Earth Science Partnership

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Burnt Mill Academy, Harlow
Proposed School Redevelopment
Geo-environmental and Geotechnical Report

Report Reference: ESP.8511.3873

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Burnt Mill Academy, Harlow
Proposed School Redevelopment
Geo-environmental and Geotechnical Report

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Report Reference: **ESP.8511.3873**

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General Construction Advice

Executive Summary

Bowmer and Kirkland have been appointed to demolish the existing and construct a new school and sports centre. ESP have undertaken a geo-environmental and geotechnical assessment and the key potential land quality issues identified by the assessment are summarised below:

	Potential Hazard	Anticipated Risk	Discussion
Site Setting	Current Site Status. (Section 2.1)	-	The site is occupied by Burnt Mill Academy with its associated playing fields and areas of hardstanding (car parking and access roads). The building is locally 4 storeys high, includes a basement and swimming pool.
	Identified Ground Conditions. (Section 4.1)	-	Made Ground (MG) generally below 1m thick, followed by Lowestoft Formation (LWST) and Glaciofluvial (GFD) superficial deposits overlying the London Clay Formation (LCF). Thick Made Ground proven to the north of the existing school within an infilled former valley to approx. depths of between 2 and at least 5m. The hand pits undertaken in an area of potential buried ACM, in some cases, identified a placed Topsoil overlying a geotextile membrane followed by Made Ground, indicating a potential soil capping layer.
	Groundwater Conditions. (Section 4.2)	-	The GFD are classified as Secondary A Aquifer, the LWST as a Secondary Undifferentiated Aquifer and the LCF as an Unproductive Aquifer. The main groundwater body is within the deeper GFD/upper LCF. Localised shallower perched water bodies are present including the Made Ground in the infilled valley.
	Historical Land Use. (Section 2.2)	-	The site was undeveloped fields, until the school and playing fields were present from the mid 1960's. Prior to the school a valley was present in the north two thirds, and we consider up to around 6 to 7m of filling occurred in the deepest part. Anecdotal evidence of buried ACM in the north east of the school was provided by the school staff and the public.
Geo-environmental	Potential Contamination Sources (Section 2.7.1)	Moderate to High	The main sources are thick Made Ground in the former valley, suspected buried ACM on the north east boundary, ACM within the existing building and a chimney and plant room within the existing building.
	Chronic Risks to Human Health (Section 6.1) **See below for asbestos**	Low to Moderate	The risks to end users are generally likely to be low, however check testing is recommended in areas un-investigated and in landscaped post completion to confirm the risks posed due to localised elevated levels.
	Risks to Controlled Waters (Section 6.2)	Low	We consider the risk to controlled waters is likely to be low. If contamination is identified as part of further investigation, the assessment should be revised.
	Hazardous Ground Gas (Section 6.3)	Moderate to High	We consider that the site would be classified as CS-2. The combination of gas protection elements will depend to a large degree on the design of the buildings. The requirements should be assessed in accordance with BS8485:2019. Any organic materials encountered during construction should be excavated and replaced.
	Asbestos Contamination (Section 7.1.1.)	Moderate to High	There is a potential risk from asbestos within the existing school and shallow soils (particularly where buried ACM was suspected). Further testing to delineate the risks and advice of an asbestos specialist is recommended. Remediation may be needed which will need to be planned in a method statement.
Geotechnical	Abandoned Mine Workings and/or Old Mine Entries (Section 2.6.1)	Low	Gravel pits were located near the southwest boundary. None have been recorded on-site. Coarse grained soils are present, therefore they cannot be discounted.
	Weak/Compressible Ground, requiring non-traditional foundations (Section 7.3 and 7.4)	Moderate to High	A range of different foundation designs will likely be required to provide structure-specific options based on proposed loadings, settlement tolerances and ground conditions. Initial advice includes piles for the school and sports centre with ground bearing floor slabs. Vibro-replacement is to be utilised for the demountable classrooms.
	Shrinkage or Swelling (Section 7.2.3)	Low to Moderate	Shallow fine-grained Lowestoft Formation soils are of low to medium shrinkage potential. Trees are to remain, be removed and planted. Foundations and floor slabs will need to be designed in accordance with NHBC/BRE guidelines.
	Sulphate Attack on Buried Concrete (Section 6.4.2)	Moderate	Elevated level of sulphate (or potential) has been identified for the superficial deposits and LCF. Concrete design will need to consider this.
	Soakaway Feasibility (Section 7.8)	-	Due to the low infiltration rates recorded, soakaway drainage is unlikely to be suitable for the scheme.
Others	UXO (Section 7.1.1)	-	A Detailed UXO Risk Assessment (Ref: P11211-21-R1) concluded that the risk from UXO is Low (November, 2021). No mitigation measures were required.
	Flooding (Section 2.5)	Low	A flood risk assessment (FRA) by HSP in December 2021 (Ref: HSP2021-C3825-C&S-FRAS1-441), concluded that "the site is not considered to be at an unacceptable risk of flooding from any source".
	Invasive Plants (Section 7.1.2)	-	No evidence of invasive plants was identified during the site works. Their growth is seasonal and their presence cannot be discounted.
	Further Investigation Required?	Yes	See Section 8.

Note: The above is intended to provide a brief summary of the conclusions of the assessment. It does not provide a definitive assessment and must not be referenced as a separate document. Refer to the main body of the report for details.

1 Introduction

1.1 Background

1.1.1 Proposed Development

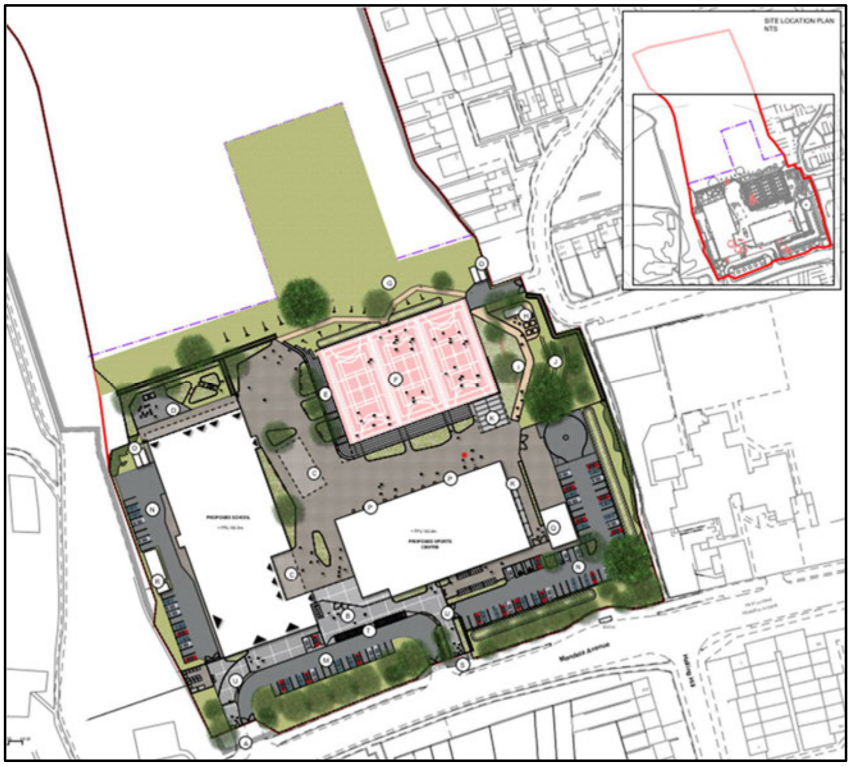
Bowmer and Kirkland (hereafter known as the Client) have been appointed to demolish the existing Burnt Mil Academy and construct a new school. The site location is shown on Insert 1 in Section 2.1.

The existing school is generally one to two storeys, with a localised parts four storeys. A localised 2.5m deep basement is present and includes a boiler room. A swimming pool is also located within the building.

The proposed development will comprise the construction of a new three storey school building, sports centre with a 2m swimming pool, MUGA and areas of landscaping and hardstanding (see Insert 1).

The structural designer has indicated the maximum column unfactored load for the new teaching block is around 1350kN. The sports hall will require an unfactored load of circa 800kN. These are worst case loads based on preliminary designs. A ground bearing slab solution with piled foundations are proposed.

The demolition and construction is programmed to be undertaken in phases with the school remaining active throughout. A temporary classroom will be constructed in the fields to the north of the school to enable this. We understand maximum point loads of around 55kN are anticipated for the temporary classroom (double stacked) and the classroom will have a total and differential settlement tolerance of 25mm.



Insert 1 - Proposed Development Plan. Provided by the Client.

Based on the above, we understand that the proposed structures would be classified as Geotechnical Category 2 (BS5930:2020).

1.1.2 Previous and 2023 ESP Investigation

A desk study and integrated geotechnical and geo-environmental investigation and assessment have been previously undertaken at the site:

- **HSP, 2021** - Phase 1 Geo-environmental Desk Study Report (HSP consulting – Ref: HSP2021-C3825-G-GPI-392, dated November 2021) – see Appendix B.
- **HSP, 2022** - Phase 2 Geo-environmental Assessment Report (HSP consulting – Ref: HSP2022-C3825-G-GPII-601, dated May 2022) – see Appendix C.

Additional reports and surveys have also been undertaken which include a flood risk assessment and arboricultural, asbestos, topographic and services surveys.

To satisfy recommendations within these reports and supplement them to fulfil likely design requirements or gaps in information, the Earth Science Partnership Ltd (ESP), Consulting Engineers, Geologists and Environmental Scientists, were instructed by Ashfield Solutions, acting on behalf of the Client, to undertake an integrated geotechnical and geo-environmental investigation and assessment.

1.2 Objective and Scope of Works

The objective of the ESP investigation was to obtain additional information on the geotechnical character and properties of the ground beneath the site, potential risks posed by contamination and ground gas, and to allow an updated assessment of these ground conditions with particular reference to the potential impact on the proposed development.

We are not aware of any ground hazard related planning conditions relating to the development.

The scope of works for the investigation was mutually developed with the Consultant by ESP within an agreed budget, and comprised the supervision and direction of cable percussion boreholes, windowless sample boreholes, trial pits, soakaway infiltration testing, hand-excavated trial pits, measurement of in-situ CBR values (using DCP equipment), geotechnical and geo-environmental laboratory testing, gas and groundwater monitoring, assessment and reporting.

The initial investigation and assessment was undertaken in February to April 2023 with finalisation of the report in May 2023. Following supplementary works in June 2023, an updated finalised report has been prepared in July 2023.

The contract was awarded on the basis of a competitive tender quotation.

The terms of reference for the assessments are as laid down in the ESP proposals of 22nd December 2022 (ref: 8511 ESP Offer Letter 1) and 12th June 2023 (ref: 8511.02.REV1).

1.3 Report Format

This report includes a summary of the findings of the previous desk study and site investigation report undertaken (Section 2), details of the ESP investigation undertaken in accordance with BS5930:2020 (Section 3), along with the Preliminary Risk Assessment stage (Section 2.8) and Generic Quantitative Risk Assessment (Section 4) of the land contamination risk management (LCRM) guidelines (formerly CLR11). A preliminary evaluation of the resulting risks and any remedial measures potentially required to mitigate identified unacceptable risks from contamination and hazardous ground gas is included in Sections 5 and

6. However, it should be appreciated that this is a preliminary evaluation only, and will not generally meet the requirements of the LCRM guidelines.

A preliminary risk register, identifying potential geotechnical hazards from review of the previous reports, is presented as Section 2.6, with a full assessment of the geotechnical conditions including foundation and floor slab options, the feasibility of soakaways, etc. in Section 7 – this complies the relevant elements of the Geotechnical Design Report of BS EN 1997-2 (Eurocode 7) and BS5930:2020. The geotechnical risk register is updated using the findings of the intrusive investigation and assessment in Section 7.2. The report concludes with a summary of any further surveys/ investigations/ assessments recommended (Section 8).

The assessment of the potential for hazardous substances (contamination) or conditions to exist on, at or near the site at levels or in a situation likely to warrant mitigation or consideration appropriate to the proposed end use has been undertaken using the guidance published by CIRIA (2001). This is discussed in more detail in Section 2.8.1 and in Appendix A.

This report is issued as a digital version only.

1.4 Limitations of Report

This report represents the findings of the brief relating to the proposed end use and geotechnical category of structure(s) as detailed in Section 1.1.1 above. The brief did not require an assessment of the implications for any other end use or structures, nor is the report a comprehensive site characterisation and should not be construed as such. Should an alternative end use or structure be considered, the findings of the assessment should be re-examined relating to the new proposals.

Where preventative, ameliorative or remediation works are required, professional judgement will be used to make recommendations that satisfy the site-specific requirements in accordance with good practice guidance.

Consultation with regulatory authorities will be required with respect to proposed works as there may be overriding regional or policy requirements which demand additional work to be undertaken. It should be noted that both regulations and their interpretation by statutory authorities are continually changing.

This report represents the findings and opinions of experienced geo-environmental and geotechnical specialists. Earth Science Partnership does not provide legal advice and the advice of lawyers may also be required.

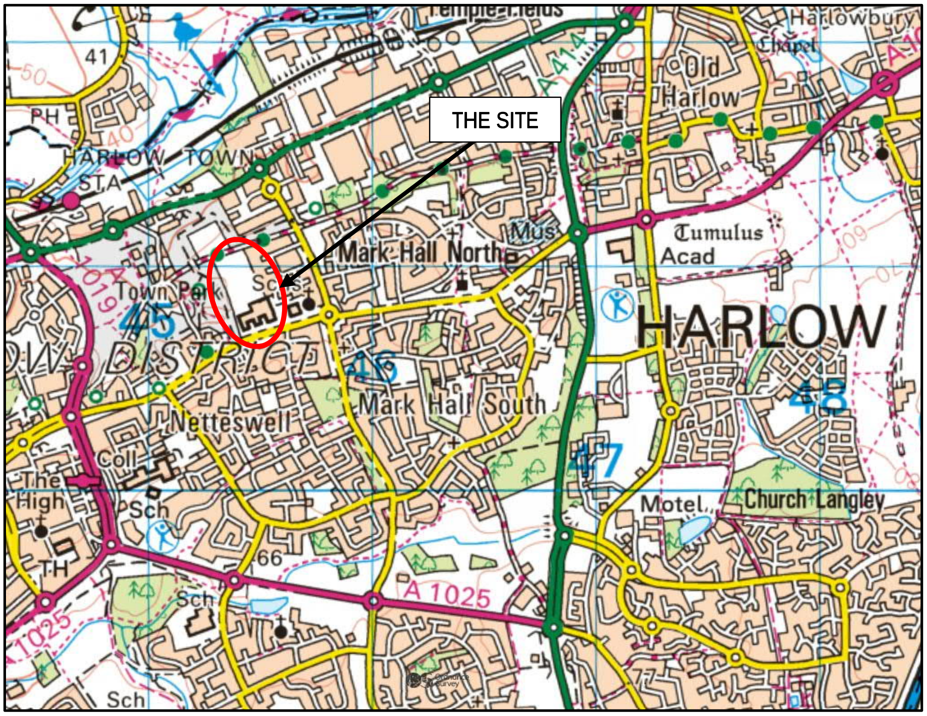
2 Desk Study and Field Reconnaissance Visit

An updated comprehensive desk study was not included within the scope of ESP's commission. However, previous ground investigation reports and surveys were provided by the Client for review (see Section 1.1.2). These have been summarised in the following sections and supplemented with additional information if available. A new preliminary risk assessment has then been provided at the end of section based on ESP's review.

The site description is largely based on a field reconnaissance and site inspection visit made at the site during the fieldworks in February and March 2023 during dry and wet weather.

2.1 Site Location and Description

The site is located on the northern side of First Avenue in north eastern Harlow, Essex. The National Grid Reference of the centre of the site is (TL) 545365 210780 and the postcode is CM20 2NR. A Site Location Plan is presented as Insert 2 below.



Insert 2 - Site Location Plan from Ordnance Survey 1:25,000 scale map.
Reproduced with permission (OS License No.: AL100015788).

The site comprises a roughly rectangular shaped parcel of land of around 360m length (north to south) and 180m width (east to west), occupying an area of around 5.5ha. The existing Burnt Mill Academy School occupied the southern third of the site with the north portion comprising playing fields and a hard surfaced court.

It is bounded by:

- To the north and west: by park land.
- To the east: by residential properties and associated gardens.
- To the south: First/Mandela Avenue with residential properties and gardens beyond.

Vehicular access to the site is currently gained via the southern end of the site, off First Avenue.

A tree survey has been provided and this confirms the presence of Cherry, Beech, Oak and Turkey Oak (amongst others) across the site. Some trees will be removed as part of the re-development.

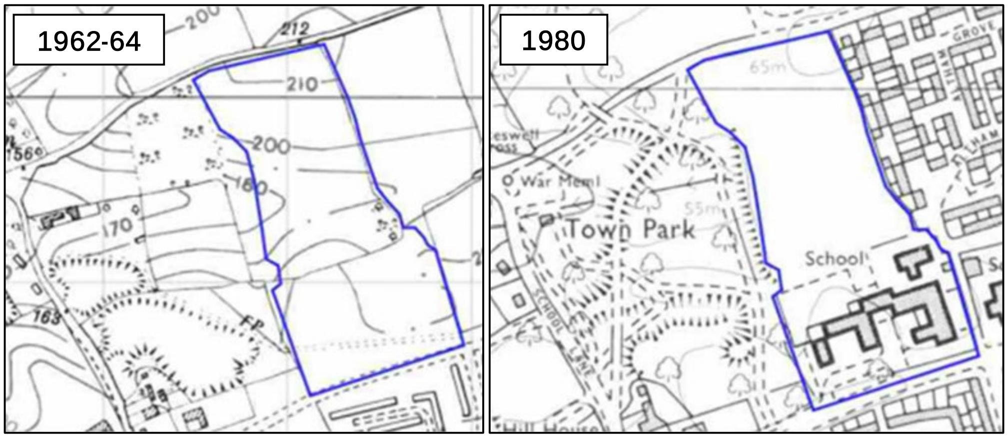
The built area of the site is split level, with levels of approximately 65 m AOD at the entrance (southern boundary) reducing to approximately 61.5 m AOD at the rear north eastern corner of the buildings. The changes in level are marked by steps, ramps, slopes and retaining walls. The levels across the playing fields rise gently from approx. 61.5 m AOD in the southwest corner to approximately 64.75 m AOD at the northeast. A steep downward slope is present along part of the north eastern boundary of the site to accommodate the change in level between the playing field and the rear gardens of neighbouring properties. A slope is also present along the west boundary leading down to the park, with an elevation change of around 8 to 9m over 20 to 30m. The slope height reduces to the south towards the school buildings.

A GPR services survey has been undertaken by the Client and statutory service plans were obtained by ESP prior to investigation. Gas, electric, drainage, water supply and telecommunications surveys are present on-site, and are illustrated on Figure 1 and 2.

2.2 Site History

The previous report (HSP, 2021) provides the following summary: "The site was undeveloped on the First Edition Mapping and shown as two large fields. A large building identified as the Burnt Mill Comprehensive School with associated hardstanding is recorded in the south of site with a playing field recorded in the north of site from the mid 1960's onwards, with gradual addition of buildings and hard play areas on subsequent map editions."

Prior to the earthworks associated with the school construction a valley-like structure was present in the north two thirds of the site. The lowest contour on-site (the elevation does reduce slightly beyond this) is around 54.9m AOD (180ft AOD) and the current elevation in this area is around 62m AOD. This would suggest up to around 6 to 7m of filling occurred in the deepest part of the former valley, likely reducing to the south towards the existing school and to the east. A heap was also present in the northwest portion post earthworks.



Insert 3 – Comparison of historic mapping data showing infilling of former valley

Between the 1920s and the late 1940s, two large gravel pits were excavated to the west/southwest and were later infilled to form Town Park.

The site investigation report states "anecdotal evidence gathered during the walkover with the premises manager indicates that potential asbestos containing materials (ACM) have been buried under part of the schools playing field. No exact location was provided during the walkover but it is understood to be adjacent to the eastern boundary of the site." There is no formal record of this.

Between 2018 and 2020 a smaller rectangular classroom was constructed/placed (if temporary) to the north of the existing main school building but this is no longer present.

2.3 Geology

2.3.1 Published BGS Information

HSP, 2021 states that based on British Geological Survey (BGS) data, the site is indicated to be underlain by superficial Glaciofluvial Deposits (sands and gravels) in the north and south with a band of Lowestoft Formation (Glacial Till) expected in the centre. The superficial deposits are anticipated to be underlain by bedrock of the London Clay Formation.

No Made Ground is indicated on-site based on the BGS resources, however, considering the earthworks some would be expected, particularly in the infilled valley. Made Ground is indicated to the west/southwest in the infilled gravel pits.

BGS boreholes to a depth of 6m (e.g. TL41SE185, TL41SE309 and TL41SE309) constructed prior to the construction of the school, identified sands and gravels (probable Glaciofluvial Deposits) directly below the Topsoil, or beneath a localised stoney loam to around 1 to 1.5m possibly representing the Lowestoft Formation.

2.3.2 Previous Investigation Findings (HSP, 2022)

The previous intrusive investigation was undertaken between 26th November 2021 and the 14th – 18th February 2022. The exploratory investigation comprised 12no. windowless sampled boreholes (WS01 – WS12) to a maximum depth of 5m and 4no. cable percussive boreholes (CP01 – CP04) to a maximum depth of 15m.

The investigation point locations (indicated on Figure 2) generally confirmed the published information with Made Ground (generally below 1m deep) overlying superficial coarse grained Glaciofluvial and fine grained Lowestoft Formation deposits. Deeper fine grained layers within the Glaciofluvial Deposits below a depth of 10m were identified and have been called Lowestoft Formation.

Thicker Made Ground was recorded up to 2.5m in WS12 (in the area of the infilled valley), however we consider that deeper Made Ground was also recorded in WS02 and WS03, including potential relict Topsoil layers (where black staining and an organic odour was noted).

Bedrock deposits belonging to the London Clay Formation were not proven to a depth of 15m.

Further detail on the previous ground conditions is incorporated into our description of the geological model in Section 4.1.

2.4 Hydrogeology

2.4.1 Aquifer Classification

The Glaciofluvial Deposits were classified as Secondary A Aquifer. The Lowestoft Formation is classified as a Secondary Aquifer – Undifferentiated. The London Clay Formation is classified as Unproductive Aquifer.

There site is not situated in a Source Protection Zone and there are no groundwater abstraction licenses within 1000m of the site.

2.4.2 Groundwater Strikes and Monitoring

Only two groundwater strikes were recorded during advancement of the windowless sample boreholes and cable percussive boreholes. A strike was recorded within WS02 at 1.50 m bgl which is likely a perched water body due to a permeability contrast in the ground conditions (i.e. where coarse grained soils overlie fine grained soils). A strike was also recorded at 11.50 m bgl within CP02 which was within a confined coarse grained layer overlain and underlain by fine grained soils.

The HSP, 2022 groundwater level monitoring results are presented in Table 1.

Table 1 - Previous Groundwater Monitoring (HSP, 2022)

Well ID	Response Zone depth	Response Zone Stratum	10/03/22 (m bgl)	23/03/22 (m bgl)	30/03/22 (m bgl)	07/04/22 (m bgl)
WS01	1 – 5 m	Lowestoft Formation and Glaciofluvial Deposits	4.98	4.97	4.98	5.0
WS02	1 – 5 m	Lowestoft Formation[1]	4.73	4.93	4.94	-
WS03	1 – 5 m	Lowestoft Formation and Glaciofluvial Deposits[1]	-	2.16	2.33	2.47
WS04	1 – 5 m	Glaciofluvial Deposits	4.91	4.91	4.94	4.95
WS09	1 – 2 m	Glaciofluvial Deposits	Dry	Dry	Dry	Dry
WS10A	1 – 5 m	Lowestoft Formation	3.33	3.50	3.66	3.54
WS11	1 – 5 m	Glacial Fluvial Deposits	4.81	4.77	4.77	Damp

Notes:
1. Based on the historic filled valley and the presence of organic layers we consider that a proportion of the stratum encountered could be Made Ground.

The majority of the installations where wet at the base or dry, with the exception of WS03 and WS10A which were located to the north of the school.

No consistent groundwater body was recorded across the site, however localised perched water bodies appear to be present.

2.5 Hydrology and Flooding

No surface water features identified within 250 m.

The site lies within an area categorised as Flood Zone 1 by the Environment Agency. The site is shown at risk from surface water flooding in the north and also in the centre.

A flood risk assessment (FRA) undertaken by HSP in December 2021 (Ref: HSP2021-C3825-C&S-FRAS1-441), concluded that overall “the site is not considered to be at an unacceptable risk of flooding from any source”.

There is a moderate risk of groundwater flooding in areas indicated to be underlain by coarse grained Glaciofluvial Deposits. The FRA states “that the depth of ground water should be established by intrusive investigation. While not considered a significant risk, further site investigation works are recommended”. Investigation and monitoring by HSP, 2022 confirmed the general absence of a consistent shallow groundwater bodies within the coarse grained Glaciofluvial Deposits (see Section 2.4.2).

2.6 Geotechnical Hazard Register

2.6.1 Mining (non-coal)

Gravel pits for the extraction of coarse grained Glaciofluvial soils are common in the area, included two large ones near the west boundary.

Whilst none are indicated on available historical mapping data, the presence of historic gravel pits on-site cannot be discounted.

2.6.2 Compressible Soils

2.6.2.1 Made Ground

An infilled former valley appears to be present in the northern two thirds of the site and we estimate fill depths of up to around 7m or more could be present. The drainage in the area is around 8.5 m bgl.

Made Ground was recorded up to 2.5m in WS12, however we consider that deeper Made Ground was also recorded in WS02 and WS03, including potential relict Topsoil layers.

Low SPT values (a minimum ‘N’ value of 4) have been recorded in these soils which indicates they are low strength and likely compressible, particularly where containing organic materials are present. Loading these soil could lead to settlement at the surface. As a result, HSP, 2022 stated that traditional foundations are unlikely to be feasible in this area for the temporary classroom and raft foundations could be considered.

2.6.2.2 Glaciofluvial Deposits

Whilst generally medium dense, locally loose coarse grained Glaciofluvial Deposits have been recorded (‘N’ value of 8 in CP04 at 5m). These soils could be prone to settlement when loaded.

A piled foundation was recommended for higher loaded structures in the south portion. Shallow foundations were considered feasible for lightly loaded structures.

2.6.3 Shrinkage and Swelling

The previous investigation (HSP, 2022), identified near-surface fine-grained soils to have plasticity indices of between 16 and 25 (unmodified). These soils would be of potential low to moderate volume change potential with changes in moisture content (shrinkage).

A tree survey has been provided and this confirms the presence of Cherry, Beech, Oak and Turkey Oak (amongst others) across the site. Some trees will be removed and planted as part of the re-development, which will result in changes to the moisture content of surrounding soils (in particular fine grained).

We consider that the potential for shrinkable/swelling soils at the site is **Moderate**.

2.6.4 Running/Blowing Sand

HSP, 2022 identified glacial deposits with a high proportion of sand-sized particles. No significant water bodies were identified to a depth of 15m, however localised perched water bodies were noted.

Running/blowing sand could be experienced within any excavations/borings below the groundwater table at greater depth.

We consider that the potential for running/blowing sands beneath the site is Low to **Moderate.**

2.6.5 Pyritic Ground

The previous report concluded that “it was appropriate to adopt a basic Design Sulphate Class of DS-1 together with and Aggressive Chemical Environment for Concrete (ACEC) of AC-1s” for the shallow soils tested. We do not concur with this assessment, based on elevated levels of water soluble sulphate in the Made Ground and total potential sulphate in the Lowestoft Formation.

In addition, if deeper foundations are required (e.g. piles), the London Clay Formation underlying the site is listed by the BRE (2005) as potentially containing elevated levels of pyrite, which may oxidise to sulphates and lead to aggressive attack on buried concrete. Depending on its origin, the Made Ground and glacial soils may also contain elevated levels of pyrite.

Given the above, we consider that the potential for sulphate/pyrite attack on buried concrete would be **Moderate to High.**

2.6.6 Underground Structures

As part of the re-development, we understand the existing school building in the south portion will be demolished which includes a basement. Any remaining structures will need to be grubbed up as part of the redevelopment and this will have cost (larger machinery, backfill materials, disposal costs etc.) and time implications for the re-development.

Care should be executed to avoid damaging the underlying formation, to avoid the requirement for further deepening of the foundations beyond the disturbed ground if shallow foundations are to be utilised.

Deep drainage crosses the site in the central portion in a general south/southeast to north/northwest direction. Survey information indicates the depth between the cover level and invert level is around 8.42m near the west boundary. The significant depth may be associated with the former infilled valley. We understand no structures are located above the deep drainage, however if they were their presence would require consideration.

2.6.7 Slope Stability

A slope is present along the west boundary leading down to the park, with an elevation change of around 8 to 9m over 20 to 30m which reduces to the south towards the school buildings. Based on historic investigation, the slope likely consists of low strength end tipped Made Ground associated with the infilling of the former valley, with localised organic layers. The soils could be prone to failure when loaded.

The main buildings are likely to be piled or are located away from the slope and therefore should not adversely affect its stability. The west edge of the temporary classroom is proposed near this slope/boundary and therefore placement and design will need to ensure it is located sufficient distance away not adversely affect its stability.

2.7 Geo-environmental Risk Assessment

2.7.1 Contamination Sources

The following salient features have been identified on-site based on available information:

- Electric sub-station on the east boundary.
- Made Ground particularly the thick Made Ground in the former valley.
- Suspected buried asbestos containing materials (ACM) on the east boundary.
- ACM within the existing building.
- “A chimney and plant room within one of the buildings in the east of the site. The premises management team indicate the chimney and solid fuel boiler are no longer in use as the buildings are heated using mains gas (HSP, 2021)”.
- The premises management team indicate “To the best of their knowledge there are no fuel storage tanks present on site (HSP, 2021)”. There are no recorded petrol stations or tanks within 100m of the site.
- The London Clay and superficial soils (depending on their origin) can potentially contain sulphates/pyrite.

A Contaminated Land Enquiry was placed with Harlow Council’s Environmental Health Team identified the old gravel pits (123m) to the west of the site as ‘A Site of Potential Land Contamination: Gravel pit infilled, mounded up and landscaped, now part of Town Park’. The same information is also referred to in response to a request for information on records of landfills within 250m of the site (HSP, 2021).

2.7.2 Soil Contamination Testing

18no. samples were tested for a suite of contaminants typically found on brownfield site in the UK. This included 8no. samples of Made Ground, 8no. samples of natural superficial soils and 2no. samples of possible Made Ground in WS03 consisting of re-worked natural soils (area of infilled valley).

Comparted to the GAC for a residential without home grown produce setting, slight and isolated exceedances of Lead (WS03 at 2.2 m depth) and Arsenic (WS04 at 0.8 m depth) were recorded (HSP, 2022). It was noted that these guideline values were conservative. The sample from WS03 (in the area of the infilled valley) was within a layer described as having ‘dark black staining and an organic odour’ and may be Made Ground. The elevated level of Arsenic was recorded in natural Glaciofluvial Deposits.

A site specific assessment criteria (SSAC) was generated for Arsenic using the CLEA model. The SSAC for Arsenic (66mg/kg) was higher than the concentration recorded, therefore the risk to human health was considered low (HSP, 2022). Due to the depth of the elevated lead concentration, it was considered a low risk to human health, however if earthworks were proposed and levels reduced, further consideration would be required.

No evidence of asbestos was identified in the eight samples of Made ground that were screened. However, anecdotal evidence suggests buried ACM may be present in the east portion and this was not targeted although we understand WS10 and WS10A were close.

2.7.3 Ground Gas Sources and Summary of Previous Monitoring

The following on and off-site sources of ground gas have been identified:

- Made Ground across the site, including likely thicker deposits within the infilled valley to the north of the existing school.
- Organic/possible relict Topsoil layers within WS02 and WS03 in the infilled valley area.
- Infilled gravel pits to the west which have been infilled with unknown materials.

Based on the guidelines presented by O'Riordan and Milloy (1995) and revised by Wilson et al (2009), the above potential gas sources would generally be classified as of very low to low gas generation potential, however, as the pits to the west are infilled with unknown materials they could have a higher gas generation potential.

Seven monitoring wells were installed as part of the previous investigation (HSP, 2022) as summarised in Table 2 below.

Table 2 - HSP Gas Well Installations

Well ID	Date of Installation	Response Zone depth	Response Zone Stratum
WS01	17/02/23	1 – 5m	Lowestoft Formation and Glaciofluvial Deposits
WS02	17/02/23	1 – 5m	Lowestoft Formation
WS03	17/02/23	1 - 5m	Lowestoft Formation and Glaciofluvial Deposits
WS04	16/02/23	1 – 5m	Glaciofluvial Deposits
WS09	24/02/23	1 – 2m	Glaciofluvial Deposits
WS10A	17/02/23	1 – 5m	Lowestoft Formation
WS11	15/02/22	1 – 5m	Glacial Fluvial Deposits

HSP, 2022 undertook four rounds of ground gas monitoring. They recorded concentrations of methane and carbon dioxide within WS02 and WS10A (located within the vicinity of the infilled valley), with a maximum steady state methane concentration of 10.6% and carbon dioxide concentration of 5.7%. Steady state gas flows were recorded ranging from 0.1l/hr to 4.9l/hr in WS02.

Methane concentrations within the remaining boreholes were below the limits of detection, together with Carbon Dioxide concentrations recorded between 0.3% and 4.5% and steady state gas flows recorded up to a maximum of 0.1l/hr.

The previous report indicated site is located within an area which has a low probability (less than 1% of properties above the action level) for Radon. Reference to current risk maps (www.ukradon.org), indicates this remains the case. No radon protection measures are considered necessary for any new dwellings on the site.

2.8 Preliminary Risk Evaluation & Plausible Pollutant Linkages

Review of the previous information (inc. HSP, 2021 and 2022), has identified a number of potential contamination linkages due to ground conditions or former operations either on, adjacent to, or in the vicinity of the site. These potential linkages will need to be later assessed and re-established using updated actual site data obtained from the ESP exploratory investigation.

2.8.1 Introduction to Risk Evaluation Methodology

The general methodology set out in CIRIA C552 Contaminated Land Risk Assessment – A Guide to Good Practice (Rudland et al, 2001), has been used to assess whether or not risks are acceptable, and to determine the need for collating further information or remedial action.

The assessment is a method of interpreting findings to date and evaluating risk. The methodology requires the classification of:

- The magnitude of the potential consequence (severity) of risk occurring (Table A1 in Appendix A):
- The magnitude of the probability (likelihood) of risk occurring (Table A2 in Appendix A).

The classifications defined above are then compared to indicate the risk presented by each pollutant linkage, allowing evaluation of a risk category (Tables A3 and A4 in Appendix A). These tables have been revised slightly by ESP from those presented in CIRIA C552, to allow for the circumstances where no plausible linkage has been identified and, therefore, no risk would exist.

The methodology described above has been used to establish Plausible Pollutant Linkages (PPL) based on the Conceptual Site Model generated for the site and proposed development, and to evaluate the risks posed by those linkages, using information known about the site, at this stage. This is presented as Table 3 in Section 2.8.2 below.

2.8.2 Tabulated Preliminary Risk Evaluation & Plausible Pollutant Linkages

Table 3 - ESP Preliminary Risk Evaluation & Plausible Pollutant Linkages (PPL) based on works to date

Source	Pathway	Receptor	Classification of Consequence	Classification of Probability	Risk Category	Further Investigation or Remedial Action to be Taken
Potential contaminants in shallow soils	Direct contact/ inhalation/ ingestion of contaminated soil or dust	Site Users	Medium – potential for chronic levels.	Low likelihood[2]	Moderate/Low Risk	Further sampling of near-surface soils to confirm levels of total contamination present. **Risks from asbestos assessed separately below.**
	Direct contact/ inhalation/ ingestion of contaminated soil or dust	Construction/ Maintenance Workers	Minor – standard PPE likely to be sufficient	Likely[2]	Low Risk	
	Leaching of soil contaminants	Impact on Groundwater	Medium – site lies on Secondary A Aquifer	Low likelihood[2]	Moderate/Low Risk	
	Leaching of soil contaminants	No Surface Water bodies within 250m	No Linkage			
Asbestos in existing buildings	Inhalation of fibres	Demolition Workers/ Ground Workers	Medium – potential for chronic levels	High Likelihood[3]	High Risk	Asbestos in existing building to be removed by licenced contractor.
Asbestos in shallow soils	Inhalation of fibres	Site Users/Construction/ Maintenance Workers	Medium – potential for chronic levels	High Likelihood[3]	High Risk	Sampling of shallow soils for asbestos inc. targeted investigation in area of suspected buried ACM.
Soil sulphate and pyrite	Aggressive groundwater	Buried Concrete	Mild – damage to structures	High likelihood[4]	Moderate Risk	Sampling of soils to confirm levels of sulphate, pH, and groundwater.
Hazardous ground gas/vapours	Asphyxiation/poisoning. Injury due to explosion.	Site Users/Visitors.	Severe – acute risk.	Likely[5]	High Risk	Install and monitor current and additional gas wells.
	Damage through explosion.	Building/Property	Severe – acute risk.		High Risk	
	Asphyxiation/poisoning. Injury due to explosion.	Construction and Maintenance Workers.	Severe – acute risk.		High Risk	
Radon gas	Migration into Buildings	Site Users	Medium – potential for chronic levels	Unlikely[6]	Low Risk	No radon protection measures required.

Notes:

1. Methodology and details of risk consequence, probability and category based on CIRIA C552 (2001) and presented in Section 2.8.1.
2. Made Ground is present however contamination levels are generally low. Isolated slight exceedances of arsenic and lead have been recorded. See Section 2.7.
3. An asbestos survey has confirmed the presence of asbestos in the existing building (Lucion Services, Ref: 502315).
4. No asbestos detected in eight samples of Made Ground tested. Anecdotal evidence indicates that buried ACM could be present near the east boundary. See Section 2.7.2.
5. The London Clay and superficial soils derived from/containing it can potentially contain sulphates/pyrite. See Section 2.6.5.
6. On an off-site sources of ground gas have been recorded and elevated levels of methane and carbon dioxide have been noted in the monitoring to date. See Section 2.7.3.
7. Radon risk identified in historic desk study. See Section 2.7.3.
8. The above risk evaluation is updated following the intrusive investigation and testing in Section 5.2.

3 Exploratory Investigation

3.1 Investigation Points

3.1.1 Introduction

The initial intrusive investigation was undertaken between 13th February and 3rd March 2023 with the supplementary phase being undertaken in June 2023. The works were undertaken in accordance with BS5930:2020 and were designed to further investigate both geo-environmental and geotechnical hazards. They comprised trial pitting, cable percussion boreholes, windowless sample boreholes, measurement of the correlated in-situ CBR value using DCP equipment, soakaway infiltration testing, gas and groundwater monitoring.

The exploratory holes were supervised and logged by an engineering geologist in general accordance with BS5930:2020, BS EN ISO 14688-1:2002, BS EN ISO 14688-2:2018, and BS EN ISO 14689:2018.

Descriptions and depths of the strata encountered are presented on the records in Appendix D to Appendix G.

The results of the in-situ testing and monitoring are presented in Appendix H to Appendix K. The investigation point positions are shown on Figure 2.

A Detailed UXO Risk Assessment has been undertaken by Zetica Limited (Ref: P11211-21-R1) which has concluded that the risk to the site from UXO is Low (November, 2021). No mitigation measures were required.

The ground levels on the investigation point records are predominantly based on the topographic survey provided by the Client and the coordinates of the investigation points were surveyed with a hand held GPS on completion.

3.1.2 Investigation Strategy

The initial investigation points were spread across the site to obtain additional information on the ground conditions present, particularly at the proposed structure locations. Selected investigation points were specified by the Client Design Team including locations of ground gas and groundwater monitoring wells.

Existing buildings, school operations (e.g. car parking) and buried services limited the accessibility of certain areas. Further investigation in these areas may be required during the phased demolition/construction of the proposed development.

Prior to the investigation, a member of the school staff outlined the areas of suspected buried ACM in the north east of the school. Whilst investigating this area, a local resident noted an additional area of hummocky ground extending northwards from where the school staff indicated, which may also contain buried ACM. Targeted investigation was undertaken in both areas (HP01 to HP04), supervised by an asbestos specialist. To minimise large-scale excavation of potential ACM, hand pitting was undertaken to investigate the shallow soils.

The supplementary investigation points were targeted in the footprint of the demountable classroom (BH201 and WS201 to WS205, WS209 and WS210) following the identification of a historic infilled valley and within the existing hardstanding court which was previously not investigated (WS206, WS207 and WS208)

3.1.3 Trial Pits

4no. trial pits (TP101 to TP104) were excavated across the site on 14th February 2023 using a wheeled, backacting hydraulic excavator. The trial pits were excavated to depths of between 1.5 and 2.1 m to undertake soakaway infiltration testing, see Section 7.8. The trial pit records are presented as Appendix E, and their positions are shown on Figure 2.

Disturbed samples were collected from the trial pits for laboratory testing as shown on the trial pit records.

On completion, the trial pits were backfilled with arisings in layers compacted with the excavator bucket. The arisings were left slightly proud of the adjacent surface to allow for future settlement.

3.1.4 Hand Excavated Trial Pits

11no. hand excavated trial pits were undertaken between 15th February and 1st March 2023 to between 0.25 and 1.2 m depth to investigate areas of potential buried ACM in the north east of the school, as indicated by school staff and local residents. The hand excavated pit records are presented in Appendix F.

HP08, HP09 and HP10 were terminated upon encountering a geotextile separator. HP02 and HP03 were progressed through the geotextile into the underlying soils.

On completion all pits were backfilled with arisings and topsoil reinstated.

3.1.5 Cable Percussion Boreholes

5no. cable percussion boreholes (BH101 to BH105) were constructed to depths between 16.9 and 25.0 m between 13th February and 3rd March 2023. BH102 and B105 did not reach the target depth of 25 m due to being able progress through very dense ground conditions.

BH201 was constructed on the 5th and 6th of June 2023 to a depth of 15m. The borehole was constructed to confirm the base of the Made Ground in the northwest corner of the proposed demountable footprint (which remained unproven in WS106).

The borehole records are presented as Appendix D, and their positions are shown on Figure 2.

At the commencement of each borehole, a square of the grass landscaping was cut and a service inspection pit was excavated by hand to a depth of 1.2 m. Where present, the surface tarmacadam was broken out using a hydraulic breaker prior to excavating the inspection pit.

100mm diameter thin wall (OS-T/W) open tube samples were collected from the fine-grained soils within the boreholes, where suitable, with a disturbed sample recovered from the open tube cutting shoe. Further small and large plastic tub and bag disturbed samples were obtained throughout the boreholes for identification and laboratory testing purposes, as shown on the borehole records.

Standard Penetration Tests (SPT) were carried out using either split spoon or solid cone, depending on the ground conditions present, in accordance with BS EN ISO 22476-3 (2005) and BS5930 (2020) to assess the relative density of the coarse-grained soils encountered in the borehole and to provide a correlated assessment of the likely undrained shear strength of fine-grained soils using relationships published by Stroud (1975). As required in BS5930:2020, the SPT N-values shown on the borehole records are the direct, uncorrected results obtained in the field.

In accordance with BS EN ISO 22476-3 (2005), SPT N-values in sandy soils need to be corrected for a number of aspects such as overburden pressure, rod length and rod energy ratio in sands.

Caution must be applied when using in-situ data collected using a solid cone: Much of the existing correlations using N-values obtained from Standard Penetration Tests rely on the energy imposed on a split-spoon sampler (SPT) and not a solid cone (SPT-C). The solid cone has a greater surface area and, therefore, imparts a lower energy per blow than the split-spoon sampler, and can result in an over-estimation of the true SPT N-value. Based on the relationship of energy inputs at the point of penetration (Thorburn 1986), it can be inferred that the equivalent SPT N-value for a test using a cone (SPT-C) is equal to:

$$\text{SPT N-value} = \frac{\text{SPT-C}}{1.869}$$

On completion, boreholes 103 and 104 were backfilled with arisings/bentonite, with the concrete/tarmacadam reinstated at the surface. Monitoring instrumentation was installed in boreholes 101, 102 and 105 as detailed in Section 4.2.

3.1.6 Windowless Sampling

6no. windowless sample drillholes (WS103 to WS108) were constructed between 15th and 16th February 2023 to depths between 3.0 and 5.0m. Whilst planned, WS101 and WS102 were unable to be completed in the south portion due to a lack of time.

10no. supplementary windowless sample drillholes (WS201 to WS210) were constructed between 12th and 14th June 2023 to depths between 3.0 and 5.0m.

The windowless sample drillhole records are presented as Appendix G, and their positions are shown on Figure 2.

A hydraulically powered rig was used to drive plastic lined sampling tubes into the ground, with the soil recovered within the tubes, which are then split to allow sampling and logging. Disturbed samples were obtained throughout the boreholes for identification and laboratory testing purposes, as shown on the borehole records. The windowless sampling provided generally good recovery to the depth of refusal. Poor recovery was occasionally noted at the base of the Made Ground in the area of the infilled valley (e.g. WS202 and WS203), possibly due to the presence of perched water.

At the commencement of each borehole, a square of the grass landscaping was cut and a service inspection pit was excavated by hand to a depth of 1.2m. Where present, the surface tarmacadam was broken out using a hydraulic breaker prior to excavating the inspection pit.

Standard Penetration Tests (SPT) were carried out using either split spoon or solid cone, depending on the ground conditions present, in accordance with BS5930 (2020) to assess the relative density of the coarse-grained soils encountered in the borehole and to provide a correlated assessment of the likely undrained shear strength of fine-grained soils using relationships published by Stroud (1975). As required in BS5930:2020, the SPT N-values shown on the borehole records are the direct, uncorrected results obtained in the field.

