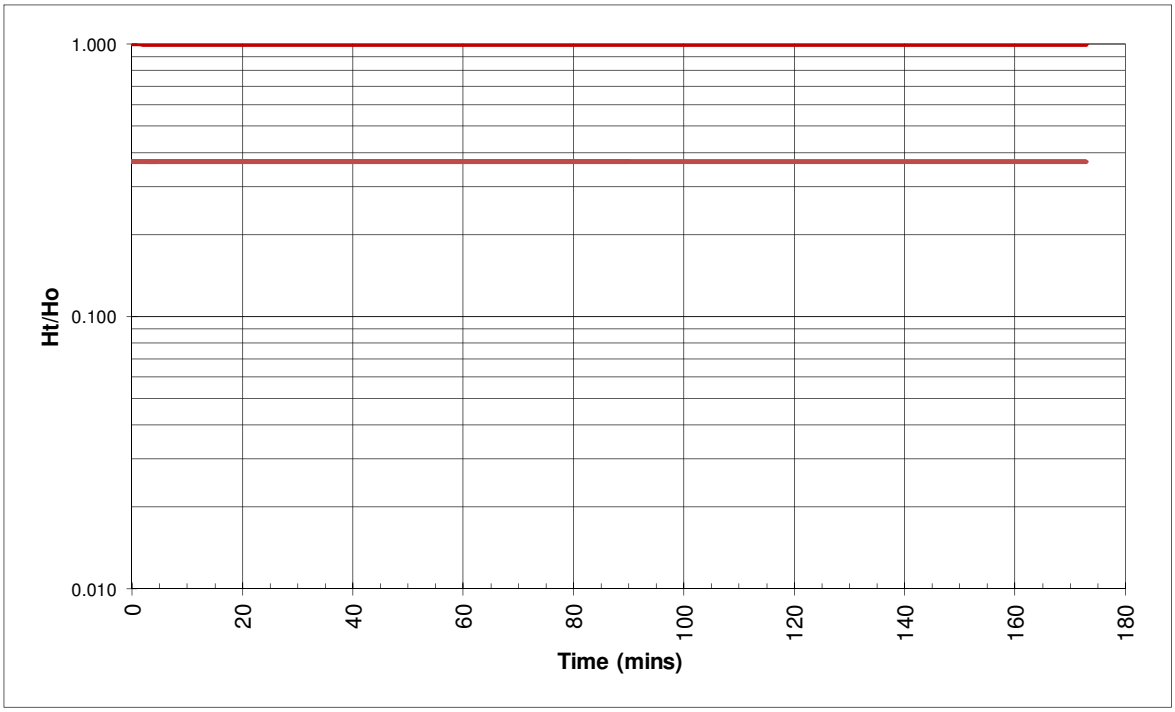
Notes: All depths measured from ground level

Insufficent uptake of water observed within WS101.

The required Ht/Ho = 0.37 intercept was not reached. Data cannot be extrapolated

TIME (min)	DEPTH TO WATER (m bgl)	Ht (m)	Ht/Ho
0	0.700	4.25	1.000
0.25	0.700	4.25	1.000
0.5	0.700	4.25	1.000
0.75	0.700	4.25	1.000
1	0.700	4.25	1.000
1.5	0.705	4.25	0.999
2	0.710	4.24	0.998
2.5	0.710	4.24	0.998
3.75	0.715	4.24	0.996
4	0.715	4.24	0.996
4.5	0.715	4.24	0.996
5	0.715	4.24	0.996
35.25	0.720	4.23	0.995
173	0.720	4.23	0.995

The required Ht/H0 = 0.37 intercept was not reached after 2.88 hours.
Test terminated after 173 minutes (2.88 Hours)



INSITU PIEZOMETER PERMEABILITY TEST

See BS 5930:1999 Para. 25.4

REC Ltd

Site Name **The Ridgeway School, Reading**

Job No. **20715**

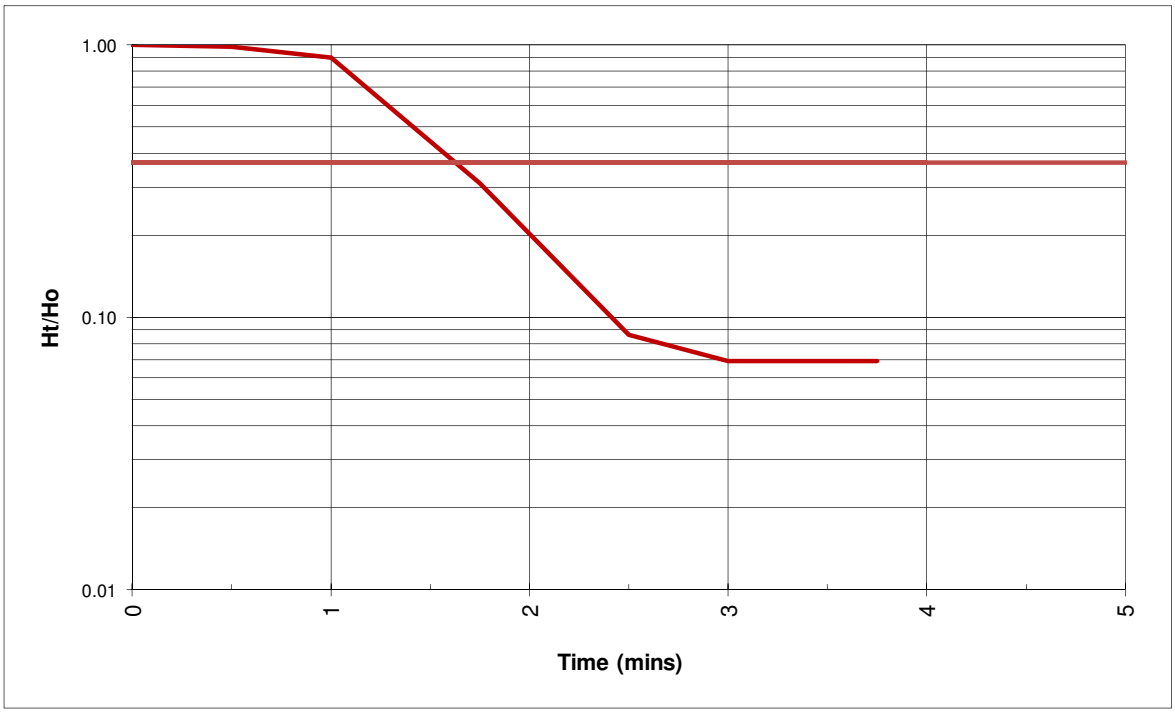
Borehole number	WS104
Date	22/05/2014
Was this a (R)ising or (F)alling test	R
Diameter of borehole	0.115 [m]
Depth to top of filter	1.00 [m]
Depth to bottom of filter	1.40 [m]
Internal diameter of piezometer	0.05 [m]
Ground water level	0.58 [m]
Water level at start of test	1.16 [m]
Initial head of water (Ho)	0.58 [m]

Time lag of test (Ht/Ho = 0.37)	1.67 [mins]
Intake factor F (Case d - BS 5930:1999 page 50)	1.28
PERMEABILITY k	8.08E-05 [m/s]

Notes: All depths measured from ground level

Depth of filter taken as base of granular strata

TIME (min)	DEPTH TO WATER (m bgl)	Ht (m)	Ht/Ho
0	1.160	0.58	1.00
0.5	1.150	0.57	0.98
1	1.100	0.52	0.90
1.75	0.760	0.18	0.31
2.5	0.630	0.05	0.09
3	0.620	0.04	0.07
3.75	0.620	0.04	0.07



INSITU PIEZOMETER PERMEABILITY TEST

See BS 5930:1999 Para. 25.4

REC Ltd

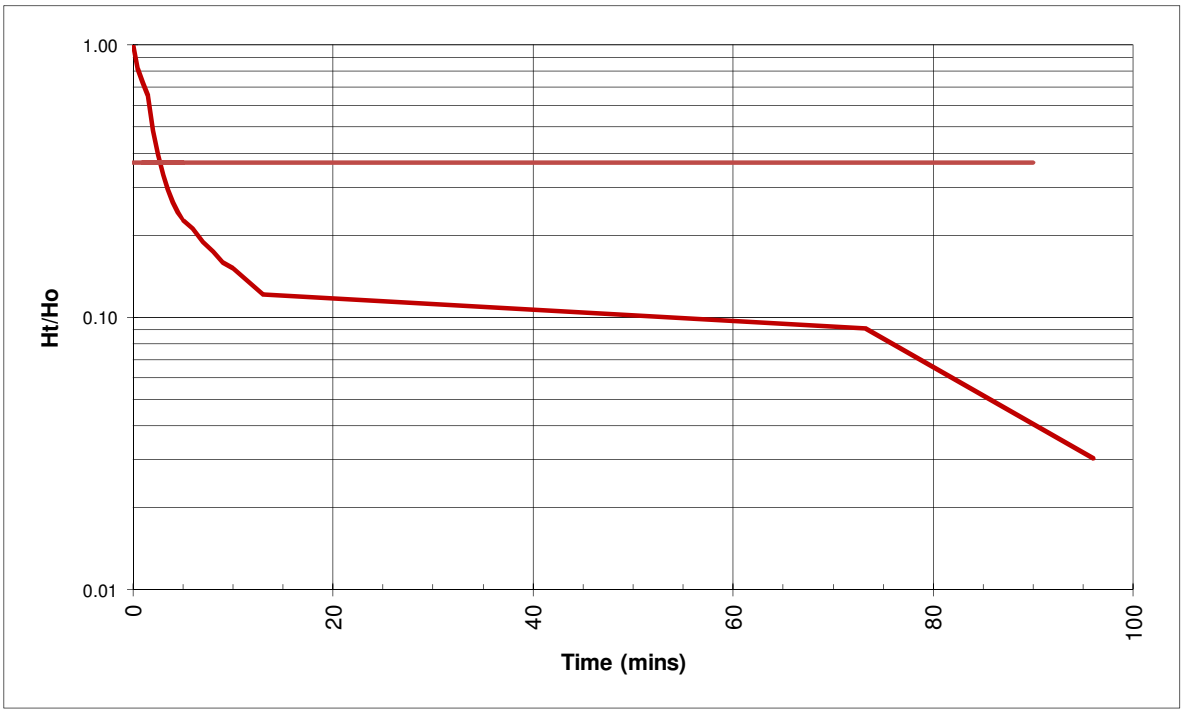
Site Name **The Ridgeway School, Reading**

Job No. **20715**

Borehole number	WS105
Date	22/05/2014
Was this a (R)ising or (F)alling test	F
Diameter of borehole	0.115 [m]
Depth to top of filter	1.00 [m]
Depth to bottom of filter	4.97 [m]
Internal diameter of piezometer	0.05 [m]
Ground water level	1.42 [m]
Water level at start of test	0.76 [m]
Initial head of water (Ho)	0.66 [m]
Time lag of test (Ht/Ho = 0.37)	2.25 [mins]
Intake factor F (Case d - BS 5930:1999 page 50)	5.89
PERMEABILITY k	1.31E-05 [m/s]

Notes: All depths measured from ground level

TIME (min)	DEPTH TO WATER (m bgl)	Ht (m)	Ht/Ho
0	0.760	0.66	1.00
0.5	0.880	0.54	0.82
1	0.940	0.48	0.73
1.5	0.990	0.43	0.65
2	1.100	0.32	0.48
2.5	1.160	0.26	0.39
3	1.200	0.22	0.33
3.5	1.225	0.20	0.30
4	1.245	0.18	0.27
4.5	1.260	0.16	0.24
5	1.270	0.15	0.23
6	1.280	0.14	0.21
7.00	1.295	0.13	0.19
8	1.305	0.12	0.17
9	1.315	0.11	0.16
10	1.320	0.10	0.15
13	1.340	0.08	0.12
73.25	1.360	0.06	0.09
96	1.400	0.02	0.03



INSITU PIEZOMETER PERMEABILITY TEST

See BS 5930:1999 Para. 25.4

REC Ltd

Site Name **The Ridgeway School, Reading**

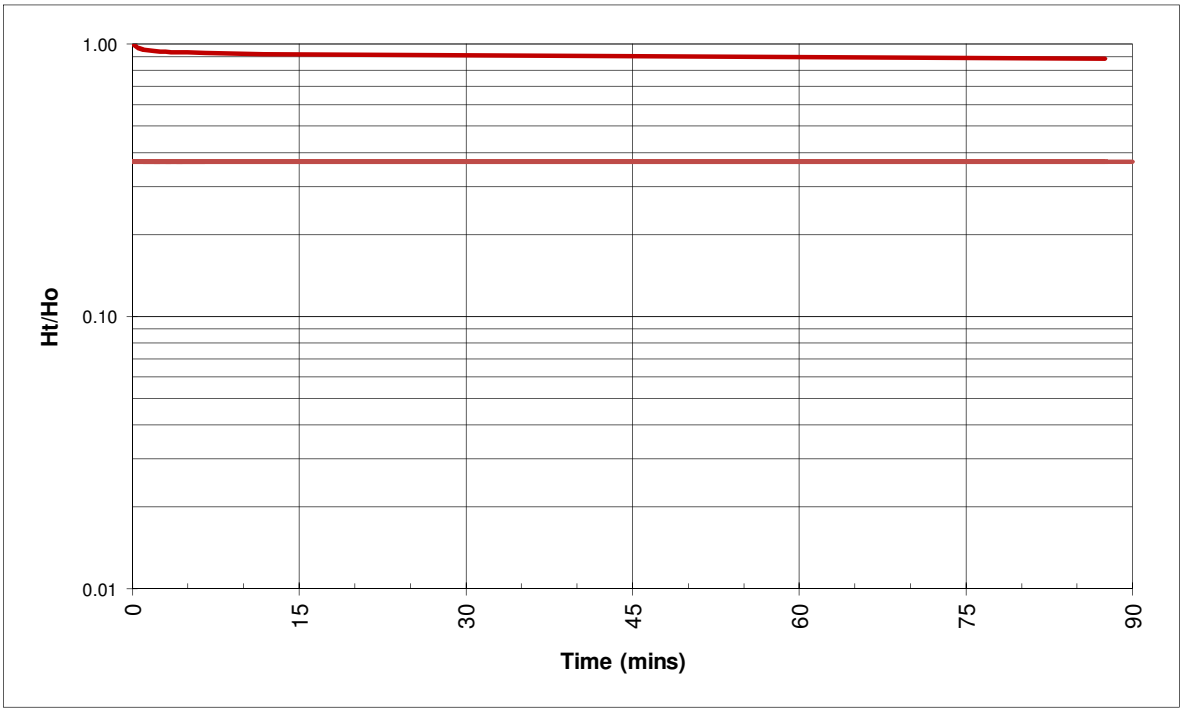
Job No. **20715**

Borehole number	WS106		
Date	22/05/2014		
Was this a (R)ising or (F)alling test	F		
Diameter of borehole	0.115	[m]	
Depth to top of filter	1.00	[m]	
Depth to bottom of filter	4.00	[m]	
Internal diameter of piezometer	0.05	[m]	
Ground water level	2.93	[m]	
Water level at start of test	0.48	[m]	
Initial head of water (Ho)	2.45	[m]	
Time lag of test (Ht/Ho = 0.37)	N/A	[mins]	
Intake factor F (Case d - BS 5930:1999 page 50)	4.77		
PERMEABILITY k	N/A	[m/s]	

Notes: All depths measured from ground level

TIME (min)	DEPTH TO WATER (m bgl)	Ht (m)	Ht/Ho
0	0.480	2.45	1.00
0.5	0.560	2.37	0.97
1	0.595	2.34	0.95
2	0.625	2.31	0.94
2.5	0.630	2.30	0.94
3	0.635	2.30	0.94
3.5	0.640	2.29	0.93
4	0.650	2.28	0.93
4.5	0.650	2.28	0.93
5	0.650	2.28	0.93
6.5	0.660	2.27	0.93
11.75	0.680	2.25	0.92
87.50	0.760	2.17	0.89

The required Ht/H0 = 0.37 intercept was not reached after 1.46 hours.
Test terminated after 87.50 minutes (1.46 Hours)

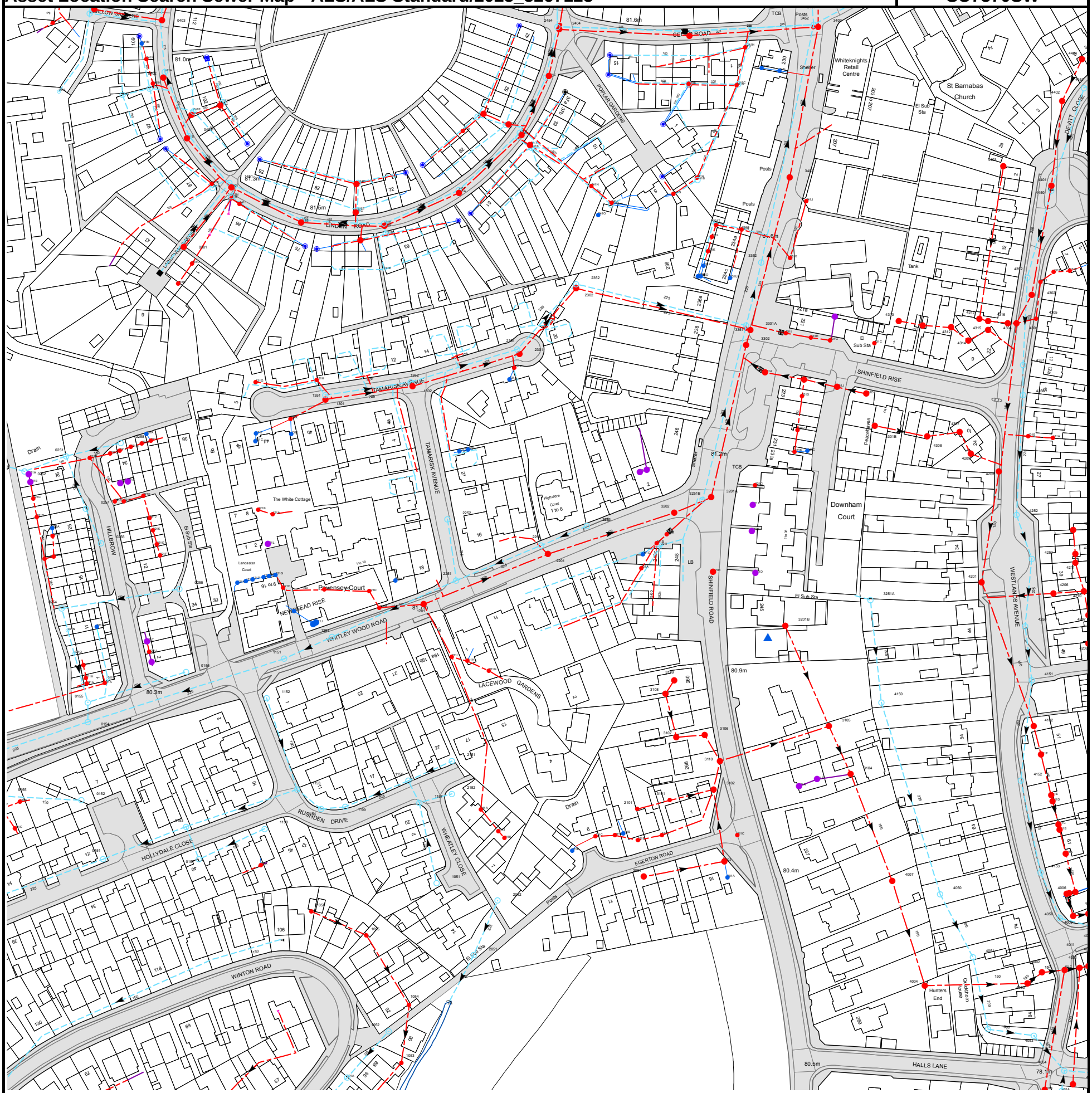


12 APPENDIX D

Asset Search Location	Thames Water Property Searches

Asset Location Search Sewer Map - ALS/ALS Standard/2025_5267123

SU7370SW



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 473250,170250

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

Based on the Ordnance Survey Map (2024) with the Sanction of the controller of H.M. Stationery Office, License no. AC0000849556 Crown Copyright Reserved.

NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
021W	n/a	n/a
021X	n/a	n/a
021Z	n/a	n/a
022E	n/a	n/a
141I	n/a	n/a
141F	n/a	n/a
041F	n/a	n/a
241P	n/a	n/a
041H	n/a	n/a
041N	n/a	n/a
041M	n/a	n/a
121I	n/a	n/a
121J	n/a	n/a
121H	n/a	n/a
121M	n/a	n/a
1201	81.41	79.16
121D	n/a	n/a
121E	n/a	n/a
121F	n/a	n/a
121N	n/a	n/a
121O	n/a	n/a
121K	n/a	n/a
121P	n/a	n/a
121Q	n/a	n/a
121R	n/a	n/a
121G	n/a	n/a
2201	81.2	78.26
121L	n/a	n/a
021Y	n/a	n/a
1053	n/a	n/a
1054	n/a	n/a
1055	n/a	n/a
1056	n/a	n/a
211K	n/a	n/a
211J	n/a	n/a
211A	n/a	n/a
211G	n/a	n/a
011I	n/a	n/a
211H	n/a	n/a
211I	n/a	n/a
021U	n/a	n/a
021T	n/a	n/a
401D	n/a	n/a
321D	n/a	n/a
321H	n/a	n/a
221G	n/a	n/a
321I	n/a	n/a
321E	n/a	n/a
321F	n/a	n/a
321G	n/a	n/a
221E	n/a	n/a
221F	n/a	n/a
321B	n/a	n/a
321C	n/a	n/a
331V	n/a	n/a
331X	n/a	n/a
341G	n/a	n/a
341A	n/a	n/a
3403	81.57	76.48
341D	n/a	n/a
341L	n/a	n/a
341K	n/a	n/a
341I	n/a	n/a
3401	81.5	77.38
3402	81.58	76.26
3404	81.59	76.2
022D	n/a	n/a
022C	n/a	n/a
022B	n/a	n/a
022A	n/a	n/a
021D	n/a	n/a
021C	n/a	n/a
021B	n/a	n/a
021A	n/a	n/a
341F	n/a	n/a
241C	81.54	79.8
241E	n/a	n/a
341H	n/a	n/a
2404	81.54	77.64
2454	81.5	79.7
3452	81.6	79.25
041J	n/a	n/a
041I	n/a	n/a
0403	80.9	78.49
0402	80.94	78.69
041A	80.95	n/a
041B	80.99	n/a
0451	81.07	n/a
041D	n/a	n/a
041E	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
041G	n/a	n/a
041C	n/a	n/a
141A	n/a	n/a
1451	81.17	79.5
141H	n/a	n/a
1401	81.17	78.42
131B	n/a	n/a
1452	81.29	79.61
141C	n/a	n/a
141B	n/a	n/a
141E	n/a	n/a
1303	81.37	n/a
331M	n/a	n/a
131A	81.44	n/a
331T	n/a	n/a
241O	n/a	n/a
241M	n/a	n/a
241L	n/a	n/a
341J	n/a	n/a
241A	81.47	n/a
2451	84.49	n/a
241N	n/a	n/a
141D	n/a	n/a
341B	n/a	n/a
241K	n/a	n/a
241J	n/a	n/a
2402	81.48	77.81
241B	81.54	n/a
241I	n/a	n/a
241G	n/a	n/a
241H	n/a	n/a
241F	n/a	n/a
341E	n/a	n/a
341C	n/a	n/a
4403	81.51	80.45
4352	81.17	n/a
4303	81.16	79.74
4401	81.65	79.71
4450	81.65	80.01
431F	n/a	n/a
4402	81.65	80.08
431E	n/a	n/a
4404	n/a	n/a
4451	81.58	80.22
331B	n/a	n/a
231A	n/a	n/a
331A	n/a	n/a
231B	n/a	n/a
2301	81.36	79.46
2351	81.37	79.88
3302	81.4	76.72
331G	n/a	n/a
331H	n/a	n/a
331I	n/a	n/a
3301A	81.4	76.7
3351	81.39	79.61
331F	n/a	n/a
2302	81.55	79.34
2352	81.55	79.8
331U	n/a	n/a
331Q	n/a	n/a
331O	n/a	n/a
331R	n/a	n/a
331P	n/a	n/a
3352	81.45	79.55
331E	n/a	n/a
331K	n/a	n/a
331L	n/a	n/a
131D	n/a	n/a
331N	n/a	n/a
331S	n/a	n/a
0258	78.15	76.64
121C	n/a	n/a
021L	n/a	n/a
031A	n/a	n/a
131J	n/a	n/a
131I	n/a	n/a
131K	n/a	n/a
1301	81.31	79.75
1351	81.32	80.07
131G	n/a	n/a
131H	n/a	n/a
031B	n/a	n/a
131E	n/a	n/a
031C	n/a	n/a
0301	81.06	78.89
131C	n/a	n/a
331D	n/a	n/a
331C	n/a	n/a
3301B	81.49	80.86
4310	n/a	n/a
4311	n/a	n/a
4308	81.39	80.59

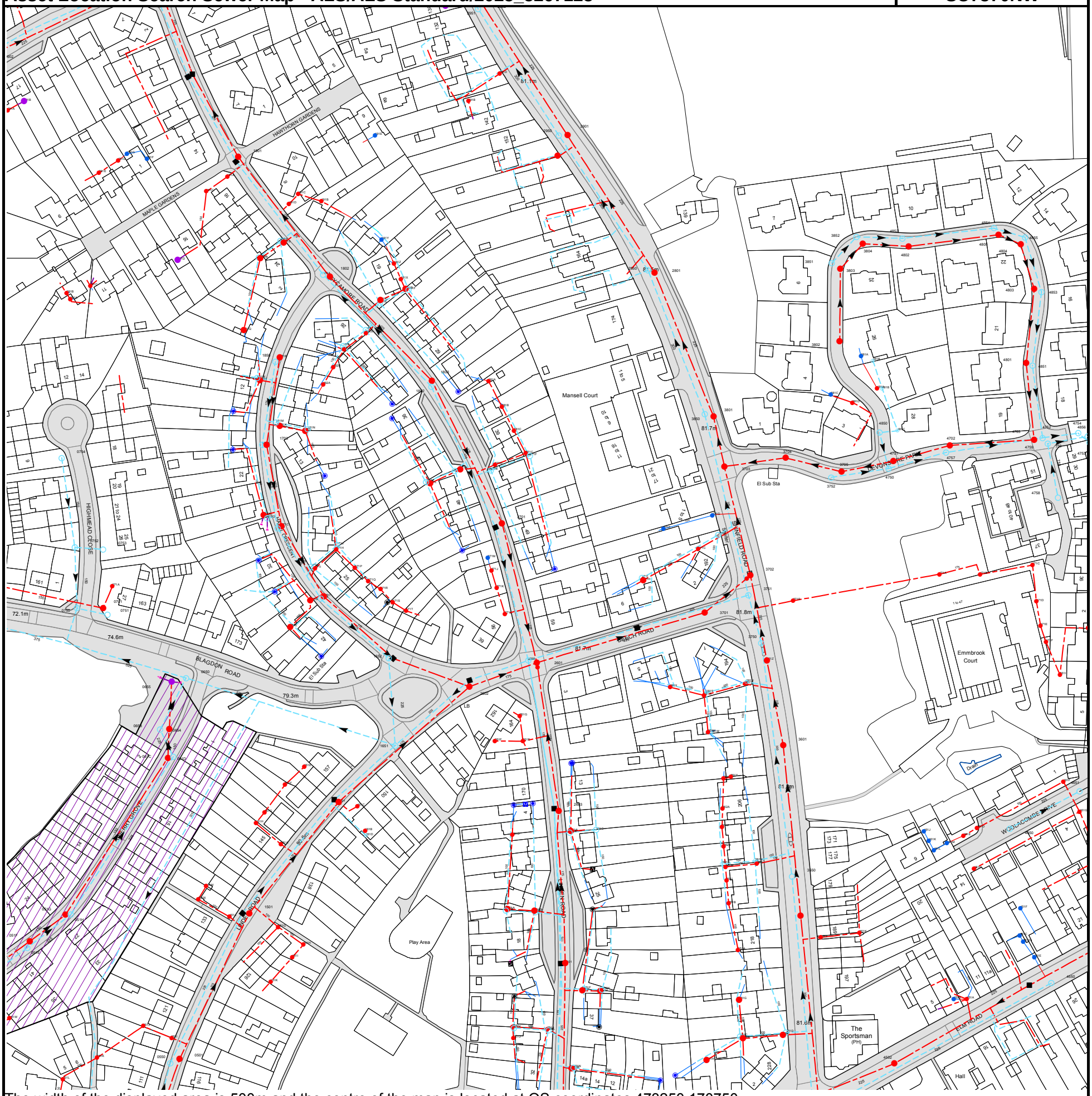
Manhole Reference	Manhole Cover Level	Manhole Invert Level
4312	n/a	n/a
4307	n/a	n/a
4314	n/a	n/a
4209	n/a	n/a
4313	n/a	n/a
4316	81.46	79.75
4315	n/a	n/a
4202	81.08	78.54
4304	81.4	79.56
4301	81.08	79.24
4351	80.97	79.63
4350	81.1	79.6
431B	n/a	n/a
4302	81.12	79.35
4305	81.13	79.6
431A	n/a	n/a
021P	n/a	n/a
0254	77.28	76.21
0256	79.18	77.77
0257	78.59	76.16
0252	76.67	74.55
021R	n/a	n/a
0251	77.45	75.56
041L	n/a	n/a
041K	n/a	n/a
0453	80.99	n/a
0404	81.03	78.93
1152	81.09	n/a
011A	n/a	n/a
011E	n/a	n/a
0156	80.29	78.77
1151	81.22	78.13
1251	81.4	78.98
0255	80.52	79.15
021F	n/a	n/a
021G	n/a	n/a
021K	n/a	n/a
021J	n/a	n/a
121A	n/a	n/a
121B	n/a	n/a
021S	n/a	n/a
021E	n/a	n/a
021Q	n/a	n/a
021M	n/a	n/a
3105	n/a	n/a
3108	n/a	n/a
3109	n/a	n/a
3201B	n/a	n/a
2251	81.41	79.67
221A	n/a	n/a
2254	81.32	79.86
221B	n/a	n/a
321A	n/a	n/a
2253	81.22	80.14
2252	81.47	80.16
3202	n/a	n/a
3251B	80.91	79.83
3201A	80.93	77.02
221D	n/a	n/a
221C	n/a	n/a
331J	n/a	n/a
1302	81.45	79.66
1352	81.45	79.98
4007	78.66	77.69
4153	77.94	77.18
411A	n/a	n/a
411B	n/a	n/a
411C	n/a	n/a
411D	n/a	n/a
411E	n/a	n/a
4152	78.98	78.21
3104	n/a	n/a
411F	n/a	n/a
4102	79.41	77.76
4150	79.62	78.02
4151	80.01	78.47
4208	n/a	n/a
4250	80.45	78.67
4207	n/a	n/a
3251A	80.22	78.72
4206	n/a	n/a
4210	n/a	n/a
4201	80.58	78.23
4211	n/a	n/a
4251	80.84	79.11
4205	80.76	80.11
4204	80.79	80.26
4252	80.88	79.24
0152	78.24	76.89
0151	79.59	78.06
0153	80.33	78.92
0157	80.73	79.74
111A	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
1158	81.03	80.17
1153	81.2	79.36
1154	81.32	79.51
1155	81.42	79.85
101A	n/a	n/a
1052	81.1	79.49
1156	81.43	80.6
1157	81.32	80.78
1051	n/a	n/a
2151	86.66	86
2152	81.36	80.89
2051	81.54	n/a
2052	81.65	n/a
4004	78.79	77.65
4050	n/a	n/a
4051	78.24	76.88
4052	78.47	76.75
4003	n/a	n/a
4053	78.09	76.51
4002	77.61	76.99
401B	78.194	77.117
4056	n/a	n/a
401A	78.244	76.351
4054	78.1	76.35
401C	77.58	76.68
4006	77.67	76.87
4008	77.89	77.1
4009	77.55	76.81
4005	77.48	76.9
4001	77.69	76.51
4010	77.41	76.77
4011	77.09	76.44
4055	77.36	76.64
4012	77.1	76.39
301A	n/a	n/a
2001	n/a	n/a
3103	n/a	n/a
211F	n/a	n/a
211E	n/a	n/a
211C	n/a	n/a
211D	n/a	n/a
311D	n/a	n/a
311C	n/a	n/a
211B	n/a	n/a
2101	n/a	n/a
3101	n/a	n/a
3102	n/a	n/a
311A	n/a	n/a
311B	n/a	n/a
3110	n/a	n/a
3107	n/a	n/a
3106	n/a	n/a
021N	n/a	n/a
021O	n/a	n/a
011D	n/a	n/a
011F	n/a	n/a
011H	n/a	n/a
011G	n/a	n/a
0154	76.57	75.56
0155	77.01	75.45
011C	n/a	n/a
011B	n/a	n/a

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Asset Location Search Sewer Map - ALS/ALS Standard/2025_5267123

SU7370NW



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 473250,170750

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

Based on the Ordnance Survey Map (2024) with the Sanction of the controller of H.M. Stationery Office, License no. AC0000849556 Crown Copyright Reserved.

NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
091E	n/a	n/a
091D	n/a	n/a
091G	n/a	n/a
091F	n/a	n/a
1901	81.26	78.96
191E	n/a	n/a
291C	n/a	n/a
291B	n/a	n/a
2951	80.85	77.79
2902	80.92	74.42
291D	n/a	n/a
291A	n/a	n/a
2950	81.05	77.98
2901	81.08	74.62
2850	81.38	78.2
2801	81.32	74.93
3851	n/a	n/a
3803	n/a	n/a
3852	n/a	n/a
3804	n/a	n/a
4852	n/a	n/a
4802	n/a	n/a
4854	n/a	n/a
4805	n/a	n/a
4804	n/a	n/a
4855	n/a	n/a
181X	n/a	n/a
1802	81.33	79.28
181A	81.34	79.23
181Z	n/a	n/a
081D	n/a	n/a
181R	n/a	n/a
181O	n/a	n/a
181S	n/a	n/a
181P	n/a	n/a
181Y	n/a	n/a
191D	n/a	n/a
191B	n/a	n/a
191C	n/a	n/a
091C	n/a	n/a
191A	n/a	n/a
4803	n/a	n/a
0701	n/a	n/a
0750	74.04	71.57
171G	n/a	n/a
171D	n/a	n/a
1701	80.6	78.15
071A	n/a	n/a
171I	n/a	n/a
171K	n/a	n/a
171H	n/a	n/a
0753	78.44	76.2
0752	77.99	75.69
171B	n/a	n/a
171C	n/a	n/a
171O	n/a	n/a
171N	n/a	n/a
1703	81.05	78.54
171A	80.96	78.16
181L	n/a	n/a
181N	n/a	n/a
181K	n/a	n/a
181M	n/a	n/a
182A	n/a	n/a
181T	n/a	n/a
181W	n/a	n/a
182B	n/a	n/a
1850	81.21	79.35
181B	81.24	78.74
181Q	n/a	n/a
081A	n/a	n/a
271L	n/a	n/a
171T	n/a	n/a
171S	n/a	n/a
171R	n/a	n/a
271K	n/a	n/a
171Q	n/a	n/a
271J	n/a	n/a
171P	n/a	n/a
271M	n/a	n/a
171J	n/a	n/a
2701	81.48	78.37
171L	n/a	n/a
171M	n/a	n/a
271B	n/a	n/a
271E	n/a	n/a
271A	n/a	n/a
271D	n/a	n/a
281C	n/a	n/a
281B	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
1852	81.33	79.57
281A	n/a	n/a
1803	81.29	78.7
181G	n/a	n/a
181I	n/a	n/a
181H	n/a	n/a
181J	n/a	n/a
181E	n/a	n/a
181C	n/a	n/a
181F	n/a	n/a
181D	n/a	n/a
381D	n/a	n/a
381A	n/a	n/a
381B	n/a	n/a
481A	n/a	n/a
4850	n/a	n/a
481B	n/a	n/a
4750	n/a	n/a
4701	n/a	n/a
481C	n/a	n/a
471A	n/a	n/a
4757	n/a	n/a
4702	n/a	n/a
471B	n/a	n/a
4801	n/a	n/a
4851	n/a	n/a
471C	n/a	n/a
4703	n/a	n/a
471D	n/a	n/a
471E	n/a	n/a
4853	n/a	n/a
4752	n/a	n/a
4759	79.16	77.15
4758	79.66	77.25
4754	n/a	n/a
4856	79.25	77.08
4753	n/a	n/a
361S	n/a	n/a
361X	n/a	n/a
361T	n/a	n/a
361U	n/a	n/a
2601	81.53	77.09
2650	81.55	79.27
361Z	n/a	n/a
3750	81.68	78.68
3701	81.79	76.83
371E	n/a	n/a
3751	81.71	78.62
271H	n/a	n/a
271I	n/a	n/a
3702	81.7	75.46
371C	n/a	n/a
371D	n/a	n/a
371F	n/a	n/a
371G	n/a	n/a
3752	n/a	n/a
3705	n/a	n/a
3703	81.64	75.26
3704	n/a	n/a
271F	n/a	n/a
271C	n/a	n/a
3801	81.52	75.21
3850	81.61	78.4
381C	n/a	n/a
3802	n/a	n/a
161C	n/a	n/a
1601	80.5	77.6
161F	n/a	n/a
161E	n/a	n/a
061C	n/a	n/a
061D	n/a	n/a
1651	80.8	78.38
261F	n/a	n/a
0658	76.98	74.44
0654	76.87	75.33
2602	81.2	77.26
0655	76.52	74.1
0650	76.66	73.38
1652	80.94	78.55
171E	n/a	n/a
0751	n/a	n/a
261D	n/a	n/a
261G	n/a	n/a
261E	n/a	n/a
2603	81.45	78.38
261B	n/a	n/a
261A	n/a	n/a
261C	n/a	n/a
361R	n/a	n/a
361V	n/a	n/a
361W	n/a	n/a
361P	n/a	n/a
361O	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
362A	n/a	n/a
361Q	n/a	n/a
362B	n/a	n/a
361M	n/a	n/a
361Y	n/a	n/a
361N	n/a	n/a
361L	n/a	n/a
3601	81.64	75.66
251A	n/a	n/a
251I	n/a	n/a
251O	n/a	n/a
251D	n/a	n/a
251C	n/a	n/a
251J	n/a	n/a
2501	81.44	78.68
351I	n/a	n/a
351B	n/a	n/a
351A	n/a	n/a
3550	81.63	78.97
3502	81.57	75.95
351J	n/a	n/a
351K	n/a	n/a
451F	n/a	n/a
151K	n/a	n/a
151I	n/a	n/a
151H	n/a	n/a
151G	n/a	n/a
151J	n/a	n/a
051H	n/a	n/a
1501	80.58	77.84
251B	n/a	n/a
051N	n/a	n/a
051M	n/a	n/a
161A	n/a	n/a
161D	n/a	n/a
161B	n/a	n/a
161H	n/a	n/a
161G	n/a	n/a
081C	n/a	n/a
091A	n/a	n/a
091B	n/a	n/a
0754	78.97	76.56
081B	n/a	n/a
051E	n/a	n/a
051F	n/a	n/a
051G	n/a	n/a
4502	81.24	76.44
451A	n/a	n/a
451B	n/a	n/a
4550	80.93	79.74
451E	n/a	n/a
451D	n/a	n/a
451C	n/a	n/a
461H	n/a	n/a
461L	n/a	n/a
461M	n/a	n/a
461K	n/a	n/a
461E	n/a	n/a
461J	n/a	n/a
461O	n/a	n/a
4650	80.7	79.31
461G	n/a	n/a
4651	80.26	78.84
461F	n/a	n/a
461I	n/a	n/a
471F	n/a	n/a
471G	n/a	n/a
251M	n/a	n/a
251N	n/a	n/a
351H	n/a	n/a
351E	n/a	n/a
351C	n/a	n/a
351F	n/a	n/a
351D	n/a	n/a
251L	n/a	n/a
251K	n/a	n/a
351G	n/a	n/a
251G	n/a	n/a
251E	n/a	n/a
251H	n/a	n/a
251F	n/a	n/a
051J	n/a	n/a
0550	80.74	79.09
051I	n/a	n/a
0501	80.81	78.16
051L	n/a	n/a
051K	n/a	n/a
951W	n/a	n/a

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Asset Location Search - Sewer Key

Public Sewer Types (Operated and maintained by Thames Water)

Foul Sewer: A sewer designed to convey waste water from domestic and industrial sources to a treatment works.

Surface Water Sewer: A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses.

Combined Sewer: A sewer designed to convey both waste water and surface water from domestic and industrial sources to a treatment works.

- Storm Sewer
- Sludge Sewer
- Foul Trunk Sewer
- Surface Trunk Sewer
- Combined Trunk Sewer
- Foul Rising Main
- Surface Water Rising Main
- Combined Rising Main
- Vacuum
- Thames Water Proposed
- Vent Pipe
- Gallery

Other Sewer Types (Not operated and maintained by Thames Water)

- Sewer
- Culverted Watercourse
- Proposed
- Decommissioned Sewer
- Content of this drainage network is currently unknown
- Ownership of this drainage network is currently unknown

Sewer Fittings

A feature in a sewer that does not affect the flow in the pipe. Example: a vent is a fitting as the function of a vent is to release excess gas.

- Air Valve
- Meter
- Dam Chase
- Vent
- Fitting

Operational Controls

A feature in a sewer that changes or diverts the flow in the sewer. Example: A hydrobrake limits the flow passing downstream.

- Ancillary
- Drop Pipe
- Control Valve
- Weir

End Items

End symbols appear at the start or end of a sewer pipe. Examples: an Undefined End at the start of a sewer indicates that Thames Water has no knowledge of the position of the sewer upstream of that symbol. Outfall on a surface water sewer indicates that the pipe discharges into a stream or river.

- Inlet
- Outfall
- Undefined End

Other Symbols

Symbols used on maps which do not fall under other general categories.

- Change of Characteristic Indicator
- Public / Private Pumping Station
- Invert Level
- Summit

Areas

Lines denoting areas of underground surveys, etc.

- Agreement
- Chamber
- Operational Site

Ducts or Crossings

- Casement

Ducts may contain high voltage cables. Please check with Thames Water.

- Conduit Bridge
- Subway
- Tunnel

Notes:

1) All levels associated with the plans are to Ordnance Datum Newlyn.
2) All measurements on the plan are metric.
3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate the direction of flow.
4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.
5) 'na' or '0' on a manhole indicates that data is unavailable.
6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in millimeters. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement. If you are unsure about any text or symbology, please contact Property Searches on 0800 009 4540.

13 APPENDIX E

Drainage Layout Drawings

Drainage Calculations and Hydraulic Modelling Outputs

N

INDICATIVE ONLY

DRAINAGE LEGEND

EXISTING FEATURES

- EXISTING SURFACE WATER SEWER AND MANHOLE TO BE RETAINED
- EXISTING SURFACE WATER DRAIN AND MANHOLE TO BE RETAINED
- ASSUMED EXISTING SURFACE WATER DRAIN
- DEFECTED EXISTING SURFACE WATER DRAIN
- EXISTING SURFACE WATER SOAKAWAY
- EXISTING FOUL WATER SEWER AND MANHOLE TO BE RETAINED
- EXISTING FOUL WATER DRAIN AND MANHOLE TO BE RETAINED
- ASSUMED EXISTING FOUL WATER DRAIN
- DEFECTED EXISTING FOUL WATER DRAIN
- EX FW RISING MAIN
- EXISTING UNKNOWN DRAIN/UTILITY AND MANHOLE WHICH REQUIRES FURTHER INVESTIGATION
- EXISTING FOUL/SURFACE/COMBINED WATER DRAIN AND MANHOLE TO BE ABANDONED. CONTRACTOR TO CONFIRM THAT NO LIVE CONNECTIONS REMAIN. PIPES TO BE FULLY REMOVED.

PROPOSED FEATURES

- SURFACE WATER DRAIN
- RG — ROAD GULLY (TRAPPED)
- STORM WATER MANHOLE TYPE D
  INTERNAL DIMENSIONS 450mm MINIMUM
  DEPTH FROM COVER TO SOFFIT OF PIPE UP TO 3m
  RESTRICT ACCESS TO Ø350 IF DEPTH FROM COVER TO SOFFIT OF PIPE IS MORE THAN 1.2m
  (MAX PIPE DIAMETER 150mm 450Ø/475Ø)
  (MAX PIPE DIAMETER 225mm 600Ø)
- SUMP / DRAINAGE CHANNEL — CHANNEL DRAIN SYSTEM WITH SUMP UNIT
- FOUL WATER DRAIN
- FOUL WATER RISING MAIN
- FW — ABOVE GROUND FOUL WATER CONNECTION - REFER TO PUBLIC HEALTH ENGINEERS/ARCHITECTS DRAWINGS FOR DETAILS
- TG — TRAPPED GULLY
- FOUL WATER MANHOLE TYPE D
  INTERNAL DIMENSIONS 450mm MINIMUM
  DEPTH FROM COVER TO SOFFIT OF PIPE UP TO 3m
  RESTRICT ACCESS TO Ø350 IF DEPTH FROM COVER
  SOFFIT OF PIPE IS MORE THAN 1.2m
  (MAX PIPE DIAMETER 150mm)
- FOUL WATER PUMP CHAMBER
- FW MH 01.00 / CL 00.00 / IL 00.00 / TYPE C MH / D400 — MANHOLE REFERENCE: COVER LEVEL, INVERT LEVEL, MH TYPE, COVER GRADE
- FFL: XX.XXX — ARCHITECTURAL FINISHED FLOOR LEVEL
- COMPULSORY — A COMPULSORY ACTION
- CONSTRUCTION WARNING — SPECIAL ATTENTION BY THE CONTRACTOR

EXTERNAL FINISHES LEGEND

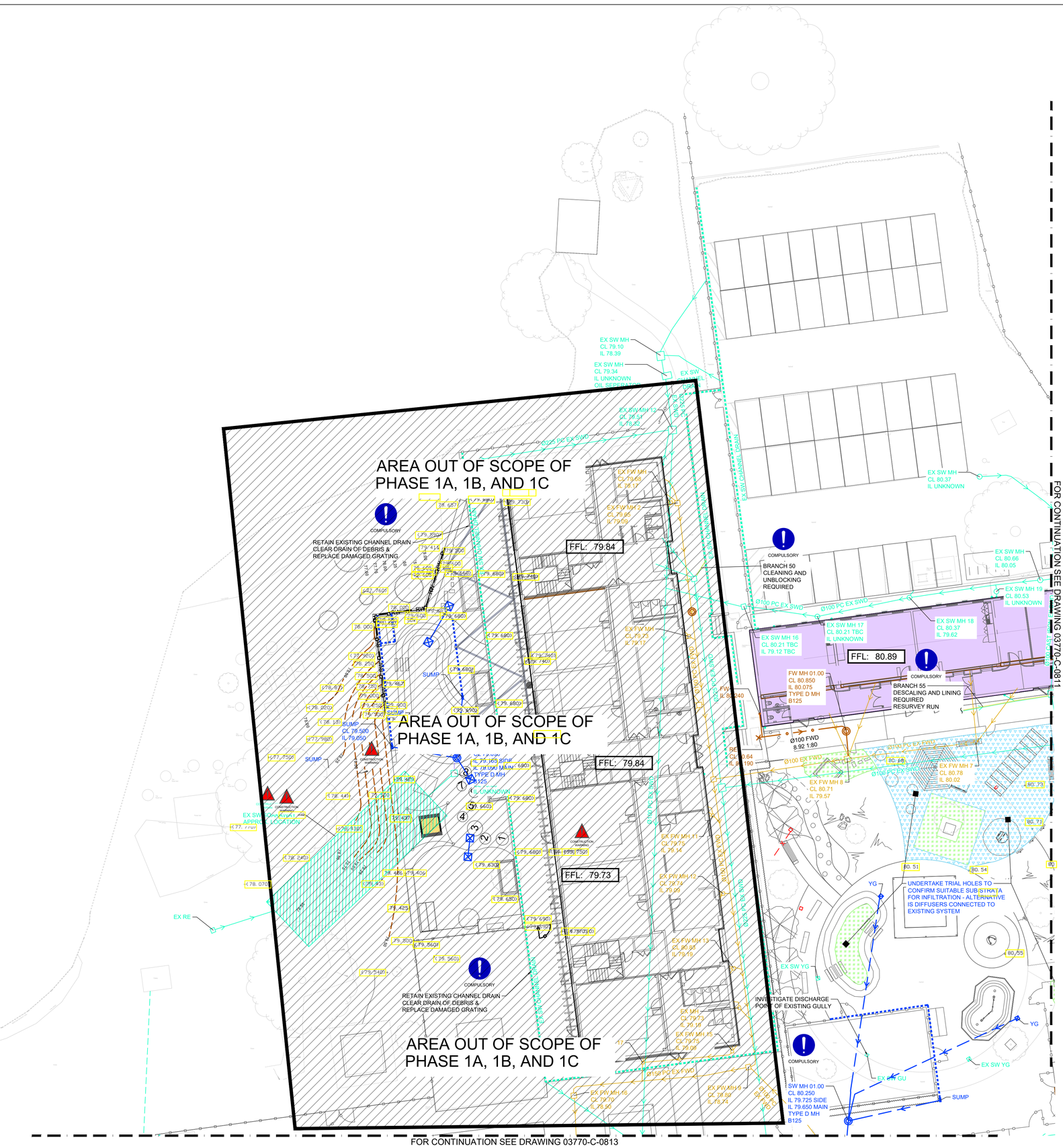
- RUBBER CRUMB (POROUS WITH OPEN GRADED CRUSHED ROCK) SUB-BASE DEPTH TBC 400mm MINIMUM
- POROUS ASPHALT SUB-BASE TBC 400mm MINIMUM
- RESIN BOND SURFACE (POROUS WITH OPEN GRADED CRUSHED ROCK) SUB-BASE DEPTH TBC 400mm MINIMUM
- ARTIFICIAL GRASS (POROUS WITH OPEN GRADED CRUSHED ROCK) SUB-BASE DEPTH TBC 400mm MINIMUM
- PERMEABLE BLOCK PAVING PARKING BAYS SUB-BASE 200mm TBC

PHASES LEGEND

- PHASE 1A CONSTRUCTION AREA
- PHASE 1B CONSTRUCTION AREA
- PHASE 1C CONSTRUCTION AREA

CONSTRUCTION WARNING — IMPORTANT NOTE: CAUTION

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NOTES:

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2. ANY DISCREPANCIES SHOULD BE REPORTED TO THE ARCHITECT AND/OR ENGINEER IMMEDIATELY, SO THAT CLARIFICATION CAN BE SOUGHT PRIOR TO THE COMMENCEMENT OF WORK.