In accordance with BS EN ISO 22476-3 (2005), SPT N-values in sandy soils need to be corrected for a number of aspects such as overburden pressure, rod length and rod energy ratio in sands.

Monitoring instrumentation was installed in selected drillholes as detailed in Section 4.2. Where an installation was not constructed, the drillholes were backfilled with arisings/bentonite, with the concrete/tarmacadam reinstated at the surface (where necessary).

3.1.7 Soakaway Infiltration Testing

Soakaway infiltration tests were undertaken in general accordance with BRE Digest 365 (2016) in TP101, TP102 and TP104 . The results of the infiltration testing, and the calculated infiltration rates, are presented in Appendix J. It was proposed to undertake a infiltration test within TP103, however, due to accessibility issues with the water bowser, this could not be undertaken.

At each position, the test pit was excavated to between 1.5 to 2.1m. Clean water was added from a towed bowser and the water level monitored as it percolated into the soil.

The infiltration rate was calculated from the time taken for the water to fall between the 75% and 25% full level. However, where the water level only dropped marginally during the available test period, we consider that there is insufficient data to allow a valid extrapolation with any confidence and no infiltration rate can be estimated.

Herras fencing was erected around the test pits during the testing to protect site workers/ the general public. On completion of the testing in each pit, any remaining water was removed from the test pit and it was backfilled with the excavated arisings.

3.1.8 Dynamic Cone Penetration (DCP) Testing

CBR testing using the TRL approved dynamic cone penetrometer (DCP) was undertaken at 4no. positions (CBR1 to CBR4) between 20th and 21st February 2023. The test positions are shown on Figure 2, and test results are presented in Appendix K. The DCP testing was undertaken from the existing ground surface with no service pit excavated. Appropriate precautions were taken during the testing to ensure the safety of ESP operatives.

The DCP test involves the fall of a fixed weight over a fixed height to force a 20mm diameter, 60º cone into the near surface soils. The depth of penetration for varying numbers of blows is recorded and is then converted to a CBR value using well established empirical correlations (Highways Agency, 2008). In general, the tests were undertaken between the existing ground surface and 0.9m below ground level, thus providing a profile of correlated CBR values within the near-surface soils. No water was added to the soils prior to testing, so they were in their natural condition. The correlated CBR values are also shown on the test result sheets in Appendix K.

3.2 Instrumentation

3.2.1 Gas and Groundwater Well Installations

A 50mm diameter monitoring well was installed in selected boreholes in accordance with BS8576:2013 in order to allow monitoring of hazardous ground gases. The wells, comprising slotted plastic pipe with a gravel surround (the response zone), bentonite seals above the response zone, and a lockable vandal proof cover, were installed as detailed on the borehole records and summarised in Table 4 below.

Table 4 - ESP Gas Well Installations

Well ID	Date of Installation	Response Zone depth	Response Zone Stratum
Initial ESP Monitoring Installations (February and March 2023)			
WS103	17/02/23	1 – 3 m	Glaciofluvial Deposits
WS104	17/02/23	1 – 3 m	Glaciofluvial Deposits
WS105	17/02/23	1 – 4 m	Made Ground and Lowestoft Formation
WS106	16/02/23	1 – 5 m	Made Ground
BH101	24/02/23	4.8 – 18.8 m	Glaciofluvial Deposits
BH102	17/02/23	1.0 – 14.5 m	Possible Made Ground, Lowestoft Formation and Glaciofluvial Deposits
BH105s	03/03/23	1 – 5 m	Made Ground and Glaciofluvial Deposits
BH105d		16 – 21 m	Glaciofluvial Deposits and London Clay Formation.
Supplementary Monitoring Installations (June 2023)			
BH201	06/06/23	1 – 5.5m	Made Ground and possible re-worked natural deposits
WS201	12/06/23	1 – 5m	Made Ground and Lowestoft Formation
WS202	13/06/23	0.5 – 4.6m	Made Ground
WS204	13/06/23	1 – 3m	Made Ground and Lowestoft Formation

Notes:
1. Details of each monitoring well are presented on the individual borehole records (Appendix D and G).

In addition to the ESP installations, the following locatable and functional historic installations were monitored as part of the ESP works (see Table 2 and Appendix C for further details):

- WS01;
- WS09;
- WS10A; and
- WS11

3.2.2 ESP 'Spot' Gas Monitoring

6no. initial 'spot' monitoring visits (periodic visits to monitor gas levels at the time of the visit) were undertaken of the ESP and the functional historic wells between 13th of March and 6th June 2023. The historic wells were not monitored on the first visit.

Following installation of supplementary wells in the area of the infilled valley (June 2023), 1no. supplementary spot visit was undertaken on 3rd of July and the monitoring regime was completed with two high frequency visits undertaken on the 18th and 19th of July.

During each visit, Gas Data LMSxi G3.18e portable monitoring equipment was used to measures levels of the following ground gases within the airspace in the wells and the flow rates from the wells:

- Methane - total and percentage of Lower Explosive limit (LEL);
- Carbon dioxide;
- Oxygen; and
- Hydrogen sulphide.

The percentage of nitrogen is also calculated by difference. The equipment uses infra-red methane (CH_4) and carbon dioxide (CO_2) detectors, coupled with pressure (barometric and well), temperature and flow sensors. A photo-ionisation detector (PID) was used during the monitoring to measure the levels of volatile organic compounds present in the well.

Following measurement of gas levels and flow rates, the well cap was removed, and groundwater levels were measured using a dipmeter from the site surface.

3.3 Sampling Strategy

3.3.1 Soil Sampling

Soil samples were collected from the exploratory holes as discussed in the previous sections. The sampling procedures were selected on the basis of the suitability for the laboratory testing proposed (see Sections 3.5 and 3.6).

A non-targeted, random sampling strategy was generally used to obtain representative information on soil contamination across the site as a whole. Targeted sampling of the Made Ground was undertaken in the northeast of the site to assess the potential asbestos contamination suggested by anecdotal evidence pre-commencement and during the works.

As part of the supplementary phase, targeted samples were collected of the tarmacadam layer forming the existing hardstanding court. In addition, additional samples of Made Ground were collected from the area of the infilled valley for asbestos screening and WAC testing.

Environmental samples (denoted as ES on the exploratory holes records) were collected for possible geo-environmental laboratory testing and generally comprised a plastic tub, an amber glass jar and an amber glass vial. The sample containers provided clean by the testing laboratory appropriate for the proposed testing to be scheduled. Immediately after collection the samples were placed in sealed cool boxes with ice packs where they remained during storage and transport to the laboratory.

Samples for logging and geotechnical laboratory testing purposes were collected at regular intervals within the exploratory holes.

3.3.2 Groundwater Sampling

To inform the sulphate risks (see Section 4.7), samples of groundwater were collected from the installed wells on 18th April and the 22nd May 2023 in general accordance with BS ISO 5667-11 (2009). Prior to sampling, the wells were purged by the removal of three well volumes where practical, to obtain a water sample representative of the groundwater.

All groundwater samples taken for possible laboratory chemical analysis were collected in suitable clean containers provided by the testing laboratory for (e.g. clean polyethylene jars/bottles with fitted lids for routine soil testing, clear or amber glass bottles with screw on air-tight caps for organic contaminants, glass vials for volatile contaminants, etc.). Immediately after collection the samples were placed in sealed cool boxes with an ice pack where they remained during storage and transport to the laboratory.

3.4 Evidence of Site Contamination Found During Site Works

No obvious visual/olfactory evidence of contamination was identified in the investigation points.

Made Ground was generally thin (less than 1m) across the south portion where the existing school is present. However, greater thicknesses of between around 2 m and 5 m were recorded in the fields to the north in the infilled valley. The base of the Made Ground was unproven in WS106 which is in the general vicinity of the lowest historic elevation within the former valley (see Insert 3). The thicker

Made Ground in the infilled valley generally consisted of re-worked natural soils with fragments of man-made materials and organic layers (including possible Relict Topsoil at the base).

No obvious visual evidence of ACM was noted by ESP or the specialist during their attendance.

In the area of suspected buried ACM in the north east, demolition rubble was noted in the south at shallow depth (e.g. HP01 and HP04). In the north, a Topsoil layer (with brick, concrete, porcelain fragments) overlayed a membrane and was followed by re-worked natural soils with some rubble (e.g. brick and concrete). The membrane was not encountered in some pits.

3.5 Geotechnical Laboratory Testing

Geotechnical laboratory testing was undertaken on samples from the suitable quality classes recovered from the exploratory holes in order to obtain information on the geotechnical properties on the soils beneath the site.

The following tests were undertaken by a UKAS accredited laboratory on samples selected by ESP in accordance with the methodologies presented in BS1377:1990. The results are presented in Appendix L.

- Natural moisture content.
- Atterberg limits.
- Particle size analysis.
- Oedometer consolidation.
- Quick undrained triaxial (undrained shear strength).

Selected samples were also analysed for soil sulphate and pH value in accordance with the analytical methods specified in BRE Special Digest SD1 (BRE, 2005). The results of the sulphate testing are included with the geo-environmental test results in Appendix M.

3.6 Geo-environmental Laboratory Testing

Laboratory testing has been undertaken as both phases to identify the levels of selected contaminants within samples of soil.

The geo-environmental analyses were carried out by a UKAS accredited testing laboratory with detection limits being generally compatible with the relevant guideline values adopted in the assessment (see Section 4.4).

3.6.1 Soil Samples

3.6.1.1 ESP (February and March 2023)

A total of 6no. selected samples of the general Made Ground from across the site have been analysed for a range of determinands typically present on brownfield sites in the UK. The general suite of geo-environmental laboratory testing undertaken comprised:

- Arsenic, barium, beryllium, boron, cadmium, total chromium, chromium VI, copper, lead, mercury, nickel, selenium, vanadium, zinc;
- US EPA 16 polyaromatic hydrocarbon (PAH) compounds;
- Total monohydric phenols;
- Total cyanide, asbestos qualitative screen (presence or absence);
- Soil organic content, pH value.

3no. of the samples of general Made Ground were also tested for petroleum hydrocarbons (CWG ali/aro carbon banded C_5 to C_{35}).

A further 9no. samples of general Made Ground were screened for presence of asbestos.

The geo-environmental soil test results are presented in Appendix M and asbestos quantification results in Appendix N.

3.6.1.2 ESP (June 2023)

As part of the supplementary phase, 4no. selected samples of the Made Ground from beneath the existing hardstanding court and 3no. samples of the tarmacadam surface have been analysed. The suite of geo-environmental laboratory testing undertaken comprised:

- Arsenic, barium, beryllium, boron, cadmium, total chromium, chromium VI, copper, lead, mercury, nickel, selenium, vanadium, zinc (except tarmacadam from W207 at 0.1m);
- US EPA 16 polyaromatic hydrocarbon (PAH) compounds;
- Coronene (three tarmacadam samples only);
- Petroleum hydrocarbons (CWG ali/aro carbon banded C_5 to C_{35}) – except tarmacadam from WS207 at 0.1m.
- Total monohydric phenols;
- Total cyanide, asbestos qualitative screen (except tarmacadam from W207 at 0.1m);
- Soil organic content, pH value (except tarmacadam from W207 at 0.1m).

A further 8no. samples of general Made Ground were screened for presence of asbestos in the area of the infilled valley (proposed footprint of the demountable classroom and beneath the existing hardstanding court).

The geo-environmental soil test results are presented in Appendix P.

3.6.2 Soil Testing in Area of Suspected Buried ACM (February and March 2023)

The hand pits undertaken to investigate the areas of potential buried ACM, in some cases, identified a placed Topsoil overlying a geotextile membrane followed by Made Ground, indicating a potential soil capping layer.

8no. samples from above the membrane or in shallow soils where the membrane was not proven, were scheduled for the suite of geo-environmental testing outlined above including petroleum hydrocarbons (CWG ali/aro carbon banded C_5 to C_{35}) to assess its contamination status.

An additional 15no. samples were also screened for presence of asbestos above and below the geotextile (or where it was not proven).

The geo-environmental soil test results are presented in Appendix M and asbestos quantification results in Appendix N.

3.6.3 Leachate Samples – Tarmacadam (June 2023)

To inform the assessment of the re-use potential of the tarmacadam in the court area (to be undertaken by others), leachate analysis for monohydric phenol was undertaken on 3no. samples of tarmac from WS206, WS207 and WS208. The results are presented in Appendix P.

3.6.4 Waste Acceptance Criteria (WAC) Testing (June 2023)

To assess the disposal options for the site arisings in term of landfill, the soils have been classified in terms of hazardous/inert waste by analysing leachate generated from six samples of Made Ground soils and 3no. samples of tarmacadam, likely to require excavation and removal from the site, in accordance with the Landfill Directive (2004) – Waste Acceptance Criteria (WAC) testing.

Leachate generated from the soils (at 10:1 concentration) were analysed for the following determinands:

- Total organic carbon, loss on ignition, pH, acid neutralisation capacity, total dissolved solids, dissolved organic carbon.
- BTEX, PCBs (7 congeners), mineral oil (C_{10}-C_{40}), PAHs, phenol index.
- Arsenic, barium, cadmium, chromium, copper, mercury, molybdenum, nickel, lead, antimony, selenium, zinc.
- Chloride, fluoride, sulphate (as SO_4).

The results of the WAC testing are presented in Appendix P.

3.6.5 Groundwater Sulphate Testing

Samples of groundwater have been obtained during gas monitoring visit to assess concentrations of groundwater sulphate (Sulphate as SO4).

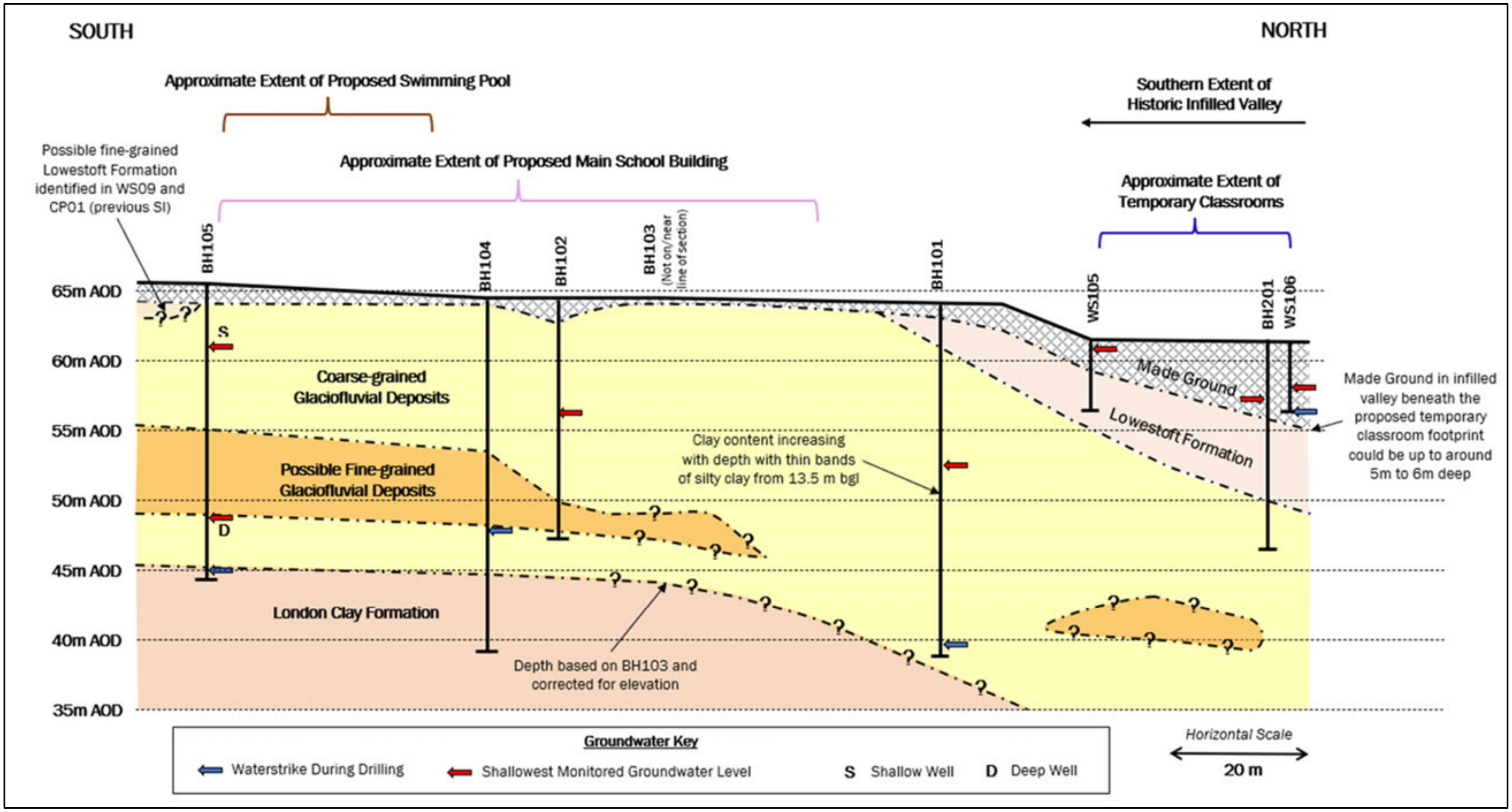
3no. samples were collected and tested from BH101, WS10A and WS106 on the 18th April 2023 and 3no. samples were collected and tested from BH101, BH102 and BH105d on the 22nd of May 2023.

The results are presented in Appendix O.

4 Development of the Revised Conceptual Model

4.1 Conceptual Ground Model - Geology

The exploratory holes have identified the site to be generally underlain Made Ground, Lowestoft Formation, Glaciofluvial Deposits and London Clay Formation. These strata are discussed in more detail in the following sections and a conceptual model is presented as Insert 4.



Insert 4 – Conceptual Ground Model based on information to date. All measurements are approximate and scales are as shown. See Figure 2 for line of section.

4.1.1 Made Ground

4.1.1.1 General (South Portion)

In the south portion where the existing school is present the Made Ground was generally less than 1m thick. It generally consisted of a layer of Topsoil or tarmacadam followed by re-worked natural deposits with fragments of man-made material (e.g. brick and concrete) or coarse grained layers including tarmac, concrete, brick and porcelain.

The area of general Made Ground is indicated on Figure 2.

4.1.1.2 Former Infilled Valley (North of the School)

Made Ground was recorded between 1.6m and in excess of 5 m in the fields to the north of the school. The deeper Made Ground increases in thickness to the north and west and correlates with an infilled historic valley in the central/northern portion of the site (see Figure 2). The base of the Made Ground was unproven in WS106 which is nearest to the approximate lowest historic elevation within the former valley (see Insert 3 and 4). BH201 constructed close to WS106 recorded Made Ground to 4.5m, with possible re-worked natural soils to a depth of 5.5m.

The thicker Made Ground in the infilled valley generally consisted of very soft to firm, fine grained re-worked natural soils (probable Lowestoft Formation) with fragments of man-made materials (e.g. brick and concrete) and localised dark grey to black organic layers (including possible Relict Topsoil layers at the base of the fill in some investigation points). Localised coarse grained layers were also noted. A tree was identified in the base of TP101 (see Insert 5).

Insert 5 - Tree in the base of TP101.

Due to the Made Ground consisting of re-worked natural soils, the boundary with the underlying natural Lowestoft Formation was difficult to discern and localised poor recovery of the soils at the interface (possibly due to perched water) further reduced the accuracy locally (e.g. WS202, WS203 and WS210). This is likely why the likely Made Ground encountered during the historic investigation in WS02 and WS03 (HSP, 2022) was described as natural soils.

ESP Field SPT ‘N’ values of between 0 and 23 (mean of 7) have been recorded in the Made Ground in this area. An SPT plot for the investigation points in the footprint of the proposed temporary classroom in this area is presented in Appendix H.

4.1.1.3 Area of Suspected Buried ACM

In the southern portion of this area (HP01, HP04 and HP05), the Made Ground consisted of a thin Topsoil (between 0.1m and 0.2m thick) followed by a mix of natural soils and demolition rubble (inc. brick, concrete, porcelain) including cobbles of brick and concrete.

Insert 6 - View of ground conditions and arisings in HP04.

The surface was noted to be hummocky to the north which suggested that some earthworks had occurred. The Made Ground consisted of a Topsoil layer (with brick, concrete, porcelain fragments) overlying a geotextile followed by re-worked natural soils with some rubble (e.g. brick and concrete) and other man made materials (e.g. slag, metal and plastic).

The geotextile was present in 5no. hand pits (HP02, HP03, HP08, HP09 and HP10) at depths of between 0.25m and 0.6m. HP02 and HP03 were progressed through the geotextile (see Insert 7). The geotextile was not encountered in HP06, HP07 and HP11 to depths of between 0.8m and 1.0m.

Insert 7 - View of ground conditions and arisings in HP03. Note the geotextile at around 0.4 m bgl in the left picture.

4.1.2 Probable Lowestoft Formation

Locally present beneath the Made Ground, the Lowestoft Formation generally comprised firm to stiff grey mottled orange brown gravelly sandy silty clay with clasts of chalk and flint. It was identified in the south (in the previous investigation) to around 1 to 2m and thicknesses increased to the north, with the base unproven to 5m in many of the exploratory holes in the area of the former valley. The base of the Lowestoft was proven in BH201 in the northwest corner of the proposed temporary classroom footprint at a depth of around 12m.

The Lowestoft Formation may also be present locally as a coarse grained soil, possibly consisting of a silty gravelly sand with fragments of chalk to 6.3m in BH102.

Insert 8 - View of fine-grained Lowestoft Formation in TP102

ESP Field SPT N-values in the fine grained probable Lowestoft Formation varied between 5 and 35 (mean of 18). Possibly re-worked soils or coarse grained soils have not been included.

Laboratory testing within the Lowestoft Formation indicated liquid limits between 28 and 60%, plasticity indices between 16 and 41%, and natural moisture contents between 8.9 and 26%. The modified plasticity indices (after the coarse-grained particles have been removed) suggest that the soils are generally of low to medium shrinkage and swelling potential and would be classified as clays of low to high plasticity (CL to CH).

Triaxial testing recorded, measures an undrained shear strength of 49kPa for a shallow sample of Lowestoft Formation from BH103 at its current overburden pressure. Oedometer testing indicates that the shallow fine grained Lowestoft Formation has medium to high compressibility at current overburden pressures.

4.1.3 Glaciofluvial Deposits

Glaciofluvial Deposits were present beneath the Made Ground and probable Lowestoft Formation (where present) to between around 18.0 m to in excess of 25 m depth (BH101).

It was variable in composition mainly comprising coarse grained soils (sands and gravels) with deeper bands of gravelly clay (previously identified as Lowestoft Formation but included in the Glaciofluvial Deposits in this report).

Field and design SPT N-values ranged between 0 and 50. Reduced values were encountered in the sand dominant deposits, where coarser soils were absent (see Appendix G).

Particle size analyses within the laboratory have indicated this layer to mainly comprise between 0 and 90% gravel, between 6 and 88% sand, and with between 1 and 81% fines (clay/silt). Based on our observations on site, these proportions would appear representative of the mix of in-situ soils, which are described below.

4.1.3.1 Sand Layers

The sand dominant layers generally comprised occasionally slightly gravelly to gravelly, slightly to very silty/clayey, sands with thin bands of silt/clay.

During progression of the boreholes, running/blowing sands were noted in these layers.

4.1.3.2 Gravel Layers

Silty, sandy, gravel bands were present in the upper and lower portions of the glaciofluvial deposits. Generally medium dense to dense, locally loose.

Insert 9 - View of coarse grained Glaciofluvial Deposits in TP104.

4.1.3.3 Clay Layers

Encountered in CP01, CP02, BH102, BH104 and BH105 at depths of between around 11 and 17m, as 1m to 6m thick layer firm to stiff, locally soft, gravelly silty clay within the glaciofluvial deposits. The clay layer was generally overlain by the sand-dominant deposits and underlain by a gravel band before then going into the London Clay Formation below. The gravelly clay layer appeared to be absent from BH101 and CP03 at the north extent of the current school (see Insert 4), however an increase in clay content and thin clay bands were noted in BH101 below around 13.5 m bgl.

Field SPT N-values in the clay layer varied between 18 and 50.

Laboratory testing within the fine-grained Glaciofluvial Deposits indicated liquid limits between 31 and 47%, plasticity indices between 17 and 31%, and natural moisture contents between 13 and 19%. The modified plasticity indices (after the coarse-grained particles have been removed) suggest that the soils are generally of low/medium shrinkage potential and would be generally classified as clays of low to intermediate plasticity (CL to CI).

Triaxial testing recorded, measured undrained shear strength of between around 44kPa and 220kPa at current overburden pressures. Oedometer testing indicates that the fine grained Glaciofluvial Deposits has a low to medium compressibility at current overburden pressures.

4.1.4 London Clay Formation

Encountered in boreholes BH103, BH104 and BH105 the London Clay Formation was identified from between 18 to 19.7 m depth and was not fully penetrated in any of the boreholes where encountered (>25m). The London Clay Formation generally comprised stiff to very stiff silty clay with occasional fine sand-sized selenite crystals. BH05 encountered a layer of very dense claystone from 19.8 m depth to in excess 21 m depth and was unable to progress beyond it. BH101 did not obviously encounter the London Clay formation to a depth of 25m (see Insert 4), which suggests the depth to the formation increases to the north.

Field SPT N-values in the London Clay Formation generally varied between 27 and 37. The claystone band encountered in the base of BH105 recorded an uncorrected N-value of >50.

Laboratory testing within the London Clay Formation indicated liquid limits between 51 and 66%, plasticity indices between 29 and 39%, and natural moisture contents between 25 and 31%. The modified plasticity indices (after the coarse-grained particles have been removed) suggest that the soils are generally of medium shrinkage potential and would be generally classified as clays of high plasticity (CH).

Triaxial testing recorded, measured undrained shear strength of between around 130kPa and 230kPa at current overburden pressures. Oedometer testing indicates that the fine grained London Clay Formation has a low to medium compressibility at current overburden pressures.

4.2 Conceptual Ground Model - Hydrogeology

The groundwater conditions identified in the ESP investigation are summarised in Table 9 below:

Table 5 - Summary of Groundwater Ingress in the Investigation

Hole ID	Stratum	Comment on groundwater encountered
WS106	Made Ground	Strike at 5m.
BH101	Glaciofluvial Deposits	Potential groundwater strike during SPT at 24 m, water added by the driller in the borehole rose from 18.6 m to 6.0 m depth.
BH104	Glaciofluvial Deposits	Strike at 16.1 m rising to 14.95 m depth after 20 minutes.
BH105	London Clay Formation	Strike at 19.8 m depth.
WS202	Made Ground	Groundwater struck between 4 and 5m near the base of the Made Ground. Water level was standing at 3.5m on completion.
WS203	Made Ground	Groundwater struck between 3 and 4m near the base of the Made Ground. Water level was standing at 2.4m on completion.
WS209	Lowestoft Formation	Groundwater struck between 4 and 5m near the base of the Made Ground. Water level was standing at 4.0m on completion.
WS210	Made Ground	Groundwater struck between 4 and 4.5m near the base of the Made Ground. Water level was standing at 4.4m on completion.

Notes:
1. Full details of groundwater ingress presented on exploratory hole records in Appendix D and G.

No groundwater was encountered in the remainder of the exploratory holes during construction. It should be noted that water was added during the drilling of the cable percussion boreholes and this may have obscured waterstrikes.

Two round of groundwater monitoring have been completed at the time of writing this report and the results are summarised in Table 6 below.

Table 6 - Summary of Groundwater Monitoring (Two Visits Undertaken to Date)

Hole ID	Response Zone depth	Response Zone Stratum	Monitored Groundwater Levels (m bgl)	Number of Visits
BH101	4.8 – 18.8 m	Glaciofluvial Deposits	11.35 – 14.44	9
BH102	1.0 – 14.5 m	Possible Made Ground, Lowestoft Formation and Glaciofluvial Deposits	8.41 – 8.49	9
BH105 (shallow)	1 – 5 m	Made Ground and Glaciofluvial Deposits	4.49 – 5.03	9
BH105 (deep)	16 – 21 m	Glaciofluvial Deposits and London Clay Formation.	16.47 – 16.5	9
WS103	1 – 3 m	Glaciofluvial Deposits	Dry	9
WS104	1 – 3 m	Glaciofluvial Deposits	Dry	9
WS105	1 – 4 m	Made Ground and Lowestoft Formation	0.83 – 1.55	9
WS106	1 – 5 m	Made Ground	3.09 – 4.88	9
WS01	1 – 5 m	Lowestoft Formation and Glaciofluvial Deposits	4.87 – 4.95	6[4]
WS09	1 – 2 m	Glacial Fluvial Deposits	Dry	7
WS10A[1]	1 – 5 m	Lowestoft Formation	2.19 – 4.04	8
WS11[1]	1 – 5 m	Glacial Fluvial Deposits	4.52 – Dry	7[3]
BH201	1 – 5.5m	Made Ground and possible re-worked natural deposits	4.13 – 4.22	3
WS201	1 – 5m	Made Ground and Lowestoft Formation	Dry	3
WS202	0.5 – 4.6m	Made Ground	3.36 – 3.48	3
WS204	1 – 3m	Made Ground and Lowestoft Formation	2.59 – Dry	3

Notes:

1. Wells from previous investigation that could be located during the ESP monitoring visits.
2. Based on the historic filled valley and the presence of organic layers we consider that a proportion of the stratum encountered could be Made Ground.
3. Water level not recorded during Visit 3 (18/04/2023).
4. Unable to remove bung to allow monitoring of the groundwater level during Visit 6 (06/06/2023).

Based on the above findings and the Conceptual Ground Model, we consider that the main groundwater body beneath the site is within the deeper glaciofluvial deposits/upper London Clay. Localised perched water bodies also appear to be present within the Made Ground in the area of the infilled valley or locally within the superficial deposits due to permeability contrast in the nature of the soils.

4.3 Site Instability

4.3.1 Global Site Stability

No evidence was identified of potential landslides or unstable ground in the Preliminary Geotechnical Risk Register and we identified no evidence of any existing global instability issues on the site.

The positioning of the temporary classroom will need to consider the stability of the slope on the west boundary, which consists of low strength, variable, unconsolidated Made Ground with layers of organic material (see Section 7.2.4).

4.3.2 Excavation Stability

During the excavation of TP103 and TP104, spalling of the sidewalls was noted where excavation progressed through coarse-grained soils of the Glaciofluvial Deposits.

Blowing/Running sands were noted within the boreholes when progressing through the Glaciofluvial Deposits.

Instability may also occur if water is introduced to the excavation.

4.4 Chronic Risks to Human Health – Generic Assessment of Risks

4.4.1 Assessment Methodology

The long-term risks to health have been assessed using methodologies and frameworks determined by the Environment Agency within documents SR2, SR3, SR4 and the CLEA Technical Review published to support the Contaminated Land Exposure Assessment Model (CLEA). Where applicable, reference has been made to the supporting toxicological reports (TOX Series) and the Soil Guideline Value reports (SGV Series). It is assumed that the reader is familiar with the above documents and it is not intended to repeat these described methodologies in detail, for further information, please refer directly to the specific documents.

In order to provide an initial 'screen' to identify elevated levels of contaminants, a Generic Quantitative Risk Assessment (GQRA) has been undertaken using the most appropriate Generic Assessment Criteria (GAC) determined by assessment of exposure frequency/duration relevant to the critical receptor.

4.4.2 Assessment Criteria

In 2013, CL:AIRE published the Category 4 Screening Levels (C4SL – CL:AIRE, 2013) for use in Part 2A determinations. The C4SL are designed to be more pragmatic, but still strongly precautionary, assessment criteria compared to the previous assessment criteria (SGV – see below) used to assess chronic human health risks. The C4SL have been calculated for a limited number of contaminants at this stage, and range of land uses including residential, commercial and public open space, but are based on a 'low level' of risk rather than the 'minimal level' of risk adopted by the Environment Agency in preparing their Soil Guideline Values (SGV). The C4SL have also only been published for a limited number of contaminants commonly identified in contaminated land risk assessments at present (arsenic, cadmium, chromium VI, lead, benzene, benzo[a]pyrene). However, the C4SL have been published for a range of land uses, including residential, commercial, allotments and two types of public open space.

The C4SL are designed for use in deciding whether land is suitable for use and definitely not contaminated, and DEFRA and the Welsh Government have recommended that they be used in assessing human health risks during the planning regime (i.e. as part of standard development investigations). The Welsh Local Government Association and Natural Resources Wales (WLGA/NRW) have confirmed that, 'where the site conditions are applicable to the land use scenarios adopted in their calculation, the C4SL levels can be used as screening tools' for development site risk assessments (WLGA/NRW, 2017). The C4SL have also been accepted by the NHBC for use as generic screening levels on residential developments in England and Wales (NHBC, 2014). Given this, where available and applicable, the C4SL have been adopted as the Generic Assessment Criteria in this assessment.

Where no C4SL is currently available, the Suitable For Use Levels (S4ULs) published in January 2015 by the Chartered Institute of Environmental Health (CIEH) and Land Quality Management (LQM) (Nathanail et al, 2015) have been adopted. These assessment criteria adopt updated toxicological data and exposure models, and the same 'minimal level' of risk as the SGV (i.e. unlike the C4SL). The S4ULs have been published for a large number of contaminants typically found on brownfield sites in the UK, and for the same range of land uses as the C4SL, i.e. including public open space scenarios.

Where no C4SL or S4UL is available, the Soil Guideline Values (SGV) published by the Environment Agency have been adopted as the Generic Assessment Criteria (GAC) – note several SGV have been withdrawn since originally published. However, the SGV are only available for a limited number of contaminants for three proposed land uses (residential, commercial and allotments – and not public open space).

For more exotic, predominantly organic, compounds no SGV, S4UL or C4SL assessment criteria have been published. In this instance, GAC published by CL:AIRE and the Environmental Industries Commission (CL:AIRE/EIC, 2010) have been adopted. These GAC have also been developed using the CLEA UK software based on a 'minimal level' of risk and for the same land use scenarios as the SGVs (i.e. not public open space).

Details of the Generic Assessment Criteria (GAC) adopted for each contaminant are presented on the assessment tables in the following section.

The proposed development comprises the redevelopment of the school with associated areas of hardstanding and landscaping. There are currently no GAC published for such an end use. At the Client's request, we have adopted the conservative GAC for residential without homegrown produce for the assessment.

The GAC for most organic compounds are dependent on the organic content of the soil. For the purposes of this assessment, GAC for a soil organic content of 1% has been adopted. This is considered a conservative approach for the majority of the soils at the site.

4.4.3 Generic Quantitative Risk Assessment

The samples analysed for soil contaminants comprised ten samples of Made Ground from across the site and eight shallow soil samples taken from hands pits in the area of suspected buried ACM. The risks from asbestos are considered further in Section 4.4.4.

3no. samples of the tarmacadam were also tested (WS206 at 0.1m, WS207 at 0.1m and WS208 at 0.1m), however these have not been included in the below assessment. We understand the re-use potential of the tarmacadam is being assessed by others.

The results of the Generic Quantitative Risk Assessment for the proposed development are presented in Table 7 below. It should be appreciated that if the development were to change, the following assessment should be reviewed and, if necessary, updated.

Table 7 - Generic Assessment of Human Health Risks - Residential Without Homegrown Produce

Determinand	Range Recorded – General Made Ground (10no. samples)	Range Recorded – Area of Suspected Buried ACM (8no. samples)	GAC	Source of GAC	Exceedances
Metals and Semi-metals					
Arsenic	3.4 – 15 mg/kg	10 – 19 mg/kg	40 mg/kg	C4SL[2]	No exceedances
Barium	20 – 440 mg/kg	58 – 130 mg/kg	1,300 mg/kg	CL:AIRE/EIC[5]	No exceedances
Beryllium	<0.2 – 0.8 mg/kg	0.5 – 0.8 mg/kg	1.7 mg/kg	S4UL[4]	No exceedances
Boron	<0.2 – 1.2 mg/kg	0.3 – 1.2 mg/kg	11,000mg/kg	S4UL[4]	No exceedances
Cadmium	<0.1 – 0.3 mg/kg	0.1 – 0.3 mg/kg	87 mg/kg	C4SL[2]	No exceedances
Chromium (total)[7]	3.6 – 24 mg/kg	16 – 25 mg/kg	910 mg/kg	S4UL[4]	No exceedances
Chromium (hexavalent)	<1.0 mg/kg	<1.0 mg/kg	6.1 mg/kg	C4SL[2]	No exceedances
Copper	6.3 – 35 mg/kg	24 – 97 mg/kg	7,100 mg/kg	S4UL[4]	No exceedances
Lead	11 – 340 mg/kg	24 – 130 mg/kg	310 mg/kg	C4SL[2]	1no. out of 14no. (General Made Ground)
Mercury[8]	<0.05 – 3.3 mg/kg	0.05 – 0.18 mg/kg	56 mg/kg	S4UL[4]	No exceedances
Nickel	5.5 – 25 mg/kg	15 – 23 mg/kg	180 mg/kg	S4UL[4]	No exceedances
Selenium	<0.5 mg/kg	<0.5 mg/kg	430 mg/kg	S4UL[4]	No exceedances
Vanadium	8.3 – 44 mg/kg	33 – 50 mg/kg	1,200 mg/kg	S4UL[4]	No exceedances
Zinc	13 – 350 mg/kg	58 – 120 mg/kg	40,000 mg/kg	S4UL[4]	No exceedances
Polyaromatic Hydrocarbons (PAH)					
Acenaphthene	<0.03 – 0.07 mg/kg	<0.03 – 0.12 mg/kg	3000 mg/kg	S4UL[4,9]	No exceedances
Acenaphthylene	<0.03 – 0.04 mg/kg	<0.03 - 0.03 mg/kg	2900 mg/kg	S4UL[4,9]	No exceedances
Anthracene	<0.03 – 0.24 mg/kg	<0.03 – 0.28 mg/kg	31,000 mg/kg	S4UL[4,9]	No exceedances
Benzo(a)anthracene	<0.03 – 1.2 mg/kg	<0.03 – 1.2 mg/kg	11 mg/kg	S4UL[4,9]	No exceedances
Benzo(a)pyrene	<0.03 – 1.2 mg/kg	<0.03 - 0.85 mg/kg	2.5 mg/kg	C4SL[2,9]	No exceedances
Benzo(b)fluoranthene	<0.03 – 1.5 mg/kg	<0.03 – 1.1 mg/kg	3.9 mg/kg	S4UL[4,9]	No exceedances
Benzo(ghi)perylene	<0.03 – 0.51 mg/kg	<0.03 – 0.38 mg/kg	360 mg/kg	S4UL[4,9]	No exceedances
Benzo(k)fluoranthene	<0.01 – 0.58 mg/kg	<0.03 – 0.54 mg/kg	110 mg/kg	S4UL[4,9]	No exceedances
Chrysene	<0.03 – 1.3 mg/kg	<0.03 – 1.2 mg/kg	30 mg/kg	S4UL[4,9]	No exceedances
Dibenzo(a,h)anthracene	<0.03 – 0.12 mg/kg	<0.03 – 0.09 mg/kg	0.31 mg/kg	S4UL[4,9]	No exceedances
Fluoranthene	<0.03 – 3.2 mg/kg	<0.03 – 3.8 mg/kg	1,500 mg/kg	S4UL[4,9]	No exceedances
Fluorene	<0.03 – 0.1 mg/kg	<0.03 – 0.1 mg/kg	2,800 mg/kg	S4UL[4,9]	No exceedances
Indeno(123-cd)pyrene	<0.03 – 0.47 mg/kg	<0.03 – 0.31 mg/kg	45 mg/kg	S4UL[4,9]	No exceedances
Naphthalene	<0.03 mg/kg	<0.03 mg/kg	2.3 mg/kg	S4UL[4,9]	No exceedances
Phenanthrene	<0.03 – 1.7 mg/kg	<0.03 – 1.7 mg/kg	1,300 mg/kg	S4UL[4,9]	No exceedances
Pyrene	<0.03 – 3.5 mg/kg	<0.03 – 3.5 mg/kg	3,700 mg/kg	S4UL[4,9]	No exceedances

Table 7 (continued) - Generic Assessment of Human Health Risks - Residential Without Homegrown Produce

Determinand	Range Recorded – General Made Ground (10no. samples)	Range Recorded – Area of Suspected Buried ACM (8 samples)	GAC	Source of GAC	Exceedances
BTEX Compounds					
Benzene	<0.01 mg/kg	<0.01 mg/kg	1.4mg/kg	C4SL[2,9]	No exceedances
Toluene	<0.01 mg/kg	<0.01 mg/kg	880 mg/kg	S4UL[4,9]	No exceedances
Ethyl benzene	<0.01 mg/kg	<0.01 mg/kg	83 mg/kg	S4UL[4,9]	No exceedances
Xylene[10]	<0.01 mg/kg	<0.01 mg/kg	79 mg/kg	S4UL[4,9]	No exceedances
Aliphatic Petroleum Hydrocarbons (Equivalent Carbon Number)					
Ali EC 5-6	<0.01 mg/kg	<0.01 mg/kg	42 mg/kg*	S4UL[4,9]	No exceedances
Ali EC 6-8	<0.01 mg/kg	<0.01 mg/kg	100 mg/kg		No exceedances
Ali EC 8-10	<0.01 mg/kg	<0.01 mg/kg	27 mg/kg		No exceedances
Ali EC 10-12	<1.5 mg/kg	<1.5 mg/kg	130 mg/kg		No exceedances
Ali EC 12-16	<1.2 mg/kg	<1.2 mg/kg	110 mg/kg		No exceedances
Ali EC 16-35	<4.9 - <41.5mg/kg	<4.9 – 14.0 mg/kg	65,000 mg/kg		No exceedances
Aromatic Petroleum Hydrocarbons (Equivalent Carbon Number)					
Aro EC 5-7	<0.01 mg/kg	<0.01 mg/kg	370 mg/kg	S4UL[4,9]	No exceedances
Aro EC 7-8	<0.01 mg/kg	<0.01 mg/kg	860 mg/kg		No exceedances
Aro EC 8-10	<0.01 mg/kg	<0.01 mg/kg	47 mg/kg		No exceedances
Aro EC 10-12	<0.9 – 2.0 mg/kg	<0.9 mg/kg	250 mg/kg		No exceedances
Aro EC 12-16	<0.5 – 1.4mg/kg	<0.5 mg/kg	1,800 mg/kg		No exceedances
Aro EC 16-21	<0.6 – 3.6 mg/kg	<0.6 – 1.2 mg/kg	1,900 mg/kg		No exceedances
Aro EC 21-35	<11.4 - 150 mg/kg	<11.4 – 57.0 mg/kg	1,900 mg/kg		No exceedances
Other Organic Compounds					
Phenol	<0.3 – 0.3 mg/kg	<0.3 mg/kg	750 mg/kg	S4UL[4,9]	No exceedances

Notes:

1. Assessment for residential end use without home-grown produce uptake (apart from barium – see Note 6 below)
2. C4SL: Category 4 Screening Level, published by CL:AIRE.
3. SGV: Soil Guideline Value published by Environment Agency.
4. S4ULs Suitable 4 Use Levels. Copyright Land Quality Management Limited, reproduced with permission; Publication No. S4UL3156. All Rights Reserved.
5. CL:AIRE/EIC GAC published by CL:AIRE and Environment Industries Commission.
6. GAC for barium for residential use without plant uptake. No GAC published for plant uptake risk drivers.
7. In the absence of Chromium VI, all chromium present likely to be Chromium III. GAC for Chromium III adopted.
8. GAC for inorganic mercury adopted.
9. GAC for organic compounds based on 1% soil organic content.
10. GAC for xylene based on p-xylene (lowest S4UL).
11. Exceedances highlighted in red and bold.
12. Laboratory results presented in Appendix M and P.

* GAC exceeds solubility or vapour saturation limit.

The majority of determinands analysed were below their respective GAC. A single elevated concentration of lead was recorded in the Made Ground in WS108 at 0.2 m depth (340mg/kg).

Single elevated concentrations of lead (WS03 at 2.2 m depth – 330 mg/kg) and arsenic (WS04 at 0.8 m depth – 50 mg/kg), were also recorded during the previous investigation when reviewed against the same guideline values (HSP, 2022).

The generic assessment criteria adopted are considered conservate. When reviewed against the guideline values for commercial and public open space end uses, all elevated values fall below their respective assessment criteria.

4.4.4 Asbestos

HSP Consulting screened 7no. samples of general Made Ground and 1no. sample of possibly re-worked Lowestoft Formation. No evidence of asbestos was identified (See Figure 3).

An asbestos survey undertaken by Lucion Services Ltd in 2021/2022 (Ref: 502315) identified ACM within the existing school building which consisted of Chrysotile and Amosite.

An asbestos specialist was present during the initial site works to observe the excavations in the area of suspected ACM to visually identify any ACM and monitor levels of asbestos fibres released into the air whilst disturbing shallow site soils. No visible signs of asbestos were identified by the specialist and concentrations of respirable fibres during excavation were below detection limits (<0.01 fibres/ml cm3).

A total of 52no samples were screened for the presence of asbestos by ESP. 23no. of these samples were from hand pits in the area of suspected buried ACM in the north east. 27no. samples of general Made Ground were also screened and 2no. samples of tarmacdam. Where asbestos was identified further quantitative analysis was undertaken. The positive results are summarised on Figure 3 and in Table 8 below (see laboratory results in Appendix M, N and P).

Table 8 - Summary of asbestos laboratory testing results

Investigation Point	Asbestos ID	Quantification Results	
		ACM?	Total Mass %
General Site Made Ground			
WS104 (0.3m)	Chrysotile fibres present in visible & microscopic cement debris & bundles of Chrysotile	Yes – Cement	0.756
WS106 (0.2m)	Amosite fibre bundles	NI	0.013
Area of Suspected Buried ACM (Anecdotal evidence from caretaker)			
HP01 (0.2m)	Bundles of Chrysotile fibres	NI	<0.001
HP04 (0.3m)	Bundles of Amosite fibres	NI	0.003
Area of Suspected Buried ACM (Anecdotal evidence from public) – Above Geotextile/Geotextile Not Present			
HP03 (0.35m)	Bundles of Chrysotile fibres	NI	0.003
HP08 (0.1m)	Amosite present as fibre bundles	NI	<0.001
HP07 (0.1m)	Amosite present in microscopic board debris	Yes – Board	0.002
Area of Suspected Buried ACM (based on anecdotal evidence from the public) – Below Geotextile			
HP02 (0.7m)	Chrysotile fibres present in visible insulation debris & bundles of Chrysotile fibres	Yes – Insulation	0.140
HP03 (0.7m)	Bundles of Chrysotile fibres	NI	0.004

Notes:
1. ACM – Asbestos Containing Material NI – None identified.
2. Laboratory results presented in Appendix M, N and P.

There is no clear UK guidance on what would constitute an acceptable concentration of asbestos in soil. The advice of an asbestos specialist will be needed and this will likely include further assessment of the risks (See Section 6.1.1).

4.5 Hazardous Ground Gas

4.5.1 Degradation of Organic Materials

The following on and off-site sources of ground gas have been identified:

- Made Ground across the site, including thicker deposits within the infilled valley to the north of the existing school (5 m deep and base unproven in WS106).
- Tree within the base of TP101.
- Organic and possible relict Topsoil layers identified in the Made Ground in the infilled valley.
- Infilled gravel pits to the west which have been infilled with unknown materials.

The ESP gas wells (inc. functional historic wells) have been monitored on nine occasions. The monitoring results are presented in Appendix I and are summarised in the table below:

Table 9 - Summary of Gas Monitoring Data (Visits 1 to 6)

Well	Response Zone Depth[1] (m)	No visits	Maximum Methane (%)	Maximum Carbon dioxide (%)	Minimum Oxygen (%)	Maximum Gas Flow (L/hr)[4]	Shallowest Water depth (m)	Atmospheric pressure
BH101	4.8 – 18.8 m	9	ND	7.8	11.5	6.0	11.35	979 - 1020
BH102	1.0 – 14.5 m	9	0.7	2.4	17.9	0.5	8.41	979 - 1020
BH105 (shallow)	1 – 5 m	9	ND	2.6	13.8	4.9	4.49	979 - 1020
BH105 (deep)	16 – 21 m	8	ND	3.1	13.7	39.0	16.47	979 - 1020
WS103	1 – 3 m	9	0.7	3.8	17.3	ND	Dry	979 - 1020
WS104	1 – 3 m	9	0.3	5.3	11.4	0.3	Dry	979 - 1020
WS105	1 – 4 m	9	ND	5.9	0.2	ND	0.83	979 - 1020
WS106	1 – 5 m	9	5.3	8.5	0.1	3.0	3.09	979 - 1020
WS01	1 – 5 m	7	ND	9.6	14.7	1.5	4.87	999 - 1020
WS09	1 – 2 m	7	ND	3.0	17.0	ND	Dry	999 - 1020
WS10A[1]	1 – 5 m	8	2.1	10.0	6.6	ND	2.19	999 - 1020
WS11[1]	1 – 5 m	8	0.4	1.7	13.3	ND	4.52	999 - 1020
BH201	1 – 5.5m	3	ND	6.0	1.5	0.6	4.13	999 - 1012
WS201	1 – 5m	3	ND	5.9	15.4	ND	Dry	999 - 1012
WS202	0.5 – 4.6m	3	1.5	3.1	14.5	ND	3.36	999 - 1012
WS204	1 – 3m	3	2.1	3.6	2.2	ND	2.59	999 - 1012

Notes:

1. See Section 2.8 (historic) and 3.2.1 (ESP) for details of the strata the response zones are located within.
2. ND – none detected with instrument (<0.2% for methane, <0.1% for carbon dioxide).
3. Full monitoring results presented in Appendix I.
4. Maximum flow does not include peak instantaneous flows in line with BS8485.

The ESP monitoring has indicated levels of methane between below the limit of detection (0.2%) and 2.1%, carbon dioxide levels between below detection limit (0.1%) and 10.0%. The highest levels of Carbon Dioxide were recorded in WS10A and methane in WS106, both located to the north of the existing school in the area of the infilled valley, where the highest gas concentrations were generally recorded. Oxygen was depleted where the levels of methane and carbon dioxide were elevated, significantly in some monitoring wells in the area of the infilled valley (e.g. WS105, WS106).

Maximum methane concentrations of 10.6% and carbon dioxide concentrations of 5.7% were recorded during the 4no. previous visits undertaken (HSP, 2022), with the highest concentrations being recorded in WS02 (see Figure 2) in the area of the infilled valley (north of any of the currently proposed development). Lower levels were recorded in WS10A.

Maximum gas flow rates of 39l/hr were recorded in BH105d (ESP, 2023), however this well was designed to allow water sampling and monitoring at depth. The response zone is almost entirely flooded at the interface between the deeper Glaciofluvial Deposits and London Clay formation and this can often result in anomalous results not representative of the site. Whilst flows have been recorded in the shallow well of this borehole (BH105s), generally located within the unsaturated zone, they are not of the same order as the deeper installation. In addition, it should be noted that the flows in the deeper well have diminished with time and no flows have been recorded since visit 5 (22nd May 2023). Considering the above and in accordance with current guidance (e.g. BS8485 and NHBC), we do not consider this well is suitable for gas monitoring and therefore we have not used the maximum flow values in our characterisation of the risk at the site.

Excluding peak instantaneous flows, the highest flow reading recorded was 6.0l/hr in BH101. Due to the long well screen in this borehole, higher than characteristic flows could be being recorded, however we consider using this value as part of our characterisation to be appropriate. Excluding BH105d, steady state readings in all boreholes was less than this.

Levels of volatile organic compounds were recorded as between below the limit of detection and 1.8ppm, which is considered low.

4.5.2 Gas Screening Values

The results of monitoring undertaken to date (eleven visits including the historic monitoring) have been used to calculate Gas Screening Values (GSV) appropriate for the site using the methodology published in CIRIA C665 (Wilson et al, 2007). In the first instance, a worst case GSV (see BS8485) has been calculated for the site by using the maximum recorded flow in any standpipe (discounting any peak instantaneous flows) and multiplying it with the maximum gas concentration in any other standpipe. As part of a 'worst case check' (BS8485) the results should be from the same zone and strata, however due to the variability of the conceptual ground model and potential pathways between strata and zones, we have considered all monitoring wells across the site (excluding BH105d).

The results are presented in table 10.

Table 10 - Gas Screening Values (based on eleven visits – ESP and historic)

	Maximum Recorded Level (%)	Maximum Gas Flow Rate (L/hr)	GSV (L/hr)
Methane	10.6	6.0	0.636
Carbon dioxide	10.0	6.0	0.6

Notes:
1. GSV calculated using method derived in CIRIA 665 (2007).

On the basis of the above calculated worst case GSV, we consider that the site would be classified as Characteristic Situation CS-2 (CIRIA C665:2007). Based on the sources identified and the elevated gas concentrations recorded (above CS-1 thresholds), we consider this characterisation is suitable.

4.5.3 Radon

No radon protection is required for the development (HSP, 2021).

4.6 Sulphate Attack

The assessment of the concrete protection against sulphate attack has been undertaken in accordance with BRE SD1 (2005).

4.6.1 Classification of Site

As the site has been previously developed, we consider that it should be considered as ‘brownfield’ in terms of concrete classification.

4.6.2 Groundwater Setting

Groundwater was generally identified below 5 m depth, however monitoring is ongoing and therefore this will be updated on completion of the remaining monitoring.

Proposed shallow foundations (e.g. temporary school buildings) likely within the Made Ground, fine-grained Lowestoft Formation or upper coarse-grained Glaciofluvial Deposits are not anticipated to come into contact with groundwater and ‘static’ conditions should be adopted. Localised perched water may be present.

Deeper piled foundations are likely to come into contact with groundwater within the deeper Glaciofluvial Deposits (fine and coarse-grained) and London Clay Formation and ‘mobile’ conditions should be adopted for their concrete assessment.

4.6.3 Soil Sulphate Levels

Laboratory testing (ESP and previous) to assess the risk from sulphate attack was undertaken on soil samples of Made Ground, Lowestoft Formation, Glaciofluvial Deposits (coarse and fine-grained soils) and the London Clay Formation. Some of the samples tested previously were only for pH and water soluble sulphate but these have been included for completeness. Testing for topsoil has not been included.

The results from the sulphate testing are summarised in Table 11 below.

Table 11 - Summary of sulphate testing

Stratum	Water soluble sulphate (mg/l)	pH values	Acid soluble sulphate (%)	Total Sulphur (%)	Total Potential Sulphate (%)	Oxidisable Sulphate (%)
Made Ground	<10 – 1700 (13)	7.4 – 9.2 (13)	<0.01 – 0.05 (5)	<0.01 – 0.03 (5)	0.03 – 0.09 (5)	0.01 – 0.05 (5)
Lowestoft Formation	<10 – 120 (10)	7.7 – 8.9 (10)	<0.01 – 0.08 (7)	<0.01 – 0.25 (7)	0.03 – 0.75 (7)	0.01 – 0.74 (7)
Glaciofluvial Deposits (coarse-grained)	<10 – 190 (15)	8.1 – 8.7 (15)	<0.01 – 0.05 (13)	<0.01 – 0.03 (13)	0.03 – 0.09 (13)	0.01 – 0.08 (13)
Glaciofluvial Deposits (fine-grained)	21 – 96 (3)	8.0 – 8.3 (3)	0.03 – 0.21 (3)	0.03 – 0.62 (3)	0.09 – 1.86 (3)	0.01 – 1.66 (3)
London Clay Formation	92 – 150 (3)	8.2 – 8.6 (3)	0.13 – 0.18 (3)	0.29 – 0.40 (3)	0.87 – 1.20 (3)	0.69 – 1.04 (3)

Notes:
1. The number of samples tested is presented in brackets after the range recorded.

As the levels of oxidisable sulphide are below 0.3%, pyrite is unlikely to be present in the Made Ground and the coarse-grained Glaciofluvial Deposits.

The levels are generally below 0.3% in the Lowestoft Formation, however one elevated level was recorded in WS08 (0.9 – 1.0m) as part of the previous works.

The levels of oxidisable sulphide exceed 0.3% in the fine grained Glaciofluvial Deposits and the London Clay Formation, the testing indicates that pyrite is likely to be present in these strata.

As the pH levels all exceed 5.5, there is no need to further assess the soils for the types of acids present (e.g. hydrochloric and nitric acids).

4.6.4 Groundwater Sulphate Levels

Samples of groundwater have been obtained during gas monitoring visits to assess concentrations of groundwater sulphate (Sulphate as SO4). The results are summarised in Table 12 below.

Table 12 – Groundwater Sulphate Results

Borehole Reference	Response Strata	Sulphate as SO_4 (mg/l)	
		Visit 1 (18/04/23)	Visit 2 (22/05/23)
BH101	Glaciofluvial Deposits	54	74
BH102	Possible Made Ground, Lowestoft Formation and Glaciofluvial Deposits	-	100
BH105d	Glaciofluvial Deposits and London Clay Formation	-	110
WS10A	Lowestoft Formation	750	-
WS106	Made Ground	120	-

Some of the installation response zones cross multiple strata, and therefore the values obtained cannot be allocated to specific strata for some of the boreholes.

4.6.5 Foundation Concrete Design:

Using the soil results, and the methodologies outlined in BRE SD1 we have chosen characteristic values for each stratum and based on these values, design sulphate and concrete classes (see Table 13).

Due to the limited groundwater testing, the results have not been included below but have been considered in our assessment in Section 6.4.2.

Table 13 - Characteristic Values for each Strata

Stratum	Characteristic Values		
	Water Soluble Sulphates (mg/l)	pH values	Total Potential Sulphates
Made Ground	857[1]	7.7	0.075
Lowestoft Formation	107	7.9	0.44[2]
Glaciofluvial Deposits (coarse-grained)	81	8.2	0.069
Glaciofluvial Deposits (fine-grained)[3]	96	8.0	1.86
London Clay Formation[3]	150	8.2	1.20

Notes:

1. Only 2 out of 13 samples (from the previous investigation) recorded water soluble sulphate above the DS-1 threshold (500mg/l) – WS05 at 0.15 m and WS10A at 0.3 to 0.4m.
2. One elevated TPS above the DS-1 threshold recorded in previous investigation – WS08 at 0.9 m to 1.0 m (0.75%).
3. Only based on three samples.

5 Phase Two Geo-Environmental Risk Assessment

5.1 Discussion on Occurrence of Contamination and Distribution

5.1.1 Desk Based Evidence and Ground Model

Thick Made Ground was anticipated to the north of the existing building based on historical data and investigation has confirmed its presence with the base unproven at 5m in WS106. We estimate fill depths of up to around 7m or more could be present. The drainage in the general area of the deepest part of the former valley area is around 8.5 m bgl deep which could be indicative of maximum thicknesses. The Made Ground generally consisted of re-worked natural soils with fragments of man-made materials.

The Made Ground was generally less than 1m thick in the remainder of the site.

5.1.2 Soil Contamination

No obvious visual evidence of contamination or asbestos was identified by ESP.

In total, 36no. samples of shallow soils have been tested across the site. The amounts relative to each strata are summarised in Table 14 below. The shallow soils tested in the area of ACM were generally above a geotextile membrane identified at greater depth, however in some pits this was not encountered/present.

Table 14 – Summary of Contamination Testing

Strata	General Made Ground	Natural Deposits	Shallow Soils in Area of Suspected Buried ACM
Samples Tested	20no[1]	8no.	8no.

Notes:
1. 2no. previous samples indicated to be within natural soils are within suspected Made Ground and have therefore been added to this total (WS03 at 0.25m and WS03 at 2.2m).
2. 3no. samples of tarmacadam have not been included in the above.

The majority of determinands analysed (including HSP, 2022) were below their respective GAC which included samples of general Made Ground, natural soils and shallow soils in the area of suspected buried ACM in the north east.

When compared to the residential without plant uptake guidelines, slight elevated concentrations of lead were recorded in the Made Ground (probable sub-base) in WS108 at 0.2 m depth (340mg/kg) and in the possible Made Ground (organic layer) in WS03 at 2.2 m depth (330 mg/kg). An isolated elevated level of arsenic was also identified in the natural Glaciofluvial Deposits in WS04 at 0.8 m depth (50 mg/kg).

The generic assessment criteria adopted are considered conservative. When reviewed against the guideline values for commercial and public open space end uses, all elevated values fall below their respective assessment criteria. The levels also fall below SSAC developed as part of the previous report (HSP, 2022).

No investigation was undertaken beneath the school footprint and some external areas where also inaccessible. We recommend check investigation and testing is undertaken in these areas as part of the phased demolition of the school including targeted investigation beneath the chimney and plant room. The presence of unidentified contamination cannot be discounted.

3no. samples of the tarmacadam were also tested (WS206 at 0.1m, WS207 at 0.1m and WS208 at 0.1m), however these have not been included in the below assessment. We understand the re-use potential of the tarmacadam is being assessed by others.

5.1.3 Asbestos

Existing building in the south contain ACM and multiple sources have indicated that buried ACM is present in the north east of the site.

No obvious visual evidence of ACM was identified by ESP or the specialist during their attendance.

9no. of the 52no. samples screened, confirmed the presence of asbestos, both Chrysotile (white) and Amosite (brown). 7no. of these were encountered in the area of suspected buried ACM in the north east, above and below the membrane (where encountered). Microscopic asbestos and visible asbestos containing material (ACM) was noted.

Localised shallow asbestos contamination was also encountered in the school ground (WS104 – inc. ACM) and on the existing playing field.

5.1.4 Sulphates

Elevated levels of sulphate or potential sulphate have been recorded in the superficial (Made Ground and Lowestoft Formation and fine grained Glaciofluvial) and bedrock strata (London Clay).

Limited groundwater sulphate testing has recorded generally low levels, with elevated sulphate levels recorded in WS10A (Lowestoft Formation).

5.1.5 Ground Gas

Potential sources of ground gas have generally been identified on-site in the infilled valley to the north of the existing school development (organic layers, possible relict Topsoil and buried trees). Off-site sources are also present to the south west in the form of infilled historic gravel pits.

Elevated methane, carbon dioxide and flows have been recorded during the monitoring to date generally in the proximity of the sources identified and the site has been characterised as CS-2.

5.2 Revised Risk Evaluation & Relevant Pollutant Linkages

The methodology set out in CIRIA C552 (2001) has been used to assess whether or not risks are acceptable, and to determine the need for collating further information or remedial action.

The risks evaluated have been reviewed and summarised in Table 15 following information learned from the exploratory works and results of monitoring and laboratory testing.

Table 15 - Revised Risk Evaluation & Relevant Pollutant Linkages (RPL)

Source	Pathway	Receptor	Classification of Consequence	Classification of Probability	Risk Category	Further Investigation or Remedial Action to be Taken
Potential contaminants in shallow soils	Direct contact/ inhalation/ ingestion of contaminated soil or dust	Site Users	Medium – potential for chronic levels.	Low likelihood[2]	Low/ Moderate Risk	See Section 6.1 for further discussion. **Risks from asbestos assessed separately below.**
	Direct contact/ inhalation/ ingestion of contaminated soil or dust	Construction/ Maintenance Workers	Minor – standard PPE likely to be sufficient	Likely[2]	Low Risk	
	Leaching of soil contaminants	Impact on Groundwater	Medium – site lies on Secondary Aquifer underlain by Unproductive Strata	Unlikely[2]	Low Risk	See Section 6.2 for further discussion.
Asbestos in existing buildings	Inhalation of fibres	Demolition Workers/ Ground Workers	Medium – potential for chronic levels	High Likelihood[3]	High Risk	See Section 6.1.1 for further discussion.
Asbestos in shallow soils – General Made Ground	Inhalation of fibres	Site Users/Construction/ Maintenance Workers	Medium – potential for chronic levels	Likely[4]	Moderate Risk	
Asbestos in shallow soils in areas of buried ACM				High Likelihood[4]	High Risk	
Soil sulphate and pyrite	Aggressive groundwater	Buried Concrete	Mild – damage to structures	High likelihood[5]	Moderate Risk	See Section 6.4.2 for further discussion.
Hazardous ground gas/vapours	Asphyxiation/poisoning. Injury due to explosion.	Site Users/Visitors.	Severe – acute risk.	Likely[6]	High Risk	See Section 6.3 for further discussion.
	Damage through explosion.	Building/Property	Severe – acute risk.		High Risk	
	Asphyxiation/poisoning. Injury due to explosion.	Construction and Maintenance Workers.	Severe – acute risk.		High Risk	
Radon gas	Migration into Buildings	Site Users	Medium – potential for chronic levels	Unlikely[7]	Low Risk	No radon protection required.

Notes:

1. Methodology and details of risk consequence, probability and category presented in Appendix A.
2. Levels generally below the residential without plant uptake GAC. Isolated elevated arsenic and lead levels identified in Made Ground and natural deposits. **Risks from asbestos assessed separately.**
3. An asbestos survey was undertaken by Lucion Services Limited and ACM was positively identified within the existing school structures.
4. Quantifiable levels of microscopic and visual ACM consistently identified in the area of suspected buried ACM in the northeast. Isolated occurrences identified in the general Made Ground in areas investigated – see Section 4.4.4.
5. Elevated levels of sulphates/potential sulphates are present within the superficial and bedrock soils – see Section 4.6.
6. Elevated methane, carbon dioxide and flows have been recorded during the monitoring to date generally in the proximity of the sources identified and the site has been characterised as CS-2.
7. The previous HSP Consulting report did not identify a significant risk from Radon.

6 Remedial Strategy for Contamination Risks

The following recommendations are based on interpretations made from the relatively limited site investigation data obtained to-date, and do not form the full Options Appraisal stage of CLR11. If at any stage of the construction works, contamination or a potential for such contamination is identified that is different to that presented within this report, all of the following should be reviewed and the advice of a geo-environmental specialist sought immediately.

6.1 Risks to Health

6.1.1 Asbestos

Of the 52no soil samples screened, 9no. positively identified asbestos (Chrysotile and Amosite) in the area of suspected buried ACM in the north east and in general Made Ground (see Figure 3). The levels of asbestos identified were between <0.001 and 0.756%, with the majority encountered at shallow depth, within 0.3 m of the surface.

An asbestos survey undertaken by Lucion Services Ltd confirmed the presence of ACM within the school building.

Based on the phased development plan, shallow soils contaminated with asbestos will be exposed as the school is gradually redeveloped and surface stripping is undertaken, potentially releasing fibres into the air resulting in short term exposure to site users, construction workers and the general public. There is also a potential long term exposure risk to site users in landscaped areas. There is therefore a potential high risk from asbestos both within existing structures and within shallow site soils.

There is no clear UK guidance on what would constitute an acceptable concentration of asbestos in soil. An asbestos specialist should be employed to undertake further assessment of the risk from the asbestos present in the soils beneath the site with a view to investigating whether there would be an alternative risk mitigation method to prevent the expensive and non-sustainable removal and disposal of soils.

If an alternative risk mitigation is not feasible, then the asbestos contaminated soils may need to be removed from site prior to/during re-development and replaced with clean material. This should be detailed in a remediation method statement for the site.

Working with asbestos (even within soils) is governed by the Control of Asbestos Regulations (2012). This requires that the excavation and removal of the asbestos contaminated soils musty be undertaken by a licensed contractor.

Further investigation and sampling for asbestos contamination across the site is recommended in advance of the demolition/construction works to confirm the extent of the contamination (in particular areas where no testing is currently available). Appropriate PPE and specialist supervision will likely be required. Check testing for the presence of asbestos is also recommended in areas of landscaping where Made Ground soils are to remain at shallow depth.

If any suspected asbestos containing materials (ACM) are identified during development, the advice of a suitably qualified specialist should be sought immediately. Any identified ACM would need to be removed from site by a licensed specialist contractor.

All the ACM identified within the asbestos survey forming part of the existing school building should be removed by a licensed specialist contractor prior to demolition.

6.1.2 Site End Users

This section presumes that any risks from asbestos materials at the site are mitigated.

Two slightly elevated concentrations of lead and one elevated concentration of arsenic have been identified (out of 32no.) relative to the conservative residential without plant uptake GAC . The generic assessment criteria adopted are considered conservative. When reviewed against the guideline values for commercial and public open space end uses, all elevated values fall below their respective assessment criteria. The levels also fall below SSAC developed as part of the previous report (HSP, 2022).

The organic layer tested in WS03 was at 2.2m, and where encountered in other investigation points in the playing field area (WS105, WS106 and WS107), it was not encountered above a depth of 1.5m. It is unlikely that any exposure risks are going to be realised form this layer at these depths, however if elevation changes are proposed in this area, this may require re-assessment.

The shallow exceedance of lead in WS108 (0.2m) is located within the sub-base which may be removed as part of the re-development and it is located beneath the proposed MUGA and therefore potential pathways to end users would likely be severed post development. However, this sub-base may present elsewhere in proposed landscaped areas.

The slightly elevated level of arsenic was within the shallow Glaciofluvial Deposits in WS04 at 0.8m (based on HSP, 2022). Lower levels were recorded in the two others samples of Glaciofluvial Deposits tested at shallow depth. The result is below the SSAC derived and further testing and statistical analysis may demonstrate the levels are below the GAC adopted.

We consider the risks to end users are generally likely to be low, however check testing is recommended for shallow soils in areas of landscaping post completion to confirm the risks posed to end users.

No investigation was undertaken beneath the school footprint (inc. plant room) and some external areas were also inaccessible. It is unknown whether the sub-stations is being removed/re-located as part of the re-development. We recommend check investigation and testing is undertaken in these areas as part of the phased demolition of the school. The presence of unidentified contamination cannot be discounted considering the earthworks that have occurred on the site, and the presence of historic backfilled gravel pits in the general area.

6.1.3 New Service Connections

The current water industry guidance for the suitability of pipe materials on potentially contaminated sites (Blackmore et al, 2010) has onerous requirements and it is likely/possible, based on this guidance, that the levels of contaminants on site may prevent the use of plastic pipework. We recommend that enquiries are made to the local water authority to confirm their requirements for underground service materials for this development.

6.1.4 Risk to Construction and Maintenance Workers

Short term (acute) risks to construction and maintenance workers are generally poorly understood within the industry, certainly when compared to the volume of research undertaken on long term risks.

Due to the presence of asbestos within the shallow soils, in accordance with best practice, we recommend prevention of exposure to the soils to mitigate any potential health risks. The recommendations contained within the Health and Safety Executive Document: Protection of Workers and the General Public During the Development of Contaminated Land (HSE, 1991) should be implemented. An asbestos specialist will need to be consulted to confirm the mitigation measures required and provide method statements for the proposed works. The advice provided should be strictly implemented at this site.

The levels of general contamination at the site are not likely to pose a severe acute risk to construction workers or future maintenance workers.

The above precautions would be required for both construction workers during development and maintenance workers following development. A copy of this report and these recommendations should be included in the Health and Safety File for the development and provided to all future ground workers, including utility companies so that they may undertake their own assessment of risks to their operatives.

We recommend some further check testing for the presence of asbestos to inform the risk assessments and the mitigation measures required.

6.1.5 General Public/Neighbouring Properties

We understand the demolition and construction of the proposed development is to be phased with the school remaining active throughout. The site users (students, full time staff and visitors etc.) at the school would be particularly sensitive to any dust created during development.

We recommend strict dust control measures during development, and particular care would be required when excavating and removing the asbestos containing soils within the Made Ground and the existing buildings. The advice of an asbestos specialist will be required to ensure appropriate controls and mitigation measures are in place.

6.2 Risks to Controlled Waters

No specific assessment of the risks to controlled waters has been undertaken to date. However, the following points are considered salient.

- No past contaminative use has been identified on-site. However, notable filling has occurred in the northern two thirds.
- Historic infilled gravel pits and industrial uses are noted in the wider area.
- The levels of soil contaminants are low. Slight sporadic elevated levels of Arsenic and Lead have been identified relative to the conservative residential without plant uptake GAC.
- Localised perched water has been identified within the Made Ground and glacial soils, with a deeper groundwater body at the base of the superficial deposits/the upper London Clay Formation.

- The bedrock beneath the site is classified as Unproductive Strata. The Glaciofluvial Deposits are classified as a Secondary A Aquifer and the Lowestoft Formation is classified as a Secondary Aquifer – Undifferentiated.
- No significant water courses are present within the vicinity.
- Soakaways are unlikely to be used for the development.

We consider that the overall risk to controlled waters from the development of the site is likely to be low and no further assessment is warranted.

If contamination is identified as part of recommend further investigation in areas not currently accessible, the above assessment should be revised and updated.

6.3 Risks from Ground Gas

6.3.1 Risk to the Development – Degradation of Organic Material

On the basis of the above calculated GSV, we consider that the site would be classified as Characteristic Situation 2 (CIRIA C665:2007).

The best combination of gas protection elements will depend to a large degree on the design of the buildings. The requirements should be assessed in accordance with BS8485:2019, which considers gas protection in terms of a ranking ‘score’ for various types of property.

If during construction any organic materials are encountered they should be excavated and replaced (e.g. buried tree in TP101).

6.3.2 Risk to the Development – Radon

No radon protection is considered necessary (HSP, 2021).

6.3.3 Risk to Construction and Maintenance Workers

The elevated levels of ground gas identified could pose a risk to construction workers, and lead to asphyxiation in confined spaces.

All excavations should be treated as confined spaces and suitable precautions taken prior to man entry.

6.4 Risks to Property

6.4.1 Spontaneous Combustion

No evidence of combustible materials has been identified in the shallow soils. Therefore, the risk from spontaneous combustion is considered to be low.

6.4.2 Sulphate Attack on Buried Concrete

From Section 4.6, the following characteristic values are applicable for each strata and subsequently the following Design Sulphate Classes and Aggressive Chemical Environment for Concrete Classes have been assigned.

Table 16 - Design classes for buried concrete

Stratum	Characteristic Values			Groundwater	Design Class	ACEC
	Water Soluble Sulphates (mg/l)	pH values	Total Potential Sulphates			
Made Ground	857[1]	7.7	0.075	Static	DS-2	AC-1s
Lowestoft Formation	107	7.9	0.44[2]	Static	DS-2	AC-1s
Glaciofluvial Deposits (coarse-grained)	81	8.2	0.069	Mobile	DS-1[3]	AC-1
Glaciofluvial Deposits (fine-grained)[4]	96	8.0	1.86	Mobile	DS-4	AC-4
London Clay Formation[4]	150	8.2	1.20	Mobile	DS-3	AC-3

Notes:

1. Only 2no.. out of 13no. samples (from the previous investigation) recorded water soluble sulphate above the DS-1 threshold (500mg/l) – WS05 at 0.15 m and WS10A at 0.3 to 0.4m.
2. One elevated TPS above the DS-1 threshold recorded in previous investigation – WS08 at 0.9 m to 1.0 m (0.75%).
3. For shallow foundations within the coarse grained Glaciofluvial Deposits, static conditions could likely be adopted. To be confirmed based on area specific information.
4. Only based on three samples.

Some groundwater sampling to assess sulphate levels has been undertaken and has indicated that at least DS-2 is required locally (Lowestoft Formation). Lower levels have been recorded in wells within the Glaciofluvial Deposits which is consistent with the soil data. Lower levels have also been recorded in BH105d, which extends into the London Clay formation, however this may be due to mixing.

While the initial groundwater data suggests lower design classes may be possible (e.g. for the piled design that will cross multiple strata), we do not consider there are enough deeper wells, with discrete response zones within the London Clay in particular, to robustly confirm this.

As these strata are known to pose a risk of sulphate attack, to ensure a protective approach, we recommend the characteristic soil data is utilised for design.

6.5 Re-Use of Materials/Disposal of Excess Arisings

6.5.1 General Comments on Re-use/Disposal

All soils or other materials excavated from any site are generally classified as waste under the Waste Framework Directive (European Union, 2008) and their re-use is controlled by this legislation.

If the soils are to be re-used on site (e.g. within the red-line planning boundary), provided that they are 'uncontaminated' or other naturally occurring deposits and they are certain to be used for the purposes of construction in their natural state on the site from which they are excavated, they may be excluded from waste regulation (Duckworth, 2011). Natural soils excavated to form the new swimming pool may be fall into this category. Made Ground soils may also be suitable for re-use on-site e.g. re-worked natural soils. A Materials Management Plan (MMP) may be required (it will if Made Ground soils are to be used) – further guidance can be provided by this office once proposals have been finalised.

We understand an assessment of the re–use potential of the tarmacadam to be removed from the existing court area is to be undertaken by others, and testing was undertaken as part of the supplementary phase to inform this (see Appendix P).

If the soils are to be removed from site, they are automatically classified as waste, and they may only be:

- Disposed at a licensed landfill;
- Disposed at a licensed, permitted soil treatment centre; or
- Removed to a Receiver Site for beneficial re-use.

In Scenarios 1 and 2, the materials must be transferred by a licensed waste carrier and the waste producer (the developer) must ensure that the destination landfill or treatment centre is a legitimate operation (e.g. by requesting a copy of the Environmental Permit before releasing the soils). Prior to removal from site, the excavated arisings would need to be classified as either 'hazardous' or 'non-hazardous' waste based on the hazard that they pose– a WM3 assessment (note that this is a different assessment to the risk assessments reported on in earlier sections of this report). This can commonly be undertaken on the results of soils testing undertaken during the investigation, although further sampling and testing may be required. Only once the soils have been classified under the WM3 assessment, would Waste Acceptability Criteria (WAC) testing then be required to determine the type of landfill in which the arisings could be disposed in Scenario 1. Further testing and assessment may also be required by the soil treatment centre in Scenario 2.

WAC testing for the Made Ground soils in the area of the infilled valley was undertaken as part of the supplementary phase and the results are presented in Appendix P.

In Scenario 3, management of soils could be undertaken via an Environmental Permit or Exemption. However, these can take time and are costly to arrange. Therefore, in certain circumstances, it is permissible to use the protocols laid down in the CL:AIRE Definition of Waste, Development Industry Code of Practice (DoWCoP, Duckworth, 2011) to classify the arisings and put a management plan in place to control the use. This involves approval of the proposals by a Qualified Person and is generally more efficient (in terms of time and cost) to implement.

Further guidance on the legislative requirements of the re-use/disposal of materials generated by the development can be provided by this office once the development proposals have been finalised.

6.5.2 Imported Materials

Any soils or materials to be imported to site (including Topsoil) should be certified clean and inert, and suitable for use. An appropriate number of samples (depending on the volume of soils imported) should be analysed for an appropriate suite of contaminants, and verification certificates should be provided. Further guidance can be provided by this office if required.

7 Geotechnical Comments

7.1 Site Preparation and Earthworks

7.1.1 Unexploded Ordnance

A Detailed UXO Risk Assessment has been undertaken by Zetica Limited (Ref: P11211-21-R1) which has concluded that the risk to the site from UXO is Low (November, 2021). No mitigation measures were required.

Notwithstanding this, the site is located in the London area, which was heavily bombed during the Second World War.

A careful watch should be maintained during all excavation and any suspected ordnance identified should be investigated further by specialists. Ordnance awareness is recommended during site inductions.

7.1.2 Invasive Plants

No evidence of invasive plants such as Japanese Knotweed/Himalayan Balsam etc. was identified on the site during the site works. However, their growth is seasonal and therefore their presence cannot be discounted.

7.1.3 Existing Foundations and Services

The site is developed with an existing school and foundations/underground structures are present beneath the site, including a basement and swimming pool. The school will be demolished as part of the development. All sub-structures should be grubbed up within the zone of influence of the development as part of the site preparation works.

Live services have been identified on site as described in Section 2.1. Considering the presence of these services, an allowance for diversion/a suitable exclusion zone should be made when planning the phased demolition and development and site works. Further details and permissions should be obtained from the provider.

Land drains should be diverted where they enter foundation excavations.

7.1.4 New Services

For new services, flexible pipework and connections should be provided as a safeguard against potential settlements. Consideration could be given to increasing the gradients on sewage connections to mitigate against possible settlements.

7.1.5 Earthworks

We understand earthworks are proposed as part of the redevelopment including the excavation of a new swimming pool and the infilling of the existing pool and basement. Detailed designs for the proposed earthworks have not been provided at this stage.

Any permanent cuttings or embankment surcharges associated with earthworks or landscaping within the site should be kept to a minimum to avoid any possible adverse effects on the existing stability. Any proposed changes to the topography should reviewed by a geotechnical engineer.

We consider that the shallow natural superficial soils would be suitable for reuse in the earthworks scheme subject to suitable testing and assessment. Additional assessment can be provided by this office if required.

7.2 Geotechnical Risk Register

7.2.1 Updated Geotechnical Risk Register

Following the site investigation the potential geotechnical hazards have been assessed as described in the following section. This includes construction risks identified by the intrusive investigation.

For risk associated with poor temporary stability of excavations and groundwater ingress see Section 7.7. For risks associated with sulphate attack see Section 6.4.2.

7.2.2 Compressibility

Made Ground of very low to low strength has been identified to the north of the existing school in the area of the infilled valley where the temporary classrooms are proposed. Locally very loose to loose Glaciofluvial Deposits have been identified beneath the area of the proposed new school and sports centre. These layers will be possibly highly compressible and this has been considered as part of the foundation design (see Section 7.3).

Oedometer testing indicates that the shallow fine grained Lowestoft Formation has medium to high compressibility, while the deep fine grained layers within the Glaciofluvial Deposits and the London Clay formation have low to medium compressibility, based on existing overburden pressures.

7.2.3 Shrinkage and Swelling

The shallow Glaciofluvial Deposits generally comprise coarse grained soils and these should not be affected by seasonal changes in moisture content.

A tree survey has been provided and this confirms the presence of Cherry, Beech, Oak and Turkey Oak (amongst others) across the site. Some trees will be removed and planted as part of the re-development, which will result in changes to the moisture content of surrounding soils (in particular fine grained).

Fine-grained soils of the Lowestoft Formation are locally present at shallow depth and will be susceptible to changes in moisture content. Laboratory testing has indicated, based on the modified plasticity index (which excludes the non-plastic coarser fraction within the soil), that the fine-grained soils at shallow (probable foundation) depth are of low to high plasticity and low to medium shrinkage potential.

Whilst deeper fine grained soils have also been encountered (in excess of 10m depth), we have not considered these as they are likely beyond the influence of any existing, recent or proposed planting. This should be checked by the structural designer.

We understand piled foundations are preferred for the development. However, where localised shallow foundations are to be utilised, and based on this volume change potential, the minimum foundation depth would need to be 0.9m. This depth would need to be increased in accordance with NHBC/BRE guidelines within the zone of influence of recent, existing or future planting. The current tree survey should be used to allow an assessment of the foundation design and depths. Appropriately proportioned sub-floor voids would also be required beneath suspended floor slabs – see Section 7.4.

Lateral swelling pressures on foundation surfaces (inc. piles) can lead to rotation or other movement which could lead to failure of the foundation, and they may be subject to uplift forces from the soil swelling. This should be considered as part of the design.

Swelling pressures can be reduced with the use of suitably dimensioned compressible layers, such as Clayboard or similar, on the sides of the foundations. BRE report 298 provides further guidance on other methods which may be adopted.

One the design proposals have been finalised, further advice can be provided by this office as to the required safe depth of foundations across the development.

It should be appreciated that the timing of construction will have an impact on the likelihood of shrinkage and swelling affecting the development. As such, consideration should be given to the proposed construction programme and then the need to carry out further testing and analysis of the potential and scale of movements.

7.2.4 Slope Stability

The positioning of the temporary classroom will need to consider the stability of the slope on the west boundary, which consists of low strength, variable, unconsolidated Made Ground with layers of organic material.

We recommend the development is located a minimum of 5m from the slope crest.

Potential slope stability implications should be considered by the vibro-replacement specialist during the temporary works as part of the foundation construction. Provided the classrooms are located a sufficient distance from the crest of the slope on the west boundary, the implications should be limited.

7.3 Foundation Design and Construction

We understand the proposed development includes multiple different structures including a 3-storey “superblock”, a sports centre with swimming pool, temporary classrooms and small subsidiary structures.

A range of different foundation designs will likely be required to provide structure-specific options based on proposed loadings, settlement tolerances and ground conditions. Initial advice is provided in the following section. Further design advice can be provided by this office once design details are known.

7.3.1 Temporary Classroom (North of the School)

7.3.1.1 Design Information

We understand a temporary classroom is to be located on the existing fields, north of the current school buildings. We understand it is to be 2 storeys with a maximum point load of around 55kN/m^2 (including variable loads). The design drawings, indicate that the “ground condition to be level, consolidated ground”. The structural designer has indicated that the demountable classrooms will have a settlement tolerance of around 25mm and that the foundation legs/supports will not be adjustable. We understand the classrooms may be present for around 1.5 years.

7.3.1.2 Ground Model

Numerous windowless samples and a cable percussion borehole (BH201) have been constructed in the footprint of the proposed demountable and have encountered unconsolidated Made Ground likely consisting of re-worked fine grained natural soils (with localised organic layers including possible relict Topsoil) from depths of 1.8m to in excess of 5m. The Made Ground is believed to be associated with the infilling of a historic valley in this area of the site (see Insert 4 and Figure 2). Field SPT ‘N’ values of between 0 and 23 (mean of 7) have been recorded in the Made Ground and thickness increases to the north and west and are generally underlain by firm to stiff fine grained Lowestoft Formation. An SPT plot for the investigation points in the footprint of the demountable classroom is presented in Appendix H.

The use of shallow foundations on untreated, unconsolidated Made Ground cannot be recommended. The Made Ground is generally lower strength and compressible and notable total and differential settlement could occur.

7.3.1.3 Vibro-replacement and pad foundations

The use of shallow foundations on untreated, unconsolidated Made Ground cannot be recommended. The Made Ground is generally lower strength and compressible and notable total and differential settlement could occur.

The structural designer has confirmed that pad foundations constructed on vibro-improved ground will provide a suitable foundation option. We understand vibro-replacement will be the chosen technique to improve the shallow Made Ground, which involves the installation of compacted stone columns into the ground to increase the load bearing characteristics.

Any vibro-replacement works should be undertaken by an experienced specialist contractor, whose propriety system should be compatible with the end use of the proposed structures and on the basis of the proposed structural design details. Allowable loadings should normally be determined by the contractor. All designs and site works should however, be assessed and fully supervised by a suitably qualified geotechnical engineer and comply with the ICE Specification for Ground Treatment (1987).

The vibro contractor should satisfy himself that their propriety system would enable penetration through the materials encountered. No obvious obstructions were encountered in the footprint during the investigation, however limited large excavation was undertaken. TP1 to the south of the footprint, did encounter a petrified tree at the base of the Made Ground (see Insert 5).

Perched water was encountered locally at the base of the Made Ground and this will require consideration.

Preliminary enquiries have been made to Keller by the Client Team, who have confirmed that their vibro-technique is likely to be successful in the Made Ground soils encountered in the investigation.

Potential slope stability implications should be considered by the vibro-replacement specialist during the temporary works as part of the foundation construction. Provided the classrooms are located a sufficient distance from the crest of the slope on the west boundary, the implications should be limited.

7.3.2 Lightly Loaded Structures

Outside of the infilled valley (in the south portion – see Figure 2), we consider that normally loaded structures could likely utilise shallow strip/pad foundations founded on competent natural soils of the Glaciofluvial Deposits and Lowestoft Formation.

If the coarse-grained Glaciofluvial Deposits form the founding stratum, they should not be affected by seasonal changes in moisture content. If the founding stratum is the fine-grained Lowestoft Formation this will be affected by shrinking/swelling with changes in moistures content (see Section 7.2.3).

Foundation depth and allowable bearing pressures will be dependent on the structure locations, their sensitivity to settlement and the shrinkage potential of the founding soils. Further design advice can be provided by this office once further details are available.

7.3.3 School Building and Sports

The structural designer has indicated the maximum column unfactored load for the new teaching block is around 1350 kN and the sports hall will require an unfactored load of circa 800 kN.

To limit settlement considering the high loadings, we understand piled foundations are to be utilised for the development. We understand that specialist contractors have confirmed that ground treatment (e.g. vibro-replacement is unlikely to be suitable for the development.

The basal depth of the piles will be dependent on the end bearing resistance required once skin friction has been taken into account, however they will likely be terminated in the deeper Glaciofluvial Deposits or the London Clay Formation.

Localised clay bands and variable strength with depth within the deeper Glaciofluvial Deposits will require consideration. The London Clay was encountered at depths of between 17.9 m and 19.7 m in BH103, BH104 and BH105, however it was unproven to a depth of 25m in BH101. This indicates its depth increases to the north, which may be associated with the historic valley.

Once the depth of piles are known, it should be checked that sufficient investigation information is available beyond this depth (minimum of 5m below the end depth dependent on pile design and grouping) to ensure compliance with British Standards (e.g. BS8004:2020).

The following criteria should be considered for pile design:-

- The magnitude and resulting effect of different structural loadings, including any machine vibration effects;
- Possible impacts on neighbouring structures and underground services;
- Pile/soil/structure interaction effects;
- The design philosophy for pile bearing capacity - the estimation of pile bearing capacity requires careful consideration of the skin friction developed over the penetration depth and the end bearing resistance beneath the pile toe.

- The probable presence of obstructions. Buried concrete slabs and structures will be removed prior to construction during demolition. A very dense claystone layer was identified in BH105 within the London Clay Formation at a depth of 19.8 to 21m;
- Buckling;
- Negative skin friction forces.

The final safe working load on the pile will be dependent on the pile type, diameter and length of the piles, the penetration into the bearing stratum, and the settlement tolerances required.

The most appropriate system will need to be determined by the chosen contractor based on the available information, and given the site constraints and phased nature of the re-development. A displacement pile system would limit the quantity of arisings, however they should only be considered if vibrations and environmental constraints can be maintained within acceptable limits, with regard to the proximity of existing buildings and services.

A non-displacement vibration-less technique such as bored piles or continuous flight auger piles, will generate arisings at the surface which will need to be re-used or disposed of under a materials management plan. In addition, consideration to blowing/running sands would be required.

Pile foundations will create a potential pollution pathway between the near-surface and the underlying aquifers. However, considering the absence of general contamination we consider the potential associated controlled waters risks are likely to be low and detailed risk assessment is unlikely to be required. This should be update following the recommended check investigation.

Discussions should be held with specialist piling contractors to obtain specific piling proposals based on their particular proprietary system and to evaluate costs. The piling contractor should be asked to provide a performance specification and in particular the magnitude of total and differential settlements which could be guaranteed. Test loading will be required on a proportion of the piles to confirm that they are adequate to carry the design working loads, and the contractor should monitor closely the pile installations to satisfy himself that the ground conditions encountered are as good as, or better than, those assumed in his design. Care should be taken to ensure that piles are not stopped short on obstructions and that all are taken down into the coarse-grained glacial soils.

If required, further guidance on design criteria can be given by this office when structural loadings, design and cost implications have been finalised.

A consistent shallow groundwater body has not been proven across the area of development, therefore the consideration of associated uplift for the swimming pool will likely not be required. Monitoring is ongoing and this will be confirmed on completion.

7.4 Floor Slab Foundations

We understand the use of cast in-situ ground bearing floor slabs is proposed for the development. We understand it will be cast on a layer of compacted aggregate above the piled foundation and will be lightly loaded (around 10kN/m^2). We understand the compacted aggregate layer will be the piling/crane mat and the thickness will likely be determined by the temporary works design.

The Made Ground is generally less than 600mm thick in the area of development, however it is locally thicker (generally less than 1m). Prior to placement of the compacted aggregate beneath the slab, the formation should be inspected for any soft spots or deeper Made Ground, which if found should be excavated and replaced with compacted, suitable, granular fill. The formation and layer of compacted aggregate should be compacted to a specification.