DRAINAGE NOTES

3. ALL PIPES TO BE ADOPTED, OR CONNECTING TO ADOPTED SEWERS, AND/OR SITUATED UNDER HIGHWAY TO BE VITRIFIED CLAY TO BS EN 295 & BS65 (SWS ONLY), OR CONCRETE PIPES TO BE EN 1916 & BS5911 PART 1, OR THERMOPLASTIC STRUCTURED WALL SEWER PIPES TO WIS 4-35-01 (CLASS 8KN/SQM) AND BE CAPABLE OF WITHSTANDING 4000 PSI JETTING PRESSURE. PRIVATE PIPES MAY BE VC OR PLASTIC.
4. ADOPTABLE HIGHWAY WORKS ARE TO BE IN ACCORDANCE WITH LOCAL AUTHORITY DESIGN GUIDANCE.
5. ANY WORKS ASSOCIATED WITH THE HIGHWAY/EXTERNAL WORKS INCLUDING HIGHWAY DRAINAGE, SHALL BE IN ACCORDANCE WITH THE HIGHWAYS AGENCY 'MANUAL OF CONTRACT DOCUMENTS FOR HIGHWAY WORKS, VOL 1' (MCHW), UNLESS OTHERWISE SPECIFIED.
6. FOR CONSTRUCTION DETAILS REFER TO THE RELEVANT MARBAS DRAWING NUMBERS LISTED ON THE DRAWING ISSUE SHEET.
7. ALL DRAINAGE WORKS SHOULD COMMENCE AT THE PROPOSED DOWNSTREAM CONNECTION POINT, THE WORKS CONTINUING UPSTREAM FOLLOWING CONFIRMATION OF THE TIE-IN INVERT LEVELS TO THE ENGINEER. CONNECTIONS TO MANHOLES OR LARGER SIZED PIPES ETC. SHOULD BE SOFFIT TO SOFFIT UNLESS OTHERWISE INSTRUCTED BY THE ENGINEER, IF THIS IS NOT POSSIBLE INFORM THE ENGINEER IMMEDIATELY
8. COVER LEVELS SHOWN ARE APPROXIMATE. COVERS AND FRAMES SHALL BE SET TO FINISHED GROUND LEVELS AND FALLS.
9. ROAD GULLY PIPES ARE TO BE 150mm DIA. WITH CONCRETE SURROUND AND FLEXIBLE JOINTS, ALL OTHER UN-REFERENCED PIPES ARE ASSUMED TO BE 100mm DIA.
   - FW MIN GRADIENT - 1 IN 40 (100 DIA) NO WC'S CONNECTED
   - FW MIN GRADIENT - 1 IN 80 (100 DIA) MIN 1 WC CONNECTED
   - FW MIN GRADIENT - 1 IN 150 (150 DIA) MIN 5 WC'S CONNECTED
   - SW MIN GRADIENT - 1 IN 100 (100 DIA)
   - SW MIN GRADIENT - 1 IN 150 (150 DIA)
12. ALL GULLIES SHALL BE FITTED WITH GRADE D400 GRATINGS AND FRAMES TO BS EN124, UNLESS OTHERWISE STATED.
13. IN ORDER TO MAINTAIN THE SATISFACTORY FUNCTIONING OF SURFACE WATER SEWERS, ALL ROAD AND YARD GULLIES ARE TO BE "TRAPPED".
14. ALL NON ADOPTABLE LATERALS BENEATH THE HIGHWAY SHALL BE BACK FILLED WITH A TYPE 1 GRANULAR MATERIAL AS CL.803 (MCHW) APPROVED BY THE ENGINEER.
15. ALL PRIVATE DRAINAGE TO BE IN ACCORDANCE WITH THE BUILDING REGULATIONS APPROVED DOCUMENT PART-H, AND TO THE SATISFACTION OF THE BUILDING CONTROL INSPECTOR.
16. WHERE DRAINS PASS THROUGH FOUNDATIONS OR CONNECT TO MANHOLES, A FLEXIBLE PIPE JOINT SHOULD BE PROVIDED TO FORM A ROCKER PIPE IN ACCORDANCE WITH THE STANDARD DETAIL PROVIDED.
17. SHALLOW PRIVATE DRAINS MAY REQUIRE PROTECTION USING CLASS 'Z' CONCRETE SURROUND OR PAVING SLABS BRIDGING THE TRENCH SUBJECT TO THE NHBC INSPECTOR'S REQUIREMENTS.
18. WHERE DRAINAGE RUNS PASS CLOSE TO BUILDINGS OR THEIR INVERT LEVELS ARE BELOW FOUNDATION LEVEL, THEN THE TRENCHES ARE TO BE BACK FILLED IN ACCORDANCE WITH THE STANDARD DETAIL PROVIDED.
19. REFERENCE SHOULD BE MADE TO THE STRUCTURAL ENGINEERS DETAILS FOR ALL ASPECTS OF FOUNDATION DESIGN AND CONSTRUCTION.
20. THE CONTRACTOR IS TO KEEP A RECORD OF ANY VARIATIONS MADE ON SITE, INCLUDING THE RELOCATION OF SEWERS OR DRAINS, SO THAT AN AS CONSTRUCTED DRAWING CAN BE PREPARED UPON COMPLETION OF THE PROJECT.
21. THE CONTRACTOR SHOULD CHECK ALL DIMENSIONS ON SITE. NO DIMENSIONS ARE TO BE SCALED FROM THESE DRAWINGS.
22. IT IS THE CONTRACTORS/SUBCONTRACTORS RESPONSIBILITY TO ENSURE COMPLIANCE WITH THE CURRENT BUILDING REGULATIONS AND CODES OF PRACTICE.
23. STUB CONNECTIONS TO ADOPTABLE MANHOLES SHALL BE MADE FROM VITRIFIED CLAY AND CONSIST OF TWO ROCKER PIPES LAID AT THE SAME GRADIENT AS THE UP OR DOWNSTREAM PIPE.
24. ALL DOWNPIPES ARE TO BE SEALED, IE CONNECTED DIRECTLY TO THE STORMWATER DRAIN. ACCESS POINTS TO BE PROVIDED 1m ABOVE GROUND LEVEL FOR EXTERNAL RWP'S AND 1m ABOVE FFL FOR INTERNAL RWP'S.
25. UNLESS OTHERWISE NOTED OR SIMILAR APPROVED CHANNEL DRAINS TO BE ACO MULTI DRAIN WITH A15 GRATING IN PEDESTRIAN AREAS, C250 IN CAR PARKS AND D400 IN CARRIAGEWAYS. SLOTTED CHANNEL TO BE USED FOR AREAS WITH FALLS <1:15 MESH GRATING TO BE USED WHERE FALLS >1:15.
26. GULLY AND CHANNEL DRAIN POSITIONS ARE LIABLE TO AMENDMENT WHEN THE DESIGN LEVELS HAVE BEEN DETERMINED.
27. MODULAR GEOCELLULAR STORAGE/SOAKAWAY SYSTEM TO CONFORM TO CIRIA C793 THE SUDS MANUAL, C680 STRUCTURAL DESIGN OF MODULAR GEOCELLULAR DRAINAGE TANKS & C698 SITE HANDBOOK FOR THE CONSTRUCTION OF SUDS. THE MANUFACTURER SHOULD PROVIDE A COMPLETE SET OF INDEPENDENT TEST RESULTS FOR A PROPOSED SYSTEM INCLUDING, AS A MINIMUM, STRESS/STRAIN CURVES FOR VERTICAL AND LATERAL COMPRESSION, AND CREEP TESTS UNDER SUSTAINED LONG-TERM LOADS. A BBA CERTIFICATE IS NOT INDEPENDENT TEST DATA.
28. ALL REDUNDANT DRAINAGE TO BE ABANDONED ONCE THE CONTRACTOR HAS SATISFIED HIMSELF THAT NO CONNECTIONS REMAIN LIVE. REDUNDANT DRAINAGE TO BE GRUBBED OUT.
29. ALL BELOW GROUND CONCRETE TO ACCORD WITH BS5328:1997;SULPHATE CLASS TBA.
30. IF ANY SUB SOIL DRAINAGE SYSTEMS ARE UNCOVERED DURING THE WORKS CONTACT THE ENGINEER FOR INSTRUCTIONS. GENERALLY SUB SOIL DRAINS AFFECTED ARE TO BE DIVERTED AROUND NEW WORKS AND CONNECTED INTO THE SURFACE WATER DRAINAGE SYSTEM. PIPE DIAMETERS AND GRADIENTS ARE TO BE MAINTAINED.
31. BEFORE COMMENCING CONSTRUCTION THE CONTRACTOR MUST CHECK THE INVERT LEVELS OF EXISTING SEWERS TO WHICH CONNECTIONS ARE MADE. IN ADDITION THE CONTRACTOR MUST LOCATE AND DETERMINE INVERT LEVELS OF THE EXISTING SPURS TO WHICH CONNECTIONS ARE PROPOSED. ADDITIONAL SPUR/MANHOLE CONNECTIONS ARE TO BE AGREED WITH THE RELEVANT ADOPTING AUTHORITY. ANY DISCREPANCIES ARE TO BE NOTIFIED TO THE ENGINEER IMMEDIATELY, PRIOR TO CONSTRUCTION.
32. ROAD REINSTATEMENTS ARE TO BE TO THE HIGHWAY AUTHORITY APPROVAL.
33. NO PRIVATE AREAS ARE TO DRAIN ONTO ADOPTABLE AREAS AND VICE VERSA.

REV	DATE	BY	DESCRIPTION
P04	21/08/26	SPB	UPDATED TO SUIT COMMENTS
P03	17/07/26	SPB	STAGE 3+ ISSUE
P02	15/04/26	BLT	REVISED TO ARCHITECTS AND LANDSCAPE UPDATES
P01	24/02/26	BLT	PRELIMINARY ISSUE

DRAWING STATUS: PRELIMINARY

marbas

CLIENT: READING BOROUGH COUNCIL

PROJECT: RIDGEWAY PRIMARY SCHOOL, READING, RG2 8JD

DRAWING TITLE: PHASE 1A & 1B PROPOSED BELOW GROUND DRAINAGE DESIGN SHEET 1 OF 5

DRAWING No.	REV.
03770-C-0810	P04

SCALE	DATE	DRAWN	CHECKED	SHT.
1:200	23/12/25	BT	SB	A1

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INDICATIVE ONLY

DRAINAGE LEGEND

EXISTING FEATURES

- EXISTING SURFACE WATER SEWER AND MANHOLE TO BE RETAINED
- EXISTING SURFACE WATER DRAIN AND MANHOLE TO BE RETAINED
- ASSUMED EXISTING SURFACE WATER DRAIN
- DEFECTED EXISTING SURFACE WATER DRAIN
- EXISTING SURFACE WATER SOAKAWAY
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- EXISTING FOUL WATER DRAIN AND MANHOLE TO BE RETAINED
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PROPOSED FEATURES

- SURFACE WATER DRAIN
- RG — ROAD GULLY (TRAPPED)
- STORM WATER MANHOLE TYPE D
  INTERNAL DIMENSIONS 450mm MINIMUM
  DEPTH FROM COVER TO SOFFIT OF PIPE UP TO 3m
  RESTRICT ACCESS TO Ø350 IF DEPTH FROM COVER TO SOFFIT OF PIPE IS MORE THAN 1.2m
  (MAX PIPE DIAMETER 150mm 450Ø/475Ø)
  (MAX PIPE DIAMETER 225mm 600Ø)
- SUMP / DRAINAGE CHANNEL — CHANNEL DRAIN SYSTEM WITH SUMP UNIT
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- FOUL WATER RISING MAIN
- FW — ABOVE GROUND FOUL WATER CONNECTION - REFER TO PUBLIC HEALTH ENGINEERS/ARCHITECTS DRAWINGS FOR DETAILS
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  INTERNAL DIMENSIONS 450mm MINIMUM
  DEPTH FROM COVER TO SOFFIT OF PIPE UP TO 3m
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- FOUL WATER PUMP CHAMBER
- FW MH 01.00 / CL 00.00 / IL 00.00 / TYPE C MH / D400 — MANHOLE REFERENCE: COVER LEVEL, INVERT LEVEL, MH TYPE, COVER GRADE
- FFL: XX.XXX — ARCHITECTURAL FINISHED FLOOR LEVEL
- COMPULSORY — A COMPULSORY ACTION
- CONSTRUCTION WARNING — SPECIAL ATTENTION BY THE CONTRACTOR

EXTERNAL FINISHES LEGEND

- RUBBER CRUMB (POROUS WITH OPEN GRADED CRUSHED ROCK) SUB-BASE DEPTH TBC 400mm MINIMUM
- PORUS ASPHALT SUB-BASE TBC 400mm MINIMUM
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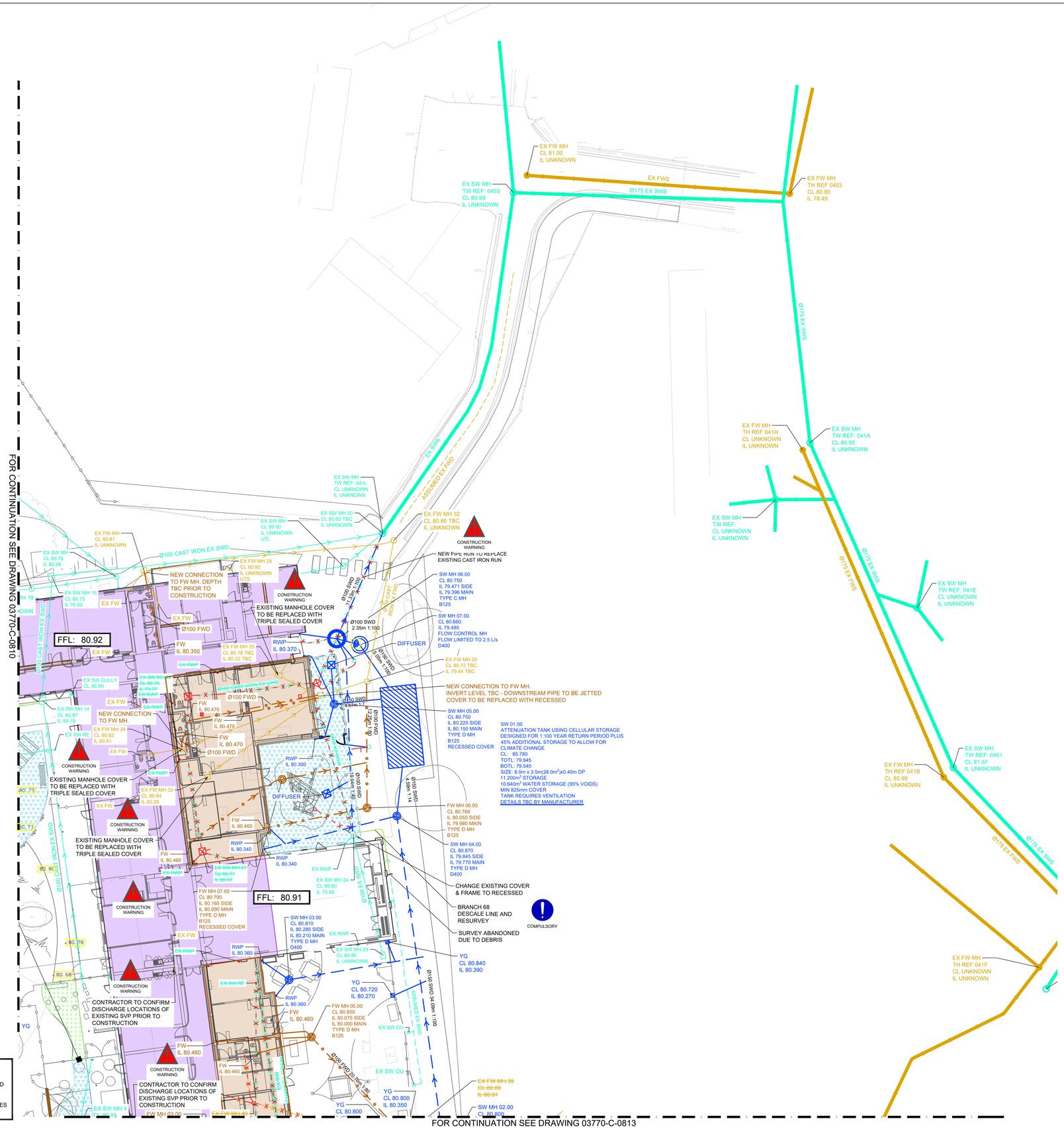
PHASES LEGEND

- PHASE 1A CONSTRUCTION AREA
- PHASE 1B CONSTRUCTION AREA
- PHASE 1C CONSTRUCTION AREA

IMPORTANT NOTE: CAUTION

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DRAINAGE NOTES

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P02	15/04/26	BLT	REVISED TO ARCHITECTS AND LANDSCAPE UPDATES
P01	24/02/26	BLT	PRELIMINARY ISSUE

DRAWING STATUS: PRELIMINARY

marbas

CLIENT: READING BOROUGH COUNCIL

PROJECT: RIDGEWAY PRIMARY SCHOOL, READING, RG2 8JD

DRAWING TITLE: PHASE 1A & 1B PROPOSED BELOW GROUND DRAINAGE DESIGN SHEET 2 OF 5

DRAWING No.	REV.
03770-C-0811	P04

SCALE	DATE	DRAWN	CHECKED	SHT.
1:200	23/12/25	BT	SB	A1

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INDICATIVE ONLY

DRAINAGE LEGEND

EXISTING FEATURES

- EXISTING SURFACE WATER SEWER AND MANHOLE TO BE RETAINED
- EXISTING SURFACE WATER DRAIN AND MANHOLE TO BE RETAINED
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PROPOSED FEATURES

- SURFACE WATER DRAIN
- RG — ROAD GULLY (TRAPPED)
- STORM WATER MANHOLE TYPE D
  INTERNAL DIMENSIONS 450mm MINIMUM
  DEPTH FROM COVER TO SOFFIT OF PIPE UP TO 3m
  RESTRICT ACCESS TO Ø350 IF DEPTH FROM COVER TO SOFFIT OF PIPE IS MORE THAN 1.2m
  (MAX PIPE DIAMETER 150mm ø600ø/475ø)
  (MAX PIPE DIAMETER 225mm 600ø)
- SUMP / DRAINAGE CHANNEL — CHANNEL DRAIN SYSTEM WITH SUMP UNIT
- FOUL WATER DRAIN
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- TG — TRAPPED GULLY
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- FOUL WATER PUMP CHAMBER
- FW MH 01.00 / CL 00.00 / IL 00.00 / TYPE C MH / D400 — MANHOLE REFERENCE: COVER LEVEL, INVERT LEVEL, MH TYPE, COVER GRADE
- FFL: XX.XXX — ARCHITECTURAL FINISHED FLOOR LEVEL
- COMPULSORY — A COMPULSORY ACTION
- CONSTRUCTION WARNING — SPECIAL ATTENTION BY THE CONTRACTOR

EXTERNAL FINISHES LEGEND

- RUBBER CRUMB (POROUS WITH OPEN GRADED CRUSHED ROCK) SUB-BASE DEPTH TBC 400mm MINIMUM
- PORUS ASPHALT SUB-BASE TBC 400mm MINIMUM
- RESIN BOND SURFACE (POROUS WITH OPEN GRADED CRUSHED ROCK) SUB-BASE DEPTH TBC 400mm MINIMUM
- ARTIFICIAL GRASS (POROUS WITH OPEN GRADED CRUSHED ROCK) SUB-BASE DEPTH TBC 400mm MINIMUM
- PERMEABLE BLOCK PAVING PARKING BAYS SUB-BASE 200mm TBC

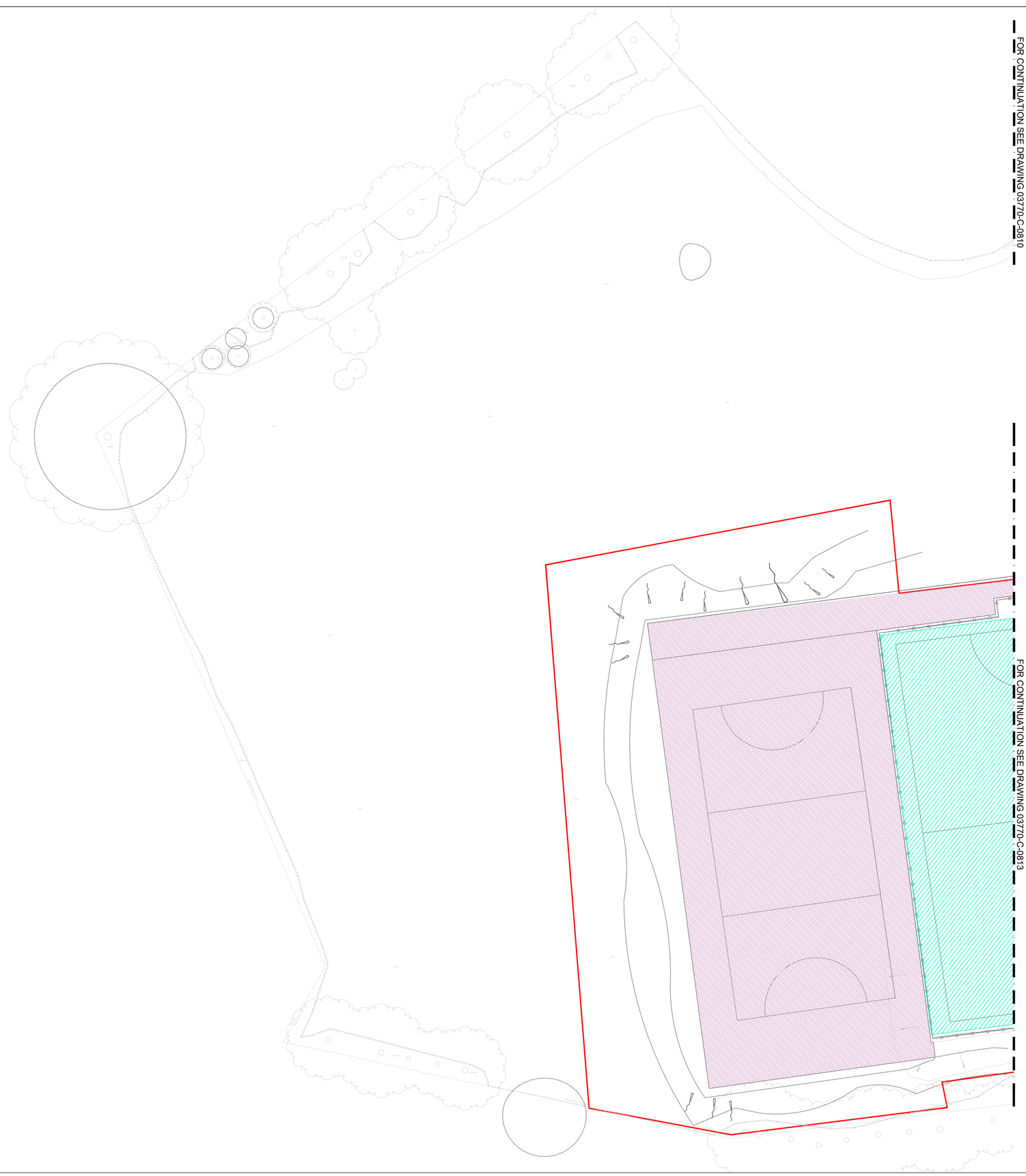
PHASES LEGEND

- PHASE 1A CONSTRUCTION AREA
- PHASE 1B CONSTRUCTION AREA
- PHASE 1C CONSTRUCTION AREA

CONSTRUCTION WARNING

IMPORTANT NOTE: CAUTION

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FOR CONTINUATION SEE DRAWING 03770-C-0810

FOR CONTINUATION SEE DRAWING 03770-C-0813

NOTES:

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2. ANY DISCREPANCIES SHOULD BE REPORTED TO THE ARCHITECT AND/OR ENGINEER IMMEDIATELY, SO THAT CLARIFICATION CAN BE SOUGHT PRIOR TO THE COMMENCEMENT OF WORK.