Consideration of the interaction of the ground bearing floor slab and the piled foundation will be required by the structural designer.

Despite the anticipated low loads, some performance testing of the aggregate layer could be considered prudent prior to construction of the ground bearing floor slab.

Alternatively, the floor slabs could be suspended off the piled foundations.

Consideration of the volume change potential of the fine grained Lowestoft Formation in accordance with NHBC and BRE guidelines will be required as part of the floor slab design, where present at formation level considering the presence of trees being removed/locally planted.

7.5 Retaining Wall Design

The side walls of the proposed swimming pool will form retaining structures, supporting the surrounding soils.

Additional assessment and provision of design advice can be undertaken by this office if required.

7.6 Pavement Design

We understand that vehicle access roads and hardstanding is proposed at the site.

7.6.1 Design CBR Value

An assessment of the likely CBR values in areas of grade (no change in ground level) has been undertaken using a dynamic cone penetrometer (DCP). Testing was undertaken at 4no. locations concentrated along the proposed access roads. The results of the DCP testing are converted to CBR values using correlations published by the Highways Agency (2008).

The DCP results and the correlated CBR values are presented in Appendix K.

Based on the above testing, we consider that an initial design CBR value of 5% would be suitable for preliminary design purposes where natural soils (Lowestoft or Glaciofluvial Deposits) form the subgrade. Given the heterogeneous nature of Made Ground a lower bound CBR of 2.5% should be adopted, however localised lower values could be present.

Locally the near-surface soils comprise fine-grained materials. The CBR value is particularly sensitive to changes in moisture content. Careful consideration should be given to whether in the long term, the existing moisture content at which the test was undertaken is appropriate. If the formation were to become wetter the long term Design CBR value would reduce, possibly dramatically. In accordance with the recommendations in IAN73/06 (Highways Agency, 2009a), we recommend that the sensitivity of the Design CBR value of the fine-grained soils to variations in moisture content be assessed by further laboratory testing.

The final sub-grade should be inspected by a qualified engineer, and any soft or loose material removed and replaced as necessary, to ensure that the Design CBR value is achieved. It is further recommended that the sub-grade be proof-rolled with a suitable roller prior to the placement of the sub-base materials. In order to improve the sub-base performance the use of a suitable geo-grid may be considered.

We consider that it would be prudent to re-measure the CBR values of the sub-grade on exposure to confirm that they are equal to or better than the values measured in this investigation (as recommended by the Highways Agency [HA, 2009a]). If the CBR values in the sub-grade are found to be lower than the Design CBR, the subgrade must be improved to achieve the Design CBR or the road pavement foundation redesigned.

7.6.2 Susceptibility to Frost Action

The near surface fine and coarse grained soils are considered to be non-frost susceptible.

7.7 Excavation and Dewatering

It is anticipated that excavation throughout most of the site will be within the capabilities of conventional mechanical excavators. Old foundations will require higher capacity machines for their removal.

For shallow excavations through fine-grained soils, support of excavation sides is unlikely to be necessary. However, spalling of side walls was encountered in trial pits TP103 and TP104 where progressing through coarse-grained soils of the Glaciofluvial Deposits. Should any excavations encounter coarse-grained soils, they should be considered potentially unstable and suitable support should be provided.

Based on our understanding of the proposed development, no significant groundwater ingress is anticipated above 4m depth. However, localised shallower perched water bodies are present, particularly in the infilled valley to the north. Where water ingress occurs it is likely that pumping from screened sumps within shallow excavations will be adequate.

7.8 Soakaway Drainage

Soakaway infiltration tests were undertaken in 3no. test pits excavated across the site (TP101, TP102 and TP104). The results of the testing are presented in Appendix J and summarised in Table 17 below.

Table 17 - Summary of soakaway infiltration test results

Test Pit	Test depth	Measured Infiltration Rate	Infiltration Soils
TP101	2.1m	Test failed[2]	Slightly sandy gravelly CLAY (PROBABLE LOWESTOFT FORMATION)
TP102	2.0m	Test failed[2]	Slightly gravelly slightly sandy CLAY (PROBABLE LOWESTOFT FORMATION)
TP104	1.5m	Test failed[2]	Slightly gravelly with low cobble content (GLACIOFLUVIAL DEPOSITS)

Notes:
1. Testing undertaken in accordance with BRE 365.
2. Tests failed to empty 75% of fill volume in 48hrs (or more).

The head of water in TP101 fell below the 75% fill line after approximately 4 hours and continued to gradually drain through the upper granular Made Ground down to around 1.7 m depth after approximately 20 hours. However, fine grained probable Lowestoft Formation was present between 1.6 to 2.1 m depth and minimal infiltration occurred in these soils after a total of approximately 51 hours where the head of water stable at 1.75 m depth. The test did not pass the 25% fill line and was therefore considered to have failed. Infiltration within the Made Ground, is not considered a suitable option for the drainage design due to its local variability and general fine grained nature in this area of the site, consisting of re-worked Lowestoft Formation.

TP102 was undertaken solely within the fine-grained Lowestoft Formation and minimal infiltration was recorded after approximately 51 hours. Therefore, this was deemed a failed test.

TP103 was undertaken within the coarse-grained Glaciofluvial Deposits. Slow infiltration was recorded as the head of water fell between 0.48 to 1.21 m depth after approximately 48 hours. The test did not pass the 25% fill line and was therefore considered a failed test. If the test was extrapolated, we estimate infiltration rates of the order of 10^{-7}m/s. Due to the size of attenuation chambers required at these low infiltration rates, soakaway drainage is unlikely suitable for the scheme.

Faster infiltration rates may be possible in the coarse grained Glaciofluvial Deposits, however further testing would be required in specific areas where present.

8 Recommendations

We consider that the investigation undertaken has further refined the conceptual site model, is suitable to progress the design of the development and will further help fulfil some of the regulatory requirements as part of the planning process. The following further investigation and assessment would be required or prudent prior to development:

Required Further Actions:

- Finalisation of design for temporary classroom based on the chosen vibro-replacement foundation solution this should include confirmation of the risks from the slope on the west boundary. ESP can provide further guidance as necessary.
- Ground gas protection in accordance with a CS-2 characterisation.
- The foundation and floor slab design should consider the volume change potential of the soils in accordance with NHBC guidance.
- Discussions should be held with specialist piling contractors to obtain specific piling proposals based on their particular proprietary system and to evaluate costs.
- Liaison with asbestos specialist to discuss the findings to date and to assess potential risks to construction workers and site users and the likely mitigation measures, method of working required considering the asbestos contamination identified.
- Further investigation and sampling for asbestos contamination across the site in advance of the demolition/construction works to confirm the extent of the contamination (in particular areas where no testing is currently available). Appropriate PPE and specialist supervision will likely be required.
- Removal of ACM from existing building by licenced contractor.
- No investigation was undertaken beneath the school footprint (inc. plant room) and some external areas were also inaccessible. It is unknown whether the sub-station is being removed/re-located as part of the re-development. We recommend check investigation and testing is undertaken in these areas as part of the phased demolition of the school. The presence of unidentified contamination cannot be discounted.
- Develop remedial method statement for asbestos contamination.
- Check testing for the presence of asbestos in areas of landscaping where Made Ground soils are to remain at shallow depth.
- Check testing of shallow soils in areas of landscaping for general contamination levels post completion to confirm the risks posed to end users.
- Assessment of suitability of likely site won materials for re-use as part of the proposed earthworks (inc. tarmacadam).

Recommended Further Actions:

- Re-measure CBR values at sub-grade prior to pavement construction.
- Assessment of sensitivity of CBR value with changes in moisture content.
- Further soakaway testing in areas of coarse grained Glaciofluvial Deposits, if desired.
- Verification testing of any soils imported to site.
- WM3 assessment of soils to be disposed of off-site.
- Additional WAC testing if disposal to landfill is required.
- Materials management plan for re-use of soils on site (including existing tarmacadam).
- Despite the anticipated low loads, some performance testing of the aggregate layer beneath the ground bearing floor slab (piling/crane mat) could be considered prudent prior to construction of the ground bearing floor slab.

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Figures

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LEGEND

▭ Site Boundary

Services

╍ Drainage - Combined, Foul and Surface

━ Electric (HV)

╍ Electric (LV)

━ Gas

━ Telecoms (BT and Virgin)

━ Unidentified Trace

━ Water

NOTES:

Drawing reproduced from client provided DWG (SRP1056-HSP-XX-XX-D Y-0011-059TopoAndUtilitiesISurveyDWG).

PROJECT NAME: BURNT MILL ACADEMY, HARLOW

PROJECT REF: 8511

CLIENT: ASHFIELD SOLUTIONS

FIGURE 1: SITE LAYOUT PLAN

REV.: *00*

PREPARED: *CD*
DATE: *14/04/2023*

CHECKED: *HD*
SCALE: *1: 1,250*

esp
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SCIENTISTS
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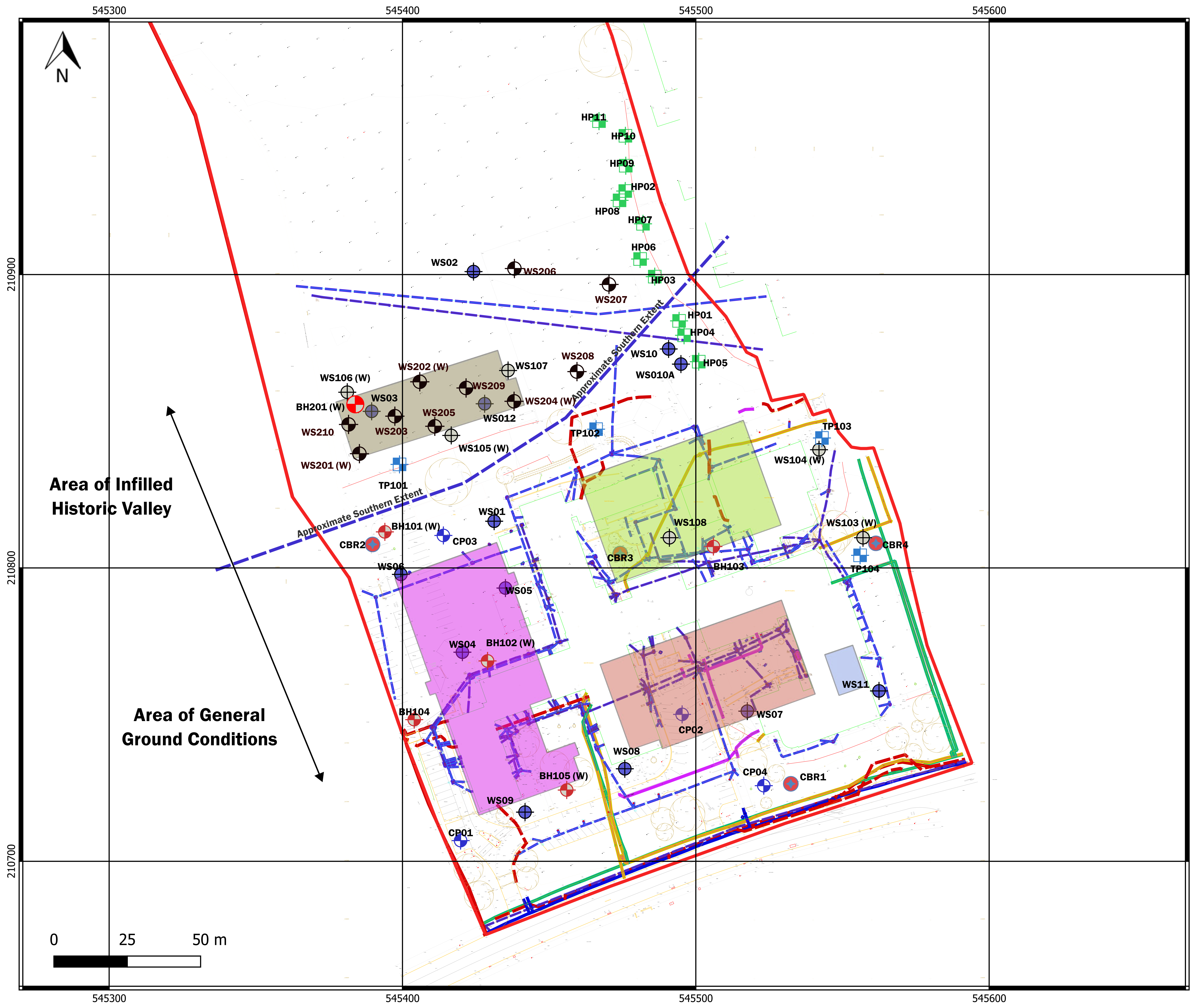

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LEGEND

🟥 Site Boundary

Services

- Drainage - Combined, Foul and Surface
- Electric (HV)
- Electric (LV)
- Gas
- Telecoms (BT and Virgin)
- Unidentified Trace
- Water

Proposed Building Footprint (Approximate Only)

- Modular Classroom Relocation
- Proposed MUGA
- Proposed School
- Proposed Sports Centre
- Temporary School Block

Investigation Points (ESP, 2023)

- ESP Cable Percussion Borehole (W: Well)
- ESP Hand Excavated Pit
- ESP Trial Pit
- ESP Windowless Sample Borehole (W: Well)
- WS Boreholes (ESP - June, 2023)
- ESP DCP

Historical Investigation Points
(HSP, 2021 - 2022)

- HSP Cable Percussion Borehole
- HSP Windowless Sample Borehole

PROJECT NAME: BURNT MILL ACADEMY, HARLOW

PROJECT REF: 8511

CLIENT: ASHFIELD SOLUTIONS

FIGURE 2: INVESTIGATION POINT PLAN

	REV.: *00*
PREPARED: *CD*	DATE: *06/07/2023*
CHECKED: *HD*	SCALE: *1: 1,250*

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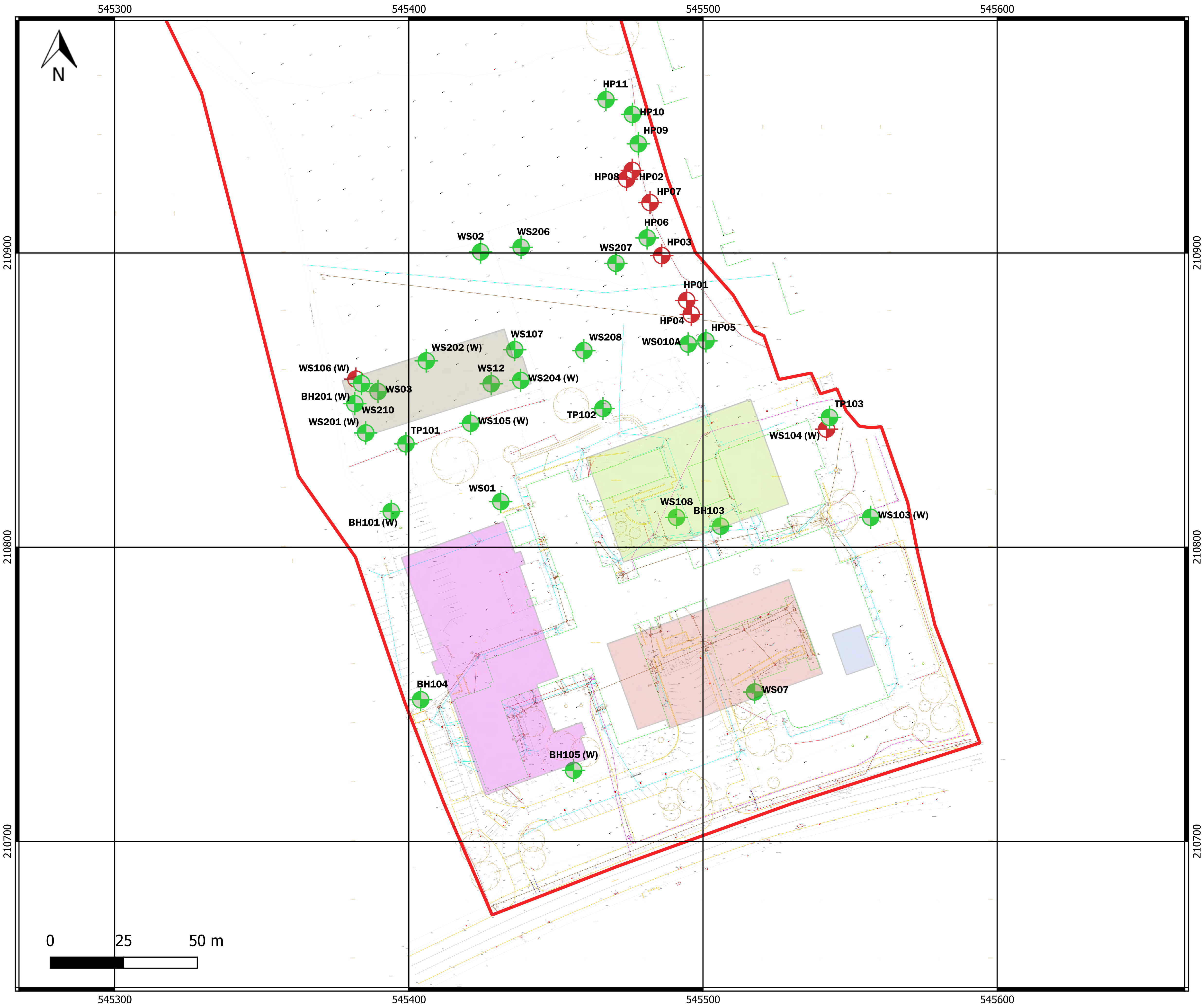

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LEGEND

🟥 Site Boundary

Proposed Building Footprint (Approximate Only)

- 🟦 Modular Classroom Relocation
- 🟩 Proposed MUGA
- 🟪 Proposed School
- 🟫 Proposed Sports Centre
- ⬜ Temporary School Block

Investigation Point (Asbestos Screen Result)

- 🔴 Asbestos Detected
- 🟢 No Asbestos Detected

NOTES:

Drawing reproduced from client provided DWG (SRP1056-HSP-XX-XX-D Y-0011-059TopoAndUtilitiesISurveyDWG).

PROJECT NAME:	BURNT MILL ACADEMY, HARLOW
PROJECT REF:	8511
CLIENT:	ASHFIELD SOLUTIONS
FIGURE 3:	ASBESTOS CONTAMINANTION PLAN

	REV.: *00*
PREPARED: *CD*	DATE: *06/07/2023*
CHECKED: *HD*	SCALE: *1: 1,250*

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Appendix A Risk Evaluation Methodology

APPENDIX A
RISK EVALUATION METHODOLOGY

The methodology set out in CIRIA C552 (2001), *Contaminated Land Risk Assessment – A Guide to Good Practice*, has been used to assess whether or not risks are acceptable, and to determine the need for collating further information or remedial action. The following tables have been used to classify the risk for each pathway. Tables A2 to A4 have been revised to include for circumstances where no plausible risk has been identified.

Table A1 - *Classification of Consequence*

Classification	Definition	Examples
Severe	• Short-term (acute) risk to human health likely to result in *Significant Harm*. • Short-term risk of pollution to a sensitive water resource. • Catastrophic damage to buildings/property. • Short-term risk to ecosystem, or organism forming part of that ecosystem.	• High concentrations of Cyanide at surface of informal recreation area. • Major spillage of contaminants from site into controlled water. • Explosion causing building collapse.
Medium	• Chronic damage to human health. • Pollution of sensitive water resource. • A significant change to ecosystem, or organism forming part of that ecosystem.	• Contaminant concentrations exceed assessment criteria. • Leaching of contaminants to Secondary A aquifer. • Death of species within nature reserve.
Mild	• Pollution of non-sensitive water resources. • Significant damage to crops, buildings, structures. • Damage to sensitive buildings, structures or the environment.	• Pollution of Secondary groundwater sources. • Damage to building rendering it unsafe to occupy.
Minor	• Harm, although not necessarily significant harm, which may result in financial loss, or expenditure to resolve. • Non permanent risks to human health (easily prevented by means of PPE). • Easily repairable effects of damage to buildings and structures.	• The presence of contaminants at such concentrations that PPE is required during site works. • The loss of plants in a landscaping scheme. • Discoloration of concrete.

Table A2: *Classification of Probability*

Classification	Definition
High Likelihood	There is a pollutant linkage and an event that either appears very likely in the short term and almost inevitable over the longer term. Or, there is already evidence at the receptor of harm or pollution.
Likely	There is a pollution linkage and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the longer term.
Low Likelihood	There is a pollutant linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a longer period such an event would take place, and is less likely in the shorter term.
Unlikely	There is a pollutant linkage, but circumstances are such that it is improbable that an event would occur, even in the very long term.
No Linkage	No plausible linkage has been established.

Table A3*: Risk Categories – Comparison of consequence against probability*

		Consequence			
		Severe	Medium	Mild	Minor
Probability	High Likelihood	Very High Risk	High Risk	Moderate Risk	Moderate / Low Risk
	Likely	High Risk	Moderate Risk	Moderate / Low Risk	Low Risk
	Low Likelihood	Moderate Risk	Moderate / Low Risk	Low Risk	Very Low Risk
	Unlikely	Moderate / Low Risk	Low Risk	Very Low Risk	Very Low Risk
	No Linkage	No Risk			

Table A4: *Description of Risk Categories*

Classification	Description
Very High Risk	• There is a probability that severe harm could arise to a designated receptor from an identified hazard. Or, there is evidence that severe harm to a designated receptor is currently happening. • The risk, if realised, is likely to result in a substantial liability. • Urgent investigation (if not already undertaken) and remedial action are likely to be required.
High Risk	• Harm is likely to arise to a designated receptor from an identified hazard. • Realisation of the risk is likely to present a substantial liability. • Urgent investigation (if not already undertaken) is required, and remedial action may be necessary in the short term and are likely over the longer term.
Moderate Risk	• It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur, it is more likely that the harm would be mild. • Investigation (if not already undertaken) is normally required to clarify the risk and to determine potential liability. Some remedial action may be required in the longer term.
Low Risk	• It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild.
Very Low Risk	• There is a very low possibility that harm could arise at a receptor. In the event of such harm being realised, it is not likely to be severe.
No Risk	• No risk mitigation required.

Appendix B HSP Consulting Phase 1 Report

PHASE I GEO-ENVIRONMENTAL DESK STUDY REPORT

Burnt Mill Academy, Harlow

HSP2021-C3825-G-GPI-392

November 2021

hsp consulting

CIVIL | STRUCTURAL | GEOTECHNICAL & ENVIRONMENTAL | TRAFFIC AND TRANSPORT

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Phase I Geo-Environmental Desk Study Report

This report was produced by HSP Consulting Engineers Ltd for MACE Group Ltd on behalf of the Department for Education as the Phase I Geo-Environmental Desk Study Report for Burnt Mill Academy, First Avenue, Harlow to provide a preliminary assessment of potential ground related development constraints and to support a feasibility study.

This report may not be used by any person other than MACE Group Ltd on behalf of the Department for Education and must not be relied upon by any other party without the explicit written permission of HSP Consulting Engineers Ltd. In any event, HSP Consulting Engineers Ltd accepts no liability for any costs, liabilities or losses arising as a result of the use or reliance upon the contents of this report by any person other than MACE Group Ltd on behalf of the Department for Education.

All parties to this report do not intend any of the terms of the Contracts (Rights of Third Party Act 1999) to apply to this report. Please note that this report does not purport to provide definitive legal advice.

Issue & Revision History

Revision	Status	Originated	Checked	Approved	Date
A	FINAL	L.Jones BSc (Hons), FGS. & N.Shafii BSc (Hons), MSc, FGS.	J,Bridgman B.Sc (Hons), CGeol, FGS	H.Pratt B.Eng (Hons), C.Eng, F.Cons.E, M.I.C.E, MI Mgt.	26.11.2021
Document Reference: HSP2021-C3825-G-GPI-392				**Project Number:** C3825/PI	

This document is also available in hard copy; please contact the author to obtain a copy.

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Appendices

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Appendix II	-	Emapsite™ Groundsure Enviro and Geo Insight Report
Appendix III	-	Emapsite™ Historical Map Pack
Appendix IV	-	Basis for Contaminated Land Qualitative Risk Assessment
Appendix V	-	Site Walkover Photographs
Appendix VI	-	Correspondence with Harlow Council Environmental Protection Team
Appendix VII	-	Zetica Detailed UXO Report

Executive Summary

HSP Consulting has been commissioned by MACE Group Ltd on behalf of the Department for Education to provide technical studies to inform the feasibility study to enable design to expand the educational facility at the site. The geo-environmental desk study (Phase I) is one of a series of studies providing information on likely constraints to the development of the site. The purpose of the report is to collate background historical and geo-environmental data to address where possible land contamination and stability matters within Planning Policy Guidance.

The site is currently occupied by Burnt Mill Academy and associated playing fields, outdoor space and car parking. The site is rectangular in shape and is approximately 5.52Ha in area.

The site was undeveloped on the First Edition Mapping and shown as two large fields. A large building identified as the Burnt Mill Comprehensive School with associated hardstanding is recorded in the south of site with a playing field recorded in the north of site from the mid 1960's onwards, with gradual addition of buildings and hard play areas on subsequent map editions.

The BGS mapping does not indicate any Made Ground on site. However, given historical development and terracing some Made Ground should be anticipated. The north and south of the site is shown by the BGS mapping to be underlain by superficial Glaciofluvial deposits. The centre of the site is shown to be underlain by the superficial Lowestoft Formation deposits. The site is underlain by bedrock deposits belonging to the London Clay Formation.

The superficial geologies are classified as Secondary A Aquifer (Glaciofluvial, in the north and south of the site) and Secondary Undifferentiated Aquifer (Lowestoft Formation, centrally across the site. The bedrock geology is classified as an Unproductive Aquifer. The site is not located in a Source Protection Zone and there are no current groundwater abstraction licences within 1000m of the site.

The site is shown at risk from surface water flooding at isolated locations in the north of the site and in the centre of site. The site is at moderate risk of groundwater flooding.

A Detailed UXO Risk Assessment has been prepared for the site which has concluded the risk to the site from UXO is Low.

The Preliminary Conceptual Site Model indicates a low possibility that harm could arise to a designated receptor from identified hazards.

The executive summary contains an overview of key findings and conclusions. However, no reliance should be placed on the executive summary until the whole of the report has been read. Other sections of the report may contain information which puts into context the findings noted within the executive summary.

1. Introduction

1.1 Background

This report has been prepared to support a feasibility study and at present no detailed development plans have been provided, it is understood that the intention is to demolish the majority of the existing structures and replace them with a new two to three storey teaching block. It is understood that the swimming pool block will be retained as part of the development.

1.2 Scope and Limitations

HSP Consulting has been commissioned by MACE Group Ltd on behalf of the Department for Education to provide technical studies to inform the feasibility study to enable design of a new education facility on the site. The geo-environmental desk study (Phase I) is one of a series of studies providing information on likely constraints to the development of the site. The purpose of the report is to collate background historical and geo-environmental data to address where possible land contamination and stability matters within Planning Policy Guidance.

The recommendations made in this report are based on the assessment of the published information and information provided by the Client.

1.3 Report Objectives

The objectives of this report are to:

- Establish the geological and hydrogeological conditions using existing available/published information.
- Summarise available information and identify site specific geotechnical and environmental hazards which may place a constraint upon the proposed site use.
- Produce a Conceptual Site Model and preliminary qualitative environmental risk assessment identifying potential pollution linkages between sources of contamination, pathways and receptors.
- Provide recommendations for Phase II Ground Investigation and any other assessments required.

1.4 Sources of Information

The following sources of information were used during the preparation of this report.

- Site sketches provided by MACE via email dated 11th October 2021: Burnt Mill Site Location Plan & BMAT Building Information
- Emapsite^{TM} Groundsure Enviro and Geo Insight Ref: EMS 735683_957174
- Emapsite^{TM} Groundsure Historical Mapping Ref: EMS 735683_957173 Various Scales
- British Geological Survey. Onshore Geoindex. www.bgs.ac.uk
- BGS 1:50,000 Mapping Sheet number 240, Epping, 1981.
- DEFRA Magic Map: http://defra.gov.uk/magicmap.aspx
- Department of the Environment Industry Profiles.

- Correspondence with Harlow Council Environmental Protection Team.

It should be noted that the Burnt Mill Site Location Plan provided by MACE shows a separate site area directly north of the existing school playing fields within Harlow Town Park. Feasibility study information was not required for this area at the time the report was commissioned, and it is not included within the Groundsure data red line boundary.

A walkover was undertaken by HSP Consulting on the 9th November 2021. The purpose of the walkover was to record the current land use, topography and principal physical features and to identify, where possible, visual and olfactory indicators of contamination.

2. Site Setting

2.1 The Site

2.1.1 Location

The site is located off First Avenue, approximately 1km northeast of Harlow town centre. The approximate National Grid Reference for the centre of the site is (NGR) 545445, 210863. A Site Location Plan is included in Appendix I.

2.1.2 Description

The site is rectangular in shape and is approximately 5.52Ha in area. The red line boundary, included within Appendix I, provided by MACE is included in Appendix I, although it should be noted the ‘Separate Site Area’ shown within the park, to the north and separated from the school site by a public footpath, is not included within the feasibility study boundary.

Access is gained off First Avenue to the south of the site. A second vehicular access is located off Altham Grove on the eastern boundary. The site boundaries along the southern, southeast and southwest of the site are all marked by green paladin fencing. The northwest, northern and north-eastern boundaries of the site are marked by wooden fencing and hedgerows.

The site is currently occupied by Burnt Mill Academy and associated playing fields. The school buildings are all located in the southern third of the site and are a mixture of 2 to 4 storey predominantly CLASP design buildings with flat roofs, a steel framed double height sports hall with a pitched roof and a single storey clad modular building. A chimney and plant room are located within one of the buildings in the east of the site. The premises management team indicate the chimney and solid fuel boiler are no longer in use as the buildings are heated using mains gas and to the best of their knowledge there are no fuel storage tanks present on site.

The built area of the site is split level, with levels of approximately 65mAOD at the entrance (southern boundary) reducing to approximately 61.5mAOD at the rear north eastern corner of the buildings. The changes in level are marked by steps, ramps, slopes and retaining walls. The levels across the playing fields rise gently from approx. 61.5mAOD in the south western corner to approximately 64.75mAOD at the north eastern boundary. A steep downward slope is present along part of the north eastern boundary of the site to accommodate the change in level between the playing field and the rear gardens of neighbouring properties. Levels information is taken from the topographical survey of the site.

The external areas between the school buildings are hard surfaced with limited areas of soft landscaping. A small playground / netball court is located to the east of the main buildings and a large hard surfaced play area with a weather canopy is located at the rear of the main school buildings in the west.

Two car parks with asphalt surfacing are present on site. One is located in the southwestern corner of the site and extends along the western boundary and the second one is irregular in shape adjacent to the southern boundary. An electricity substation is located adjacent to the western boundary of the site within a fenced off area of the car park.

Grassed playing fields are present in the northern two thirds of the site. At the time of the site walkover rugby and football pitches were marked out on the playing fields. A MUGA/hard courts area is present in the south east quadrant of the sports area. A small electrical substation is located adjacent to the MUGA pitch.

Anecdotal evidence gathered during the walkover with the premises manager indicates that potential asbestos containing materials have been buried under part of the schools playing field. No exact location was provided during the walkover but it is understood to be adjacent to the eastern boundary of the site.

2.1.3 Surrounding Land Use

The main features of interest identified are:

North:	A footpath with parkland beyond. An industrial estate is present 60m to the northeast of the site.
East:	Residential houses and associated gardens off Altham Grove.
South:	First Avenue / Mandela Avenue with residential properties and gardens beyond.
West:	Harlow Town Park with Harlow Skate Park and a Scout HQ.

2.1.4 Proposed End Use

At present no detailed development plans have been provided, it is understood that the intention is to demolish the majority of the existing structures and provide a new two to three storey teaching block. It is understood that the swimming pool block will be retained as part of the development.

2.2 Geology

2.2.1 Made Ground

The BGS mapping does not indicate any Made Ground on the site. However, given the development and terracing on the site some Made Ground should be expected.

Superficial Deposits

BGS mapping indicates that superficial Glaciofluvial deposits (Sand and Gravel) are expected to be encountered in the south and north of the site. No formal description has been provided by the BGS.

BGS mapping indicates that superficial Lowestoft Formation deposits of Till are expected to be encountered in the centre of the site. Described by the BGS as '*The Lowestoft Formation forms an extensive sheet of chalky till, together with outwash sands and gravels, silts and clays. The till is characterised by its chalk and flint content. The carbonate content of the till* *matrix is about 30%, and tills within the underlying Happisburgh Formation have less than 20%.'*

2.2.2 Bedrock Geology

BGS bedrock mapping indicates the site is underlain by the London Clay Formation comprising Clay, Silt and Sand, described by the BGS as '*The London Clay mainly comprises bioturbated or poorly laminated, blue-grey or grey-brown, slightly calcareous, silty to very silty clay, clayey silt and sometimes silt, with some layers of sandy clay. It commonly contains thin courses of carbonate concretions ('cementstone nodules') and disseminated pyrite. It also includes a few thin beds of shells and fine sand partings or pockets of sand, which commonly increase towards the base and towards the top of the formation. At the base, and at some other levels, thin beds of black rounded flint gravel occurs in places. Glauconite is present in some of the sands and in some clay beds, and white mica occurs at some levels.*

2.2.3 Structural Geology

There are no bedrock faults and other linear features recorded within 250m of the site.

2.2.4 Historical Boreholes

There are 62No BGS borehole records within 250m of the site, of which five are recorded on site. A brief summary of the pertinent information is provided in Table 2.1 below:

Table 2.1 - Summary of BGS Borehole Records

BGS Reference	Summary of Ground Conditions		
TL41SE185 On-Site	Drilled by: n/a Date: 12/09/49 – 13/09/49 Method: Auger	G.L – 0.23m	TOPSOIL.
		0.23m – 0.38m	Dry grey-brown GRAVEL.
		0.38m – 2.13m	Dry brown SAND.
		2.13m – 3.05m	Moist reddish-brown SAND.
		3.05m – 3.81m	Moist SAND as previous but different grading.
		3.81m – 6.09m	Moist yellow SAND.
TL41SE309 On-site	Drilled by: *n/a* Date: 19/09/50 – 20/09/50 Method: Auger	G.L – 0.23m	TOPSOIL.
		0.23m – 1.22m	Very hard, closely packed brown STONEY LOAM.
		1.22m – 2.36m	Closely packed, hard brown GRAVEL and SAND.
		2.36m – 3.50m	SAND and GRAVEL.
TL41SE180 On-site	Drilled by: *n/a* Date: 07/09/49 – 08/09/49 Method: Auger	G.L – 0.18m	TOPSOIL
		0.18m – 1.14m	Dry brown SANDY LOAM.
		1.14m – 1.80m	Dry reddish-brown SILT with traces of clay.
		1.80m – 1.98m	Hard brown GRAVEL.

2.2.5 Geological Hazard Ratings

The Emapsite™ Insight Report provides ground stability data for the site and surrounding area, a summary is provided in Table 2.2 below:

Table 2.2 - Summary of BGS Hazard Ratings

Hazard	Located	Direction	Hazard Potential
Potential for Collapsible Rocks Stability Hazards	On-site	-	Very Low
Potential for Landslide Ground Stability Hazards	On-site	-	Very Low
Potential for Ground Dissolution Stability Hazards	On-site	-	Negligible
Potential for Compressible Ground Stability Hazards	On-Site	-	Negligible
Potential for Running Sand Ground Stability Hazards	On-site	-	Very Low
Potential for Shrinking or Swelling Clay Ground Stability Hazards	On-site	-	Low to Negligible

2.3 Mining

2.3.1 BGS Mineral Sites

There are two records of BGS mineral sites identified within a 250m radius of the site. The closest record relates to Netteswell Cross Gravel Pits located 146m west of the site described as *'a surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site'.* The mineral commodities mined are sand and gravel. The pit has ceased to extract minerals.

2.3.2 Brine Extraction

No Brine Extraction Areas have been identified within a 250m radius of the site.

2.3.3 Surface Ground Workings

Twenty-four surface ground workings have been recorded within a 250m radius of the site. The closest recorded is 27m west of the site which relates to an unspecified pit and unspecified ground workings mapped in 1938 and 1980. A summary of the ground workings recorded are ponds (12), unspecified pits (9), unspecified ground workings (2) and unspecified heap (1).

2.3.4 Non Coal Mining

The site is located in an area unaffected by underground non coal mining.

2.3.5 Coal Mining

The site is located in an area unaffected by underground coal mining.

2.4 Hydrogeology

2.4.1 Aquifer Units

The superficial Glaciofluvial deposits in the north and south of site are classified as a Secondary A Aquifer, described by the Environment Agency as *'permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers.'*

The superficial Lowestoft Formation deposits in the centre of site are classified as a Secondary Undifferentiated Aquifer, described by the Environment Agency as *'assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to variable characteristics of the rock type.'*

The bedrock London Clay Formation deposits are classified as an Unproductive Aquifer, described by the Environment Agency as '*these are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow.'*

2.4.2 Groundwater Vulnerability

The site is not located in a Source Protection Zone.

The soils underlying the central and southern section of the site are classified as medium vulnerability while the soils underlying the northern section of the site are classified as high vulnerability.

2.4.3 Groundwater Abstractions

There are no groundwater abstraction licences located within 1000m of the site.

2.4.4 Groundwater Discharge Consents

There is one record of groundwater discharge consent recorded 212m west of the site. The record relates to miscellaneous discharges – unspecified at Marshgate Council Depot with permit number CTWC.3608, effective from 04/08/1989 and revoked 01/10/1996.

2.4.5 Groundwater Quality

There are no records of groundwater quality records within 250m of the site.

2.5 Hydrology

2.5.1 Nearest Surface Water Course

There are no surface water courses recorded within a 250m radius of the site.

2.5.2 Surface Water Quality

No surface water quality records have been recorded within a 250m radius of the site.

2.5.3 Surface Water Abstractions

There are no surface water abstractions recorded within a 250m radius of the site.

2.5.4 Surface Water Discharge Consents

There are no surface water discharge consents recorded within a 250m radius of the site.

2.6 Flood Risk

The site does not lie within 250m of an Environment Agency Zone 2 or Zone 3 floodplain.

The site does not lie within an area benefitting from flood defences or within an area used for flood storage.

There is a moderate risk to the site from groundwater flooding which is caused by unusually high groundwater levels.

There is a risk to the site from surface water flooding as a result of extreme rainfall events, the highest risk areas (1 in a 30 year rainfall events and a maximum modelled depth of 0.3m and 1.0m) are shown in east of the centre and in the north of the site.

Although the report provides some information on flood risk this does not constitute a flood risk assessment for the site. The flood risk information provided only relates to flooding from Rivers or Seas and surface water. It does not account for flooding from other sources such as blockages in drainage systems and artificial water features. A separate Flood Risk Assessment is likely to be required for the site.

2.7 Radon

The site is located within an area which has a low probability (less than 1% of properties above the action level) for Radon. No radon protection measures are considered necessary for any new dwellings on the site.

2.8 Sensitive Land Uses, Ecological and Statutory Designations

The site is located in a surface water Nitrate Vulnerable Zone.

The site is located in a SSSI Impact Risk Zone which requires consultation for certain types of development. For a school development a consultation is not required, however any discharge of water or liquid waste of more than 5m^3/day to ground (ie to seep away) or to surface water will need further consideration during detailed drainage design.

The neighbouring parkland adjacent to the western and northern boundaries of the site forms part of a conservation area.

No other records of sensitive land use (SAC, Ancient Woodland, Nature Reserves, Environmentally Sensitive Areas, Listed Buildings etc) have been identified within a 250m radius of the site.

3. Site History

The following section details the historical development of the site, with reference to historical Ordnance Survey maps. All distances are approximate and given from the site boundary. Descriptions in italics are as identified on the historical plans. For a complete list of maps consulted refer to the Emapsite™ Historical Mapping presented in Appendix III.

Table 3.1 - Summary of Historical Maps

Published Map Date & Scale	Land Use on Site	Surrounding Land Use
Date : 1873 – 1874 Scale: 1:2,500 1:10,560 County Series	The site is undeveloped and shown as two large fields. A footpath is recorded near the southern site boundary trending east to west.	The surrounding land use is predominantly agricultural. Two ponds are recorded approximately 90m east of the site. *Oldhouse* is recorded 150m west of the site.
Date : 1895 - 1899 Scale: 1: 1,250 1:10,560 County Series	No significant change identified on site.	A pond is recorded 130m west of the site.
Date : 1920 - 1923 Scale: 1:2,500 1:10,560 County Series	No significant change identified on site.	*Hill House* is recorded 210m west of the site. A *Smithy* is recorded 243m west of the site.
Date : 1947 - 1948 Scale: 1: 2,500 1:10,560 County Series	No significant change identified on site.	Two *Old Gravel Pits* are identified approximately 40m west of the site. *Oldhouse* is renamed *Snow's Farm.*
Date : 1955- 1966 Scale: 1:1,250 1:2,500 1:10,560 National Grid	The north of site is recorded as *playing fields.* A heap is recorded in the north western quadrant of the site. Several slopes and changes in level are recorded on the northern section of the site. On later historical mapping these contours are no longer recorded implying terracing has occurred to form level play areas. A large irregular-shaped building with associated hardstanding identified as *Burnt Mill Comprehensive School* is identified in the southern section of site.	The surrounding land use is mixed land, predominantly residential and leisure with industrial works to the north are recorded *Netteswell Road* is recorded immediately north of the site. Two unidentified *Works* are recorded 30m and 110m north of the site. Residential development is recorded immediately in the east of site. *St Albans Catholic Primary School* is identified immediately east of the southern section of site. *First Avenue* is recorded immediately south of site with residential development beyond. *Snow's Farm* is no longer recorded. The two old gravel pits are no longer recorded, with the same area recorded as the *Town Park,* the mapping indicates significant landscaping (slopes, raised footpaths, mounds and cuttings) A *Garage* is recorded 223m east of the site.
Date : 1982 - 1994 Scale: 1:1,250 1:10,560 National Grid	Additional school buildings and a hard play area are shown in the south of site. The heap in the northwest of the site is not longer recorded.	A *Depot* is recorded 212m to the northwest of the site.

Published Map Date & Scale	Land Use on Site	Surrounding Land Use
Date : 2001 - 2021 Scale: 1:1,250 1:10,000 Landline National Grid Aerial Photography	Additional school buildings and hard play areas are shown.	No significant change.

3.1 Potential Unexploded Ordnance Risk

During World War II, the City of London and its surrounding areas experienced a high level of aerial bombardment. Harlow is classified as having a Medium unexploded ordnance risk. As part of the feasibility study on the site a Detailed UXO Risk Assessment has been undertaken by Zetica Limited (Ref: P11211-21-R1) which has concluded that the risk to the site from UXO is Low. The Zetica report should be read in conjunction with this report and is presented within Appendix VII.

4. Environmental Data

4.1 Polluting Activity

4.1.1 Pollution Incidents

There are no records of pollution incidents recorded within 250m of the site.

4.2 Licensed Industrial Activity

4.2.1 Control of Major Accidents Hazards (COMAH)

There are no records within 250m of the site for historical COMAH and Notification of Installations Handling Hazardous Substances (NIHHS).

4.2.2 Licensed Sites

A Part A(2)/B Licensed Pollutant release is recorded within 250m of the site. The record is located 124m northeast of the site for a Part B Permit for metal coating processes by Pilkington. The permit status is revoked (no date supplied).

There are no other Local Authority Pollution Prevention and Controls or Integrated Pollution Prevention and Controls within a 250m radius of the site.

There are no Registered Radioactive Substance Licences recorded within 250m of the site.

4.2.3 Industrial Activities

There are thirteen current industrial activities recorded within a 250m radius of the site. The closest relates to an electrical substation which is recorded on site. The remaining uses include general works (1), motoring (1), educational supplies (1), chimney (1), repair and servicing (1), beds and bedding (1) and electrical substations (6).

There are fifteen historical industrial activities recorded within a 250m radius of the site. The closest is located 27m west of site and relate to the unspecified pits. The remaining uses relate to unspecified pits (10), unspecified ground workings (2), unspecified works (1), unspecified heap (1) and an unspecified depot (1).

4.2.4 Fuel Stations & Tanks

There are no recorded active petrol stations located within 250m of the site. There is one petrol station located 229m east of the site, recorded as obsolete.

There are 9No. historical tanks located within 250m of the site, the closest was located 107m north of site between 1987 and 1991. It is not known constituents the tanks contained.

There are no records of high-pressure underground pipelines (oil and gas) within 250m of the site.

4.3 Waste and Material Storage Locations

4.3.1 Landfill

There are no records of Active, Recent or Historical Landfill Sites recorded within a 250m radius of the site.

4.3.2 Waste Sites

There are no records of Historical or Active Waste Sites recorded within a 250m radius of the site.

4.3.3 Waste Exemptions

There are six waste exemptions within 250m of the site. These are for the same point located 205m east of the site and relate to the treatment of waste for use in construction.

4.4 Local Environmental Health Officer Communication

A Contaminated Land Enquiry was placed with Harlow Council's Environmental Health Team on the 5th November 2021. A response was received by email on the 8th November 2021 and is summarised below. The response is presented within Appendix VI.

- No sites within 250m of the site boundary are designated as Part IIA Contaminated Land.
- The Local Authority identified one site of potential land contamination as mentioned in section 4.3.1. The old gravel pits (123m) to the west of the site are noted as 'A Site of Potential Land Contamination: Gravel pit infilled, mounded up and landscaped, now part of Town Park'. The same information is also referred to in response to a request for information on records of landfills within 250m of the site.
- The Local Authority hold no details of any Part A(2) or Part B Environmental Permits licensed to the site or neighbouring properties.
- The site is not listed as potential Part IIA.

4.5 Summary

Based on the information collated for the desk study, the geo-environmental setting of the site is summarised as follows:

- The site was undeveloped and shown as two fields on the First Edition OS Mapping. Burnt Mill Comprehensive School with associated hardstanding and playing field is recorded on site from the mid 1960's with the gradual addition of buildings and hard play areas on subsequent map editions.
- Historically the surrounding land use has been agricultural with mixed land use predominantly residential and leisure and industrial development to the north of the site from the mid 1950's onwards.
- No Made Ground is indicated within the site boundary on the published geological mapping. However, given the historical development on the site some Made Ground should be expected.

- The north and south of the site is shown by the BGS mapping to be underlain by superficial Glaciofluvial deposits. The centre of the site is shown to be underlain by the superficial Lowestoft Formation deposits.
- The site is underlain by bedrock deposits belonging to the London Clay Formation.
- The site is not located within a Coal Mining Reporting Area. There are two records of BGS Mineral Site within a 250m radius of the site. The closest record is Netteswell Cross Gravel Pits located 146m west of site with commodities of sand and gravel. The pit has ceased to extract minerals.
- There are no records of Active, Recent or Historical Landfill Sites recorded within a 250m radius of the site. The Local Authority records for ‘A Site of Potential Land Contamination: Gravel pit infilled, mounded up and landscaped, now part of Town Park’ 123m to the west are also referred to in response to a request for information on records of landfills within 250m of the site.
- The superficial geology is classified as Secondary A Aquifer in the north and south of site and Secondary Undifferentiated Aquifer in the centre of site. The bedrock geology is classified as an Unproductive Aquifer. The site is not located in a Source Protection Zone and there are no current groundwater abstraction licences within 1000m of the site.
- The site is not within an Environment Agency Zone 2 or Zone 3 floodplain. The site is shown at risk from surface water flooding at isolated locations in the north and also in the centre of the site. The site is at moderate risk of groundwater flooding.
- No radon protection measures are required.
- A Detailed UXO Risk Assessment has been undertaken by Zetica Limited (Ref: P11211-21-R1) which has concluded that the risk to the site from UXO is Low.

Based on the above, the environmental sensitivity of the site can be considered to be Low at this stage.

5. Preliminary Conceptual Site Model (PCSM)

5.1 Introduction

The approach to the human health risk assessment reported here follows the principals given in the Land Contamination Risk Management (LCRM) Guidance https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm i.e. application of the following assessment hierarchy:

The basis of above guidance is the development of the conceptual site model (CSM) which is the representation of the source-pathway-receptor (pollutant) linkages upon which the assessment of risk can be based.

5.2 Risk Assessment Approach

The approach to the human health risk assessment reported here follows the principals given in LCRM guidance, i.e. application of the following assessment hierarchy:

- Tier 1 risk screening by establishment of potential pollutant linkages, i.e. the preliminary conceptual site model (PCSM), or
- Tier 2 generic quantitative assessment using generic assessment criteria (GACs) that represent 'acceptably low' risk, or
- Tier 3 quantitative risk assessment using site specific assessment criteria (SSACs) that represent 'unacceptable risk', or where generic assessment criteria are not available, or they are not applicable to the CSM.

The potential sources of contamination based on historical and current land uses were identified using the the Emapsite™ Enviro + Geo Insight Report and Emapsite™ Historical Mapping (Appendix II & III) and Department of the Environment Industry Profiles. In the absence of a standard scenario for a school environment the standard exposure scenario of residential without home grown produce has been used to identify potential exposure pathways for human health receptors. Controlled water, flora and fauna and property receptors have also been included within the PCSM. There is no change to the current end use of the site.

5.3 Preliminary Conceptual Site Model

The PCSM was produced by undertaking a Source-Pathway-Receptor analysis of the site:

Sources (**S**) are potential or known contaminant sources, e.g. a former land use:
Pathways (**P**) are environmental systems through which a contaminant could migrate, e.g. air, groundwater;
Receptors (**R**) are sensitive environmental receptors that could be adversely affected by a contaminant, e.g. Site Occupiers, groundwater resources.

5.3.1 For a pollutant linkage to exist between a contaminant source and a receptor, a pathway must be present.

5.3.2 Sources

The potential sources of contamination within 250m of the site and associated groups of potentially contaminative substances are outlined below. The list of potential contaminants was derived from the Department of the Environment Industry Profiles. The activities and substances listed below should not be considered exhaustive and provides a guide to the likely range of contaminants which may be present.

On Site

S1: Historical and Contemporary land use: Made Ground associated with development of the school site, potential buried Asbestos Containing Materials.
Inorganic and organic contaminants including heavy metals, metalloids, asbestos, TPH's, PAH's and ground gases.

S2: Historical and Contemporary land use: Electrical substations.
Inorganic and organic contaminants including heavy metals, metalloids, asbestos, TPHs, PAH's and PCB's.

S3: Historical and Contemporary land use: Farmland and maintained sports fields.
Inorganic and organic contaminants including heavy metals, metalloids, pesticides.

Off Site

S4: Historical & Contemporary Land Use: Made Ground, former Gravel Pit with infilling and Infilled Ponds.
Inorganic and organic contaminants including heavy metals, metalloids, asbestos, TPH's, PAH's and ground gases.

S5: Historical & Contemporary Land Use: Unidentified works, garage and depot.
Inorganic and organic contaminants including heavy metals, metalloids, asbestos, TPH's, PAH's, SVOC, VOC's and ground gases.

5.3.3 Pathways

The site is underlain by bedrock classified as Principal Aquifer and superficial deposits classified as Secondary A and Secondary Undifferentiated Aquifers.

P1: Human uptake;
- Dermal contact with soils and dust
- Ingestion of soils and dust
- Inhalation of soils, dust and vapour

P2: Horizontal and vertical migration of contaminants through potentially permeable soils and rocks

P3: Migration along preferential pathways via underground services and drainage runs (pipes, culverts and granular material)

P4: Overland flow / surface runoff

P5: Vertical and lateral migration of ground gases and/or vapour
P6: Root uptake

5.3.4 Receptors

R1: End Users: Staff and children
R2: Construction and maintenance workers
R3: Controlled Water, Surface Water and Groundwater.
R4: Property: Services (e.g. drinking water supply pipes) and structures/buildings (concrete used in foundations)
R5: Adjacent property, parkland and end users
R6: Proposed flora and fauna

5.3.5 Preliminary Qualitative Risk Assessment

For each potential pollutant linkage identified within the PCSM, the potential risk has been assessed on the probability of a pollution event and the severity it may have on the identified receptors. The results are presented in Table 5.1 below. The methodology for the assessment is presented in Appendix IV.

Table 5.3 Preliminary Conceptual Site Model and Qualitative Risk Assessment

Source	Pathway	Receptor	Consequence	Probability	Risk	Comments
On site **S1:** Historical and Contemporary land use: Made ground associated with development of the school site and terracing of playing fields and potential buried Asbestos Containing Materials. **S2:** Historical and Contemporary land use: Electrical substations. **S3:** Historical and Contemporary land use: Farmland and maintained sports pitches **Off site** **S4:** Historical and Contemporary land use: Made ground, landfill (old gravel pit) and infilled ponds.. **S5:** Historical and Contemporary land use: Unidentified works, garage and depot.	**P1:** Human uptake pathways	**R1:** End Users **R2:** Construction and maintenance workers	Mild	Low Likelihood	Low	There is the potential for shallow Made Ground associated with development of the site. It is possible that end users / construction workers will come into contact with the soils across the site. Given the limited potential for contamination, the risk is considered to be LOW and should be confirmed by ground investigation.
	P2: Horizontal and vertical migration of contaminants through potentially permeable soils and rocks. **P3:** Migration of contaminants along preferential pathways (man- made). **P4:** Surface runoff.	**R3:** Controlled Water: Surface Water and Groundwater	Mild	Low Likelihood	Low	The bedrock geology is classified as Unproductive Aquifer and the superficial deposits as Secondary A Aquifer and Secondary Undifferentiated Aquifer. Based on the low plausibility of gross contamination on site, distance between possible controlled water receptors and the site, the risk to groundwater and surface water is considered to be LOW.
	P2: Horizontal and vertical migration of contaminants through potentially permeable soils and rocks. **P3:** Migration of contaminants along preferential pathways (man- made). **P4:** Surface runoff.	**R1:** End Users **R2:** Construction and maintenance workers	Mild	Low Likelihood	Low	Due to the limited potential for and low plausibility of-site sources the risk is considered to be LOW.
	P5: Vertical and lateral migration of ground gases and/or vapour.	**R1:** End Users **R2:** Construction and maintenance workers **R4:** Property, services and substructures **R5:** Adjacent Residential, Parkland and End Users.	Mild	Low Likelihood	Low	Potential sources of ground gas generation have been identified on and off site (infilled gravel pits and made ground), based on available information there is a low plausibility of significant generation and migration of ground gases.. Uncertainty exists and ground investigation is recommended. At this stage the risk is considered to be LOW.
	P2: Horizontal and vertical migration of contaminants through potentially permeable soils and rocks. **P3:** Migration of contaminants along preferential pathways (man- made). **P4:** Surface runoff.	**R4:** Property, services and substructures	Mild	Low Likelihood	Low	Made Ground and natural deposits may be aggressive to concrete and underground utilities. Until the potential has been investigated further, the risk is considered to be LOW.

	P6: Root uptake.	**R6:** Proposed Flora and fauna	Minor	Unlikely	Very Low	Development plans are not available for the site and the proposed landscaping is not known at this stage. Any imported topsoil will be required to meet any specification provided by the Landscape Architect. The risk at this stage of uptake to proposed flora and fauna is VERY LOW.

6. Preliminary Engineering Constraints and Recommendations

At present no detailed development plans have been provided, it is understood that the intention is to demolish the majority of the existing school blocks and construct new teaching facilities. At the time of writing, no change of use is intended, and the site will remain a school.

6.1 Geotechnical Constraints

The site is currently a mixture of existing buildings, areas of hardstanding, and playing fields. Made Ground is not recorded, however Made Ground should be expected in where former and current built development is located and areas which have been subject to terracing to form level development areas. Made Ground materials of various composition and strength may be encountered and should be investigated as part of any ground investigation.

Possible sources of ground gas have been identified both on and off site, although the likelihood of significant ground gas is low. Sources include potential Made Ground from development of the school site although this is anticipated to be minimal, and infilling of former gravel pits off site to the west.

The groundwater regime on site is unknown and should be assessed further, if possible.

The soils and groundwater on site may be aggressive to buried/surface concrete and proposed utilities and should be assessed further.

6.2 Environmental Constraints

Any Made Ground on site may contain elevated concentrations of potentially harmful contaminants which may present a risk to the receptors identified in the PCSM including end users, construction and maintenance workers or adjacent land users (residential).

Potential sources of ground gas have been identified in the form of potential Made Ground associated with development of the site, although this is expected to be limited and infilled gravel pits (off site). Given the nature of the site, ground gas monitoring may be required in accordance with BS8485:2015+A1:2019.

Potential buried asbestos containing materials may be present on site within the playing field area. It would be prudent to try to delineate the extent of any asbestos contamination during the intrusive site investigation.

The Preliminary Conceptual Site Model indicates a low possibility that harm could arise to a designated receptor from identified hazards.

6.3 Potential Unexploded Ordnance Risk

During World War II, the City of London and its surrounding areas experienced a high level of aerial bombardment. Harlow is classified as having a Medium unexploded ordnance risk.

As part of the feasibility study on the site a Detailed UXO Risk Assessment has been undertaken by Zetica Limited (Ref: P11211-21-R1) which has concluded that the risk to the site from UXO is Low. The Zetica report should be read in conjunction with this report and is presented within Appendix VII.

6.4 Recommendations

HSP would recommend that an intrusive geo-environmental investigation be undertaken across the site to reduce uncertainty and refine the PCSM, provide preliminary information and assessment for design and confirm the recommendations outlined above.

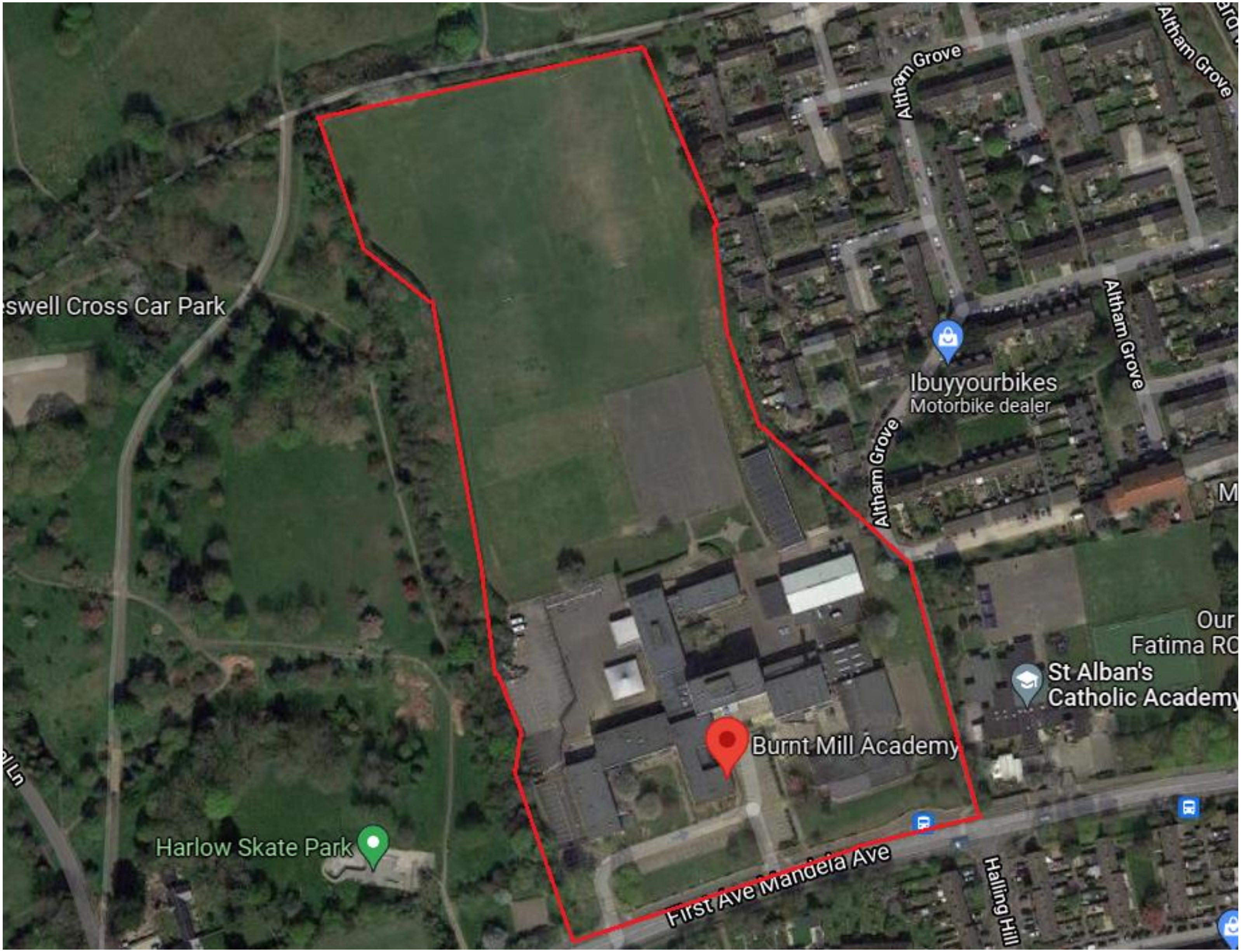
The objectives of the investigation should be as follows:

- To establish the ground conditions laterally and vertically across the site, including the presence, distribution and composition of any Made Ground.
- To obtain soil samples for contamination analysis, in order to refine the PCSM and undertake generic quantitative risk assessment.
- To obtain data on the ground gas and groundwater regime.
- To obtain geotechnical design parameters for the proposed new buildings including in-situ and laboratory testing.
- To assess if the soils and groundwater on site are likely to be aggressive to buried/surface concrete and proposed utilities.

Once detailed design proposals have been made available we can provide a Ground Investigation Scope. As a guide the following is likely to be required

- Windowless Samper and/or Cable Percussion/Rotary Open Hole Boreholes with in-situ testing and sample recovery.
- Standard CLEA chemical analysis suites (to include total metals/semi metals, inorganics, PAH speciated & TPH CWG) plus limited, VOC/SVOC, PCB, pesticides and Asbestos Screen & ID.
- Foundation inspection pits.
- Dual purpose gas and groundwater monitoring wells.
- 4No monitoring events (weekly for four weeks) for ground gases and groundwater levels (this will be reviewed based on the findings of the ground investigation).
- Geotechnical Testing to include Plasticity Index & moisture content, BRE Sulphates (soils and groundwater, if present).

Appendix I



DO NOT SCALE

N

NOTES:

▭ - Site Boundary

hsp consulting

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CLIENT:
MACE Group

PROJECT:
Burnt Mill Academy

TITLE:
Site Location Plan

SCALE@SIZE : NTS

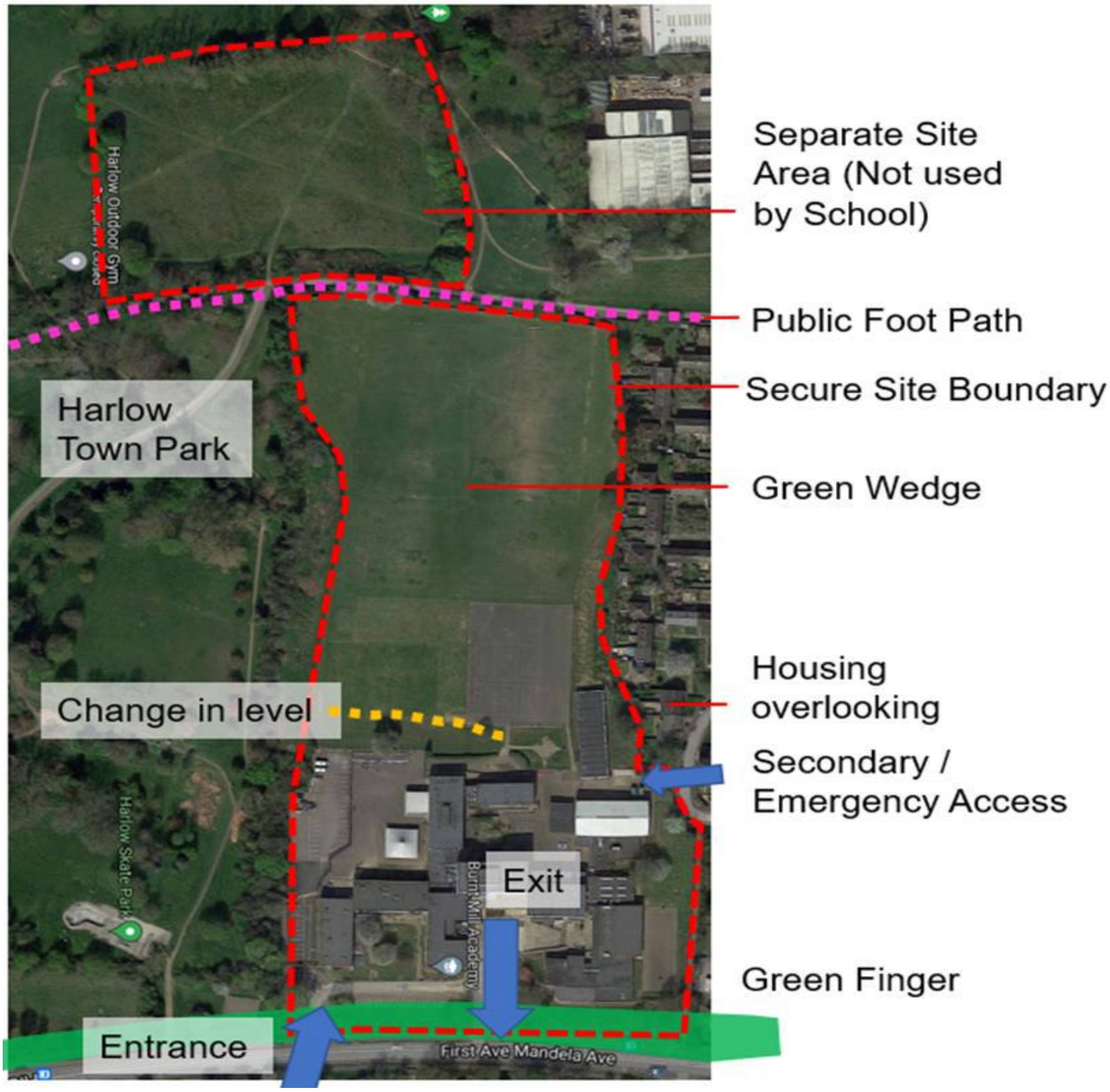
ISSUE: FINAL

DESIGN/DRAWN: LEJ

DATE: November 2021

PROJECT No: C3825

DRAWING No: 001



Burnt Wood Academy,

First Avenue,

Harlow

CM20 2NR

Appendix II

Groundsure
LOCATION INTELLIGENCE

Enviro+Geo
Insight

Burnt Mill Academy,First Avenue,Harlow,CM20 2NR

Order Details

Date: 04/11/2021

Your ref: EMS_735683_957174

Our Ref: EMS-735683_957174

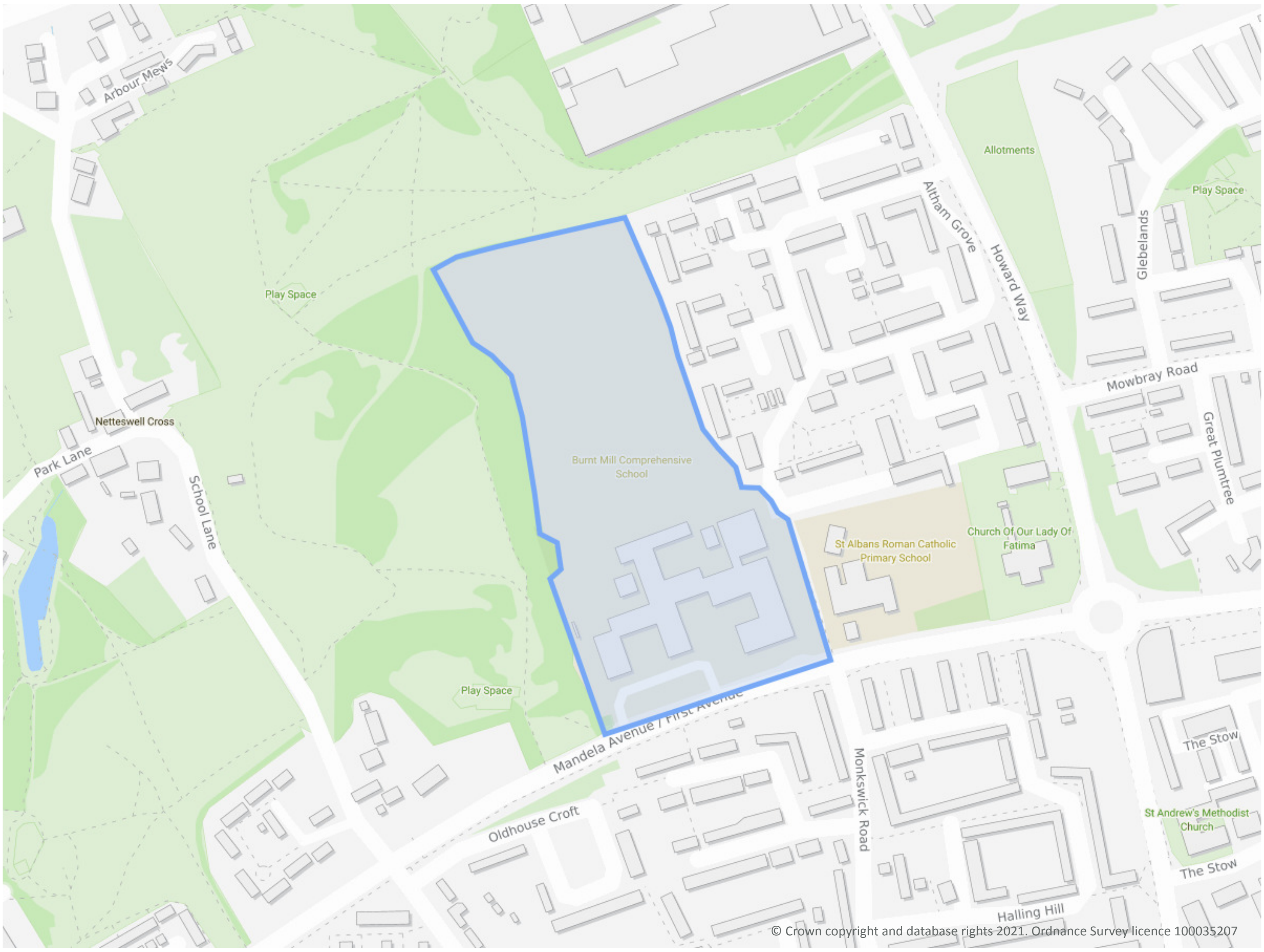
Client: emapsite

Site Details

Location: 545445 210863

Area: 5.52 ha

Authority: Harlow Council



Summary of findings p. 2

Aerial image p. 8

OS MasterMap site plan p.13

groundsure.com/insightuserguide

Contact us with any questions at:
info@groundsure.com
08444 159 000

Summary of findings

Page	Section	Past land use	On site	0-50m	50-250m	250-500m	500-2000m
14	1.1	**Historical industrial land uses**	0	5	8	31	-
16	1.2	**Historical tanks**	0	0	3	4	-
17	1.3	**Historical energy features**	0	0	4	5	-
18	1.4	Historical petrol stations	0	0	0	0	-
18	1.5	**Historical garages**	0	0	1	0	-
18	1.6	Historical military land	0	0	0	0	-
Page	Section	Past land use - un-grouped	On site	0-50m	50-250m	250-500m	500-2000m
19	2.1	**Historical industrial land uses**	0	6	9	38	-
21	2.2	**Historical tanks**	0	0	9	4	-
22	2.3	**Historical energy features**	0	0	5	7	-
23	2.4	Historical petrol stations	0	0	0	0	-
23	2.5	**Historical garages**	0	0	2	0	-
Page	Section	Waste and landfill	On site	0-50m	50-250m	250-500m	500-2000m
24	3.1	Active or recent landfill	0	0	0	0	-
24	3.2	Historical landfill (BGS records)	0	0	0	0	-
25	3.3	Historical landfill (LA/mapping records)	0	0	0	0	-
25	3.4	Historical landfill (EA/NRW records)	0	0	0	0	-
25	3.5	Historical waste sites	0	0	0	0	-
25	3.6	Licensed waste sites	0	0	0	0	-
25	3.7	**Waste exemptions**	0	0	6	2	-
Page	Section	Current industrial land use	On site	0-50m	50-250m	250-500m	500-2000m
27	4.1	**Recent industrial land uses**	1	0	12	-	-
28	4.2	**Current or recent petrol stations**	0	0	1	0	-
29	4.3	Electricity cables	0	0	0	0	-
29	4.4	Gas pipelines	0	0	0	0	-
29	4.5	Sites determined as Contaminated Land	0	0	0	0	-

29	4.6	Control of Major Accident Hazards (COMAH)	0	0	0	0	-
29	4.7	Regulated explosive sites	0	0	0	0	-
30	4.8	Hazardous substance storage/usage	0	0	0	0	-
30	**4.9**	**Historical licensed industrial activities (IPC)**	0	0	0	3	-
30	**4.10**	**Licensed industrial activities (Part A(1))**	0	0	0	5	-
31	**4.11**	**Licensed pollutant release (Part A(2)/B)**	0	0	1	2	-
32	4.12	Radioactive Substance Authorisations	0	0	0	0	-
32	**4.13**	**Licensed Discharges to controlled waters**	0	0	1	0	-
33	4.14	Pollutant release to surface waters (Red List)	0	0	0	0	-
33	**4.15**	**Pollutant release to public sewer**	0	0	0	1	-
33	4.16	List 1 Dangerous Substances	0	0	0	0	-
33	4.17	List 2 Dangerous Substances	0	0	0	0	-
34	**4.18**	**Pollution Incidents (EA/NRW)**	0	0	0	3	-
34	4.19	Pollution inventory substances	0	0	0	0	-
34	4.20	Pollution inventory waste transfers	0	0	0	0	-
35	4.21	Pollution inventory radioactive waste	0	0	0	0	-
Page	Section	Hydrogeology	On site	0-50m	50-250m	250-500m	500-2000m
36	**5.1**	**Superficial aquifer**	Identified (within 500m)				
38	**5.2**	**Bedrock aquifer**	Identified (within 500m)				
39	**5.3**	**Groundwater vulnerability**	Identified (within 50m)				
40	5.4	Groundwater vulnerability- soluble rock risk	None (within 0m)				
41	5.5	Groundwater vulnerability- local information	None (within 0m)				
42	**5.6**	**Groundwater abstractions**	0	0	0	0	1
43	**5.7**	**Surface water abstractions**	0	0	0	0	4
44	5.8	Potable abstractions	0	0	0	0	0
44	5.9	Source Protection Zones	0	0	0	0	-
44	5.10	Source Protection Zones (confined aquifer)	0	0	0	0	-
Page	Section	Hydrology	On site	0-50m	50-250m	250-500m	500-2000m
45	6.1	Water Network (OS MasterMap)	0	0	0	-	-

45	6.2	Surface water features	0	0	0	-	-
46	**6.3**	**WFD Surface water body catchments**	1	-	-	-	-
46	**6.4**	**WFD Surface water bodies**	0	0	0	-	-
47	6.5	WFD Groundwater bodies	0	-	-	-	-
Page	Section	River and coastal flooding	On site	0-50m	50-250m	250-500m	500-2000m
48	7.1	Risk of flooding from rivers and the sea	None (within 50m)				
48	7.2	Historical Flood Events	0	0	0	-	-
48	7.3	Flood Defences	0	0	0	-	-
49	7.4	Areas Benefiting from Flood Defences	0	0	0	-	-
49	7.5	Flood Storage Areas	0	0	0	-	-
50	7.6	Flood Zone 2	None (within 50m)				
50	7.7	Flood Zone 3	None (within 50m)				
Page	Section	Surface water flooding					
51	**8.1**	**Surface water flooding**	1 in 30 year, 0.3m - 1.0m (within 50m)				
Page	Section	Groundwater flooding					
53	**9.1**	**Groundwater flooding**	Moderate (within 50m)				
Page	Section	Environmental designations	On site	0-50m	50-250m	250-500m	500-2000m
54	10.1	Sites of Special Scientific Interest (SSSI)	0	0	0	0	0
55	10.2	Conserved wetland sites (Ramsar sites)	0	0	0	0	0
55	10.3	Special Areas of Conservation (SAC)	0	0	0	0	0
55	10.4	Special Protection Areas (SPA)	0	0	0	0	0
55	10.5	National Nature Reserves (NNR)	0	0	0	0	0
56	**10.6**	**Local Nature Reserves (LNR)**	0	0	0	1	2
56	**10.7**	**Designated Ancient Woodland**	0	0	0	0	2
56	10.8	Biosphere Reserves	0	0	0	0	0
57	10.9	Forest Parks	0	0	0	0	0
57	10.10	Marine Conservation Zones	0	0	0	0	0
57	**10.11**	**Green Belt**	0	0	0	0	3
57	10.12	Proposed Ramsar sites	0	0	0	0	0

58	10.13	Possible Special Areas of Conservation (pSAC)	0	0	0	0	0
58	10.14	Potential Special Protection Areas (pSPA)	0	0	0	0	0
58	10.15	Nitrate Sensitive Areas	0	0	0	0	0
58	**10.16**	**Nitrate Vulnerable Zones**	1	0	0	0	1
60	**10.17**	**SSSI Impact Risk Zones**	2	-	-	-	-
61	10.18	SSSI Units	0	0	0	0	0

Page	Section	Visual and cultural designations	On site	0-50m	50-250m	250-500m	500-2000m
62	11.1	World Heritage Sites	0	0	0	-	-
63	11.2	Area of Outstanding Natural Beauty	0	0	0	-	-
63	11.3	National Parks	0	0	0	-	-
63	**11.4**	**Listed Buildings**	0	0	3	-	-
64	**11.5**	**Conservation Areas**	1	0	1	-	-
64	11.6	Scheduled Ancient Monuments	0	0	0	-	-
64	**11.7**	**Registered Parks and Gardens**	1	1	1	-	-

Page	Section	Agricultural designations	On site	0-50m	50-250m	250-500m	500-2000m
66	**12.1**	**Agricultural Land Classification**	Urban (within 250m)				
67	12.2	Open Access Land	0	0	0	-	-
67	12.3	Tree Felling Licences	0	0	0	-	-
67	12.4	Environmental Stewardship Schemes	0	0	0	-	-
67	12.5	Countryside Stewardship Schemes	0	0	0	-	-

Page	Section	Habitat designations	On site	0-50m	50-250m	250-500m	500-2000m
68	**13.1**	**Priority Habitat Inventory**	0	1	13	-	-
69	13.2	Habitat Networks	0	0	0	-	-
69	13.3	Open Mosaic Habitat	0	0	0	-	-
69	13.4	Limestone Pavement Orders	0	0	0	-	-

Page	Section	Geology 1:10,000 scale	On site	0-50m	50-250m	250-500m	500-2000m
71	**14.1**	**10k Availability**	Identified (within 500m)				
72	14.2	Artificial and made ground (10k)	0	0	0	0	-
73	14.3	Superficial geology (10k)	0	0	0	0	-

73	14.4	Landslip (10k)	0	0	0	0	-
74	14.5	Bedrock geology (10k)	0	0	0	0	-
74	14.6	Bedrock faults and other linear features (10k)	0	0	0	0	-
Page	Section	Geology 1:50,000 scale	On site	0-50m	50-250m	250-500m	500-2000m
75	**15.1**	**50k Availability**	Identified (within 500m)				
76	**15.2**	**Artificial and made ground (50k)**	0	1	0	2	-
77	15.3	Artificial ground permeability (50k)	0	0	-	-	-
78	**15.4**	**Superficial geology (50k)**	3	0	1	2	-
79	**15.5**	**Superficial permeability (50k)**	Identified (within 50m)				
79	15.6	Landslip (50k)	0	0	0	0	-
79	15.7	Landslip permeability (50k)	None (within 50m)				
80	**15.8**	**Bedrock geology (50k)**	1	0	0	0	-
81	**15.9**	**Bedrock permeability (50k)**	Identified (within 50m)				
81	15.10	Bedrock faults and other linear features (50k)	0	0	0	0	-
Page	Section	Boreholes	On site	0-50m	50-250m	250-500m	500-2000m
82	**16.1**	**BGS Boreholes**	5	2	55	-	-
Page	Section	Natural ground subsidence					
86	**17.1**	**Shrink swell clays**	Low (within 50m)				
87	**17.2**	**Running sands**	Very low (within 50m)				
88	**17.3**	**Compressible deposits**	Negligible (within 50m)				
89	**17.4**	**Collapsible deposits**	Very low (within 50m)				
90	**17.5**	**Landslides**	Very low (within 50m)				
91	**17.6**	**Ground dissolution of soluble rocks**	Negligible (within 50m)				
Page	Section	Mining, ground workings and natural cavities	On site	0-50m	50-250m	250-500m	500-2000m
92	18.1	Natural cavities	0	0	0	0	-
93	**18.2**	**BritPits**	0	0	2	4	-
94	**18.3**	**Surface ground workings**	0	6	18	-	-
95	18.4	Underground workings	0	0	0	0	0
95	**18.5**	**Historical Mineral Planning Areas**	1	1	1	0	-

96	**18.6**	**Non-coal mining**	0	0	0	0	1
96	18.7	Mining cavities	0	0	0	0	0
96	18.8	JPB mining areas	None (within 0m)				
96	18.9	Coal mining	None (within 0m)				
97	18.10	Brine areas	None (within 0m)				
97	18.11	Gypsum areas	None (within 0m)				
97	18.12	Tin mining	None (within 0m)				
97	18.13	Clay mining	None (within 0m)				

Page	Section	Radon	
98	**19.1**	**Radon**	Less than 1% (within 0m)

Page	Section	Soil chemistry	On site	0-50m	50-250m	250-500m	500-2000m
99	**20.1**	**BGS Estimated Background Soil Chemistry**	7	2	-	-	-
100	20.2	BGS Estimated Urban Soil Chemistry	0	0	-	-	-
100	20.3	BGS Measured Urban Soil Chemistry	0	0	-	-	-

Page	Section	Railway infrastructure and projects	On site	0-50m	50-250m	250-500m	500-2000m
101	21.1	Underground railways (London)	0	0	0	-	-
101	21.2	Underground railways (Non-London)	0	0	0	-	-
101	21.3	Railway tunnels	0	0	0	-	-
101	21.4	Historical railway and tunnel features	0	0	0	-	-
101	21.5	Royal Mail tunnels	0	0	0	-	-
102	21.6	Historical railways	0	0	0	-	-
102	21.7	Railways	0	0	0	-	-
102	21.8	Crossrail 1	0	0	0	0	-
102	21.9	Crossrail 2	0	0	0	0	-
102	21.10	HS2	0	0	0	0	-

Recent aerial photograph

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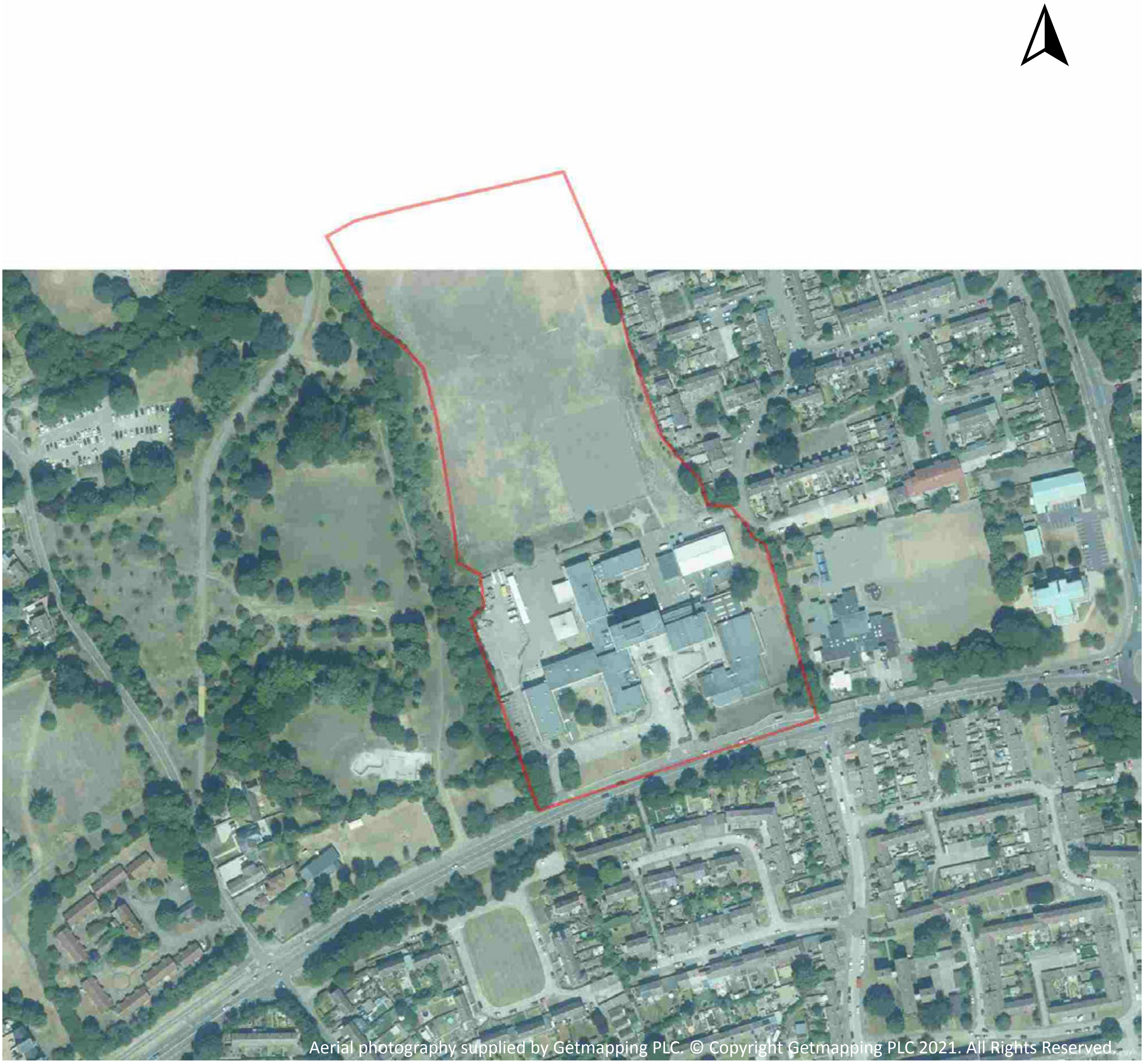
Capture Date: 09/04/2020

Site Area: 5.52ha

Recent site history - 2018 aerial photograph



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Capture Date: 02/08/2018

Site Area: 5.52ha

Recent site history - 2014 aerial photograph

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Capture Date: 03/07/2014

Site Area: 5.52ha

Recent site history - 2009 aerial photograph

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Capture Date: 23/06/2009

Site Area: 5.52ha

Recent site history - 1999 aerial photograph

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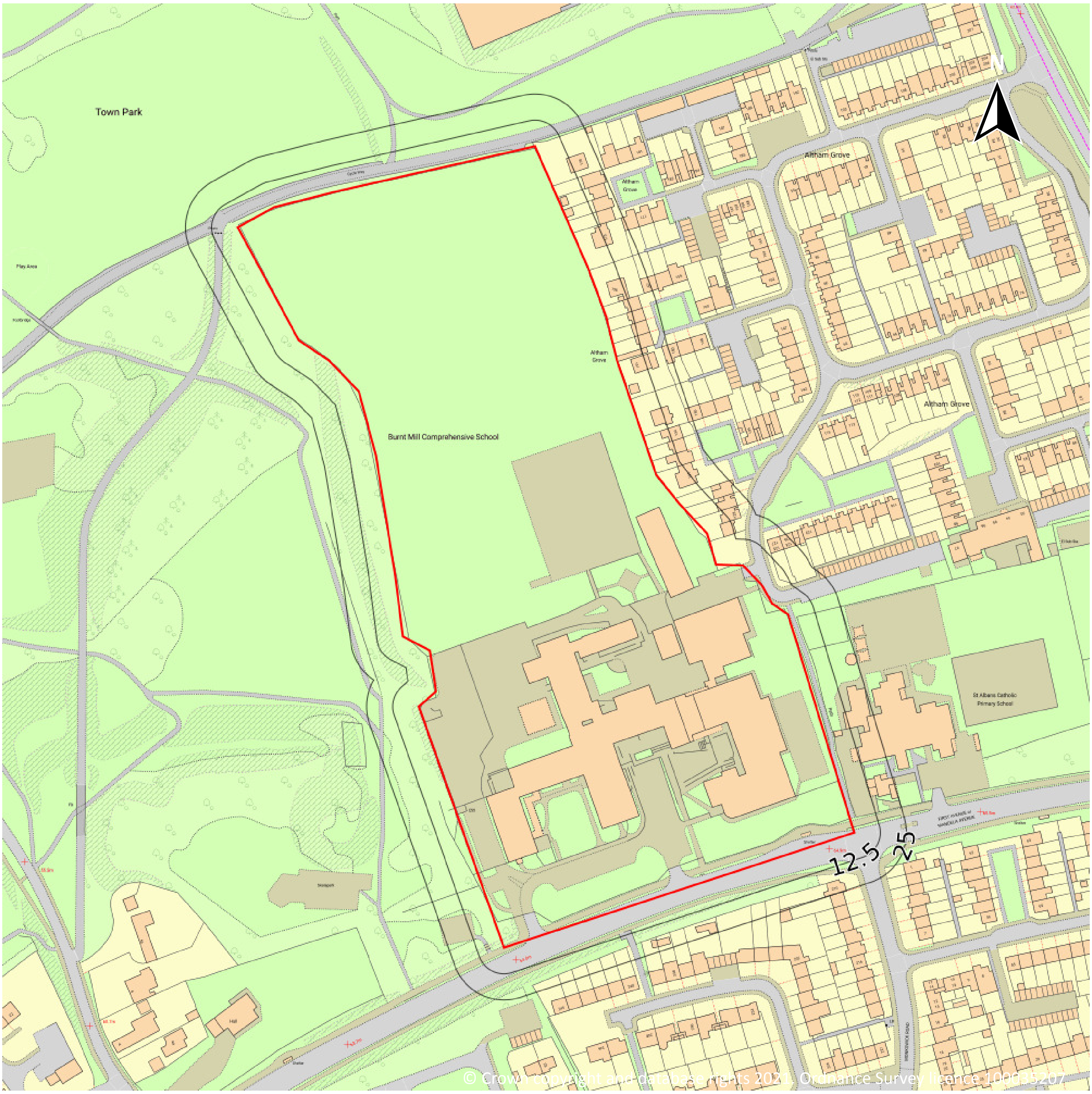
Capture Date: 18/07/1999

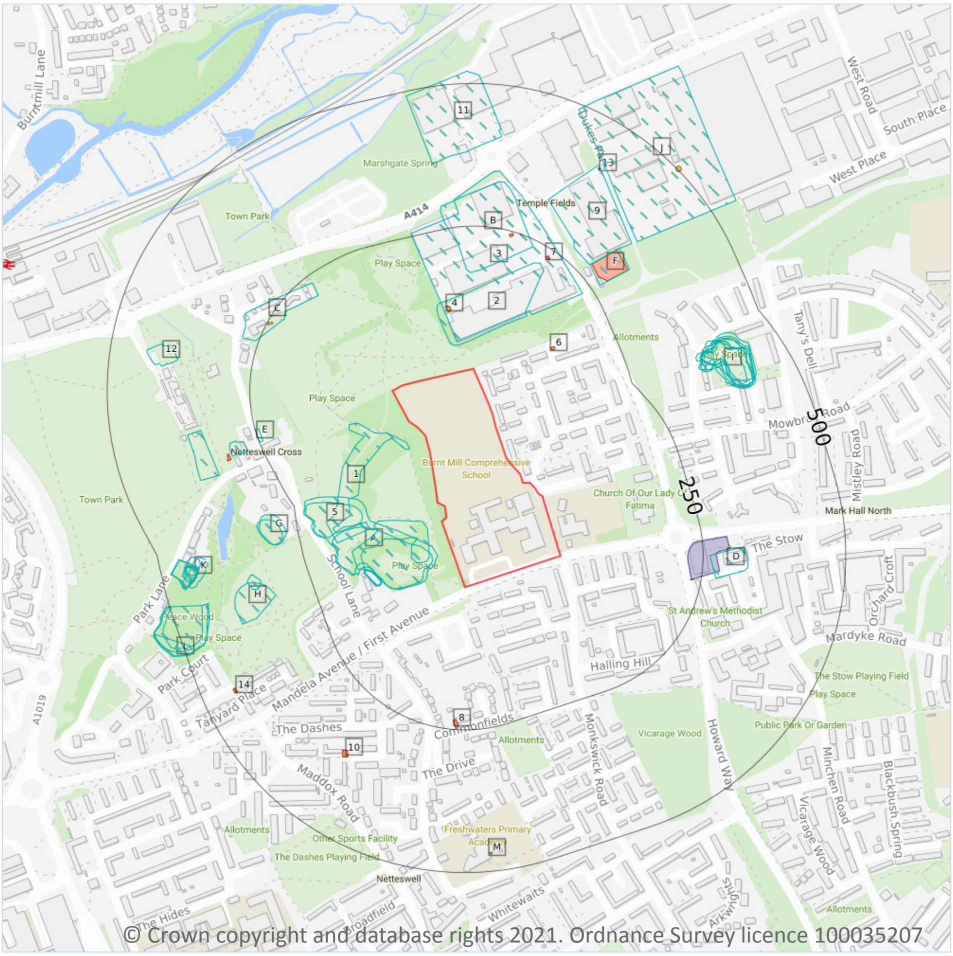
Site Area: 5.52ha

OS MasterMap site plan



Site Area: 5.52ha

1 Past land use



— Site Outline

Search buffers in metres (m)

▨ Historical industrial land uses

🟨 Historical tanks

🟥 Historical energy features

🟪 Historical garages

1.1 Historical industrial land uses

Records within 500m	44

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 1:10,560 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 14**

ID	Location	Land use	Dates present	Group ID
A	27m W	Unspecified Pits	1938 - 1947	2069184

ID	Location	Land use	Dates present	Group ID
A	28m W	Unspecified Ground Workings	1980	2061037
1	32m SW	Unspecified Ground Workings	1980	2061038
A	36m W	Unspecified Pit	1955	2104074
2	46m N	Unspecified Pit	1955	2040435
3	54m N	Unspecified Works	1980	2046705
5	134m W	Unspecified Pit	1955	2040438
A	134m W	Unspecified Pit	1923	2115789
A	135m W	Unspecified Pit	1923	2110385
A	136m W	Unspecified Pit	1955	2095169
B	169m N	Unspecified Heap	1955	2054473
C	212m NW	Unspecified Depot	1980	2048144
E	243m W	Smithy	1923	2059148
D	262m E	Telephone Exchange	1955	2054735
F	266m NE	Electricity Substation	1980	2043742
G	270m W	Unspecified Pit	1938 - 1947	2115810
9	273m NE	Unspecified Depot	1980	2048146
E	274m SW	Smithy	1923	2059149
G	277m W	Unspecified Pit	1955	2111723
H	317m W	Unspecified Heap	1980	2054464
H	334m W	Unspecified Pit	1947 - 1955	2085456
E	337m SW	Nursery	1980 - 1992	2089768
I	354m NE	Refuse Heap	1880	2063417
I	357m NE	Old Gravel Pit	1899	2081134
I	363m NE	Sand Pit	1874	2057393
I	363m NE	Old Gravel Pit	1896	2096096
J	363m NE	Unspecified Works	1980	2046709
11	365m N	Unspecified Depot	1980	2048145
I	367m NE	Old Gravel Pit	1923	2121927

ID	Location	Land use	Dates present	Group ID
I	368m NE	Unspecified Pit	1955	2040436
I	368m NE	Old Gravel Pit	1947	2099134
I	374m NE	Old Gravel Pit	1938	2105213
12	380m W	Unspecified Heap	1874 - 1880	2087941
K	416m W	Sand Pit	1874	2057392
K	429m W	Refuse Heap	1880	2075189
K	433m W	Unspecified Heap	1947	2054471
L	434m W	Unspecified Ground Workings	1938	2061040
K	434m W	Refuse Heap	1923	2084242
K	435m W	Gravel Pit	1923	2055479
K	435m W	Unspecified Ground Workings	1979	2061039
K	436m W	Unspecified Pit	1895	2084326
L	436m W	Unspecified Pit	1947	2111285
K	436m W	Unspecified Pit	1897	2103121
L	487m W	Unspecified Pit	1980 - 1992	2067131

This data is sourced from Ordnance Survey / Groundsure.