DRAINAGE NOTES

3. ALL PIPES TO BE ADOPTED, OR CONNECTING TO ADOPTED SEWERS, AND/OR SITUATED UNDER HIGHWAY TO BE VITRIFIED CLAY TO BS EN 295 & BS65 (SWS ONLY), OR CONCRETE PIPES TO BE EN 1916 & BS5911-PART 1, OR THERMOPLASTIC STRUCTURED WALL SEWER PIPES TO WIS 4-35-01 (CLASS 8KN/SQM) AND BE CAPABLE OF WITHSTANDING 4000 PSI JETTING PRESSURE. PRIVATE PIPES MAY BE VC OR PLASTIC.
4. ADOPTABLE HIGHWAY WORKS ARE TO BE IN ACCORDANCE WITH LOCAL AUTHORITY DESIGN GUIDANCE.
5. ANY WORKS ASSOCIATED WITH THE HIGHWAY/EXTERNAL WORKS INCLUDING HIGHWAY DRAINAGE, SHALL BE IN ACCORDANCE WITH THE HIGHWAYS AGENCY 'MANUAL OF CONTRACT DOCUMENTS FOR HIGHWAY WORKS, VOL 1' (MCHW), UNLESS OTHERWISE SPECIFIED.
6. FOR CONSTRUCTION DETAILS REFER TO THE RELEVANT MARBAS DRAWING NUMBERS LISTED ON THE DRAWING ISSUE SHEET.
7. ALL DRAINAGE WORKS SHOULD COMMENCE AT THE PROPOSED DOWNSTREAM CONNECTION POINT, THE WORKS CONTINUING UPSTREAM FOLLOWING CONFIRMATION OF THE TIE-IN INVERT LEVELS TO THE ENGINEER. CONNECTIONS TO MANHOLES OR LARGER SIZED PIPES ETC. SHOULD BE SOFFIT TO SOFFIT UNLESS OTHERWISE INSTRUCTED BY THE ENGINEER, IF THIS IS NOT POSSIBLE INFORM THE ENGINEER IMMEDIATELY
8. COVER LEVELS SHOWN ARE APPROXIMATE. COVERS AND FRAMES SHALL BE SET TO FINISHED GROUND LEVELS AND FALLS.
9. ROAD GULLY PIPES ARE TO BE 150mm DIA. WITH CONCRETE SURROUND AND FLEXIBLE JOINTS, ALL OTHER UN-REFERENCED PIPES ARE ASSUMED TO BE 100mm DIA.
   - FW MIN GRADIENT - 1 IN 40 (100 DIA) NO WC'S CONNECTED
   - FW MIN GRADIENT - 1 IN 80 (100 DIA) MIN 1 WC CONNECTED
   - FW MIN GRADIENT - 1 IN 150 (150 DIA) MIN 5 WC'S CONNECTED
   - SW MIN GRADIENT - 1 IN 100 (100 DIA)
   - SW MIN GRADIENT - 1 IN 150 (150 DIA)
12. ALL GULLIES SHALL BE FITTED WITH GRADE D400 GRATINGS AND FRAMES TO BS EN124, UNLESS OTHERWISE STATED.
13. IN ORDER TO MAINTAIN THE SATISFACTORY FUNCTIONING OF SURFACE WATER SEWERS, ALL ROAD AND YARD GULLIES ARE TO BE "TRAPPED".
14. ALL NON ADOPTABLE LATERALS BENEATH THE HIGHWAY SHALL BE BACK FILLED WITH A TYPE 1 GRANULAR MATERIAL AS CL.803 (MCHW) APPROVED BY THE ENGINEER.
15. ALL PRIVATE DRAINAGE TO BE IN ACCORDANCE WITH THE BUILDING REGULATIONS APPROVED DOCUMENT PART-H, AND TO THE SATISFACTION OF THE BUILDING CONTROL INSPECTOR.
16. WHERE DRAINS PASS THROUGH FOUNDATIONS OR CONNECT TO MANHOLES, A FLEXIBLE PIPE JOINT SHOULD BE PROVIDED TO FORM A ROCKER PIPE IN ACCORDANCE WITH THE STANDARD DETAIL PROVIDED..
17. SHALLOW PRIVATE DRAINS MAY REQUIRE PROTECTION USING CLASS 'Z' CONCRETE SURROUND OR PAVING SLABS BRIDGING THE TRENCH SUBJECT TO THE NHBC INSPECTOR'S REQUIREMENTS.
18. WHERE DRAINAGE RUNS PASS CLOSE TO BUILDINGS OR THEIR INVERT LEVELS ARE BELOW FOUNDATION LEVEL, THEN THE TRENCHES ARE TO BE BACK FILLED IN ACCORDANCE WITH THE STANDARD DETAIL PROVIDED.
19. REFERENCE SHOULD BE MADE TO THE STRUCTURAL ENGINEERS DETAILS FOR ALL ASPECTS OF FOUNDATION DESIGN AND CONSTRUCTION.
20. THE CONTRACTOR IS TO KEEP A RECORD OF ANY VARIATIONS MADE ON SITE, INCLUDING THE RELOCATION OF SEWERS OR DRAINS, SO THAT AN AS CONSTRUCTED DRAWING CAN BE PREPARED UPON COMPLETION OF THE PROJECT.
21. THE CONTRACTOR SHOULD CHECK ALL DIMENSIONS ON SITE. NO DIMENSIONS ARE TO BE SCALED FROM THESE DRAWINGS.
22. IT IS THE CONTRACTORS/SUBCONTRACTORS RESPONSIBILITY TO ENSURE COMPLIANCE WITH THE CURRENT BUILDING REGULATIONS AND CODES OF PRACTICE.
23. STUB CONNECTIONS TO ADOPTABLE MANHOLES SHALL BE MADE FROM VITRIFIED CLAY AND CONSIST OF TWO ROCKER PIPES LAID AT THE SAME GRADIENT AS THE UP OR DOWNSTREAM PIPE.
24. ALL DOWNPIPES ARE TO BE SEALED, IE CONNECTED DIRECTLY TO THE STORMWATER DRAIN. ACCESS POINTS TO BE PROVIDED 1m ABOVE GROUND LEVEL FOR EXTERNAL RWP'S AND 1m ABOVE FFL FOR INTERNAL RWP'S.
25. UNLESS OTHERWISE NOTED OR SIMILAR APPROVED CHANNEL DRAINS TO BE ACO MULTI DRAIN WITH A15 GRATING IN PEDESTRIAN AREAS, C250 IN CAR PARKS AND D400 IN CARRIAGEWAYS. SLOTTED CHANNEL TO BE USED FOR AREAS WITH FALLS <1:15 MESH GRATING TO BE USED WHERE FALLS >1:15.
26. GULLY AND CHANNEL DRAIN POSITIONS ARE LIABLE TO AMENDMENT WHEN THE DESIGN LEVELS HAVE BEEN DETERMINED.
27. MODULAR GEOCELLULAR STORAGE/SOAKAWAY SYSTEM TO CONFORM TO CIRIA C793 THE SUDS MANUAL, C680 STRUCTURAL DESIGN OF MODULAR GEOCELLULAR DRAINAGE TANKS & C698 SITE HANDBOOK FOR THE CONSTRUCTION OF SUDS. THE MANUFACTURER SHOULD PROVIDE A COMPLETE SET OF INDEPENDENT TEST RESULTS FOR A PROPOSED SYSTEM INCLUDING, AS A MINIMUM, STRESS/STRAIN CURVES FOR VERTICAL AND LATERAL COMPRESSION, AND CREEP TESTS UNDER SUSTAINED LONG-TERM LOADS. A BBA CERTIFICATE IS NOT INDEPENDENT TEST DATA.
28. ALL REDUNDANT DRAINAGE TO BE ABANDONED ONCE THE CONTRACTOR HAS SATISFIED HIMSELF THAT NO CONNECTIONS REMAIN LIVE. REDUNDANT DRAINAGE TO BE GRUBBED OUT.
29. ALL BELOW GROUND CONCRETE TO ACCORD WITH BS5328:1997;SULPHATE CLASS TBA.
30. IF ANY SUB SOIL DRAINAGE SYSTEMS ARE UNCOVERED DURING THE WORKS CONTACT THE ENGINEER FOR INSTRUCTIONS. GENERALLY SUB SOIL DRAINS AFFECTED ARE TO BE DIVERTED AROUND NEW WORKS AND CONNECTED INTO THE SURFACE WATER DRAINAGE SYSTEM. PIPE DIAMETERS AND GRADIENTS ARE TO BE MAINTAINED.
31. BEFORE COMMENCING CONSTRUCTION THE CONTRACTOR MUST CHECK THE INVERT LEVELS OF EXISTING SEWERS TO WHICH CONNECTIONS ARE MADE. IN ADDITION THE CONTRACTOR MUST LOCATE AND DETERMINE INVERT LEVELS OF THE EXISTING SPURS TO WHICH CONNECTIONS ARE PROPOSED. ADDITIONAL SPUR/MANHOLE CONNECTIONS ARE TO BE AGREED WITH THE RELEVANT ADOPTING AUTHORITY. ANY DISCREPANCIES ARE TO BE NOTIFIED TO THE ENGINEER IMMEDIATELY, PRIOR TO CONSTRUCTION.
32. ROAD REINSTATEMENTS ARE TO BE TO THE HIGHWAY AUTHORITY APPROVAL.
33. NO PRIVATE AREAS ARE TO DRAIN ONTO ADOPTABLE AREAS AND VICE VERSA.

REV	DATE	BY	DESCRIPTION
P04	21/08/2026	SPB	UPDATED TO SUIT COMMENTS
P03	17/07/26	SPB	STAGE 3+ ISSUE
P02	15/04/26	BLT	REVISED TO ARCHITECTS AND LANDSCAPE UPDATES
P01	24/02/26	BLT	PRELIMINARY ISSUE

DRAWING STATUS: PRELIMINARY

marbas

CLIENT: READING BOROUGH COUNCIL

PROJECT: RIDGEWAY PRIMARY SCHOOL, READING, RG2 8JD

DRAWING TITLE: PHASE 1A & 1B PROPOSED BELOW GROUND DRAINAGE DESIGN SHEET 3 OF 5

DRAWING No.: 03770-C-0812

REV.: P04

SCALE	DATE	DRAWN	CHECKED	SHT.
1:200	23/12/25	BT	SB	A1

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INDICATIVE ONLY

DRAINAGE LEGEND

EXISTING FEATURES

- EXISTING SURFACE WATER SEWER AND MANHOLE TO BE RETAINED
- EXISTING SURFACE WATER DRAIN AND MANHOLE TO BE RETAINED
- ASSUMED EXISTING SURFACE WATER DRAIN
- DEFECTED EXISTING SURFACE WATER DRAIN
- EXISTING SURFACE WATER SOAKAWAY
- EXISTING FOUL WATER SEWER AND MANHOLE TO BE RETAINED
- EXISTING FOUL WATER DRAIN AND MANHOLE TO BE RETAINED
- ASSUMED EXISTING FOUL WATER DRAIN
- DEFECTED EXISTING FOUL WATER DRAIN
- EX FW RISING MAIN
- EXISTING UNKNOWN DRAIN/UTILITY AND MANHOLE WHICH REQUIRES FURTHER INVESTIGATION
- EXISTING FOUL/SURFACE/COMBINED WATER DRAIN AND MANHOLE TO BE ABANDONED. CONTRACTOR TO CONFIRM THAT NO LIVE CONNECTIONS REMAIN. PIPES TO BE FULLY REMOVED.

PROPOSED FEATURES

- SURFACE WATER DRAIN
- RG — ROAD GULLY (TRAPPED)
- STORM WATER MANHOLE TYPE D
  INTERNAL DIMENSIONS 450mm MINIMUM
  DEPTH FROM COVER TO SOFFIT OF PIPE UP TO 3m
  RESTRICT ACCESS TO Ø350 IF DEPTH FROM COVER TO SOFFIT OF PIPE IS MORE THAN 1.2m
  (MAX PIPE DIAMETER 150mm 450Ø/475Ø)
  (MAX PIPE DIAMETER 225mm 600Ø)
- SUMP DRAINAGE CHANNEL — CHANNEL DRAIN SYSTEM WITH SUMP UNIT
- FOUL WATER DRAIN
- FOUL WATER RISING MAIN
- FW — ABOVE GROUND FOUL WATER CONNECTION - REFER TO PUBLIC HEALTH ENGINEERS/ARCHITECTS DRAWINGS FOR DETAILS
- TG — TRAPPED GULLY
- FOUL WATER MANHOLE TYPE D
  INTERNAL DIMENSIONS 450mm MINIMUM
  DEPTH FROM COVER TO SOFFIT OF PIPE UP TO 3m
  RESTRICT ACCESS TO Ø350 IF DEPTH FROM COVER SOFFIT OF PIPE IS MORE THAN 1.2m
  (MAX PIPE DIAMETER 150mm)
- FOUL WATER PUMP CHAMBER
- FW MH 01.00 / CL 00.00 / IL 00.00 / TYPE C MH / D400 — MANHOLE REFERENCE: COVER LEVEL, INVERT LEVEL, MH TYPE, COVER GRADE
- FFL: XX.XXX — ARCHITECTURAL FINISHED FLOOR LEVEL
- COMPULSORY — A COMPULSORY ACTION
- CONSTRUCTION WARNING — SPECIAL ATTENTION BY THE CONTRACTOR

EXTERNAL FINISHES LEGEND

- RUBBER CRUMB (POROUS WITH OPEN GRADED CRUSHED ROCK) SUB-BASE DEPTH TBC 400mm MINIMUM
- PORUS ASPHALT SUB-BASE TBC 400mm MINIMUM
- RESIN BOND SURFACE (POROUS WITH OPEN GRADED CRUSHED ROCK) SUB-BASE DEPTH TBC 400mm MINIMUM
- ARTIFICIAL GRASS (POROUS WITH OPEN GRADED CRUSHED ROCK) SUB-BASE DEPTH TBC 400mm MINIMUM
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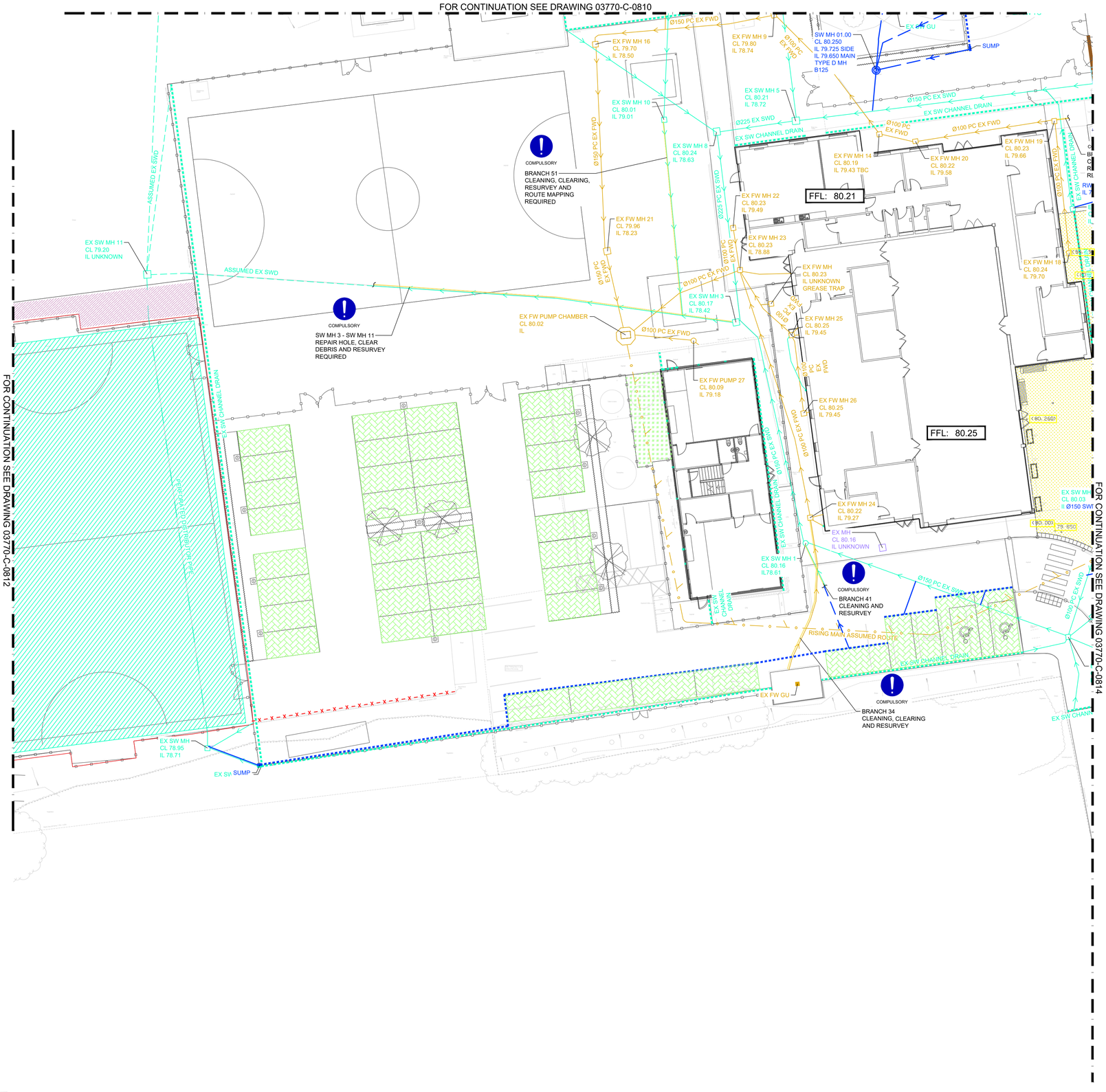
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- PHASE 1A CONSTRUCTION AREA
- PHASE 1B CONSTRUCTION AREA
- PHASE 1C CONSTRUCTION AREA

CONSTRUCTION WARNING

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27. MODULAR GEOCELLULAR STORAGE/SOAKAWAY SYSTEM TO CONFORM TO CIRIA C793 THE SUDS MANUAL, C680 STRUCTURAL DESIGN OF MODULAR GEOCELLULAR DRAINAGE TANKS & C698 SITE HANDBOOK FOR THE CONSTRUCTION OF SUDS. THE MANUFACTURER SHOULD PROVIDE A COMPLETE SET OF INDEPENDENT TEST RESULTS FOR A PROPOSED SYSTEM INCLUDING, AS A MINIMUM, STRESS/STRAIN CURVES FOR VERTICAL AND LATERAL COMPRESSION, AND CREEP TESTS UNDER SUSTAINED LONG-TERM LOADS. A BBA CERTIFICATE IS NOT INDEPENDENT TEST DATA.
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29. ALL BELOW GROUND CONCRETE TO ACCORD WITH BS5328:1997;SULPHATE CLASS TBA.
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32. ROAD REINSTATEMENTS ARE TO BE TO THE HIGHWAY AUTHORITY APPROVAL.
33. NO PRIVATE AREAS ARE TO DRAIN ONTO ADOPTABLE AREAS AND VICE VERSA.