1.2 Historical tanks

Records within 500m	7

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 14**

ID	Location	Land use	Dates present	Group ID
4	107m N	Tanks	1987 - 1991	353464
C	241m NW	Unspecified Tank	1987 - 1991	357744
C	245m NW	Unspecified Tank	1987 - 1991	356539

ID	Location	Land use	Dates present	Group ID
M	467m S	Unspecified Tank	1966	352369
M	467m S	Unspecified Tank	1965	353121
M	467m S	Unspecified Tank	1975	354590
J	497m NE	Unspecified Tank	1991	346698

This data is sourced from Ordnance Survey / Groundsure.

1.3 Historical energy features

Records within 500m	**9**

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 14**

ID	Location	Land use	Dates present	Group ID
6	139m NE	Electricity Substation	1991	226911
7	231m NE	Electricity Substation	1991	226912
8	233m S	Electricity Substation	1975 - 1992	234214
B	240m N	Electricity Substation	1991	226913
F	272m NE	Electricity Substation	1991	226910
E	308m SW	Electricity Substation	1986	226905
10	352m SW	Electricity Substation	1975 - 1992	235021
13	412m NE	Electricity Substation	1991	226914
14	439m SW	Electricity Substation	1975 - 1992	232460

This data is sourced from Ordnance Survey / Groundsure.

1.4 Historical petrol stations

Records within 500m	**0**

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

1.5 Historical garages

Records within 500m	**1**

Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 14**

ID	Location	Land use	Dates present	Group ID
D	223m E	Garage	1965 - 1966	72182

This data is sourced from Ordnance Survey / Groundsure.

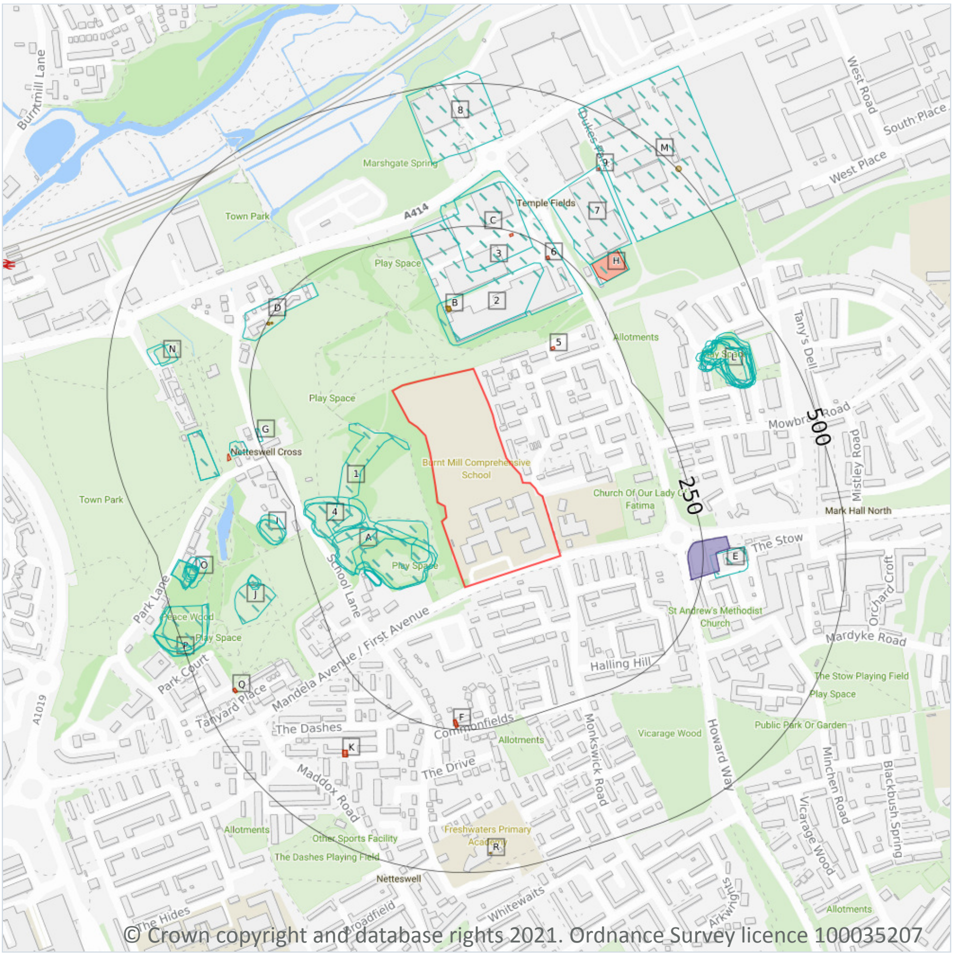
1.6 Historical military land

Records within 500m	**0**

Areas of military land digitised from multiple sources including the National Archives, local records, MOD records and verified other sources, intelligently grouped into contiguous features.

This data is sourced from Ordnance Survey / Groundsure / other sources.

2 Past land use - un-grouped



— Site Outline

Search buffers in metres (m)

▨	Historical industrial land uses
🟨	Historical tanks
🟥	Historical energy features
🟪	Historical garages

2.1 Historical industrial land uses

Records within 500m **53**

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 10,560 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 19**

ID	Location	Land Use	Date	Group ID
A	27m W	Unspecified Pits	1938	2069184
A	28m W	Unspecified Ground Workings	1980	2061037
1	32m SW	Unspecified Ground Workings	1980	2061038

ID	Location	Land Use	Date	Group ID
A	32m W	Unspecified Pits	1947	2069184
A	36m W	Unspecified Pit	1955	2104074
2	46m N	Unspecified Pit	1955	2040435
3	54m N	Unspecified Works	1980	2046705
4	134m W	Unspecified Pit	1955	2040438
A	134m W	Unspecified Pit	1923	2115789
A	135m W	Unspecified Pit	1923	2110385
A	135m W	Unspecified Pit	1923	2110385
A	136m W	Unspecified Pit	1955	2095169
C	169m N	Unspecified Heap	1955	2054473
D	212m NW	Unspecified Depot	1980	2048144
G	243m W	Smithy	1923	2059148
E	262m E	Telephone Exchange	1955	2054735
H	266m NE	Electricity Substation	1980	2043742
I	270m W	Unspecified Pit	1938	2115810
I	272m W	Unspecified Pit	1947	2115810
7	273m NE	Unspecified Depot	1980	2048146
G	274m SW	Smithy	1923	2059149
I	277m W	Unspecified Pit	1955	2111723
J	317m W	Unspecified Heap	1980	2054464
J	334m W	Unspecified Pit	1947	2085456
G	337m SW	Nursery	1992	2089768
G	337m SW	Nursery	1980	2089768
J	339m W	Unspecified Pit	1955	2085456
L	354m NE	Refuse Heap	1880	2063417
L	357m NE	Old Gravel Pit	1899	2081134
L	361m NE	Old Gravel Pit	1899	2081134
L	363m NE	Old Gravel Pit	1896	2096096

ID	Location	Land Use	Date	Group ID
L	363m NE	Sand Pit	1874	2057393
M	363m NE	Unspecified Works	1980	2046709
8	365m N	Unspecified Depot	1980	2048145
L	367m NE	Old Gravel Pit	1923	2121927
L	368m NE	Unspecified Pit	1955	2040436
L	368m NE	Old Gravel Pit	1947	2099134
L	371m NE	Old Gravel Pit	1923	2121927
L	374m NE	Old Gravel Pit	1938	2105213
N	380m W	Unspecified Heap	1874	2087941
N	394m W	Unspecified Heap	1880	2087941
O	416m W	Sand Pit	1874	2057392
O	429m W	Refuse Heap	1880	2075189
O	433m W	Unspecified Heap	1947	2054471
P	434m W	Unspecified Ground Workings	1938	2061040
O	434m W	Refuse Heap	1923	2084242
O	435m W	Gravel Pit	1923	2055479
O	435m W	Unspecified Ground Workings	1979	2061039
O	436m W	Unspecified Pit	1895	2084326
P	436m W	Unspecified Pit	1947	2111285
O	436m W	Unspecified Pit	1897	2103121
P	487m W	Unspecified Pit	1992	2067131
P	487m W	Unspecified Pit	1980	2067131

This data is sourced from Ordnance Survey / Groundsure.

2.2 Historical tanks

Records within 500m	**13**

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 19**

ID	Location	Land Use	Date	Group ID
B	107m N	Tanks	1987	353464
B	107m N	Tanks	1991	353464
B	107m N	Tanks	1991	353464
D	241m NW	Unspecified Tank	1987	357744
D	241m NW	Unspecified Tank	1991	357744
D	241m NW	Unspecified Tank	1991	357744
D	245m NW	Unspecified Tank	1987	356539
D	245m NW	Unspecified Tank	1991	356539
D	245m NW	Unspecified Tank	1991	356539
R	467m S	Unspecified Tank	1966	352369
R	467m S	Unspecified Tank	1975	354590
R	467m S	Unspecified Tank	1965	353121
M	497m NE	Unspecified Tank	1991	346698

This data is sourced from Ordnance Survey / Groundsure.

2.3 Historical energy features

Records within 500m	**12**

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 19**

ID	Location	Land Use	Date	Group ID
5	139m NE	Electricity Substation	1991	226911
6	231m NE	Electricity Substation	1991	226912
F	233m S	Electricity Substation	1975	234214
F	233m S	Electricity Substation	1992	234214
C	240m N	Electricity Substation	1991	226913
H	272m NE	Electricity Substation	1991	226910

ID	Location	Land Use	Date	Group ID
G	308m SW	Electricity Substation	1986	226905
K	352m SW	Electricity Substation	1975	235021
K	353m SW	Electricity Substation	1992	235021
9	412m NE	Electricity Substation	1991	226914
Q	439m SW	Electricity Substation	1975	232460
Q	439m SW	Electricity Substation	1992	232460

This data is sourced from Ordnance Survey / Groundsure.

2.4 Historical petrol stations

Records within 500m	**0**

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

2.5 Historical garages

Records within 500m	**2**

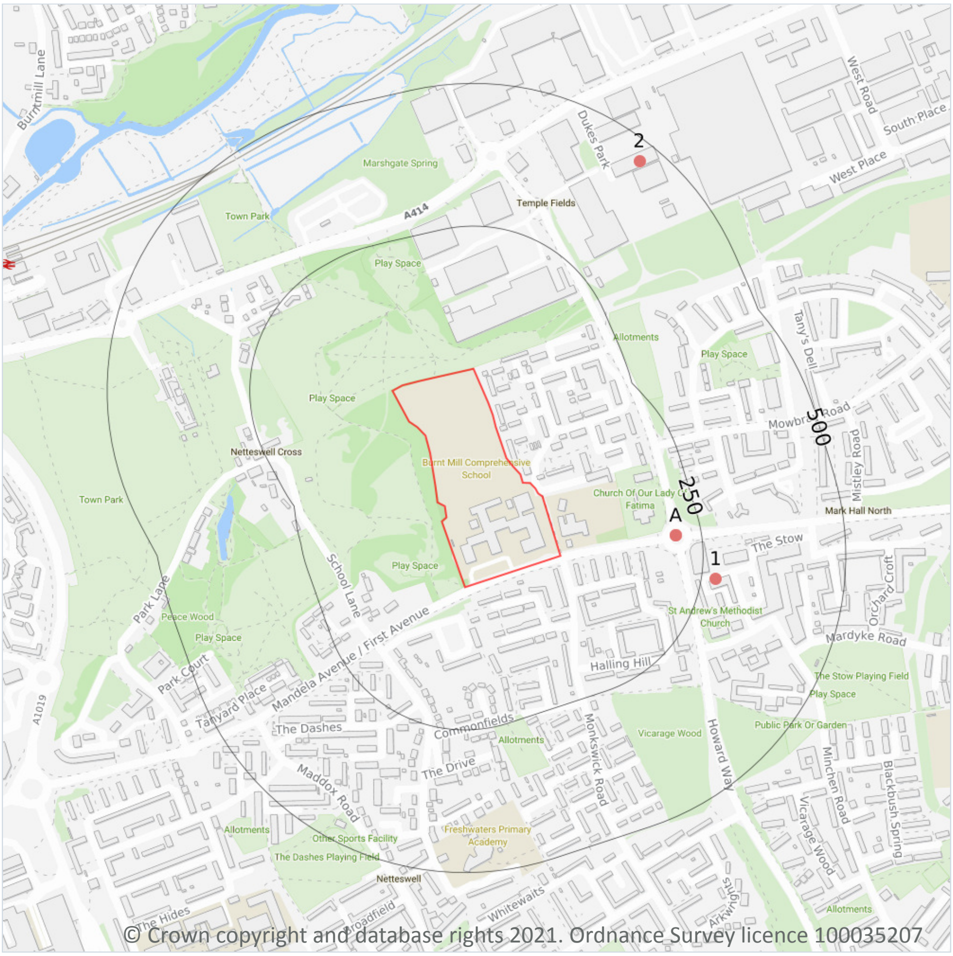
Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 19**

ID	Location	Land Use	Date	Group ID
E	223m E	Garage	1965	72182
E	224m E	Garage	1966	72182

This data is sourced from Ordnance Survey / Groundsure.

3 Waste and landfill



🟥 Site Outline

Search buffers in metres (m)

● Waste exemptions

3.1 Active or recent landfill

Records within 500m	**0**

Active or recently closed landfill sites under Environment Agency/Natural Resources Wales regulation.

This data is sourced from the Environment Agency and Natural Resources Wales.

3.2 Historical landfill (BGS records)

Records within 500m	**0**

Landfill sites identified on a survey carried out on behalf of the DoE in 1973. These sites may have been closed or operational at this time.

This data is sourced from the British Geological Survey.

3.3 Historical landfill (LA/mapping records)

Records within 500m	**0**

Landfill sites identified from Local Authority records and high detail historical mapping.

This data is sourced from the Ordnance Survey/Groundsure and Local Authority records.

3.4 Historical landfill (EA/NRW records)

Records within 500m	**0**

Known historical (closed) landfill sites (e.g. sites where there is no PPC permit or waste management licence currently in force). This includes sites that existed before the waste licensing regime and sites that have been licensed in the past but where a licence has been revoked, ceased to exist or surrendered and a certificate of completion has been issued.

This data is sourced from the Environment Agency and Natural Resources Wales.

3.5 Historical waste sites

Records within 500m	**0**

Waste site records derived from Local Authority planning records and high detail historical mapping.

This data is sourced from Ordnance Survey/Groundsure and Local Authority records.

3.6 Licensed waste sites

Records within 500m	**0**

Active or recently closed waste sites under Environment Agency/Natural Resources Wales regulation.

This data is sourced from the Environment Agency and Natural Resources Wales.

3.7 Waste exemptions

Records within 500m	**8**

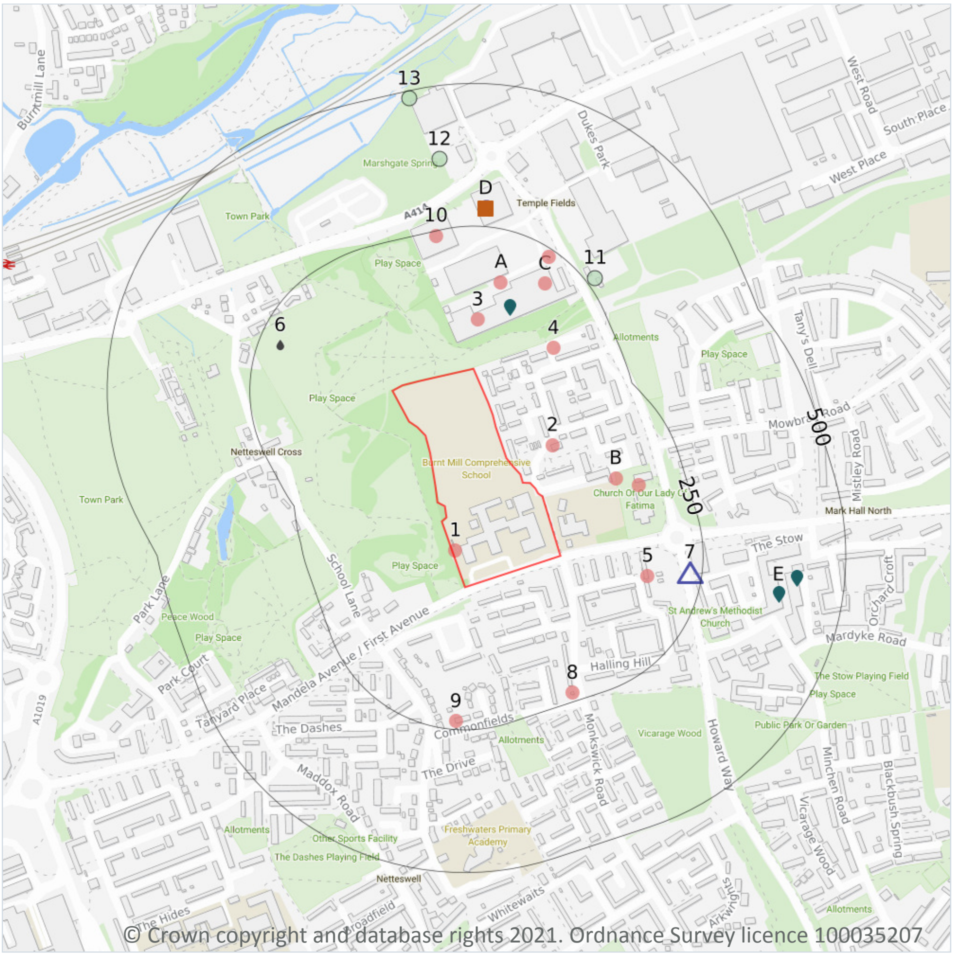
Activities involving the storage, treatment, use or disposal of waste that are exempt from needing a permit. Exemptions have specific limits and conditions that must be adhered to.

Features are displayed on the Waste and landfill map on **page 24**

ID	Location	Site	Reference	Category	Sub-Category	Description
A	205m E	Jackson Civil Engineering Clock Tower Roundabout CM18 6AA	EPR/DF0339JY/A001	Treating waste exemption	Non-Agricultural Waste Only	Treatment of waste aerosol cans
A	205m E	Jackson Civil Engineering Clock Tower Roundabout CM18 6AA	EPR/DF0339JY/A001	Treating waste exemption	Non-Agricultural Waste Only	Treatment of waste wood and waste plant matter by chipping, shredding, cutting or pulverising
A	205m E	Jackson Civil Engineering Clock Tower Roundabout CM18 6AA	EPR/DF0339JY/A001	Using waste exemption	Non-Agricultural Waste Only	Use of waste in construction
A	205m E	Jackson Civil Engineering Clock Tower Roundabout CM18 6AA	EPR/DF0339JY/A001	Using waste exemption	Non-Agricultural Waste Only	Use of mulch
A	205m E	Jackson Civil Engineering Clock Tower Roundabout CM18 6AA	EPR/DF0339JY/A001	Using waste exemption	Non-Agricultural Waste Only	Spreading of plant matter to confer benefit
A	205m E	Jackson Civil Engineering Clock Tower Roundabout CM18 6AA	EPR/DF0339JY/A001	Using waste exemption	Non-Agricultural Waste Only	Use of waste for a specified purpose
1	275m E	Just Appliances Units25-26 The Stow Service Industry Bays Harlow CM20 3AB	EA/EPR/VP3749EA/A001	Treating waste exemption	Non-Agricultural Waste Only	Repair or refurbishment of WEEE
2	465m NE	Unit 7 Dukes Park Edinburgh Way Harlow Essex CM20 2GF	EPR/ZF0600HS/A001	Storing waste exemption	Non-Agricultural Waste Only	Storage of waste in a secure place

This data is sourced from the Environment Agency and Natural Resources Wales.

4 Current industrial land use



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━ Site Outline

Search buffers in metres (m)

● Recent industrial land uses

△ Current or recent petrol stations

● Historical licensed industrial activities

○ Part A(1) industrial activities

● Licensed pollutant release (Part A(2)/B)

● Licensed Discharges to controlled waters

■ Pollutant release to public sewer

○ Pollution Incidents (EA/NRW)

4.1 Recent industrial land uses

Records within 250m **13**

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on **page 27**

ID	Location	Company	Address	Activity	Category
1	**On site**	**Electricity Sub Station**	**Essex, CM20**	**Electrical Features**	**Infrastructure and Facilities**
2	76m NE	Ibuyyourbikes	115, Altham Grove, Harlow, Essex, CM20 2PJ	New Vehicles	Motoring
3	87m N	Works	Essex, CM20	Unspecified Works Or Factories	Industrial Features

ID	Location	Company	Address	Activity	Category
B	132m E	Electricity Sub Station	Essex, CM20	Electrical Features	Infrastructure and Facilities
4	143m NE	Electricity Sub Station	Essex, CM20	Electrical Features	Infrastructure and Facilities
5	157m E	Mobile Car Services	83, Halling Hill, Harlow, Essex, CM20 3JL	Vehicle Repair, Testing and Servicing	Repair and Servicing
A	159m N	Electricity Sub Stations	Essex, CM20	Electrical Features	Infrastructure and Facilities
B	168m E	Chimney	Essex, CM20	Chimneys	Industrial Features
C	195m NE	Gratnells Ltd	8, Howard Way, Harlow, Essex, CM20 2SU	Educational Equipment and Supplies	Industrial Products
8	235m S	Electricity Sub Station	Essex, CM20	Electrical Features	Infrastructure and Facilities
9	236m S	Electricity Sub Station	Essex, CM20	Electrical Features	Infrastructure and Facilities
C	236m NE	Electricity Sub Station	Essex, CM20	Electrical Features	Infrastructure and Facilities
10	242m N	Lewis's	3, Princes Gate Retail Park, Howard Way, Town Centre, Harlow, Essex, CM20 2SU	Beds and Bedding	Consumer Products

This data is sourced from Ordnance Survey.

4.2 Current or recent petrol stations

Records within 500m	1

Open, closed, under development and obsolete petrol stations.

Features are displayed on the Current industrial land use map on **page 27**

ID	Location	Company	Address	LPG	Status
7	229m E	OBSOLETE	First Avenue, Howard Way, Harlow, Essex, CM20 3AA	Not Applicable	Obsolete

This data is sourced from Experian.

4.3 Electricity cables

Records within 500m	**0**

High voltage underground electricity transmission cables.

This data is sourced from National Grid.

4.4 Gas pipelines

Records within 500m	**0**

High pressure underground gas transmission pipelines.

This data is sourced from National Grid.

4.5 Sites determined as Contaminated Land

Records within 500m	**0**

Contaminated Land Register of sites designated under Part 2a of the Environmental Protection Act 1990.

This data is sourced from Local Authority records.

4.6 Control of Major Accident Hazards (COMAH)

Records within 500m	**0**

Control of Major Accident Hazards (COMAH) sites. This data includes upper and lower tier sites, and includes a historical archive of COMAH sites and Notification of Installations Handling Hazardous Substances (NIHHS) records.

This data is sourced from the Health and Safety Executive.

4.7 Regulated explosive sites

Records within 500m	**0**

Sites registered and licensed by the Health and Safety Executive under the Manufacture and Storage of Explosives Regulations 2005 (MSER). The last update to this data was in April 2011.

This data is sourced from the Health and Safety Executive.

4.8 Hazardous substance storage/usage

Records within 500m	**0**

Consents granted for a site to hold certain quantities of hazardous substances at or above defined limits in accordance with the Planning (Hazardous Substances) Regulations 2015.

This data is sourced from Local Authority records.

4.9 Historical licensed industrial activities (IPC)

Records within 500m	**3**

Integrated Pollution Control (IPC) records of substance releases to air, land and water. This data represents a historical archive as the IPC regime has been superseded.

Features are displayed on the Current industrial land use map on **page 27**

ID	Location	Details	
D	282m N	Operator: Robert Stuart Plc Address: 10-11 Edinburgh Way, Harlow, Essex, CM20 2DH Process: Inorganic Chemical Processes Permit Number: AN7481	Original Permit Number: IPCAPP Date Approved: 7-10-1994 Effective Date: 1-12-1994 Status: Superseded By Variation
D	282m N	Operator: Robert Stuart Plc Address: 10-11 Edinburgh Way, Harlow, Essex, CM20 2DH Process: Inorganic Chemical Processes Permit Number: BC8902	Original Permit Number: IPCMINVAR Date Approved: 24-11-1998 Effective Date: 30-11-1998 Status: Superseded By Variation
D	282m N	Operator: Robert Stuart Plc Address: 10-11 Edinburgh Way, Harlow, Essex, CM20 2DH Process: Inorganic Chemical Processes Permit Number: BI0491	Original Permit Number: IPCMINVAR Date Approved: 30-11-2000 Effective Date: 1-12-2000 Status: Revoked - Now Ippc

This data is sourced from the Environment Agency and Natural Resources Wales.

4.10 Licensed industrial activities (Part A(1))

Records within 500m	**5**

Records of Part A(1) installations regulated under the Environmental Permitting (England and Wales) Regulations 2016 for the release of substances to the environment.

Features are displayed on the Current industrial land use map on **page 27**

ID	Location	Details	
D	282m N	Operator: ROBERT STUART LIMITED Installation Name: ROBERT STUART PLATING SHOP EPR/BP4356IN Process: FERROUS METALS; PRODUCING ETC IN ELECTRIC ARC FURNACES 7 TONNES (UNLESS 2.1 A(2) (A) OR (D)) Permit Number: SP3730NU Original Permit Number: BP4356IN	EPR Reference: - Issue Date: 19/04/2013 Effective Date: 19/04/2013 Last date noted as effective: 28/09/2020 Status: EFFECTIVE
D	282m N	Operator: ROBERT STUART PLC Installation Name: INSTALLATION NAME NOT RECORDED Process: SURFACE TREATING METALS AND PLASTICS; ELECTROLYTIC/CHEMICAL >30 CU M Permit Number: BP4356IN Original Permit Number: BP4356IN	EPR Reference: - Issue Date: 21/12/2004 Effective Date: 21/12/2004 Last date noted as effective: 01/07/2021 Status: SUPERCEDED
D	282m N	Operator: ROBERT STUART PLC Installation Name: INSTALLATION NAME NOT RECORDED Process: FERROUS METALS; PRODUCING ETC IN ELECTRIC ARC FURNACES 7 TONNES (UNLESS 2.1 A(2) (A) OR (D)) Permit Number: BP4356IN Original Permit Number: BP4356IN	EPR Reference: - Issue Date: 21/12/2004 Effective Date: 21/12/2004 Last date noted as effective: 01/01/2017 Status: SUPERCEDED
D	282m N	Operator: ROBERT STUART PLC Installation Name: ROBERT STUART PLATING SHOP Process: FERROUS METALS; PRODUCING ETC IN ELECTRIC ARC FURNACES 7 TONNES (UNLESS 2.1 A(2) (A) OR (D)) Permit Number: UP3237SV Original Permit Number: BP4356IN	EPR Reference: - Issue Date: 01/09/2005 Effective Date: 01/09/2005 Last date noted as effective: 01/07/2021 Status: SUPERCEDED
D	282m N	Operator: ROBERT STUART PLC Installation Name: ROBERT STUART PLATING SHOP Process: SURFACE TREATING METALS AND PLASTICS; ELECTROLYTIC/CHEMICAL >30 CU M Permit Number: UP3237SV Original Permit Number: BP4356IN	EPR Reference: - Issue Date: 01/09/2005 Effective Date: 01/09/2005 Last date noted as effective: 01/07/2021 Status: SUPERCEDED

This data is sourced from the Environment Agency and Natural Resources Wales.

4.11 Licensed pollutant release (Part A(2)/B)

Records within 500m	**3**

Records of Part A(2) and Part B installations regulated under the Environmental Permitting (England and Wales) Regulations 2016 for the release of substances to the environment.

Features are displayed on the Current industrial land use map on **page 27**

ID	Location	Address	Details	
A	124m NE	Pilkington, Silvered & Processed, 8 Howard Way, Harlow, Essex, CM20 2SU	Process: Metal Coating Processes Status: Revoked Permit Type: Part B	Enforcement: Data Requested, Not Received Date of enforcement: Data Requested, Not Received Comment: Data Requested, Not Received
E	387m E	Harlow Dry Cleaners, 14 The Stow, Harlow, Essex, CM20 3AH	Process: Dry Cleaning Status: Current Permit Permit Type: Part B	Enforcement: Enforcement Notified Date of enforcement: 16/07/2007 Comment: A Notice Requiring Provision of appropriately sized set of scales capable of weighing the amount of material to be washed and to record the measurements for observation by the local authority
E	415m E	Theydon Launderette, 115 The Stow, Harlow, Essex, CM20 3AS	Process: Dry Cleaning Status: Historical Permit Permit Type: Part B	Enforcement: Data Requested, Not Received Date of enforcement: Data Requested, Not Received Comment: Data Requested, Not Received

This data is sourced from Local Authority records.

4.12 Radioactive Substance Authorisations

Records within 500m	**0**

Records of the storage, use, accumulation and disposal of radioactive substances regulated under the Radioactive Substances Act 1993.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.13 Licensed Discharges to controlled waters

Records within 500m	**1**

Discharges of treated or untreated effluent to controlled waters under the Water Resources Act 1991.

Features are displayed on the Current industrial land use map on **page 27**

ID	Location	Address	Details	
6	212m W	MARSHGATE COUNCIL DEPOT, SCHOOL LAN, MARSHGATE COUNCIL DEPOT SCHOOL, LANE HARLOW ESSEX	Effluent Type: MISCELLANEOUS DISCHARGES - UNSPECIFIED Permit Number: CTWC.3608 Permit Version: 1 Receiving Water: GLACIAL GRAVELS/BOULDERCLAY.	Status: LAPSED UNDER SCHEDULE 23 ENVIRONMENT ACT 1995 Issue date: 04/08/1989 Effective Date: 04/08/1989 Revocation Date: 01/10/1996

This data is sourced from the Environment Agency and Natural Resources Wales.

4.14 Pollutant release to surface waters (Red List)

Records within 500m	**0**

Discharges of specified substances under the Environmental Protection (Prescribed Processes and Substances) Regulations 1991.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.15 Pollutant release to public sewer

Records within 500m	**1**

Discharges of Special Category Effluents to the public sewer.

Features are displayed on the Current industrial land use map on **page 27**

ID	Location	Address	Details	
D	282m N	ROBERT STUART PLC, 10-11 EDINBURGH WAY, 10-11 EDINBURGH WAY, HARLOW, ESSEX, CM20 2DH	Permission reference: BW0142 Local Authority: HARLOW DISTRICT COUNCIL First received date: 01/12/2003	Last received date: 01/01/2018 Status: DEAD (APPLICATION)

This data is sourced from the Environment Agency and Natural Resources Wales.

4.16 List 1 Dangerous Substances

Records within 500m	**0**

Discharges of substances identified on List I of European Directive E 2006/11/EC, and regulated under the Environmental Damage (Prevention and Remediation) Regulations 2015.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.17 List 2 Dangerous Substances

Records within 500m	**0**

Discharges of substances identified on List II of European Directive E 2006/11/EC, and regulated under the Environmental Damage (Prevention and Remediation) Regulations 2015.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.18 Pollution Incidents (EA/NRW)

Records within 500m	**3**

Records of substantiated pollution incidents. Since 2006 this data has only included category 1 (major) and 2 (significant) pollution incidents.

Features are displayed on the Current industrial land use map on **page 27**

ID	Location	Details	
11	266m NE	Incident Date: 04/10/2002 Incident Identification: 112559 Pollutant: Inert Materials and Wastes Pollutant Description: Soils and Clay	Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)
12	372m N	Incident Date: 24/07/2002 Incident Identification: 94202 Pollutant: Inert Materials and Wastes Pollutant Description: Construction and Demolition Materials and Wastes	Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)
13	486m N	Incident Date: 14/06/2004 Incident Identification: 244271 Pollutant: Sewage Materials Pollutant Description: Crude Sewage	Water Impact: Category 4 (No Impact) Land Impact: Category 2 (Significant) Air Impact: Category 4 (No Impact)

This data is sourced from the Environment Agency and Natural Resources Wales.

4.19 Pollution inventory substances

Records within 500m	**0**

The pollution inventory (substances) includes reporting on annual emissions of certain regulated substances to air, controlled waters and land. A reporting threshold for each substance is also included. Where emissions fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.

4.20 Pollution inventory waste transfers

Records within 500m	**0**

The pollution inventory (waste transfers) includes reporting on annual transfers and recovery/disposal of controlled wastes from a site. A reporting threshold for each waste type is also included. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.

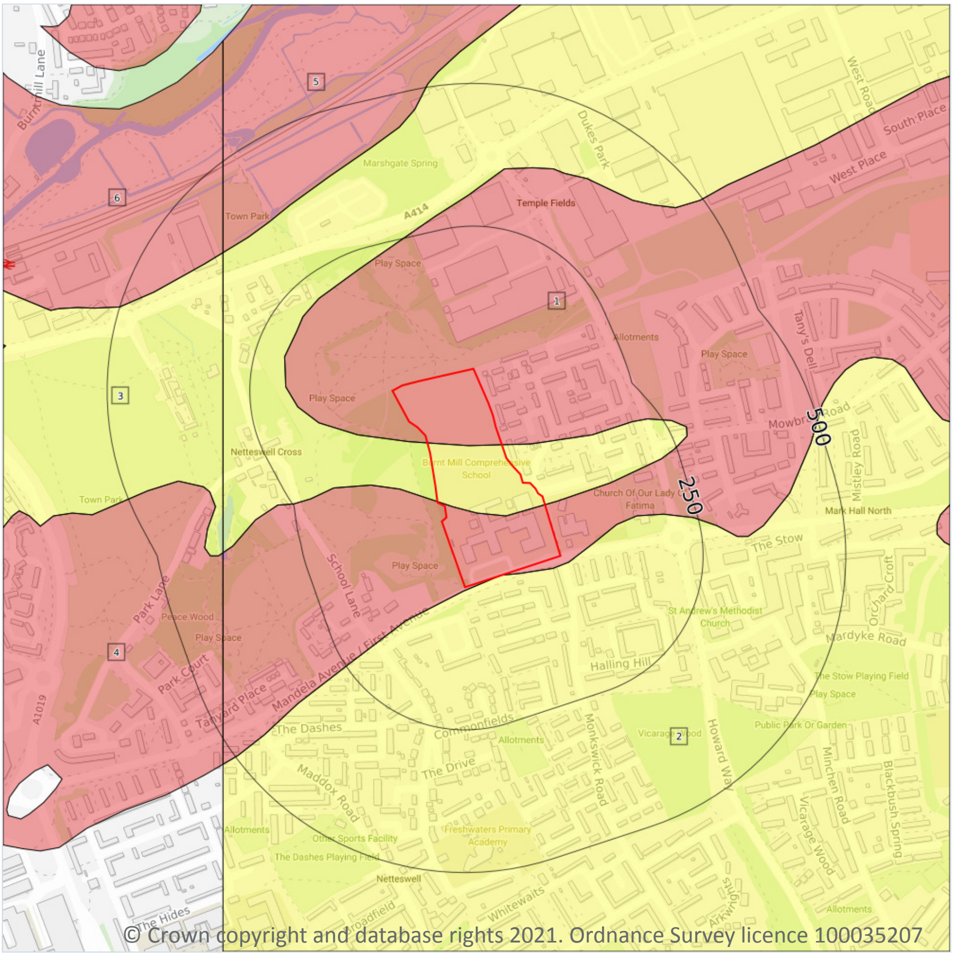
4.21 Pollution inventory radioactive waste

Records within 500m	**0**

The pollution inventory (radioactive wastes) includes reporting on annual releases of radioactive substances from a site, including the means of release. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.

5 Hydrogeology - Superficial aquifer



Site Outline

Search buffers in metres (m)

🟪 Principal
🟥 Secondary A
🟧 Secondary B
🟨 Secondary Undifferentiated
🟦 Unproductive
🟩 Unknown

5.1 Superficial aquifer

Records within 500m	6

Aquifer status of groundwater held within superficial geology.

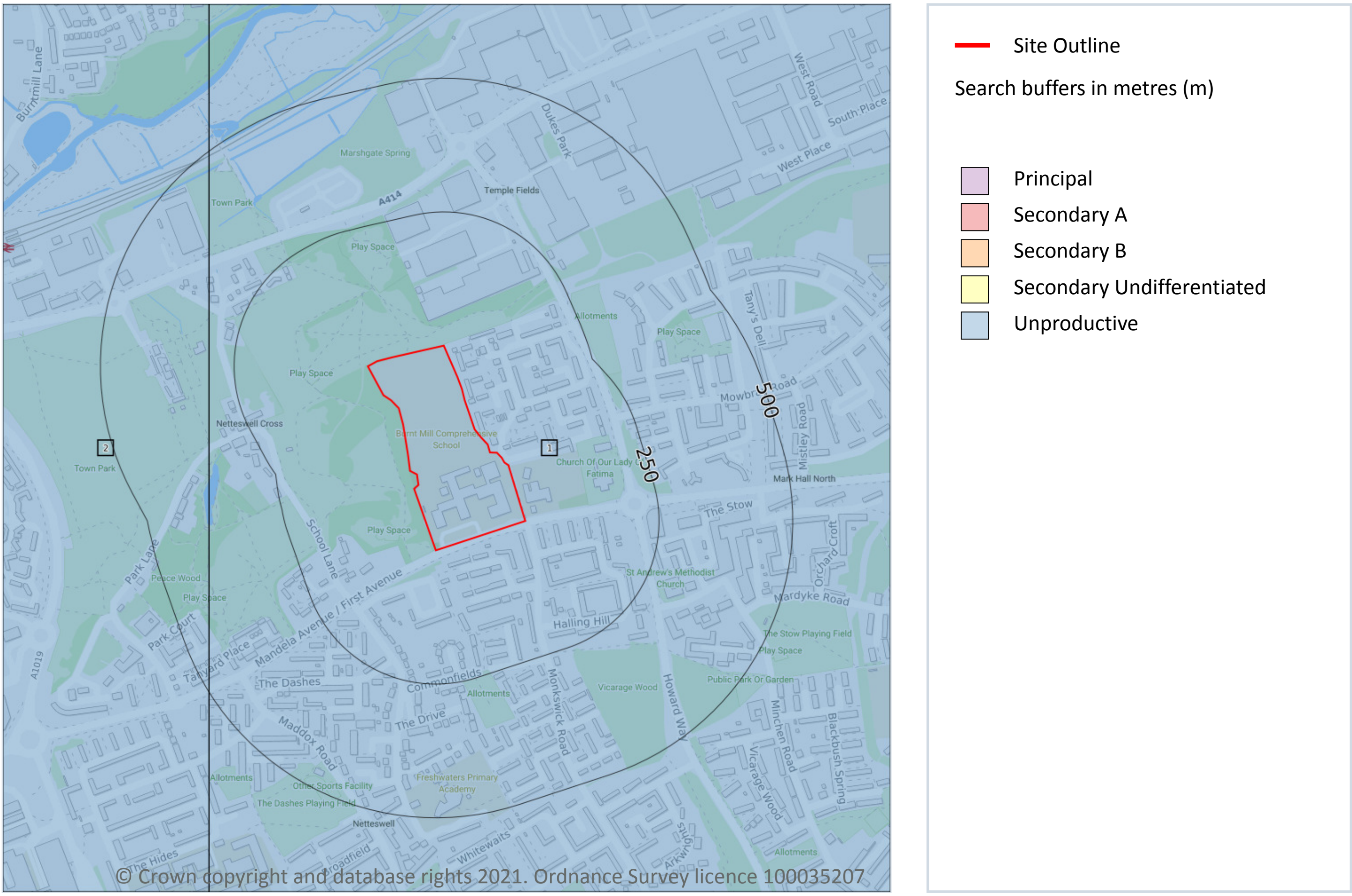
Features are displayed on the Hydrogeology map on **page 36**

ID	Location	Designation	Description
1	On site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
2	On site	Secondary Undifferentiated	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type

ID	Location	Designation	Description
3	297m W	Secondary Undifferentiated	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type
4	366m SW	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
5	366m NW	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
6	383m NW	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.

Bedrock aquifer



5.2 Bedrock aquifer

Records within 500m	**2**

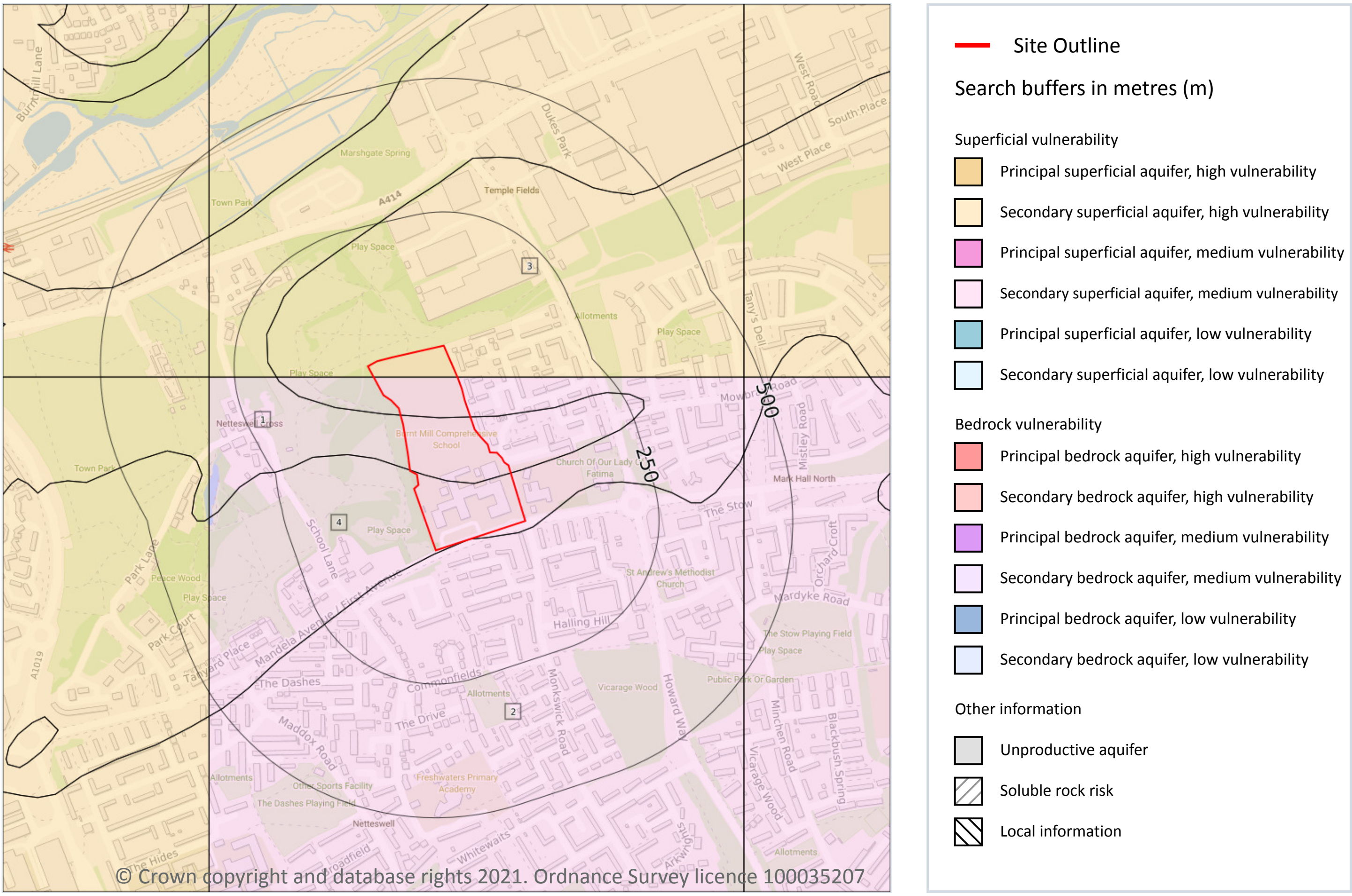
Aquifer status of groundwater held within bedrock geology.

Features are displayed on the Bedrock aquifer map on **page 38**

ID	Location	Designation	Description
1	**On site**	**Unproductive**	**These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow**
2	297m W	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.

Groundwater vulnerability



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5.3 Groundwater vulnerability

Records within 50m	**4**

An assessment of the vulnerability of groundwater to a pollutant discharged at ground level based on the hydrological, geological, hydrogeological and soil properties within a one kilometre square grid. Groundwater vulnerability is described as High, Medium or Low as follows:

- High - Areas able to easily transmit pollution to groundwater. They are likely to be characterised by high leaching soils and the absence of low permeability superficial deposits.
- Medium - Intermediate between high and low vulnerability.
- Low - Areas that provide the greatest protection from pollution. They are likely to be characterised by low leaching soils and/or the presence of superficial deposits characterised by a low permeability.

Features are displayed on the Groundwater vulnerability map on **page 39**

ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
1	**On site**	**Summary Classification: Secondary superficial aquifer - Medium Vulnerability Combined classification: Unproductive Bedrock Aquifer, Productive Superficial Aquifer**	**Leaching class: Intermediate Infiltration value: 40-70% Dilution value: <300mm/year**	**Vulnerability: Medium Aquifer type: Secondary Thickness: >10m Patchiness value: >90% Recharge potential: High**	**Vulnerability: Unproductive Aquifer type: Unproductive Flow mechanism: Mixed**
2	**On site**	**Summary Classification: Secondary superficial aquifer - Medium Vulnerability Combined classification: Unproductive Bedrock Aquifer, Productive Superficial Aquifer**	**Leaching class: Intermediate Infiltration value: 40-70% Dilution value: <300mm/year**	**Vulnerability: Medium Aquifer type: Secondary Thickness: >10m Patchiness value: >90% Recharge potential: High**	**Vulnerability: Unproductive Aquifer type: Unproductive Flow mechanism: Mixed**
3	**On site**	**Summary Classification: Secondary superficial aquifer - High Vulnerability Combined classification: Unproductive Bedrock Aquifer, Productive Superficial Aquifer**	**Leaching class: Intermediate Infiltration value: >70% Dilution value: <300mm/year**	**Vulnerability: High Aquifer type: Secondary Thickness: 3-10m Patchiness value: >90% Recharge potential: High**	**Vulnerability: Unproductive Aquifer type: Unproductive Flow mechanism: Mixed**
4	**On site**	**Summary Classification: Secondary superficial aquifer - Medium Vulnerability Combined classification: Unproductive Bedrock Aquifer, Productive Superficial Aquifer**	**Leaching class: Intermediate Infiltration value: 40-70% Dilution value: <300mm/year**	**Vulnerability: Medium Aquifer type: Secondary Thickness: >10m Patchiness value: >90% Recharge potential: High**	**Vulnerability: Unproductive Aquifer type: Unproductive Flow mechanism: Mixed**

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.

5.4 Groundwater vulnerability- soluble rock risk

Records on site	**0**

This dataset identifies areas where solution features that enable rapid movement of a pollutant may be present within a 1km grid square.

This data is sourced from the British Geological Survey and the Environment Agency.

5.5 Groundwater vulnerability- local information

Records on site	**0**

This dataset identifies areas where additional local information affecting vulnerability is held by the Environment Agency. Further information can be obtained by contacting the Environment Agency local Area groundwater team through the Environment Agency National Customer Call Centre on 03798 506 506 or by email on enquiries@environment-agency.gov.uk.

This data is sourced from the British Geological Survey and the Environment Agency.

Abstractions and Source Protection Zones

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- 🟥 Site Outline

Search buffers in metres (m)

- 🟥 Source Protection Zone 1 Inner catchment
- 🟦 Source Protection Zone 2 Outer catchment
- 🟩 Source Protection Zone 3 Total catchment
- 🟪 Source Protection Zone 4 Zone of Special Interest
- ▨ Source Protection Zone 1c Inner catchment - confined aquifer
- ▨ Source Protection Zone 2c Outer catchment - confined aquifer
- ▤ Source Protection Zone 3c Total catchment - confined aquifer
- ● Drinking water abstraction licences
- ▤ Drinking water abstraction licences Polygon features
- — Drinking water abstraction licences Linear features
- ● Groundwater abstraction licence (point)
- ▥ Groundwater abstraction licence (area)
- — Groundwater abstraction licence (linear)
- ● Surface Water Abstractions (point)
- ▥ Surface Water Abstractions (area)
- — Surface Water Abstractions (linear)

5.6 Groundwater abstractions

Records within 2000m **1**

Licensed groundwater abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, between two points (line data) or a larger area.

Features are displayed on the Abstractions and Source Protection Zones map on **page 42**

ID	Location	Details	
-	1149m NE	Status: Historical Licence No: 29/38/06/0164 Details: Pollution Remediation Direct Source: THAMES GROUNDWATER Point: SOUTH ROAD, HARLOW- BOREHOLE Data Type: Point Name: COATES LORILLEUX LIMITED Easting: 546500 Northing: 211500	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 29/04/2003 Expiry Date: 31/12/2004 Issue No: 1 Version Start Date: 29/04/2003 Version End Date: -

This data is sourced from the Environment Agency and Natural Resources Wales.

5.7 Surface water abstractions

Records within 2000m	**4**

Licensed surface water abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, a stretch of watercourse or a larger area.

Features are displayed on the Abstractions and Source Protection Zones map on **page 42**

ID	Location	Details	
-	846m NW	Status: Historical Licence No: 29/38/06/0104 Details: Spray Irrigation - Direct Direct Source: THAMES SURFACE WATER - NON TIDAL Point: EASTWICK LODGE, HARLOW - RIVER STORT Data Type: Line Name: H E CARTER (EASTWICK) LTD Easting: 544600 Northing: 211500	Annual Volume (m^3): 9092 Max Daily Volume (m^3): 204.57 Original Application No: - Original Start Date: 17/12/1971 Expiry Date: - Issue No: 100 Version Start Date: 01/04/2013 Version End Date: -
-	852m N	Status: Active Licence No: 29/38/06/0105 Details: Make-Up Or Top Up Water Direct Source: THAMES SURFACE WATER - NON TIDAL Point: RIVER STORT NAVIGATION, HARLOW, ESSEX Data Type: Point Name: HARLOW DISTRICT COUNCIL Easting: 545300 Northing: 211900	Annual Volume (m^3): 175,935 Max Daily Volume (m^3): 482.01 Original Application No: - Original Start Date: 05/04/1973 Expiry Date: - Issue No: 101 Version Start Date: 01/04/2005 Version End Date: -

ID	Location	Details	
-	1010m NW	Status: Historical Licence No: 29/38/06/0104 Details: Spray Irrigation - Direct Direct Source: THAMES SURFACE WATER - NON TIDAL Point: EASTWICK LODGE, HARLOW - FIDDLERS BROOK Data Type: Line Name: H E CARTER (EASTWICK) LTD Easting: 544700 Northing: 212200	Annual Volume (m^3): 9092 Max Daily Volume (m^3): 204.57 Original Application No: - Original Start Date: 17/12/1971 Expiry Date: - Issue No: 100 Version Start Date: 01/04/2013 Version End Date: -
-	1836m W	Status: Historical Licence No: 29/38/06/0104 Details: Spray Irrigation - Direct Direct Source: THAMES SURFACE WATER - NON TIDAL Point: EASTWICK LODGE, HARLOW - EASTWICK BROOK Data Type: Line Name: H E CARTER (EASTWICK) LTD Easting: 543400 Northing: 212200	Annual Volume (m^3): 9092 Max Daily Volume (m^3): 204.57 Original Application No: - Original Start Date: 17/12/1971 Expiry Date: - Issue No: 100 Version Start Date: 01/04/2013 Version End Date: -

This data is sourced from the Environment Agency and Natural Resources Wales.

5.8 Potable abstractions

Records within 2000m	**0**

Licensed potable water abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, a stretch of watercourse or a larger area.

This data is sourced from the Environment Agency and Natural Resources Wales.

5.9 Source Protection Zones

Records within 500m	**0**

Source Protection Zones define the sensitivity of an area around a potable abstraction site to contamination.

This data is sourced from the Environment Agency and Natural Resources Wales.

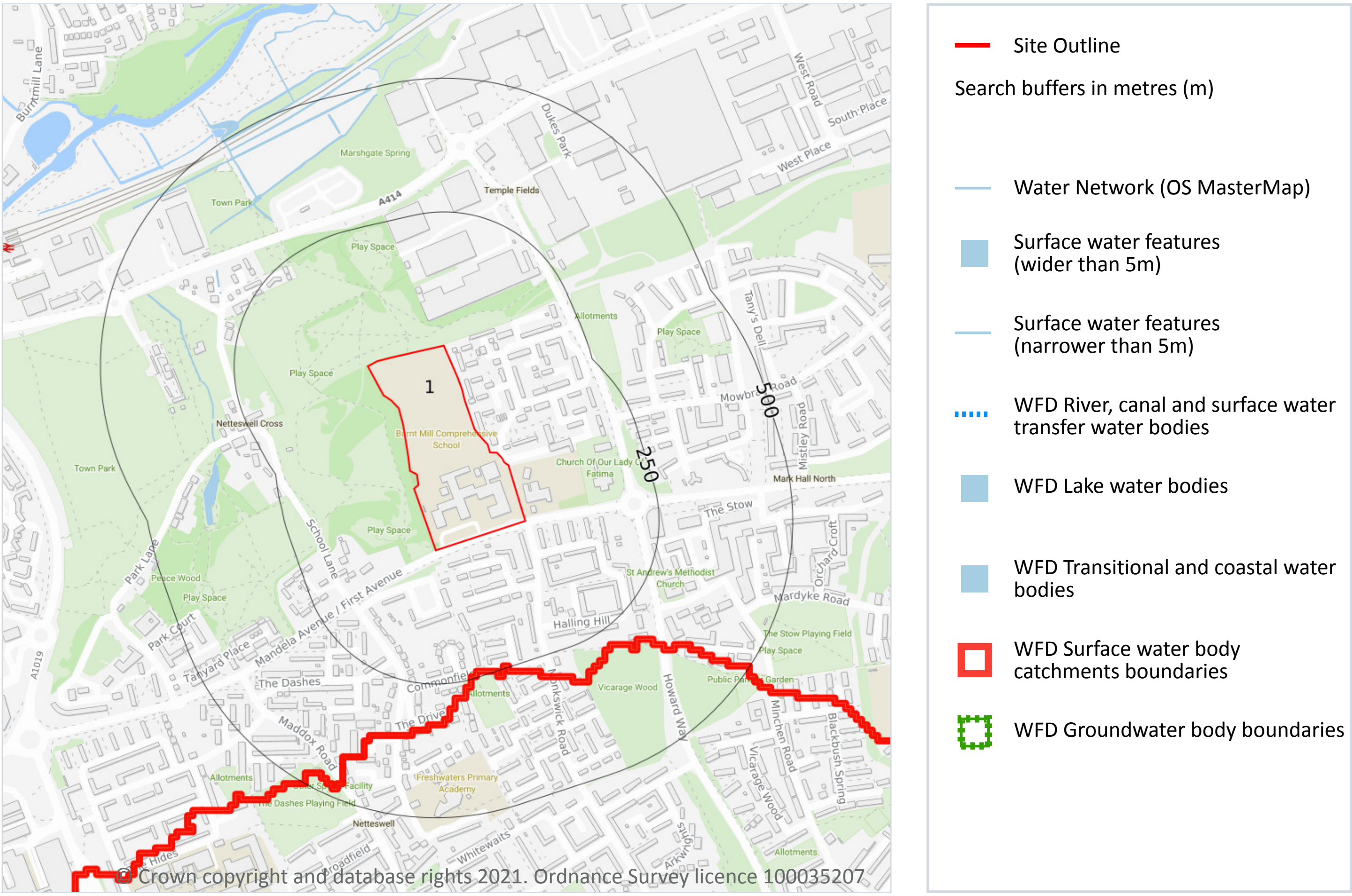
5.10 Source Protection Zones (confined aquifer)

Records within 500m	**0**

Source Protection Zones in the confined aquifer define the sensitivity around a deep groundwater abstraction to contamination. A confined aquifer would normally be protected from contamination by overlying geology and is only considered a sensitive resource if deep excavation/drilling is taking place.

This data is sourced from the Environment Agency and Natural Resources Wales.

6 Hydrology



6.1 Water Network (OS MasterMap)

Records within 250m	0

Detailed water network of Great Britain showing the flow and precise central course of every river, stream, lake and canal.

This data is sourced from the Ordnance Survey.

6.2 Surface water features

Records within 250m	0

Covering rivers, streams and lakes (some overlap with OS MasterMap Water Network data in previous section) but additionally covers smaller features such as ponds. Rivers and streams narrower than 5m are represented as a single line. Lakes, ponds and rivers or streams wider than 5m are represented as polygons.

This data is sourced from the Ordnance Survey.

6.3 WFD Surface water body catchments

Records on site **1**

The Water Framework Directive is an EU-led framework for the protection of inland surface waters, estuaries, coastal waters and groundwater through river basin-level management planning. In terms of surface water, these basins are broken down into smaller units known as management, operational and water body catchments.

Features are displayed on the Hydrology map on **page 45**

ID	Location	Type	Water body catchment	Water body ID	Operational catchment	Management catchment
1	**On site**	**River WB catchment**	**Stort and Navigation, Harlow to Lee**	**GB106038033282**	**Upper Lee**	**Upper Lee**

This data is sourced from the Environment Agency and Natural Resources Wales.

6.4 WFD Surface water bodies

Records identified **1**

Surface water bodies under the Directive may be rivers, lakes, estuary or coastal. To achieve the purpose of the Directive, environmental objectives have been set and are reported on for each water body. The progress towards delivery of the objectives is then reported on by the relevant competent authorities at the end of each six-year cycle. The river water body directly associated with the catchment listed in the previous section is detailed below, along with any lake, canal, coastal or artificial water body within 250m of the site. Click on the water body ID in the table to visit the EA Catchment Explorer to find out more about each water body listed.

Features are displayed on the Hydrology map on **page 45**

ID	Location	Type	Name	Water body ID	Overall rating	Chemical rating	Ecological rating	Year
-	600m NW	River	Stort and Navigation, Harlow to Lee	GB106038033282	Moderate	Good	Moderate	2016

This data is sourced from the Environment Agency and Natural Resources Wales.

6.5 WFD Groundwater bodies

Records on site	**0**

Groundwater bodies are also covered by the Directive and the same regime of objectives and reporting detailed in the previous section is in place. Click on the water body ID in the table to visit the EA Catchment Explorer to find out more about each groundwater body listed.

This data is sourced from the Environment Agency and Natural Resources Wales.

7 River and coastal flooding

7.1 Risk of flooding from rivers and the sea

Records within 50m	**0**

The chance of flooding from rivers and/or the sea in any given year, based on cells of 50m within the Risk of Flooding from Rivers and Sea (RoFRaS)/Flood Risk Assessment Wales (FRAW) models. Each cell is allocated one of four flood risk categories, taking into account flood defences and their condition. The risk categories for RoFRaS for rivers and the sea and FRAW for rivers are; Very low (less than 1 in 1000 chance in any given year), Low (less than 1 in 100 but greater than or equal to 1 in 1000 chance), Medium (less than 1 in 30 but greater than or equal to 1 in 100 chance) or High (greater than or equal to 1 in 30 chance). The risk categories for FRAW for the sea are; Very low (less than 1 in 1000 chance in any given year), Low (less than 1 in 200 but greater than or equal to 1 in 1000 chance), Medium (less than 1 in 30 but greater than or equal to 1 in 200 chance) or High (greater than or equal to 1 in 30 chance).

This data is sourced from the Environment Agency and Natural Resources Wales.

7.2 Historical Flood Events

Records within 250m	**0**

Records of historic flooding from rivers, the sea, groundwater and surface water. Records began in 1946 when predecessor bodies started collecting detailed information about flooding incidents, although limited details may be included on flooding incidents prior to this date. Takes into account the presence of defences, structures, and other infrastructure where they existed at the time of flooding, and includes flood extents that may have been affected by overtopping, breaches or blockages.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.3 Flood Defences

Records within 250m	**0**

Records of flood defences owned, managed or inspected by the Environment Agency and Natural Resources Wales. Flood defences can be structures, buildings or parts of buildings. Typically these are earth banks, stone and concrete walls, or sheet-piling that is used to prevent or control the extent of flooding.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.4 Areas Benefiting from Flood Defences

Records within 250m	**0**

Areas that would benefit from the presence of flood defences in a 1 in 100 (1%) chance of flooding each year from rivers or 1 in 200 (0.5%) chance of flooding each year from the sea.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.5 Flood Storage Areas

Records within 250m	**0**

Areas that act as a balancing reservoir, storage basin or balancing pond to attenuate an incoming flood peak to a flow level that can be accepted by the downstream channel or to delay the timing of a flood peak so that its volume is discharged over a longer period.

This data is sourced from the Environment Agency and Natural Resources Wales.

River and coastal flooding - Flood Zones

7.6 Flood Zone 2

Records within 50m	**0**

Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land between Flood Zone 3 (see next section) and the extent of the flooding from rivers or the sea with a 1 in 1000 (0.1%) chance of flooding each year.

This data is sourced from the Environment Agency and Natural Resources Wales.

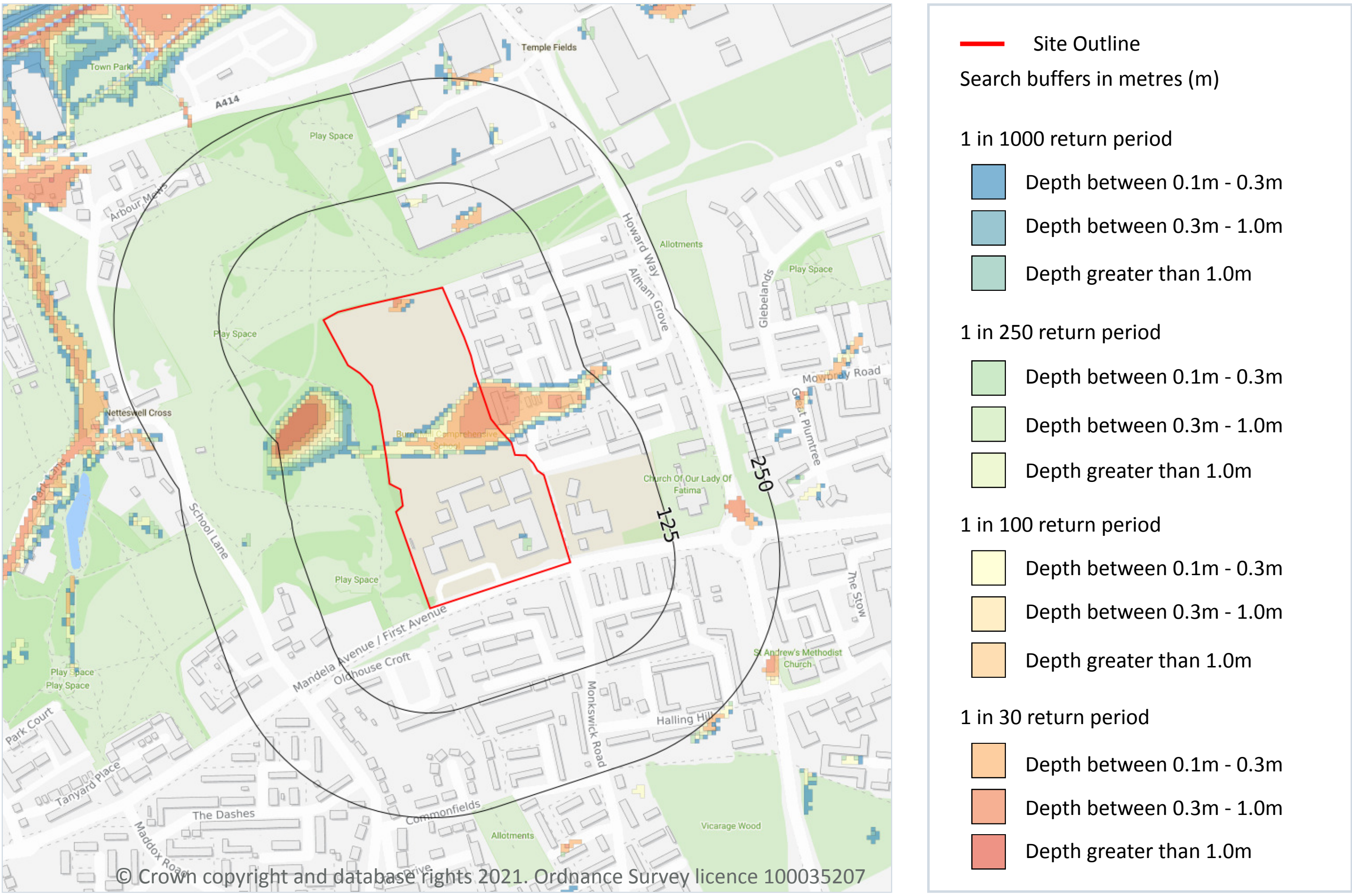
7.7 Flood Zone 3

Records within 50m	**0**

Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land with a 1 in 100 (1%) or greater chance of flooding each year from rivers or a 1 in 200 (0.5%) or greater chance of flooding each year from the sea.

This data is sourced from the Environment Agency and Natural Resources Wales.

8 Surface water flooding



8.1 Surface water flooding

Highest risk on site	**1 in 30 year, 0.3m - 1.0m**
Highest risk within 50m	**1 in 30 year, 0.3m - 1.0m**

Ambiental Risk Analytics surface water (pluvial) FloodMap identifies areas likely to flood as a result of extreme rainfall events, i.e. land naturally vulnerable to surface water ponding or flooding. This data set was produced by simulating 1 in 30 year, 1 in 100 year, 1 in 250 year and 1 in 1,000 year rainfall events. Modern urban drainage systems are typically built to cope with rainfall events between 1 in 20 and 1 in 30 years, though some older ones may flood in a 1 in 5 year rainfall event.

Features are displayed on the Surface water flooding map on **page 51**

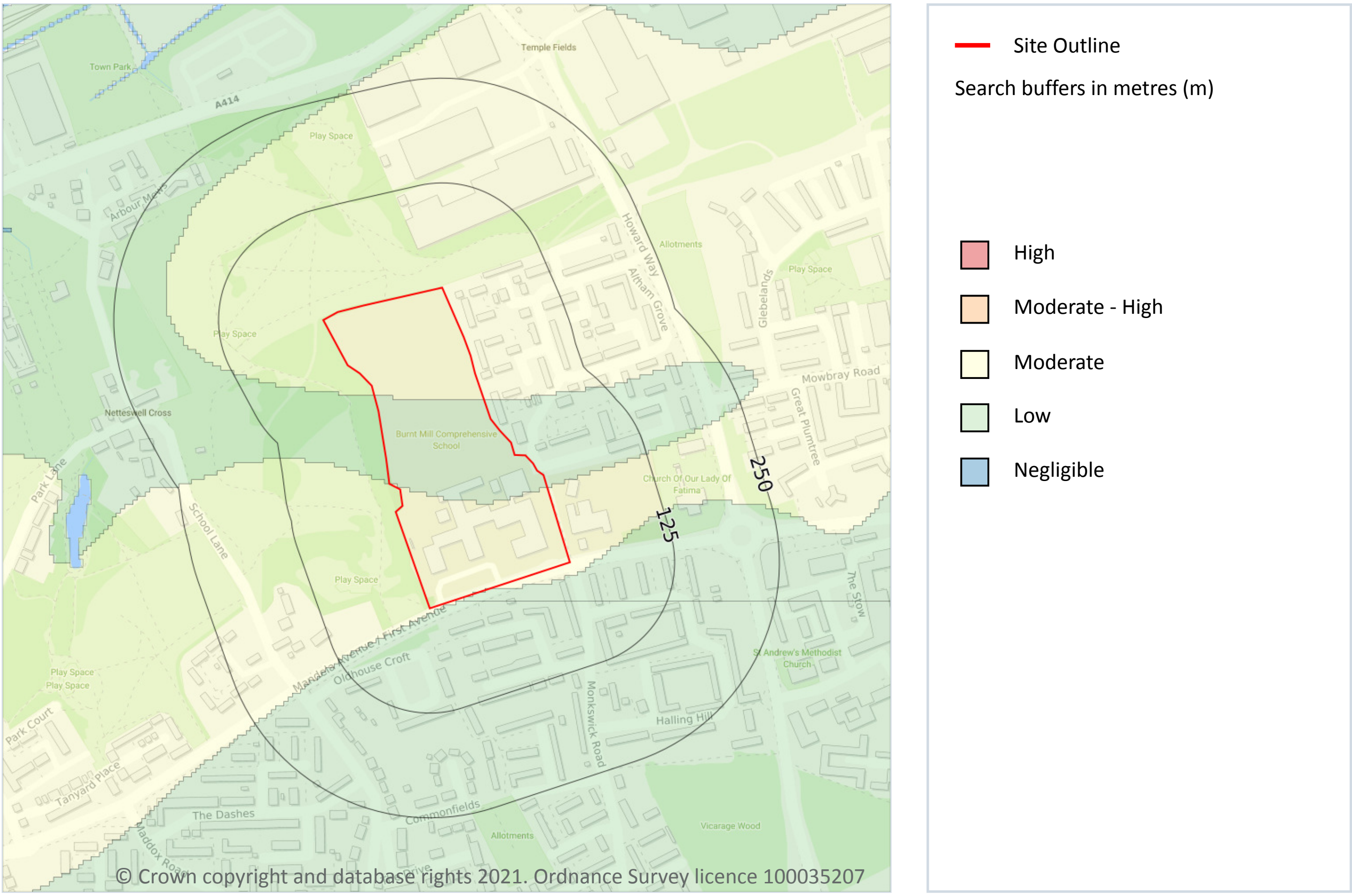
The data shown on the map and in the table above shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on a site.

The table below shows the maximum flood depths for a range of return periods for the site.

Return period	Maximum modelled depth
1 in 1000 year	Between 0.3m and 1.0m
1 in 250 year	Between 0.3m and 1.0m
1 in 100 year	Between 0.3m and 1.0m
1 in 30 year	Between 0.3m and 1.0m

This data is sourced from Ambiental Risk Analytics.

9 Groundwater flooding



9.1 Groundwater flooding

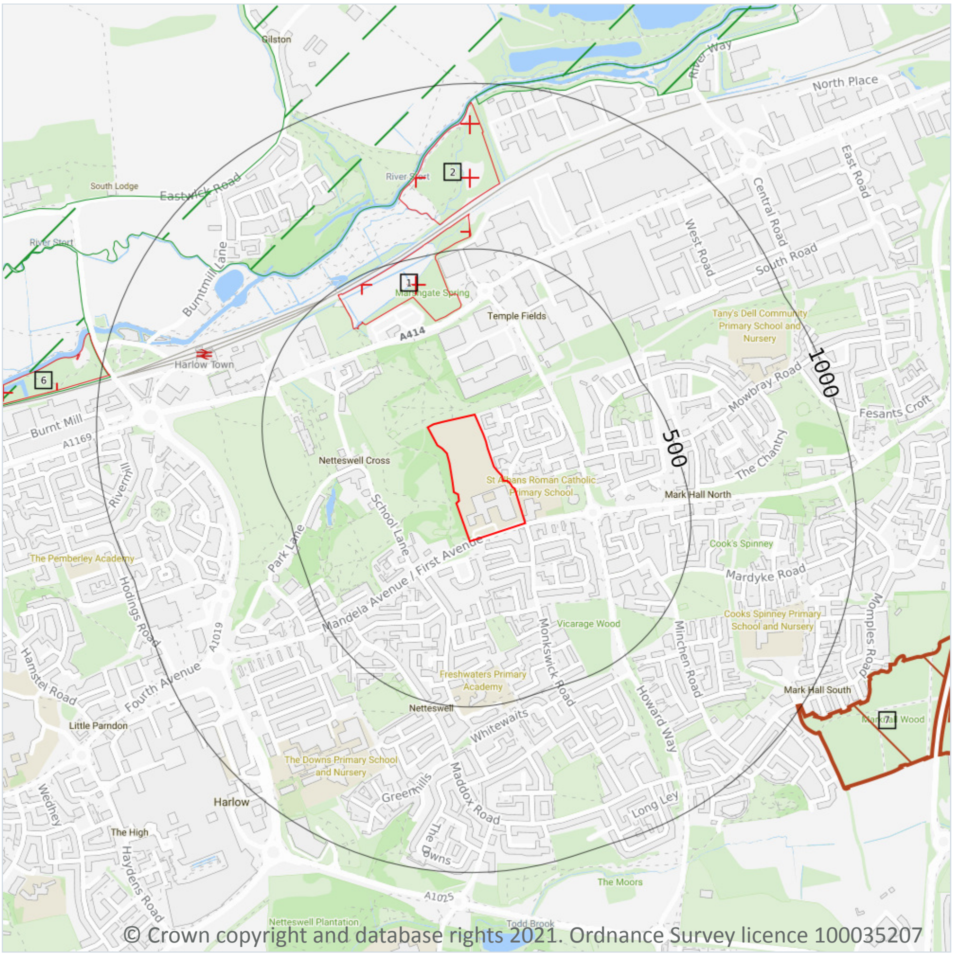
Highest risk on site	**Moderate**
Highest risk within 50m	**Moderate**

Groundwater flooding is caused by unusually high groundwater levels. It occurs when the water table rises above the ground surface or within underground structures such as basements or cellars. Groundwater flooding tends to exhibit a longer duration than surface water flooding, possibly lasting for weeks or months, and as a result it can cause significant damage to property. This risk assessment is based on a 1 in 100 year return period and a 5m Digital Terrain Model (DTM).

Features are displayed on the Groundwater flooding map on **page 53**

This data is sourced from Ambiental Risk Analytics.

10 Environmental designations



🟥 Site Outline

Search buffers in metres (m)

⊞ Local Nature Reserves (LNR)

▨ Designated Ancient Woodland

🟩 Green Belt

10.1 Sites of Special Scientific Interest (SSSI)

Records within 2000m	**0**

Sites providing statutory protection for the best examples of UK flora, fauna, or geological or physiographical features. Originally notified under the National Parks and Access to the Countryside Act 1949, SSSIs were re-notified under the Wildlife and Countryside Act 1981. Improved provisions for the protection and management of SSSIs were introduced by the Countryside and Rights of Way Act 2000 (in England and Wales) and (in Scotland) by the Nature Conservation (Scotland) Act 2004 and the Wildlife and Natural Environment (Scotland) Act 2010.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.2 Conserved wetland sites (Ramsar sites)

Records within 2000m	**0**

Ramsar sites are designated under the Convention on Wetlands of International Importance, agreed in Ramsar, Iran, in 1971. They cover all aspects of wetland conservation and wise use, recognizing wetlands as ecosystems that are extremely important for biodiversity conservation in general and for the well-being of human communities. These sites cover a broad definition of wetland; marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, and even some marine areas.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.3 Special Areas of Conservation (SAC)

Records within 2000m	**0**

Areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.4 Special Protection Areas (SPA)

Records within 2000m	**0**

Sites classified by the UK Government under the EC Birds Directive, SPAs are areas of the most important habitat for rare (listed on Annex I to the Directive) and migratory birds within the European Union.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.5 National Nature Reserves (NNR)

Records within 2000m	**0**

Sites containing examples of some of the most important natural and semi-natural terrestrial and coastal ecosystems in Great Britain. They are managed to conserve their habitats, provide special opportunities for scientific study or to provide public recreation compatible with natural heritage interests.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.6 Local Nature Reserves (LNR)

Records within 2000m	**3**

Sites managed for nature conservation, and to provide opportunities for research and education, or simply enjoying and having contact with nature. They are declared by local authorities under the National Parks and Access to the Countryside Act 1949 after consultation with the relevant statutory nature conservation agency.

Features are displayed on the Environmental designations map on **page 54**

ID	Location	Name	Data source
1	302m N	Harlow Marsh	Natural England
2	583m N	Harlow Marsh	Natural England
6	973m W	Harlow Marsh	Natural England

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.7 Designated Ancient Woodland

Records within 2000m	**2**

Ancient woodlands are classified as areas which have been wooded continuously since at least 1600 AD. This includes semi-natural woodland and plantations on ancient woodland sites. 'Wooded continuously' does not mean there is or has previously been continuous tree cover across the whole site, and not all trees within the woodland have to be old.

Features are displayed on the Environmental designations map on **page 54**

ID	Location	Name	Woodland Type
7	990m SE	Markhall Wood	Ancient & Semi-Natural Woodland
8	1363m E	Markhall Wood	Ancient & Semi-Natural Woodland

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.8 Biosphere Reserves

Records within 2000m	**0**

Biosphere Reserves are internationally recognised by UNESCO as sites of excellence to balance conservation and socioeconomic development between nature and people. They are recognised under the Man and the Biosphere (MAB) Programme with the aim of promoting sustainable development founded on the work of the local community.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.9 Forest Parks

Records within 2000m **0**

These are areas managed by the Forestry Commission designated on the basis of recreational, conservation or scenic interest.

This data is sourced from the Forestry Commission.

10.10 Marine Conservation Zones

Records within 2000m **0**

A type of marine nature reserve in UK waters established under the Marine and Coastal Access Act (2009). They are designated with the aim to protect nationally important, rare or threatened habitats and species.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.11 Green Belt

Records within 2000m **3**

Areas designated to prevent urban sprawl by keeping land permanently open.

Features are displayed on the Environmental designations map on **page 54**

ID	Location	Name	Local Authority name
3	602m NW	London	East Hertfordshire
4	937m N	London	Harlow
5	970m W	London	Harlow

This data is sourced from the Ministry of Housing, Communities and Local Government.

10.12 Proposed Ramsar sites

Records within 2000m **0**

Ramsar sites are areas listed as a Wetland of International Importance under the Convention on Wetlands of International Importance especially as Waterfowl Habitat (the Ramsar Convention) 1971. The sites here supplied have a status of 'Proposed' having been identified for potential adoption under the framework.

This data is sourced from Natural England.

10.13 Possible Special Areas of Conservation (pSAC)

Records within 2000m	**0**

Special Areas of Conservation are areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive. Those sites supplied here are those with a status of 'Possible' having been identified for potential adoption under the framework.

This data is sourced from Natural England and Natural Resources Wales.

10.14 Potential Special Protection Areas (pSPA)

Records within 2000m	**0**

Special Protection Areas (SPAs) are areas designated (or 'classified') under the European Union Wild Birds Directive for the protection of nationally and internationally important populations of wild birds. Those sites supplied here are those with a status of 'Potential' having been identified for potential adoption under the framework.

This data is sourced from Natural England.

10.15 Nitrate Sensitive Areas

Records within 2000m	**0**

Areas where nitrate concentrations in drinking water sources exceeded or was at risk of exceeding the limit of 50 mg/l set by the 1980 EC Drinking Water Directive. Voluntary agricultural measures as a means of reducing the levels of nitrate were introduced by DEFRA as MAFF, with payments being made to farmers who complied. The scheme was started as a pilot in 1990 in ten areas, later implemented within 32 areas. The scheme was closed to further new entrants in 1998, although existing agreements continued for their full term. All Nitrate Sensitive Areas fell within the areas designated as Nitrate Vulnerable Zones (NVZs) in 1996 under the EC Nitrate Directive (91/676/EEC).

This data is sourced from Natural England.

10.16 Nitrate Vulnerable Zones

Records within 2000m	**2**

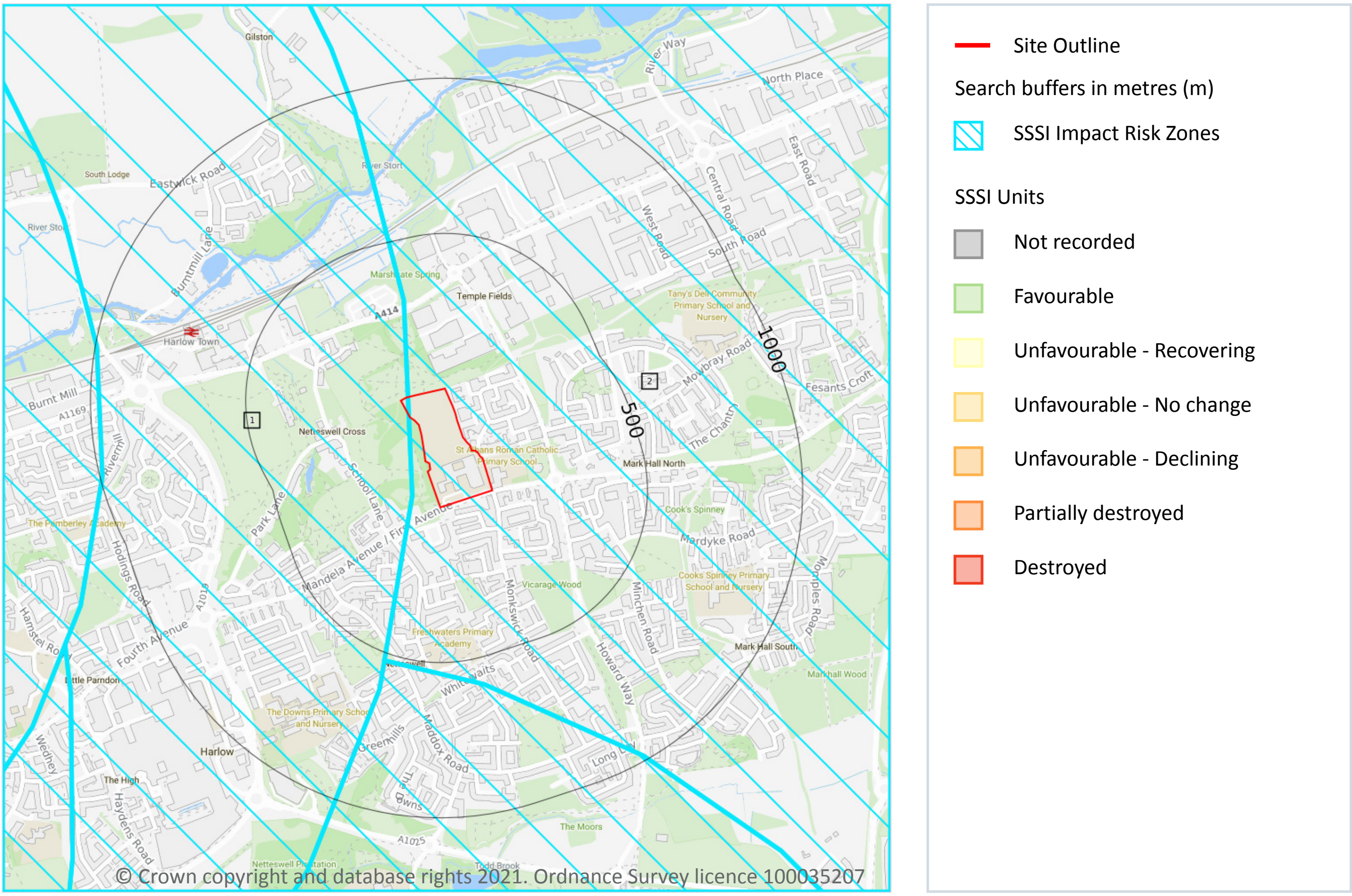
Areas at risk from agricultural nitrate pollution designated under the EC Nitrate Directive (91/676/EEC). These are areas of land that drain into waters polluted by nitrates. Farmers operating within these areas have to follow mandatory rules to tackle nitrate loss from agriculture.

Location	Name	Type	NVZ ID	Status
On site	**LEE NVZ**	**Surface Water**	**S443**	**Existing**

Location	Name	Type	NVZ ID	Status
1205m W	LEE NVZ	Surface Water	S443	Existing

This data is sourced from Natural England and Natural Resources Wales.

SSSI Impact Zones and Units



10.17 SSSI Impact Risk Zones

Records on site	2

Developed to allow rapid initial assessment of the potential risks to SSSIs posed by development proposals. They define zones around each SSSI which reflect the particular sensitivities of the features for which it is notified and indicate the types of development proposal which could potentially have adverse impacts.

Features are displayed on the SSSI Impact Zones and Units map on **page 60**

ID	Location	Type of developments requiring consultation
1	**On site**	**Infrastructure - Airports, helipads and other aviation proposals.** **Minerals, Oil and Gas - Planning applications for quarries, including: new proposals, Review of Minerals Permissions (ROMP), extensions, variations to conditions etc. Oil & gas exploration/extraction.** **Residential - Residential development of 50 units or more.** **Rural residential - Any residential development of 50 or more houses outside existing settlements/urban areas.** **Air pollution - Livestock & poultry units with floorspace > 500m², slurry lagoons > 750m² & manure stores > 3500t.** **Combustion - General combustion processes >50MW energy input. Incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion** **Discharges - Any discharge of water or liquid waste of more than 5m³/day to ground (ie to seep away) or to surface water, such as a beck or stream (NB This does not include discharges to mains sewer which are unlikely to pose a risk at this location).**
2	**On site**	**Infrastructure - Airports, helipads and other aviation proposals.** **Residential - Residential development of 50 units or more.** **Rural residential - Any residential development of 50 or more houses outside existing settlements/urban areas.** **Air pollution - Livestock & poultry units with floorspace > 500m², slurry lagoons > 750m² & manure stores > 3500t.** **Combustion - General combustion processes >50MW energy input. Incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion** **Discharges - Any discharge of water or liquid waste of more than 20m³/day to ground (ie to seep away) or to surface water, such as a beck or stream (NB This does not include discharges to mains sewer which are unlikely to pose a risk at this location)**

This data is sourced from Natural England.