REV	DATE	BY	DESCRIPTION
P04	21/08/26	SPB	UPDATED TO SUIT COMMENTS
P03	17/07/26	SPB	STAGE 3+ ISSUE
P02	15/04/26	BLT	REVISED TO ARCHITECTS AND LANDSCAPE UPDATES
P01	24/02/26	BLT	PRELIMINARY ISSUE

DRAWING STATUS: PRELIMINARY

marbas

CLIENT: READING BOROUGH COUNCIL

PROJECT: RIDGEWAY PRIMARY SCHOOL, READING, RG2 8JD

DRAWING TITLE: PHASE 1A & 1B PROPOSED BELOW GROUND DRAINAGE DESIGN SHEET 4 OF 5

DRAWING No.	REV.
03770-C-0813	P03

SCALE	DATE	DRAWN	CHECKED	SHT.
1:200	23/12/25	BT	SB	A1

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DRAINAGE LEGEND

EXISTING FEATURES

- EXISTING SURFACE WATER SEWER AND MANHOLE TO BE RETAINED
- EXISTING SURFACE WATER DRAIN AND MANHOLE TO BE RETAINED
- ASSUMED EXISTING SURFACE WATER DRAIN
- DEFECTED EXISTING SURFACE WATER DRAIN
- EXISTING SURFACE WATER SOAKAWAY
- EXISTING FOUL WATER SEWER AND MANHOLE TO BE RETAINED
- EXISTING FOUL WATER DRAIN AND MANHOLE TO BE RETAINED
- ASSUMED EXISTING FOUL WATER DRAIN
- DEFECTED EXISTING FOUL WATER DRAIN
- EX FW RISING MAIN
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PROPOSED FEATURES

- SURFACE WATER DRAIN
- RG — ROAD GULLY (TRAPPED)
- STORM WATER MANHOLE TYPE D
  INTERNAL DIMENSIONS 450mm MINIMUM
  DEPTH FROM COVER TO SOFFIT OF PIPE UP TO 3m
  RESTRICT ACCESS TO Ø350 IF DEPTH FROM COVER TO SOFFIT OF PIPE IS MORE THAN 1.2m
  (MAX PIPE DIAMETER 150mm 450Ø/475Ø)
  (MAX PIPE DIAMETER 225mm 600Ø)
- SUMP / DRAINAGE CHANNEL — CHANNEL DRAIN SYSTEM WITH SUMP UNIT
- FOUL WATER DRAIN
- FOUL WATER RISING MAIN
- FW • — ABOVE GROUND FOUL WATER CONNECTION - REFER TO PUBLIC HEALTH ENGINEERS/ARCHITECTS DRAWINGS FOR DETAILS
- TG ■ — TRAPPED GULLY
- FOUL WATER MANHOLE TYPE D
  INTERNAL DIMENSIONS 450mm MINIMUM
  DEPTH FROM COVER TO SOFFIT OF PIPE UP TO 3m
  RESTRICT ACCESS TO Ø350 IF DEPTH FROM COVER SOFFIT OF PIPE IS MORE THAN 1.2m
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- FOUL WATER PUMP CHAMBER
- FW MH 01.00 / CL 00.00 / IL 00.00 / TYPE C MH / D400 — MANHOLE REFERENCE: COVER LEVEL, INVERT LEVEL, MH TYPE, COVER GRADE
- FFL: XX.XXX — ARCHITECTURAL FINISHED FLOOR LEVEL
- COMPULSORY — A COMPULSORY ACTION
- CONSTRUCTION WARNING — SPECIAL ATTENTION BY THE CONTRACTOR

EXTERNAL FINISHES LEGEND

- RUBBER CRUMB (POROUS WITH OPEN GRADED CRUSHED ROCK) SUB-BASE DEPTH TBC 400mm MINIMUM
- POROUS ASPHALT SUB-BASE TBC 400mm MINIMUM
- RESIN BOND SURFACE (POROUS WITH OPEN GRADED CRUSHED ROCK) SUB-BASE DEPTH TBC 400mm MINIMUM
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PHASES LEGEND

- PHASE 1A CONSTRUCTION AREA
- PHASE 1B CONSTRUCTION AREA
- PHASE 1C CONSTRUCTION AREA

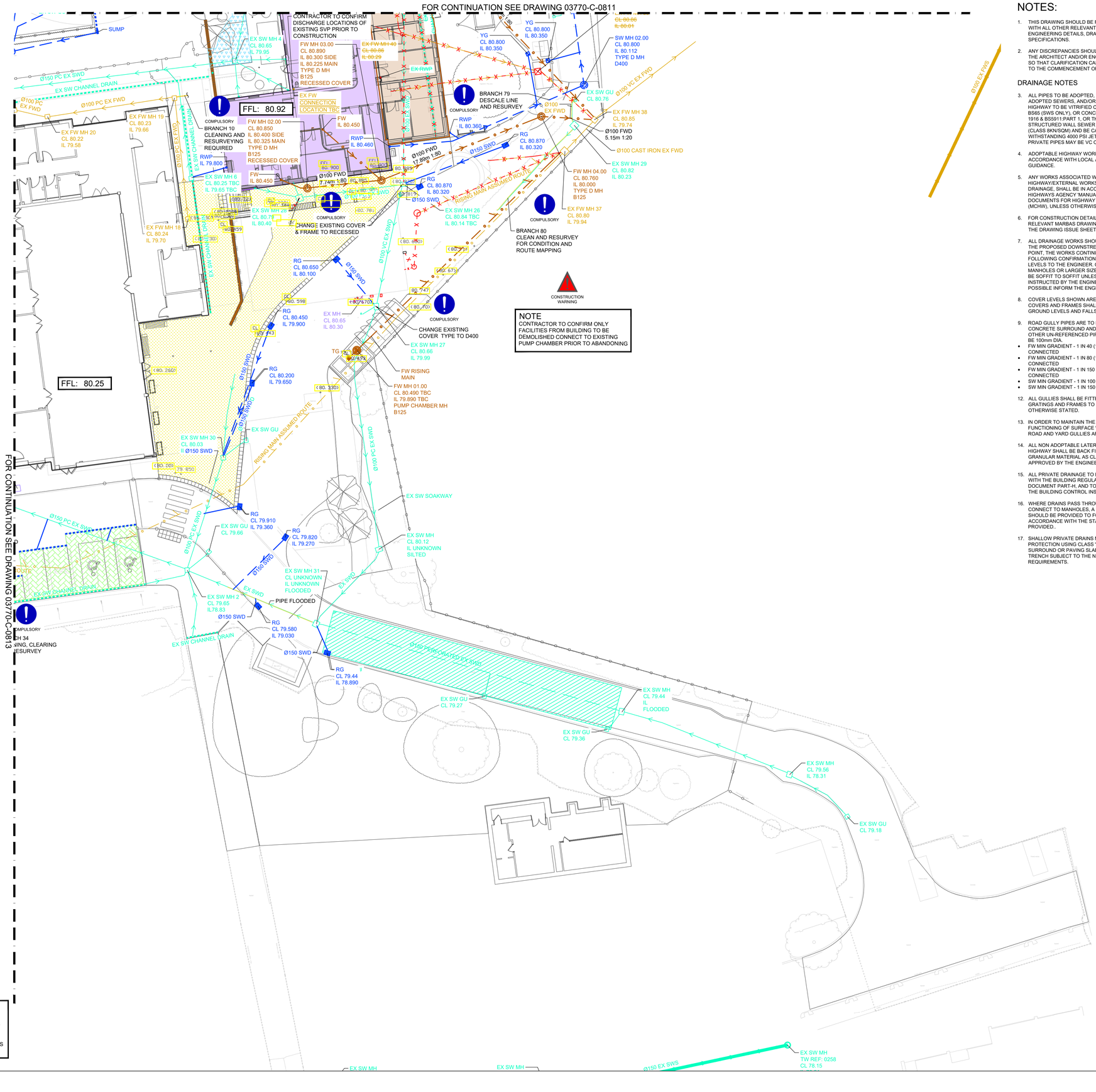
IMPORTANT NOTE: CAUTION

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FOR CONTINUATION SEE DRAWING 03770-C-0811

FOR CONTINUATION SEE DRAWING 03770-C-0813



NOTES:

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7. ALL DRAINAGE WORKS SHOULD COMMENCE AT THE PROPOSED DOWNSTREAM CONNECTION POINT, THE WORKS CONTINUING UPSTREAM FOLLOWING CONFIRMATION OF THE TIE-IN INVERT LEVELS TO THE ENGINEER. CONNECTIONS TO MANHOLES OR LARGER SIZED PIPES ETC. SHOULD BE SOFFIT TO SOFFIT UNLESS OTHERWISE INSTRUCTED BY THE ENGINEER, IF THIS IS NOT POSSIBLE INFORM THE ENGINEER IMMEDIATELY
8. COVER LEVELS SHOWN ARE APPROXIMATE. COVERS AND FRAMES SHALL BE SET TO FINISHED GROUND LEVELS AND FALLS.
9. ROAD GULLY PIPES ARE TO BE 150mm DIA. WITH CONCRETE SURROUND AND FLEXIBLE JOINTS. ALL OTHER UN-REFERENCED PIPES ARE ASSUMED TO BE 100mm DIA.
   - FW MIN GRADIENT - 1 IN 40 (100 DIA) NO WC'S CONNECTED
   - FW MIN GRADIENT - 1 IN 80 (100 DIA) MIN 1 WC CONNECTED
   - FW MIN GRADIENT - 1 IN 150 (150 DIA) MIN 5 WC'S CONNECTED
   - SW MIN GRADIENT - 1 IN 100 (100 DIA)
   - SW MIN GRADIENT - 1 IN 150 (150 DIA)
12. ALL GULLIES SHALL BE FITTED WITH GRADE D400 GRATINGS AND FRAMES TO BS EN124, UNLESS OTHERWISE STATED.
13. IN ORDER TO MAINTAIN THE SATISFACTORY FUNCTIONING OF SURFACE WATER SEWERS, ALL ROAD AND YARD GULLIES ARE TO BE "TRAPPED".
14. ALL NON ADOPTABLE LATERALS BENEATH THE HIGHWAY SHALL BE BACK FILLED WITH A TYPE 1 GRANULAR MATERIAL AS CL 803 (MCHW) APPROVED BY THE ENGINEER.
15. ALL PRIVATE DRAINAGE TO BE IN ACCORDANCE WITH THE BUILDING REGULATIONS APPROVED DOCUMENT PART-H, AND TO THE SATISFACTION OF THE BUILDING CONTROL INSPECTOR.
16. WHERE DRAINS PASS THROUGH FOUNDATIONS OR CONNECT TO MANHOLES, A FLEXIBLE PIPE JOINT SHOULD BE PROVIDED TO FORM A ROCKER PIPE IN ACCORDANCE WITH THE STANDARD DETAIL PROVIDED..
17. SHALLOW PRIVATE DRAINS MAY REQUIRE PROTECTION USING CLASS 'Z' CONCRETE SURROUND OR PAVING SLABS BRIDGING THE TRENCH SUBJECT TO THE NHBC INSPECTOR'S REQUIREMENTS.
18. WHERE DRAINAGE RUNS PASS CLOSE TO BUILDINGS OR THEIR INVERT LEVELS ARE BELOW FOUNDATION LEVEL, THEN THE TRENCHES ARE TO BE BACK FILLED IN ACCORDANCE WITH THE STANDARD DETAIL PROVIDED.
19. REFERENCE SHOULD BE MADE TO THE STRUCTURAL ENGINEERS DETAILS FOR ALL ASPECTS OF FOUNDATION DESIGN AND CONSTRUCTION.
20. THE CONTRACTOR IS TO KEEP A RECORD OF ANY VARIATIONS MADE ON SITE, INCLUDING THE RELOCATION OF SEWERS OR DRAINS, SO THAT AN AS CONSTRUCTED DRAWING CAN BE PREPARED UPON COMPLETION OF THE PROJECT.
21. THE CONTRACTOR SHOULD CHECK ALL DIMENSIONS ON SITE. NO DIMENSIONS ARE TO BE SCALED FROM THESE DRAWINGS.
22. IT IS THE CONTRACTORS/SUBCONTRACTORS RESPONSIBILITY TO ENSURE COMPLIANCE WITH THE CURRENT BUILDING REGULATIONS AND CODES OF PRACTICE.
23. STUB CONNECTIONS TO ADOPTABLE MANHOLES SHALL BE MADE FROM VITRIFIED CLAY AND CONSIST OF TWO ROCKER PIPES LAID AT THE SAME GRADIENT AS THE UP OR DOWNSTREAM PIPE.
24. ALL DOWNPIPES ARE TO BE SEALED, IE CONNECTED DIRECTLY TO THE STORMWATER DRAIN. ACCESS POINTS TO BE PROVIDED 1m ABOVE GROUND LEVEL FOR EXTERNAL RWP'S AND 1m ABOVE FFL FOR INTERNAL RWP'S.
25. UNLESS OTHERWISE NOTED OR SIMILAR APPROVED CHANNEL DRAINS TO BE ACO MULTI DRAIN WITH A15 GRATING IN PEDESTRIAN AREAS, C250 IN CAR PARKS AND D400 IN CARRIAGEWAYS. SLOTTED CHANNEL TO BE USED FOR AREAS WITH FALLS <1:15 MESH GRATING TO BE USED WHERE FALLS >1:15.
26. GULLY AND CHANNEL DRAIN POSITIONS ARE LIABLE TO AMENDMENT WHEN THE DESIGN LEVELS HAVE BEEN DETERMINED.
27. MODULAR GEOCELLULAR STORAGE/SOAKAWAY SYSTEM TO CONFORM TO CIRIA C753 THE SUDS MANUAL, C680 STRUCTURAL DESIGN OF MODULAR GEOCELLULAR DRAINAGE TANKS & C698 SITE HANDBOOK FOR THE CONSTRUCTION OF SUDS. THE MANUFACTURER SHOULD PROVIDE A COMPLETE SET OF INDEPENDENT TEST RESULTS FOR A PROPOSED SYSTEM INCLUDING, AS A MINIMUM, STRESS/STRAIN CURVES FOR VERTICAL AND LATERAL COMPRESSION, AND CREEP TESTS UNDER SUSTAINED LONG-TERM LOADS. A BBA CERTIFICATE IS NOT INDEPENDENT TEST DATA.
28. ALL REDUNDANT DRAINAGE TO BE ABANDONED ONCE THE CONTRACTOR HAS SATISFIED HIMSELF THAT NO CONNECTIONS REMAIN LIVE. REDUNDANT DRAINAGE TO BE GRUBBED OUT.
29. ALL BELOW GROUND CONCRETE TO ACCORD WITH BS5328:1997;SULPHATE CLASS TBA.
30. IF ANY SUB SOIL DRAINAGE SYSTEMS ARE UNCOVERED DURING THE WORKS CONTACT THE ENGINEER FOR INSTRUCTIONS. GENERALLY SUB SOIL DRAINS AFFECTED ARE TO BE DIVERTED AROUND NEW WORKS AND CONNECTED INTO THE SURFACE WATER DRAINAGE SYSTEM. PIPE DIAMETERS AND GRADIENTS ARE TO BE MAINTAINED.
31. BEFORE COMMENCING CONSTRUCTION THE CONTRACTOR MUST CHECK THE INVERT LEVELS OF EXISTING SEWERS TO WHICH CONNECTIONS ARE MADE. IN ADDITION THE CONTRACTOR MUST LOCATE AND DETERMINE INVERT LEVELS OF THE EXISTING SPURS TO WHICH CONNECTIONS ARE PROPOSED. ADDITIONAL SPUR/MANHOLE CONNECTIONS ARE TO BE AGREED WITH THE RELEVANT ADOPTING AUTHORITY. ANY DISCREPANCIES ARE TO BE NOTIFIED TO THE ENGINEER IMMEDIATELY, PRIOR TO CONSTRUCTION.
32. ROAD REINSTATEMENTS ARE TO BE TO THE HIGHWAY AUTHORITY APPROVAL.
33. NO PRIVATE AREAS ARE TO DRAIN ONTO ADOPTABLE AREAS AND VICE VERSA.

REV	DATE	BY	DESCRIPTION
P04	21/08/26	SPB	UPDATED TO SUIT COMMENTS
P03	17/07/26	SPB	STAGE 3+ ISSUE
P02	15/04/26	BLT	REVISED TO ARCHITECTS AND LANDSCAPE UPDATES
P01	24/02/26	BLT	PRELIMINARY ISSUE

DRAWING STATUS: PRELIMINARY

marbas

CLIENT: READING BOROUGH COUNCIL

PROJECT: RIDGEWAY PRIMARY SCHOOL, READING, RG2 8JD

DRAWING TITLE: PHASE 1A & 1B PROPOSED BELOW GROUND DRAINAGE DESIGN SHEET 5 OF 5

DRAWING No.	REV.
03770-C-0814	P04

SCALE	DATE	DRAWN	CHECKED	SHT.
1:200	23/12/25	BT	SB	A1

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Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	2	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	0.750	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	x
Maximum Rainfall (mm/hr)	50.0		

Nodes

Name	Area (ha)	Cover Level (m)	Easting (m)	Northing (m)	Depth (m)
Car Park Subbase	0.106	79.500	472925.550	170359.960	0.580
West Play Area	0.032	79.406	472936.750	170426.690	0.586

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Starting Level (m)	
Rainfall Events	Singular	Skip Steady State	x	Check Discharge Rate(s)	x
Summer CV	0.750	Drain Down Time (mins)	240	Check Discharge Volume	x
Winter CV	0.840	Additional Storage (m³/ha)	20.0		

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	0	0	0
100	45	0	0

Node Car Park Subbase Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00360	Invert Level (m)	78.920	Slope (1:X)	60.0
Side Inf Coefficient (m/hr)	0.00360	Time to half empty (mins)	1459	Depth (m)	0.730
Safety Factor	2.0	Width (m)	32.000	Inf Depth (m)	0.600
Porosity	0.32	Length (m)	20.200		

Node West Play Area Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00360	Invert Level (m)	78.820	Slope (1:X)	55.0
Side Inf Coefficient (m/hr)	0.00360	Time to half empty (mins)	1437	Depth (m)	0.730
Safety Factor	2.0	Width (m)	9.000	Inf Depth (m)	0.600
Porosity	0.32	Length (m)	31.300		

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Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
1 year 15 minute summer	57.958	16.400
1 year 15 minute winter	40.672	16.400
1 year 30 minute summer	37.233	10.536
1 year 30 minute winter	26.128	10.536
1 year 60 minute summer	24.596	6.500
1 year 60 minute winter	16.341	6.500
1 year 120 minute summer	19.727	5.213
1 year 120 minute winter	13.106	5.213
1 year 180 minute summer	16.708	4.300
1 year 180 minute winter	10.861	4.300
1 year 240 minute summer	13.876	3.667
1 year 240 minute winter	9.219	3.667
1 year 360 minute summer	11.054	2.845
1 year 360 minute winter	7.186	2.845
1 year 480 minute summer	8.847	2.338
1 year 480 minute winter	5.877	2.338
1 year 600 minute summer	7.295	1.995
1 year 600 minute winter	4.984	1.995
1 year 720 minute summer	6.520	1.747
1 year 720 minute winter	4.382	1.747
1 year 960 minute summer	5.355	1.410
1 year 960 minute winter	3.547	1.410
1 year 1440 minute summer	3.902	1.046
1 year 1440 minute winter	2.622	1.046
1 year 2160 minute summer	2.828	0.781
1 year 2160 minute winter	1.948	0.781
1 year 2880 minute summer	2.390	0.641
1 year 2880 minute winter	1.607	0.641
1 year 4320 minute summer	1.891	0.494
1 year 4320 minute winter	1.245	0.494
1 year 5760 minute summer	1.631	0.418
1 year 5760 minute winter	1.056	0.418
1 year 7200 minute summer	1.450	0.370
1 year 7200 minute winter	0.936	0.370
1 year 8640 minute summer	1.323	0.338
1 year 8640 minute winter	0.854	0.338
1 year 10080 minute summer	1.231	0.314
1 year 10080 minute winter	0.795	0.314
30 year 15 minute summer	307.852	87.112
30 year 15 minute winter	216.037	87.112
30 year 30 minute summer	200.843	56.832
30 year 30 minute winter	140.942	56.832
30 year 60 minute summer	133.740	35.343
30 year 60 minute winter	88.853	35.343
30 year 120 minute summer	80.873	21.372
30 year 120 minute winter	53.730	21.372
30 year 180 minute summer	61.027	15.704
30 year 180 minute winter	39.669	15.704
30 year 240 minute summer	47.439	12.537
30 year 240 minute winter	31.517	12.537
30 year 360 minute summer	35.105	9.034
30 year 360 minute winter	22.819	9.034

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Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
30 year 480 minute summer	26.903	7.110
30 year 480 minute winter	17.874	7.110
30 year 600 minute summer	21.529	5.889
30 year 600 minute winter	14.710	5.889
30 year 720 minute summer	18.811	5.041
30 year 720 minute winter	12.642	5.041
30 year 960 minute summer	14.956	3.938
30 year 960 minute winter	9.907	3.938
30 year 1440 minute summer	10.399	2.787
30 year 1440 minute winter	6.988	2.787
30 year 2160 minute summer	7.172	1.982
30 year 2160 minute winter	4.941	1.982
30 year 2880 minute summer	5.838	1.565
30 year 2880 minute winter	3.923	1.565
30 year 4320 minute summer	4.344	1.136
30 year 4320 minute winter	2.861	1.136
30 year 5760 minute summer	3.573	0.915
30 year 5760 minute winter	2.313	0.915
30 year 7200 minute summer	3.055	0.779
30 year 7200 minute winter	1.972	0.779
30 year 8640 minute summer	2.697	0.688
30 year 8640 minute winter	1.741	0.688
30 year 10080 minute summer	2.438	0.622
30 year 10080 minute winter	1.573	0.622
100 year 15 minute summer	398.961	112.892
100 year 15 minute winter	279.973	112.892
100 year 30 minute summer	262.134	74.175
100 year 30 minute winter	183.954	74.175
100 year 60 minute summer	176.287	46.587
100 year 60 minute winter	117.121	46.587
100 year 120 minute summer	103.926	27.465
100 year 120 minute winter	69.046	27.465
100 year 180 minute summer	77.632	19.977
100 year 180 minute winter	50.463	19.977
100 year 240 minute summer	59.999	15.856
100 year 240 minute winter	39.862	15.856
100 year 360 minute summer	44.095	11.347
100 year 360 minute winter	28.663	11.347
100 year 480 minute summer	33.685	8.902
100 year 480 minute winter	22.380	8.902
100 year 600 minute summer	26.896	7.357
100 year 600 minute winter	18.377	7.357
100 year 720 minute summer	23.457	6.287
100 year 720 minute winter	15.764	6.287
100 year 960 minute summer	18.584	4.894
100 year 960 minute winter	12.310	4.894
100 year 1440 minute summer	12.839	3.441
100 year 1440 minute winter	8.628	3.441
100 year 2160 minute summer	8.775	2.425
100 year 2160 minute winter	6.046	2.425
100 year 2880 minute summer	7.087	1.899
100 year 2880 minute winter	4.763	1.899

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Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
100 year 4320 minute summer	5.202	1.360
100 year 4320 minute winter	3.426	1.360
100 year 5760 minute summer	4.231	1.083
100 year 5760 minute winter	2.738	1.083
100 year 7200 minute summer	3.585	0.915
100 year 7200 minute winter	2.314	0.915
100 year 8640 minute summer	3.140	0.801
100 year 8640 minute winter	2.027	0.801
100 year 10080 minute summer	2.820	0.719
100 year 10080 minute winter	1.820	0.719
100 year +45% CC 15 minute summer	578.494	163.694
100 year +45% CC 15 minute winter	405.961	163.694
100 year +45% CC 30 minute summer	380.094	107.553
100 year +45% CC 30 minute winter	266.733	107.553
100 year +45% CC 60 minute summer	255.616	67.552
100 year +45% CC 60 minute winter	169.825	67.552
100 year +45% CC 120 minute summer	150.693	39.824
100 year +45% CC 120 minute winter	100.117	39.824
100 year +45% CC 180 minute summer	112.567	28.967
100 year +45% CC 180 minute winter	73.172	28.967
100 year +45% CC 240 minute summer	86.998	22.991
100 year +45% CC 240 minute winter	57.800	22.991
100 year +45% CC 360 minute summer	63.937	16.453
100 year +45% CC 360 minute winter	41.561	16.453
100 year +45% CC 480 minute summer	48.844	12.908
100 year +45% CC 480 minute winter	32.451	12.908
100 year +45% CC 600 minute summer	38.999	10.667
100 year +45% CC 600 minute winter	26.647	10.667
100 year +45% CC 720 minute summer	34.012	9.116
100 year +45% CC 720 minute winter	22.858	9.116
100 year +45% CC 960 minute summer	26.946	7.096
100 year +45% CC 960 minute winter	17.850	7.096
100 year +45% CC 1440 minute summer	18.616	4.989
100 year +45% CC 1440 minute winter	12.511	4.989
100 year +45% CC 2160 minute summer	12.724	3.516
100 year +45% CC 2160 minute winter	8.767	3.516
100 year +45% CC 2880 minute summer	10.277	2.754
100 year +45% CC 2880 minute winter	6.907	2.754
100 year +45% CC 4320 minute summer	7.543	1.972
100 year +45% CC 4320 minute winter	4.968	1.972
100 year +45% CC 5760 minute summer	6.134	1.570
100 year +45% CC 5760 minute winter	3.970	1.570
100 year +45% CC 7200 minute summer	5.199	1.326
100 year +45% CC 7200 minute winter	3.355	1.326
100 year +45% CC 8640 minute summer	4.553	1.162
100 year +45% CC 8640 minute winter	2.939	1.162
100 year +45% CC 10080 minute summer	4.089	1.043
100 year +45% CC 10080 minute winter	2.639	1.043

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Results for 1 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
960 minute winter	Car Park Subbase	720	79.124	0.204	0.9	13.5174	0.0000	OK
5760 minute winter	West Play Area	3600	79.056	0.236	0.1	4.6729	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)
960 minute winter	Car Park Subbase	Infiltration	0.2
5760 minute winter	West Play Area	Infiltration	0.1

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Results for 30 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
480 minute winter	Car Park Subbase	472	79.296	0.376	4.4	44.2715	0.0000	OK
720 minute winter	West Play Area	690	79.230	0.410	0.9	13.8112	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)
480 minute winter	Car Park Subbase	Infiltration	0.3
720 minute winter	West Play Area	Infiltration	0.1

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Results for 100 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
480 minute winter	Car Park Subbase	480	79.356	0.436	5.5	56.9729	0.0000	OK
600 minute winter	West Play Area	600	79.278	0.458	1.4	17.1402	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)
480 minute winter	Car Park Subbase	Infiltration	0.3
600 minute winter	West Play Area	Infiltration	0.1

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Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
720 minute winter	Car Park Subbase	720	79.496	0.576	5.7	86.4193	0.0000	OK
600 minute winter	West Play Area	600	79.382	0.562	2.0	25.6988	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)
720 minute winter	Car Park Subbase	Infiltration	0.3
600 minute winter	West Play Area	Infiltration	0.2

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Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	2	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	0.750	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	x
Maximum Rainfall (mm/hr)	50.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
SW TANK 01.00	0.032	5.00	80.780		473027.370	170440.550	1.235
SW MH 01.00			80.750	1200	473026.390	170448.440	1.285

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	SW TANK 01.00	SW MH 01.00	7.951	0.600	79.545	79.465	0.080	100.0	150	5.13	49.9

Name	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	1.005	17.8	4.3	1.085	1.135	0.032	0.0	50	0.828

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Starting Level (m)	
Rainfall Events	Singular	Skip Steady State	x	Check Discharge Rate(s)	x
Summer CV	0.750	Drain Down Time (mins)	240	Check Discharge Volume	x
Winter CV	0.840	Additional Storage (m³/ha)	20.0		

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	0	0	0
100	45	0	0

Node SW MH 01.00 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	79.465	Product Number	CTL-SHE-0083-2500-0480-2500
Design Depth (m)	0.480	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	2.5	Min Node Diameter (mm)	1200

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Node SW TANK 01.00 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00360	Safety Factor	2.0	Invert Level (m)	79.545
Side Inf Coefficient (m/hr)	0.00360	Porosity	0.95	Time to half empty (mins)	49

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	28.0	0.0	0.400	28.0	0.0	0.401	0.0	0.0

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
1 year 15 minute summer	57.958	16.400
1 year 15 minute winter	40.672	16.400
1 year 30 minute summer	37.233	10.536
1 year 30 minute winter	26.128	10.536
1 year 60 minute summer	24.596	6.500
1 year 60 minute winter	16.341	6.500
1 year 120 minute summer	19.727	5.213
1 year 120 minute winter	13.106	5.213
1 year 180 minute summer	16.708	4.300
1 year 180 minute winter	10.861	4.300
1 year 240 minute summer	13.876	3.667
1 year 240 minute winter	9.219	3.667
1 year 360 minute summer	11.054	2.845
1 year 360 minute winter	7.186	2.845
1 year 480 minute summer	8.847	2.338
1 year 480 minute winter	5.877	2.338
1 year 600 minute summer	7.295	1.995
1 year 600 minute winter	4.984	1.995
1 year 720 minute summer	6.520	1.747
1 year 720 minute winter	4.382	1.747
1 year 960 minute summer	5.355	1.410
1 year 960 minute winter	3.547	1.410
1 year 1440 minute summer	3.902	1.046
1 year 1440 minute winter	2.622	1.046
1 year 2160 minute summer	2.828	0.781
1 year 2160 minute winter	1.948	0.781
1 year 2880 minute summer	2.390	0.641
1 year 2880 minute winter	1.607	0.641
1 year 4320 minute summer	1.891	0.494
1 year 4320 minute winter	1.245	0.494
1 year 5760 minute summer	1.631	0.418
1 year 5760 minute winter	1.056	0.418
1 year 7200 minute summer	1.450	0.370
1 year 7200 minute winter	0.936	0.370
1 year 8640 minute summer	1.323	0.338
1 year 8640 minute winter	0.854	0.338
1 year 10080 minute summer	1.231	0.314
1 year 10080 minute winter	0.795	0.314
30 year 15 minute summer	307.852	87.112
30 year 15 minute winter	216.037	87.112
30 year 30 minute summer	200.843	56.832
30 year 30 minute winter	140.942	56.832
30 year 60 minute summer	133.740	35.343

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Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
30 year 60 minute winter	88.853	35.343
30 year 120 minute summer	80.873	21.372
30 year 120 minute winter	53.730	21.372
30 year 180 minute summer	61.027	15.704
30 year 180 minute winter	39.669	15.704
30 year 240 minute summer	47.439	12.537
30 year 240 minute winter	31.517	12.537
30 year 360 minute summer	35.105	9.034
30 year 360 minute winter	22.819	9.034
30 year 480 minute summer	26.903	7.110
30 year 480 minute winter	17.874	7.110
30 year 600 minute summer	21.529	5.889
30 year 600 minute winter	14.710	5.889
30 year 720 minute summer	18.811	5.041
30 year 720 minute winter	12.642	5.041
30 year 960 minute summer	14.956	3.938
30 year 960 minute winter	9.907	3.938
30 year 1440 minute summer	10.399	2.787
30 year 1440 minute winter	6.988	2.787
30 year 2160 minute summer	7.172	1.982
30 year 2160 minute winter	4.941	1.982
30 year 2880 minute summer	5.838	1.565
30 year 2880 minute winter	3.923	1.565
30 year 4320 minute summer	4.344	1.136
30 year 4320 minute winter	2.861	1.136
30 year 5760 minute summer	3.573	0.915
30 year 5760 minute winter	2.313	0.915
30 year 7200 minute summer	3.055	0.779
30 year 7200 minute winter	1.972	0.779
30 year 8640 minute summer	2.697	0.688
30 year 8640 minute winter	1.741	0.688
30 year 10080 minute summer	2.438	0.622
30 year 10080 minute winter	1.573	0.622
100 year 15 minute summer	398.961	112.892
100 year 15 minute winter	279.973	112.892
100 year 30 minute summer	262.134	74.175
100 year 30 minute winter	183.954	74.175
100 year 60 minute summer	176.287	46.587
100 year 60 minute winter	117.121	46.587
100 year 120 minute summer	103.926	27.465
100 year 120 minute winter	69.046	27.465
100 year 180 minute summer	77.632	19.977
100 year 180 minute winter	50.463	19.977
100 year 240 minute summer	59.999	15.856
100 year 240 minute winter	39.862	15.856
100 year 360 minute summer	44.095	11.347
100 year 360 minute winter	28.663	11.347
100 year 480 minute summer	33.685	8.902
100 year 480 minute winter	22.380	8.902
100 year 600 minute summer	26.896	7.357
100 year 600 minute winter	18.377	7.357
100 year 720 minute summer	23.457	6.287

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Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
100 year 720 minute winter	15.764	6.287
100 year 960 minute summer	18.584	4.894
100 year 960 minute winter	12.310	4.894
100 year 1440 minute summer	12.839	3.441
100 year 1440 minute winter	8.628	3.441
100 year 2160 minute summer	8.775	2.425
100 year 2160 minute winter	6.046	2.425
100 year 2880 minute summer	7.087	1.899
100 year 2880 minute winter	4.763	1.899
100 year 4320 minute summer	5.202	1.360
100 year 4320 minute winter	3.426	1.360
100 year 5760 minute summer	4.231	1.083
100 year 5760 minute winter	2.738	1.083
100 year 7200 minute summer	3.585	0.915
100 year 7200 minute winter	2.314	0.915
100 year 8640 minute summer	3.140	0.801
100 year 8640 minute winter	2.027	0.801
100 year 10080 minute summer	2.820	0.719
100 year 10080 minute winter	1.820	0.719
100 year +45% CC 15 minute summer	578.494	163.694
100 year +45% CC 15 minute winter	405.961	163.694
100 year +45% CC 30 minute summer	380.094	107.553
100 year +45% CC 30 minute winter	266.733	107.553
100 year +45% CC 60 minute summer	255.616	67.552
100 year +45% CC 60 minute winter	169.825	67.552
100 year +45% CC 120 minute summer	150.693	39.824
100 year +45% CC 120 minute winter	100.117	39.824
100 year +45% CC 180 minute summer	112.567	28.967
100 year +45% CC 180 minute winter	73.172	28.967
100 year +45% CC 240 minute summer	86.998	22.991
100 year +45% CC 240 minute winter	57.800	22.991
100 year +45% CC 360 minute summer	63.937	16.453
100 year +45% CC 360 minute winter	41.561	16.453
100 year +45% CC 480 minute summer	48.844	12.908
100 year +45% CC 480 minute winter	32.451	12.908
100 year +45% CC 600 minute summer	38.999	10.667
100 year +45% CC 600 minute winter	26.647	10.667
100 year +45% CC 720 minute summer	34.012	9.116
100 year +45% CC 720 minute winter	22.858	9.116
100 year +45% CC 960 minute summer	26.946	7.096
100 year +45% CC 960 minute winter	17.850	7.096
100 year +45% CC 1440 minute summer	18.616	4.989
100 year +45% CC 1440 minute winter	12.511	4.989
100 year +45% CC 2160 minute summer	12.724	3.516
100 year +45% CC 2160 minute winter	8.767	3.516
100 year +45% CC 2880 minute summer	10.277	2.754
100 year +45% CC 2880 minute winter	6.907	2.754
100 year +45% CC 4320 minute summer	7.543	1.972
100 year +45% CC 4320 minute winter	4.968	1.972
100 year +45% CC 5760 minute summer	6.134	1.570
100 year +45% CC 5760 minute winter	3.970	1.570
100 year +45% CC 7200 minute summer	5.199	1.326

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Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
100 year +45% CC 7200 minute winter	3.355	1.326
100 year +45% CC 8640 minute summer	4.553	1.162
100 year +45% CC 8640 minute winter	2.939	1.162
100 year +45% CC 10080 minute summer	4.089	1.043
100 year +45% CC 10080 minute winter	2.639	1.043

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Results for 1 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute winter	SW TANK 01.00	22	79.571	0.026	1.8	0.7029	0.0000	OK
30 minute winter	SW MH 01.00	23	79.518	0.053	1.2	0.0602	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)
30 minute winter	SW TANK 01.00	1.000	SW MH 01.00	1.2	0.328	0.065	0.0302	
30 minute winter	SW TANK 01.00	Infiltration		0.0				
30 minute winter	SW MH 01.00	Hydro-Brake®		1.1				1.4

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Results for 30 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute winter	SW TANK 01.00	26	79.705	0.160	9.8	4.3263	0.0000	SURCHARGED
30 minute winter	SW MH 01.00	26	79.703	0.238	5.0	0.2689	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)
30 minute winter	SW TANK 01.00	1.000	SW MH 01.00	5.0	0.408	0.282	0.1400	
30 minute winter	SW TANK 01.00	Infiltration		0.0				
30 minute winter	SW MH 01.00	Hydro-Brake®		2.5				7.6

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Results for 100 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute winter	SW TANK 01.00	29	79.778	0.233	12.7	6.3191	0.0000	SURCHARGED
30 minute winter	SW MH 01.00	29	79.776	0.311	6.3	0.3522	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)
30 minute winter	SW TANK 01.00	1.000	SW MH 01.00	6.3	0.435	0.352	0.1400	
30 minute winter	SW TANK 01.00	Infiltration		0.0				
30 minute winter	SW MH 01.00	Hydro-Brake®		2.5				9.9

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Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute winter	SW TANK 01.00	51	79.938	0.393	12.4	10.6441	0.0000	SURCHARGED
60 minute winter	SW MH 01.00	51	79.936	0.471	3.8	0.5322	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)
60 minute winter	SW TANK 01.00	1.000	SW MH 01.00	3.8	0.415	0.216	0.1400	
60 minute winter	SW TANK 01.00	Infiltration		0.0				
60 minute winter	SW MH 01.00	Hydro-Brake®		2.5				18.1

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14 APPENDIX F

Drawing 03770-C-0845 P01 Exceedance Routing Drawing

Exceedance Route Drawing

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INDICATIVE ONLY

EXEEDANCE ROUTE LEGEND

SURFACE WATER ABOVE GROUND EXCEEDANCE ROUTE

SITE BOUNDARY



NOTES:

1. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ARCHITECT AND ENGINEERING DETAILS, DRAWINGS AND SPECIFICATIONS.
2. ANY DISCREPANCIES SHOULD BE REPORTED TO THE ARCHITECT AND/OR ENGINEER IMMEDIATELY, SO THAT CLARIFICATION CAN BE SOUGHT PRIOR TO THE COMMENCEMENT OF WORK.

CONSTRUCTION WARNING

IMPORTANT NOTE: CAUTION

ALL INFORMATION SHOWN ON THIS DRAWING FOR UNDERGROUND SERVICES/STATUTORY UNDERTAKERS' PLANT IS APPROXIMATE AND IS *PROVIDED FOR THE CONTRACTOR'S INFORMATION ONLY*. IT SHOULD NOT BE RELIED ON FOR EXCAVATION OR ANY OTHER WORKS PURPOSES AND CONTRACTORS MUST SATISFY THEMSELVES OF THEIR LOCATIONS PRIOR TO THE COMMENCEMENT OF WORKS.

REV	DATE	BY	DESCRIPTION
P02	21/08/26	SPB	STAGE 3 ISSUE
P01	28/05/26	BLT	PRELIMINARY ISSUE

DRAWING STATUS

PRELIMINARY

marbas

CLIENT

READING BOROUGH COUNCIL

PROJECT

RIDGEWAY PRIMARY SCHOOL,
READING, RG2 8JD

DRAWING TITLE

EXCEEDANCE ROUTING DRAWING

DRAWING No.	REV.
03770-C-0845	P02

SCALE	DATE	DRAWN	CHECKED	SHT.
1:500	23/12/25	BLT	SPB	A1

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15 APPENDIX G

Drainage Maintenance Report Marbas

The Ridgeway Primary School
Hill brow,
Reading,
Berkshire,
RG2 8JD

Drainage System Maintenance Requirements

Project Number: 03770

28th May 2026

Revision P02

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This report has been prepared for the sole benefit, use and information of the commissioning Client. The liability of Marbas Group Limited in respect of the information contained within this report will not extend to any third party.

Author	Becky Taylor
Approved	Simon Baker
Date	28/05/2026

Revision	Description	Date Issued
P01	Draft Issue	23/12/2025
P02	Revised to consider updated drainage strategy	28/05/2026

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1 INTRODUCTION

Marbas have been appointed to provide this Drainage System Maintenance Requirements report for the proposed refurbishment and extension works at Ridgeway Primary School, located at Hillbrow, Reading. The current proposals comprise a combination of light to more extensive refurbishment works, together with the construction of several new small and medium scale extensions. These works form part of a wider programme commissioned by Reading Borough Council to enhance existing school buildings and increase capacity, including the provision of improved accommodation to support pupils with special educational needs.

This report outlines the necessary inspection and maintenance protocols to ensure the long-term effectiveness of the surface water drainage strategy.

The primary objective of this document is to establish a structured maintenance plan to be carried out by a dedicated private maintenance company. This plan will ensure that the drainage system functions optimally, preventing blockages, degradation, or inefficiencies that could compromise water management on the site.

Failure to adhere to the maintenance requirements detailed in this report could result in significant risks, including water accumulation, structural damage, and potential flooding of both the building and surrounding open areas. Regular and proactive maintenance is therefore essential to safeguard the integrity of the development and maintain compliance with relevant drainage and environmental regulations.

2 DESIGN AND OPERATION

The proposed foul water drainage strategy for Ridgeway Primary School will utilise the existing foul drainage infrastructure serving the site. Foul drainage from the proposed extensions will connect into the existing onsite foul drainage network, which conveys flows via a foul water pumping station to the public foul sewer operated by Thames Water.

The proposed surface water drainage strategy seeks, in the first instance, to utilise and connect into the existing surface water drainage network and soakaway infrastructure, subject to confirmation of their capacity and performance.

Following the construction of the proposed SuDS components and the connection of drained surfaces to these components, the drainage system will enter its operational phase. During this phase, periodic monitoring and maintenance will be required as outlined in this document.

The maintenance requirements for the drainage system will be detailed in the handover documentation provided to the operator(s) upon the completion of the development. This documentation will include Health and Safety files as well as Operation and Maintenance (O&M) manuals.

As shown in the Drainage Strategy drawing, the drainage system incorporates various SuDS components designed to effectively intercept, treat, attenuate, and convey surface water runoff.

Management responsibilities for the SuDS components will rest with the landowner or, where applicable, the asset owner. In cases where components are transferred to a Highway Authority or Water Authority, these responsibilities will be governed by statutory or private agreements.

For the purposes of this document, the maintenance responsibilities for each SuDS component are defined under the categories of monitoring, regular maintenance, occasional maintenance, and remedial maintenance.

3 OWNERSHIP AND MAINTENANCE

For the lifetime of the development, the responsibility for the ongoing management and maintenance of SuDS components will rest with the landowner or asset owner, where ownership has been transferred.

The SuDS components incorporated within the development, along with their general locations, ownership, and maintenance duty holders, are summarised in the following table:

- **Below Ground Drainage (Private):** Includes pipes, access and inspection chambers, manholes, and silt traps/catchpits, located on private land and maintained by the landowner.

Where SuDS components are not adopted by a Water Authority or dedicated to a Highway Authority, it is expected that an appropriate organisation, such as a management company, may be appointed to oversee the monitoring and maintenance of the surface water drainage system during its operational phase. Maintenance regimes developed by this organisation will adhere to the requirements outlined in this document, along with any additional requirements specified in the handover documentation.

4 HEALTH AND SAFETY REQUIREMENTS

The design of the surface water drainage system will comply with the Construction (Design and Management) (CDM) Regulations 2015. This ensures designers assess foreseeable risks during construction and maintenance, aiming to minimise these risks through the following hierarchy:

- Avoid
- Reduce
- Identify and mitigate residual risks

Designers' risk assessments and maintenance statements will be included in the handover information to inform contractors and others about the risks associated with managing and maintaining the system.

The maintenance and monitoring works required for the surface water drainage system will also adhere to the Health and Safety at Work Act and related regulations. These activities will always be subject to thorough risk assessment.

The organisation responsible for maintenance and monitoring, as outlined in this document, must take appropriate health and safety precautions to ensure compliance and minimise risks during operations.

5 COMPONENTS OF THE SYSTEM

The following components form part of the drainage system and need to be maintained as indicated within this document.

- Pipes, foul and surface water system. Clay or Plastic
- Inspection chambers and manholes
- Flow control manholes
- Filter manholes
- Pumping station
- Soakaways
- Permeable Paving

The following tables outline the maintenance requirements for various SuDS components.

Operation and Maintenance Activity	**Below Ground Drainage**
Inspection	
Removal of litter and debris	
Grass cutting	
Control of weeds and invasive vegetation	
Management of trees and shrubs	
Management of shoreline vegetation	
Management of aquatic vegetation	
Management and removal of accumulated sediment *	
Replacement of vegetation	
Sweeping and brushing with vacuum	
Rehabilitation and repair of structures	
Reconditioning of infiltration surfaces	

Key:



Will be required
May be required
Not required

***** Sediment should be collected and managed in pre-treatment systems, upstream of the main SuDS component.

6 MAINTENANCE SCHEDULES

The below sets out the requirements for maintenance of the on-site drainage system.

The maintenance requirements are based on durations and the occurrence of severe storms. However, should water be found ponding on any hard surface around channel drains, road gullies, or foul drains become blocked then this visual identifier will trigger the requirements for investigation and maintenance.

If issues are found to be the cause of failure or lack of maintenance on parts of the drainage system that do not fall under the responsibility of the maintenance company, the maintenance company is to notify the third party who has responsibility.

A severe storm is defined as any aspect of weather that poses risk to life, property or requires the intervention of authorities. Severe weather warnings will be issued by the Met Office.

The appointed maintenance company is to keep a log of all maintenance and remedial works carried out at the site. This log is to be passed on should the maintenance contract be given to another organisation.

6.1 PIPES, FOUL AND SURFACE WATER SYSTEM. CLAY OR PLASTIC

Required Action	Required Frequency
Monitoring	
Conduct visual inspections of manholes, silt traps, vortex separator inlet and outlet headwalls, and the attenuation basin to check for signs of silt accumulation, damage, or blockages.	Every 2 months during the first 12 months, followed by every 6 months thereafter.
Occasional Maintenance	
Conduct CCTV surveys of the pipes periodically to assess their structural condition. Implement any necessary actions based on the survey recommendations.	Every 5 years, or as required based on monitoring.
Remedial Actions	
Trim any roots that may be obstructing or causing blockages.	As required.
Remove blockages using methods such as rodding, jetting, hydraulic rams, or a suction tanker.	As required.
Replace any pipe sections that are structurally damaged.	As required.

6.2 INSPECTION CHAMBERS AND MANHOLES

Required Action	Required Frequency
Monitoring	
General inspection of chamber covers for signs of damage, wear, and rocking.	Every 6 months.
Structural inspection of chamber cover surrounds.	Every 6 months.
Inspection of chamber internals for evidence of pipe surcharging.	Every 6 months.
Inspection of silt accumulation rates and establishment of appropriate removal frequencies.	Monthly during the first year of operation, then every 6 months thereafter
Regular Maintenance	
Removal of accumulated deposits by suction tanker.	Every 6 months, or as determined by monitoring requirements.
Occasional Maintenance	
Washing down of sides, benching, and channels with clean water jetting.	Every 6 months, or as determined by monitoring requirements.
Removal of accumulated deposits by suction tanker following high return period storm or period of poor performance.	As required.
Remedial Actions	
Replacement of damaged chamber covers and bedding.	As required.
Sealing and repair of cracked/spalled concrete and benching.	As required.

6.3 FLOW CONTROL MANHOLES

To be checked annually and after a severe storm by visual survey and debris removed. A list of defects should be complied and with high, medium and low risk of failure. High risk defects should be fixed immediately, medium risk should be fixed within 6 months and low risk to be monitored annually.

6.4 FILTER MANHOLES

To be checked annually and after a severe storm. Debris to be removed and outlets to be checked that they are free flowing.

6.5 PUMPING STATION

Maintenance contract to be put in place for Pumping Station.

6.6 SOAKAWAYS

To be maintained in accordance with Table 13.1 of Ciria C753. If maintenance is not undertaken in accordance with the below table, deposits can become hard-packed and require considerable effort to remove. Deposits may also affect infiltration.

TABLE 13.1 Operation and maintenance requirements for soakaways	
Required Action	**Required Frequency**
Monitoring	
Inspect silt traps and note rate of sediment accumulation	Monthly in the first year and then annually
Check soakaway to ensure emptying is occurring	Annually
Regular Maintenance	
Inspect for sediment and debris in pre-treatment components and floor of inspection tube or chamber and inside of concrete manhole rings	Annually
Cleaning of gutters and any filters on downpipes	Annually (or as required based on inspections)
Trimming any roots that may be causing blockages	Annually (or as required)
Occasional maintenance	
Remove sediment and debris from pre-treatment components and floor of inspection tube or chamber and inside of concrete manhole rings	As required, based on inspections
Remedial Actions	
Reconstruct soakaway and/or replace or clean void fill, if performance deteriorates or failure occurs.	As required
Replacement of clogged geotextile (will require reconstruction of soakaway)	As required

6.7 PERMEABLE PAVING

Required Action	Required Frequency
Monitoring	
Initial inspection	Monthly for three months after installation
Inspect for evidence of poor operation and/or weed growth – if required, take remedial action	Three-monthly, within 48 hours of large storms in the first six months
Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
Monitor inspection chambers	Annually
Regular Maintenance	
Brushing and vacuuming (standard cosmetic sweep over the whole surface)	Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations – pay particular attention to areas where water runs onto pervious surfaces from adjacent impermeable areas as this area is most likely to collect the most sediment
Occasional Maintenance	
Stabilise and mow contributing and adjacent areas	As required
Removal of weeds or management using glyphosate applied directly to the weeds by an applicator rather than spraying	As required – once per year on less frequently used pavements
Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving	As required
Remedial Actions	
Remedial work to any depressions, rutting, and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	As required
Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years, or as required (if infiltration performance is reduced due to significant clogging)

The manufacturer has the following specific requirements for their product that fall outside of the recommendations of The SuDS Manual.

To ensure the performance of the Priora permeable paving, Marshalls recommend that there is a maintenance regime undertaken.

The maintenance of the pavement is to ensure the infiltration of the paving is not compromised. The following guidelines are offered as an initial regime, but maybe either increased or decreased depending on paving's local environment and any external contributing factors.

- *A visual inspection of the paving should be carried out on a regular basis, ensuring that the joints are kept fully filled. This will confirm the effectiveness of the agitation maintenance due to variations between sites and allow any refinement of the regular agitation activity if necessary.*
- *The paving should be agitated (e.g. brushed, vacuumed, etc.) at least twice a year. This is to ensure no vegetation of any sort is allowed to grow and develop in the joints. Ideally, this activity should be carried out in the spring and autumn seasons.*
- *The paving should be inspected after any heavy precipitation to ensure no displacement of any organic matter onto the surface of the pavement.*
- *For winter maintenance, the controlled use of de-icing products may be used without causing significant detrimental effects towards the permeable pavements performance. When used carefully, the use of these chlorides will not result in an increase in the chloride levels in the local ground.*
- *Where non-infiltration systems have been employed, the inspection of the outfalls should be undertaken initially on a twice-yearly basis.*
- *Weed growth – when sedimentation occurs in areas of permeable paving then there is the potential for weed growth, this will typically occur where there are overhanging trees or soft landscaping slopes down on to the paving or in areas which do not receive over run from vehicles particularly frequently.*
- *Weeds can be removed from the surface through the application of weed killers containing Glyphosate. Glyphosate based weed killers are the most common for general-purpose use, they are most effective on grasses and perennial weeds with non-woody stems. Weeds should be sprayed when they are actively growing so that the Glyphosate will go down to the root and kill the weed completely. Glyphosate will be neutralized upon contact with the ground, which makes it safe to plant in the area soon after treatment. It is available ready mixed or as a concentrate. With the ready mix you will paying a lot for the water that it is diluted with, but if you only have a small plot or if you don't have a safe chemical storage cupboard, then ready mix is the best option.*
- *Glyphosate based weed killers include: Roundup, Tumbleweed and B&Q complete.*
- *Depending on the amount of usage and the environment the permeable pavement has received and been exposed to, the laying course material may require either cleaning*

after a 25 to 30 year period. This would be evident if the infiltration rate of the paving became prolonged, allowing ponding to develop. Should this occur, the uplifting and cleaning (or replacing) of the laying course maybe considered. The laying course material, jointing and Priora blocks may be reused, minimising costs.

Stock piling of any material is prohibited on the permeable paving surface.