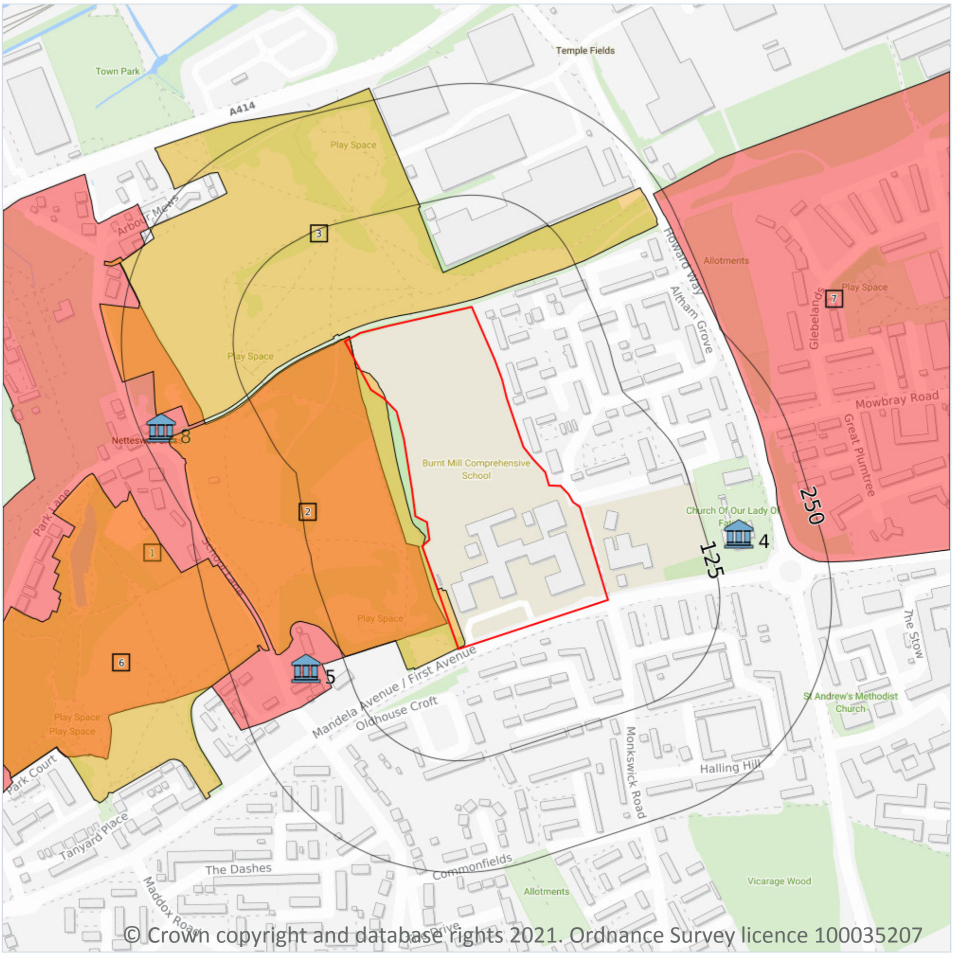
10.18 SSSI Units

Records within 2000m	**0**

Divisions of SSSIs used to record management and condition details. Units are the smallest areas for which Natural England gives a condition assessment, however, the size of units varies greatly depending on the types of management and the conservation interest.

This data is sourced from Natural England and Natural Resources Wales.

11 Visual and cultural designations



— Site Outline

Search buffers in metres (m)

- 🏛 Listed buildings
- 🟥 Conservation areas
- ⬜ Conservation areas - no data
- ▥ National Parks
- ▨ Areas of Outstanding Natural Beauty
- 🟨 Registered parks and gardens
- ▤ Scheduled Monuments
- ▨ World Heritage Sites

11.1 World Heritage Sites

Records within 250m	0

Sites designated for their globally important cultural or natural interest requiring appropriate management and protection measures. World Heritage Sites are designated to meet the UK's commitments under the World Heritage Convention.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.2 Area of Outstanding Natural Beauty

Records within 250m	**0**

Areas of Outstanding Natural Beauty (AONB) are conservation areas, chosen because they represent 18% of the finest countryside. Each AONB has been designated for special attention because of the quality of their flora, fauna, historical and cultural associations, and/or scenic views. The National Parks and Access to the Countryside Act of 1949 created AONBs and the Countryside and Rights of Way Act, 2000 added further regulation and protection. There are likely to be restrictions to some developments within these areas.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

11.3 National Parks

Records within 250m	**0**

In England and Wales, the purpose of National Parks is to conserve and enhance landscapes within the countryside whilst promoting public enjoyment of them and having regard for the social and economic well-being of those living within them. In Scotland National Parks have the additional purpose of promoting the sustainable use of the natural resources of the area and the sustainable social and economic development of its communities. The National Parks and Access to the Countryside Act 1949 established the National Park designation in England and Wales, and The National Parks (Scotland) Act 2000 in Scotland.

This data is sourced from Natural England, Natural Resources Wales and the Scottish Government.

11.4 Listed Buildings

Records within 250m	**3**

Buildings listed for their special architectural or historical interest. Building control in the form of 'listed building consent' is required in order to make any changes to that building which might affect its special interest. Listed buildings are graded to indicate their relative importance, however building controls apply to all buildings equally, irrespective of their grade, and apply to the interior and exterior of the building in its entirety, together with any curtilage structures.

Features are displayed on the Visual and cultural designations map on **page 62**

ID	Location	Name	Grade	Reference Number	Listed date
4	162m E	Church Of Our Lady Of Fatima, Netteswell, Harlow, Essex, CM20	II	1246733	20/12/2000
5	169m W	6, School Lane, Netteswell, Harlow, Essex, CM20	II	1111670	19/06/1981
8	228m SW	The Greyhound Public House, Netteswell, Harlow, Essex, CM20	II	1111698	19/06/1981

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.5 Conservation Areas

Records within 250m	**2**

Local planning authorities are obliged to designate as conservation areas any parts of their own area that are of special architectural or historic interest, the character and appearance of which it is desirable to preserve or enhance. Designation of a conservation area gives broader protection than the listing of individual buildings. All the features within the area, listed or otherwise, are recognised as part of its character. Conservation area designation is the means of recognising the importance of all factors and of ensuring that planning decisions address the quality of the landscape in its broadest sense.

Features are displayed on the Visual and cultural designations map on **page 62**

ID	Location	Name	District	Date of designation
1	**On site**	**Harlow, Town Park and Netteswell Cross, Harlow**	**Harlow**	**Unknown**
7	212m E	Harlow, Mark Hall North, Harlow	Harlow	1987

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.6 Scheduled Ancient Monuments

Records within 250m	**0**

A scheduled monument is an historic building or site that is included in the Schedule of Monuments kept by the Secretary of State for Digital, Culture, Media and Sport. The regime is set out in the Ancient Monuments and Archaeological Areas Act 1979. The Schedule of Monuments has c.20,000 entries and includes sites such as Roman remains, burial mounds, castles, bridges, earthworks, the remains of deserted villages and industrial sites. Monuments are not graded, but all are, by definition, considered to be of national importance.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.7 Registered Parks and Gardens

Records within 250m	**3**

Parks and gardens assessed to be of particular interest and of special historic interest. The emphasis being on 'designed' landscapes, rather than on planting or botanical importance. Registration is a 'material consideration' in the planning process, meaning that planning authorities must consider the impact of any proposed development on the special character of the landscape.

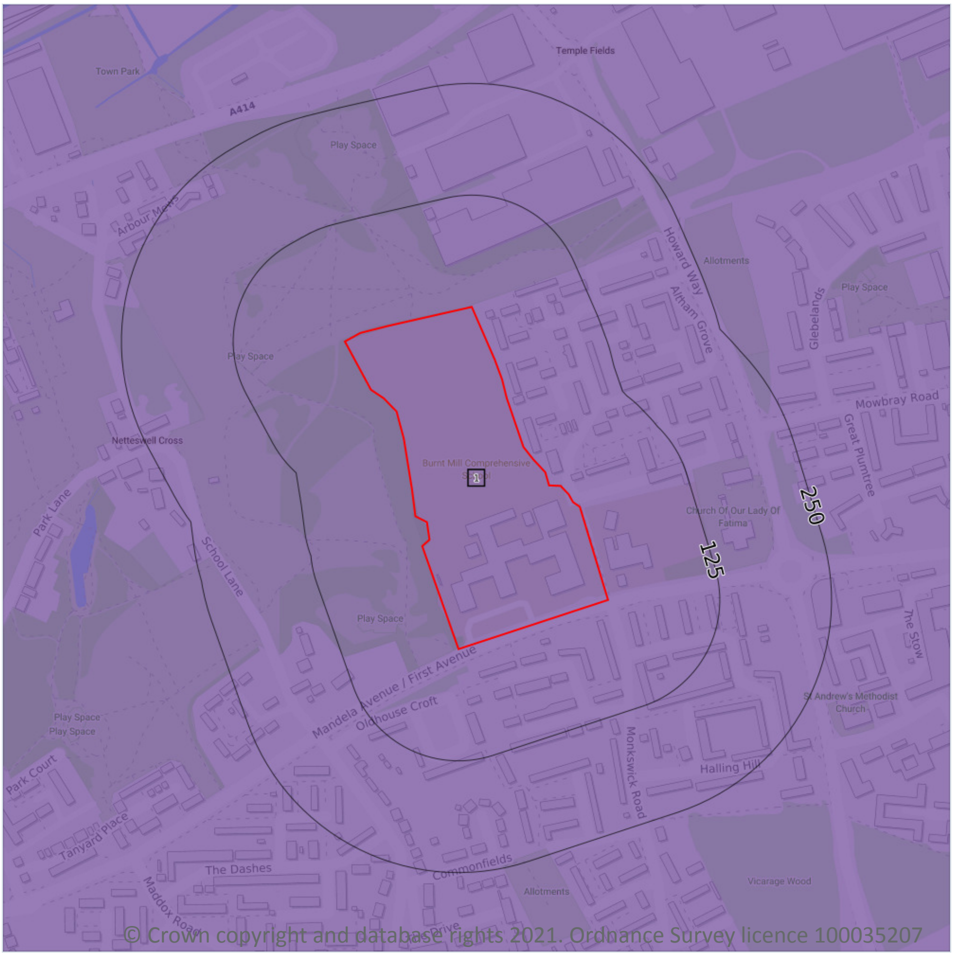
Features are displayed on the Visual and cultural designations map on **page 62**

ID	Location	Name	Grade
2	**On site**	**Harlow Town Park**	**II**
3	7m N	Harlow Town Park	II

ID	Location	Name	Grade
6	200m W	Harlow Town Park	II

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

12 Agricultural designations



— Site Outline

Search buffers in metres (m)

🟫 Grade 1 - excellent quality

🟫 Grade 2 - very good quality

🟧 Grade 3 - good to moderate quality

🟧 Grade 3a - good quality

⬜ Grade 3b - moderate quality

⬜ Grade 4 - poor quality

⬜ Grade 5 - very poor quality

🟪 Non-agricultural land

🟪 Urban land

🟪 Exclusion land

▨ Tree felling licences

▨ Open Access land

12.1 Agricultural Land Classification

Records within 250m 1

Classification of the quality of agricultural land taking into consideration multiple factors including climate, physical geography and soil properties. It should be noted that the categories for the grading of agricultural land are not consistent across England, Wales and Scotland.

Features are displayed on the Agricultural designations map on **page 66**

ID	Location	Classification	Description
1	**On site**	**Urban**	-

This data is sourced from Natural England.

12.2 Open Access Land

Records within 250m	**0**

The Countryside and Rights of Way Act 2000 (CROW Act) gives a public right of access to land without having to use paths. Access land includes mountains, moors, heaths and downs that are privately owned. It also includes common land registered with the local council and some land around the England Coast Path. Generally permitted activities on access land are walking, running, watching wildlife and climbing.

This data is sourced from Natural England and Natural Resources Wales.

12.3 Tree Felling Licences

Records within 250m	**0**

Felling Licence Application (FLA) areas approved by Forestry Commission England. Anyone wishing to fell trees must ensure that a licence or permission under a grant scheme has been issued by the Forestry Commission before any felling is carried out or that one of the exceptions apply.

This data is sourced from the Forestry Commission.

12.4 Environmental Stewardship Schemes

Records within 250m	**0**

Environmental Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment. The schemes identified may be historical schemes that have now expired, or may still be active.

This data is sourced from Natural England.

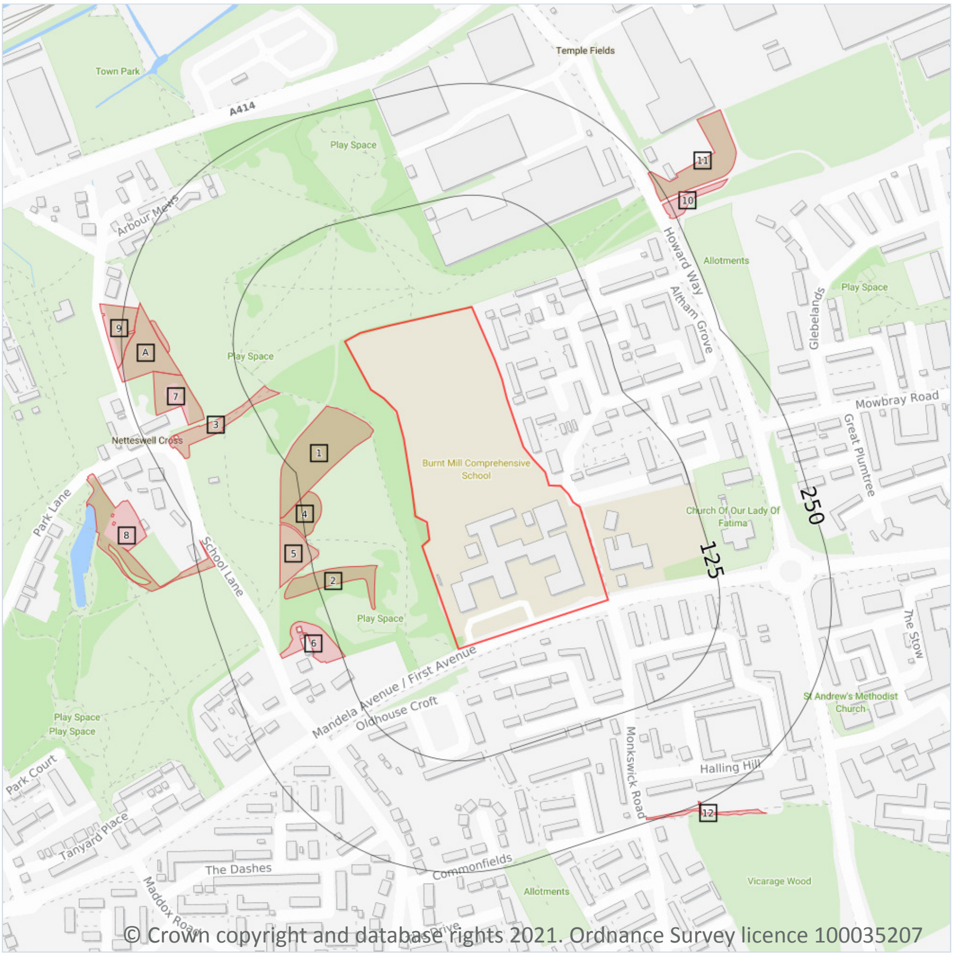
12.5 Countryside Stewardship Schemes

Records within 250m	**0**

Countryside Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment. Main objectives are to improve the farmed environment for wildlife and to reduce diffuse water pollution.

This data is sourced from Natural England.

13 Habitat designations



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— Site Outline

Search buffers in metres (m)

🟥 Priority Habitat Inventory
▨ Open Mosaic Habitat
▤ Limestone Pavement Orders

Habitat Networks

▨ Primary Habitat
▨ Restorable Habitat
▨ Associated Habitats
▨ Habitat Restoration-Creation
▨ Network Enhancement Zone 1
▨ Network Enhancement Zone 2

13.1 Priority Habitat Inventory

Records within 250m	14

Habitats of principal importance as named under Natural Environment and Rural Communities Act (2006) Section 41.

Features are displayed on the Habitat designations map on **page 68**

ID	Location	Main Habitat	Other habitats
1	31m W	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
2	55m W	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
3	92m SW	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
4	103m W	Deciduous woodland	Main habitat: DWOOD (INV > 50%)

ID	Location	Main Habitat	Other habitats
5	116m W	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
6	122m W	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
7	177m SW	Deciduous woodland	Main habitat: TORCH (INV > 50%); DWOOD (INV > 50%)
A	186m W	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
A	196m W	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
8	231m W	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
9	234m W	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
10	242m NE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
11	242m NE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
12	245m S	Deciduous woodland	Main habitat: DWOOD (INV > 50%)

This data is sourced from Natural England.

13.2 Habitat Networks

Records within 250m	0

Habitat networks for 18 priority habitat networks (based primarily, but not exclusively, on the priority habitat inventory) and areas suitable for the expansion of networks through restoration and habitat creation.

This data is sourced from Natural England.

13.3 Open Mosaic Habitat

Records within 250m	0

Sites verified as Open Mosaic Habitat. Mosaic habitats are brownfield sites that are identified under the UK Biodiversity Action Plan as a priority habitat due to the habitat variation within a single site, supporting an array of invertebrates.

This data is sourced from Natural England.

13.4 Limestone Pavement Orders

Records within 250m	0

Limestone pavements are outcrops of limestone where the surface has been worn away by natural means over millennia. These rocks have the appearance of paving blocks, hence their name. Not only do they have geological interest, they also provide valuable habitats for wildlife. These habitats are threatened due to their removal for use in gardens and water features. Many limestone pavements have been designated as SSSIs which affords them some protection. In addition, Section 34 of the Wildlife and Countryside Act 1981 gave them additional protection via the creation of Limestone Pavement Orders, which made it a criminal offence to remove any part of the outcrop. The associated Limestone Pavement Priority Habitat is part of the UK Biodiversity Action Plan priority habitat in England.

This data is sourced from Natural England.

14 Geology 1:10,000 scale - Availability

Site Outline

Search buffers in metres (m)

🟩 Full coverage

🟧 Partial coverage

☐ No coverage

14.1 10k Availability

Records within 500m	1

An indication on the coverage of 1:10,000 scale geology data for the site, the most detailed dataset provided by the British Geological Survey. Either 'Full', 'Partial' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:10,000 scale - Availability map on **page 71**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	No coverage	No coverage	No coverage	No coverage	NoCov

This data is sourced from the British Geological Survey.

Geology 1:10,000 scale - Artificial and made ground

14.2 Artificial and made ground (10k)

Records within 500m	**0**

Details of made, worked, infilled, disturbed and landscaped ground at 1:10,000 scale. Artificial ground can be associated with potentially contaminated material, unpredictable engineering conditions and instability.

This data is sourced from the British Geological Survey.

Geology 1:10,000 scale - Superficial

14.3 Superficial geology (10k)

Records within 500m	**0**

Superficial geological deposits at 1:10,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

This data is sourced from the British Geological Survey.

14.4 Landslip (10k)

Records within 500m	**0**

Mass movement deposits on BGS geological maps at 1:10,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

This data is sourced from the British Geological Survey.

Geology 1:10,000 scale - Bedrock

14.5 Bedrock geology (10k)

Records within 500m	**0**

Bedrock geology at 1:10,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

This data is sourced from the British Geological Survey.

14.6 Bedrock faults and other linear features (10k)

Records within 500m	**0**

Linear features at the ground or bedrock surface at 1:10,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

This data is sourced from the British Geological Survey.

15 Geology 1:50,000 scale - Availability

🟥 Site Outline

Search buffers in metres (m)

☐ Geological map tile

15.1 50k Availability

Records within 500m 1

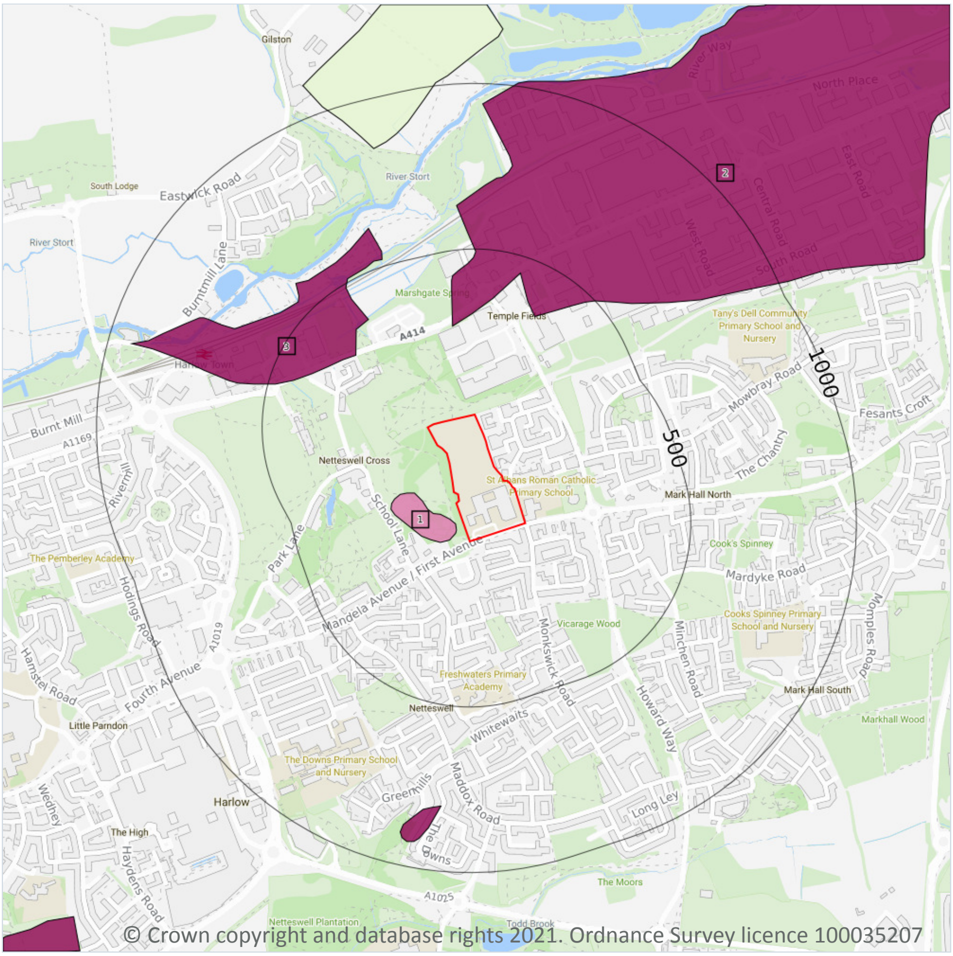
An indication on the coverage of 1:50,000 scale geology data for the site. Either 'Full' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:50,000 scale - Availability map on **page 75**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	Full	Full	Full	Full	EW240_epping_v4

This data is sourced from the British Geological Survey.

Geology 1:50,000 scale - Artificial and made ground



🟥 Site Outline

Search buffers in metres (m)

🟪 Made ground
▨ Worked ground
◻ Infilled ground
🟩 Disturbed ground
🟩 Landscaped ground

15.2 Artificial and made ground (50k)

Records within 500m	**3**

Details of made, worked, infilled, disturbed and landscaped ground at 1:50,000 scale. Artificial ground can be associated with potentially contaminated material, unpredictable engineering conditions and instability.

Features are displayed on the Geology 1:50,000 scale - Artificial and made ground map on **page 76**

ID	Location	LEX Code	Description	Rock description
1	23m W	WGR-VOID	WORKED GROUND (UNDIVIDED)	VOID
2	275m N	MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT
3	308m NW	MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT

This data is sourced from the British Geological Survey.

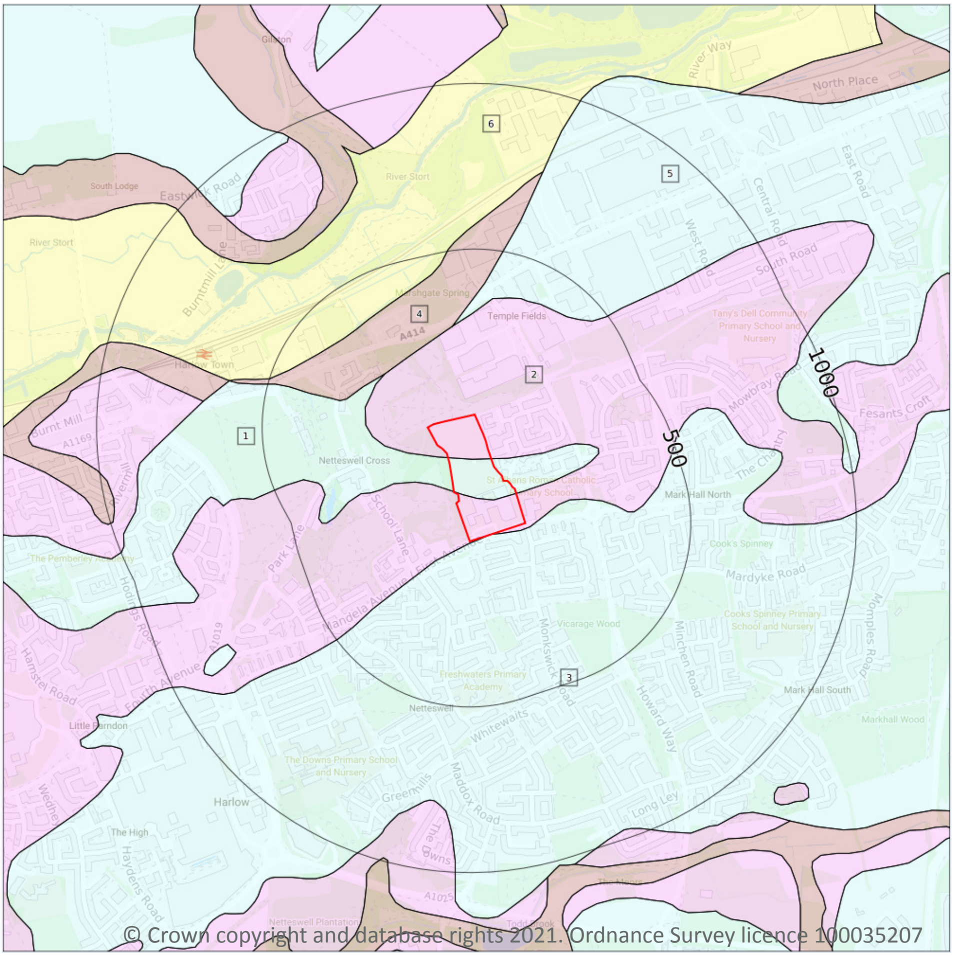
15.3 Artificial ground permeability (50k)

Records within 50m	**0**

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any artificial deposits (the zone between the land surface and the water table).

This data is sourced from the British Geological Survey.

Geology 1:50,000 scale - Superficial



🟥 Site Outline

Search buffers in metres (m)

▨ Landslip (50k)

Superficial geology (50k)
Please see table for more details.

15.4 Superficial geology (50k)

Records within 500m **6**

Superficial geological deposits at 1:50,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

Features are displayed on the Geology 1:50,000 scale - Superficial map on **page 78**

ID	Location	LEX Code	Description	Rock description
1	On site	LOFT-DMTN	LOWESTOFT FORMATION	DIAMICTON
2	On site	GFDMP-XSV	GLACIOFLUVIAL DEPOSITS, MID PLEISTOCENE	SAND AND GRAVEL
3	On site	LOFT-DMTN	LOWESTOFT FORMATION	DIAMICTON

ID	Location	LEX Code	Description	Rock description
4	207m NW	HEAD-XCZSV	HEAD	CLAY, SILT, SAND AND GRAVEL
5	275m N	LOFT-DMTN	LOWESTOFT FORMATION	DIAMICTON
6	366m NW	ALV-XCZSV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL

This data is sourced from the British Geological Survey.

15.5 Superficial permeability (50k)

Records within 50m **3**

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any superficial deposits (the zone between the land surface and the water table).

Location	Flow type	Maximum permeability	Minimum permeability
On site	**Mixed**	**Moderate**	**Low**
On site	**Intergranular**	**Very High**	**High**
On site	**Mixed**	**Moderate**	**Low**

This data is sourced from the British Geological Survey.

15.6 Landslip (50k)

Records within 500m **0**

Mass movement deposits on BGS geological maps at 1:50,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

This data is sourced from the British Geological Survey.

15.7 Landslip permeability (50k)

Records within 50m **0**

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any landslip deposits (the zone between the land surface and the water table).

This data is sourced from the British Geological Survey.

Geology 1:50,000 scale - Bedrock

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🟥 Site Outline

Search buffers in metres (m)

.... Bedrock faults and other linear features (50k)

Bedrock geology (50k)
Please see table for more details.

15.8 Bedrock geology (50k)

Records within 500m **1**

Bedrock geology at 1:50,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 80**

ID	Location	LEX Code	Description	Rock age
1	**On site**	**LC-XCZS**	**LONDON CLAY FORMATION - CLAY, SILT AND SAND**	**YPRESIAN**

This data is sourced from the British Geological Survey.

15.9 Bedrock permeability (50k)

Records within 50m	**1**

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of bedrock (the zone between the land surface and the water table).

Location	Flow type	Maximum permeability	Minimum permeability
On site	**Mixed**	**Moderate**	**Very Low**

This data is sourced from the British Geological Survey.

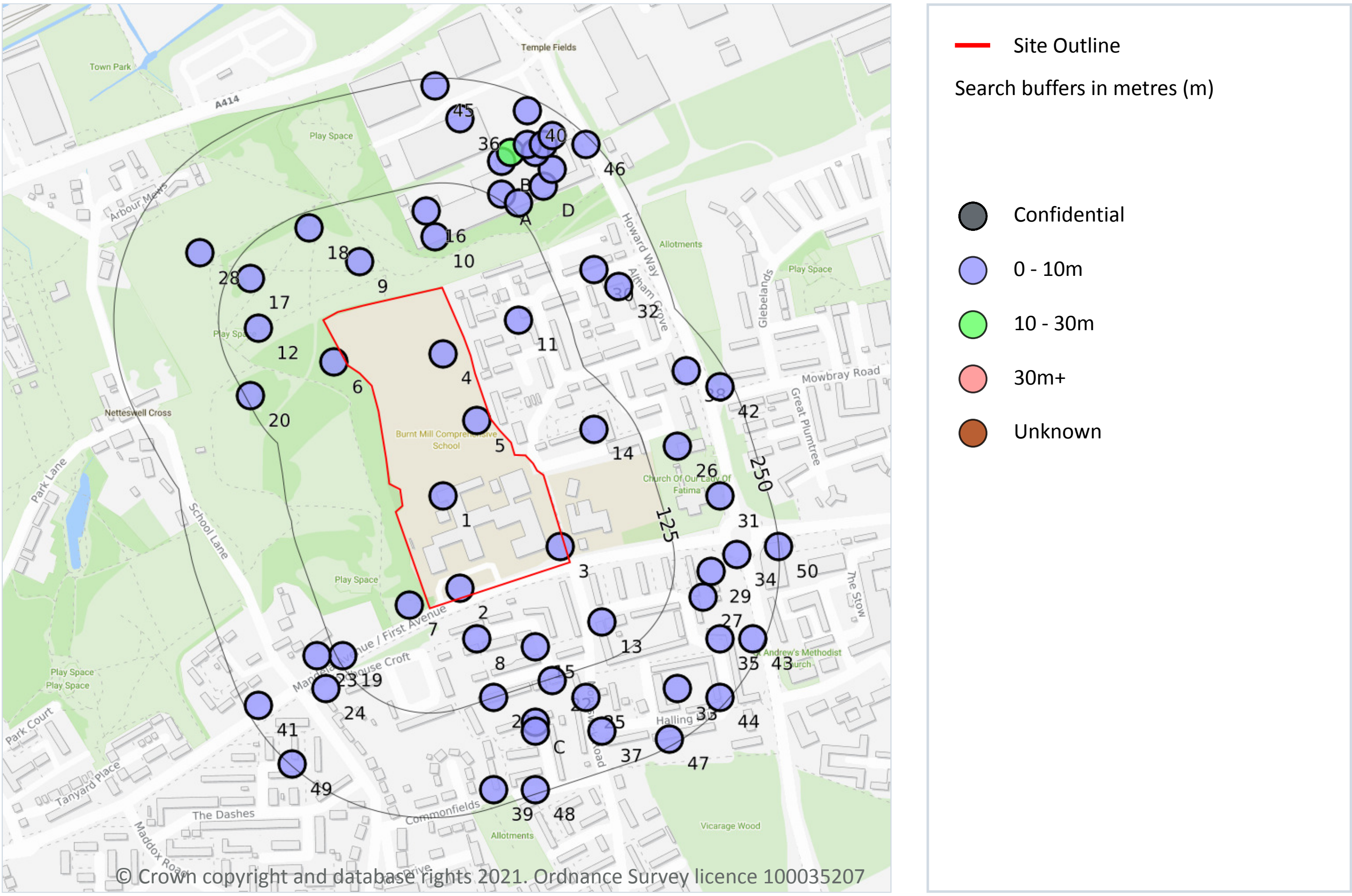
15.10 Bedrock faults and other linear features (50k)

Records within 500m	**0**

Linear features at the ground or bedrock surface at 1:50,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

This data is sourced from the British Geological Survey.

16 Boreholes



16.1 BGS Boreholes

Records within 250m	62

The Single Onshore Boreholes Index (SOBI); an index of over one million records of boreholes, shafts and wells from all forms of drilling and site investigation work held by the British Geological Survey. Covering onshore and nearshore boreholes dating back to at least 1790 and ranging from one to several thousand metres deep.

Features are displayed on the Boreholes map on **page 82**

ID	Location	Grid reference	Name	Length	Confidential	Web link
1	On site	545440 210810	NETTESWELL OS NO 56	6.1	N	540382
2	On site	545460 210700	B 183 ROAD B 4	4.0	N	540510
3	On site	545580 210750	NETTESWELL OS NO 81	1.0	N	540383

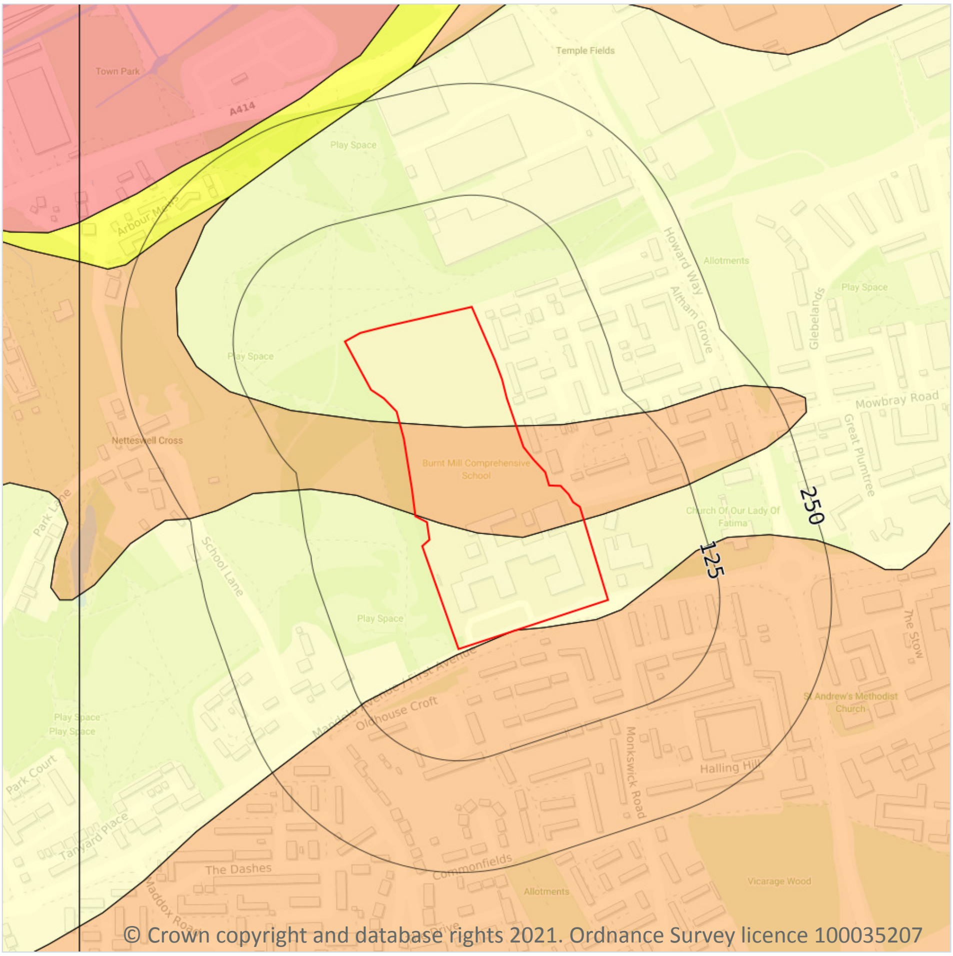
ID	Location	Grid reference	Name	Length	Confidential	Web link
4	**On site**	**545440 210980**	**NETTESWELL OS NO 56**	**6.1**	**N**	**540386**
5	**On site**	**545480 210900**	**NETTESWELL OS NO 56**	**2.0**	**N**	**540381**
6	12m SW	545310 210970	NETTESWELL OS NO 56 & 56A	6.1	N	540387
7	21m W	545400 210680	B 183 NEAR NETTSWELL COUNCIL HOUSES	1.0	N	540319
8	52m S	545480 210640	MARK HALL AREA 24	3.0	N	540582
9	52m N	545340 211090	NETTESWELL OS FIELD NO 53	9.31	N	540402
10	62m N	545430 211120	EASTERN INDUSTRIAL AREA WESTERN EXTEN	6.0	N	540685
11	68m E	545530 211020	NETTESWELL OS FIELD NO 81	3.0	N	540400
12	78m W	545220 211010	NETTESWELL OS NO 54	6.1	N	540379
13	81m SE	545630 210660	MARK HALL AREA 24	3.0	N	540723
14	82m NE	545620 210890	NETTESWELL OS NO 62	3.0	N	540385
15	83m S	545550 210630	MARK HALL AREA 24	3.0	N	540581
16	93m N	545420 211150	EASTERN INDUSTRIAL AREA WESTERN EXTEN	5.0	N	540681
17	100m NW	545210 211070	NETTESWELL OS NO 53	6.1	N	540380
18	106m N	545280 211130	NETTESWELL OS NO 54	2.0	N	540376
19	118m SW	545320 210620	B 183 NEAR NETTSWELL COUNCIL HOUSES	1.0	N	540321
20	119m SW	545210 210930	NETTESWELL OS FIELD NO 556	3.0	N	540401
21	125m S	545500 210570	MARK HALL AREA 24	3.0	N	540583
22	127m S	545570 210590	MARK HALL AREA 24	3.0	N	540586
A	132m NE	545510 211170	EASTERN INDUSTRIAL AREA WESTERN EXTEN	4.0	N	540683
A	136m NE	545530 211160	NETTESWELL OS FIELD NO 52	6.1	N	540398
23	145m SW	545290 210620	BRANCHE SEWERS NETTESWELL	3.0	N	540555
24	157m SW	545300 210580	B 183 NEAR NETTSWELL COUNCIL HOUSES	2.0	N	540322
25	159m S	545610 210570	MARK HALL AREA 24	3.0	N	540584
26	164m E	545720 210870	B 183 ROAD C	5.0	N	540507
27	164m E	545750 210690	MARK HALL AREA 24	3.0	N	540577
B	167m NE	545510 211210	NEW WAREHOUSE HARLOW 1	8.45	N	540768
28	167m NW	545150 211100	NETTESWELL OS NO 54	3.0	N	540375

ID	Location	Grid reference	Name	Length	Confidential	Web link
C	169m S	545550 210540	MARK HALL AREA 24	3.0	N	540587
29	169m E	545760 210720	MARK HALL AREA 24	3.0	N	540578
D	171m NE	545560 211180	EASTERN INDUSTRIAL AREA WESTERN EXTEN	4.0	N	540686
30	175m NE	545620 211080	NETTESWELL OS FIELD NO 62	4.0	N	540399
C	178m S	545550 210530	FIRST AVENUE (B5)	3.0	N	540524
B	181m NE	545520 211220	NEW WAREHOUSE HARLOW 2	15.5	N	540769
D	193m NE	545570 211200	EASTERN INDUSTRIAL AREA WESTERN EXTEN	3.0	N	540684
31	194m E	545770 210810	B 183 ROAD C	3.0	N	540508
32	195m E	545650 211060	B 183 ROAD C	5.0	N	540505
B	196m NE	545550 211220	EASTERN INDUSTRIAL AREA WESTERN EXTEN	4.0	N	540682
33	199m SE	545720 210580	MARK HALL AREA 24	3.0	N	540576
34	199m E	545790 210740	ROAD C3 NORTH	5.0	N	540594
B	199m NE	545540 211230	NEW WAREHOUSE HARLOW 3	10.0	N	540770
35	201m SE	545770 210640	MARK HALL AREA 24	3.0	N	540579
36	202m N	545460 211260	EASTERN INDUSTRIAL AREA WESTERN EXTEN	6.7	N	540679
37	203m S	545630 210530	MARK HALL AREA 24	3.0	N	540585
B	210m NE	545560 211230	NEW WAREHOUSE HARLOW 4	7.0	N	540771
38	211m NE	545730 210960	B 183 ROAD C	3.0	N	540506
B	224m NE	545570 211240	NEW WAREHOUSE HARLOW 5	10.0	N	540772
39	229m S	545500 210460	MARK HALL AREA 24	3.0	N	540572
40	234m NE	545540 211270	EASTERN INDUSTRIAL AREA WESTERN EXTEN	4.0	N	540680
41	235m SW	545220 210560	FIRST AVENUE (B5)	4.0	N	540525
42	235m NE	545770 210940	MARK HALL RESIDENTIAL AREA 82	2.74	N	540713
43	237m E	545810 210640	ROAD C3 NORTH	5.0	N	540593
44	241m SE	545770 210570	MARK HALL AREA 24	3.0	N	540580
45	241m N	545430 211300	EASTERN INDUSTRIAL AREA WESTERN EXTEN	4.0	N	540677
46	242m NE	545610 211230	B 183 ROAD C	5.0	N	540504
47	242m SE	545710 210520	MARK HALL AREA 24	3.0	N	540575

ID	Location	Grid reference	Name	Length	Confidential	Web link
48	245m S	545550 210460	MARK HALL AREA 24	3.0	N	540573
49	248m SW	545260 210490	MARK HALL AREA 25	4.0	N	540619
50	250m E	545840 210750	B 183 BRANCH SEWERS N E AREA	2.0	N	540474

This data is sourced from the British Geological Survey.

17 Natural ground subsidence - Shrink swell clays



Site Outline

Search buffers in metres (m)

☐ No data
☐ Negligible
☐ Very low
☐ Low
☐ Moderate
☐ High

17.1 Shrink swell clays

Records within 50m	2

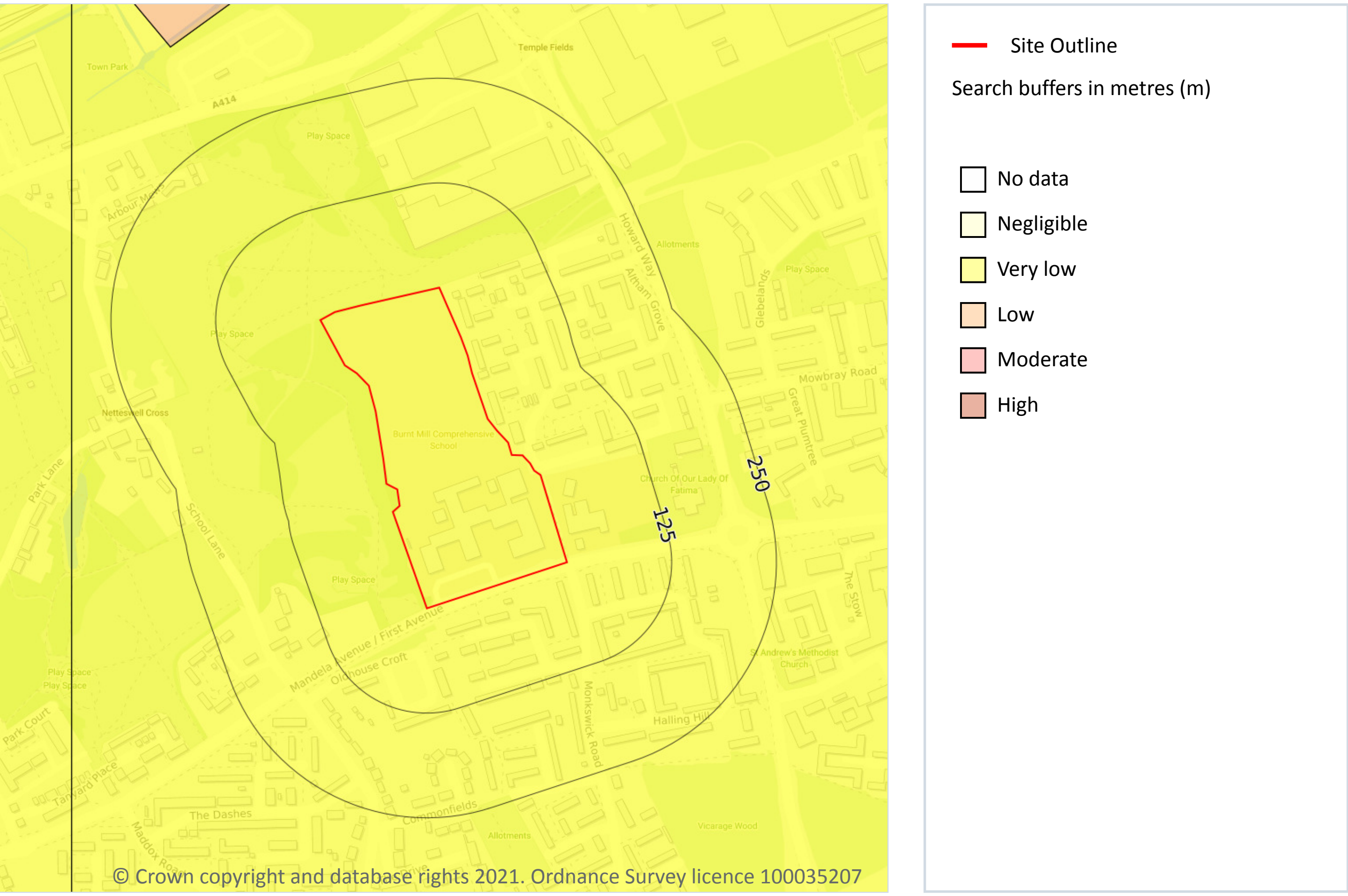
The potential hazard presented by soils that absorb water when wet (making them swell), and lose water as they dry (making them shrink). This shrink-swell behaviour is controlled by the type and amount of clay in the soil, and by seasonal changes in the soil moisture content (related to rainfall and local drainage).

Features are displayed on the Natural ground subsidence - Shrink swell clays map on **page 86**

Location	Hazard rating	Details
On site	**Negligible**	**Ground conditions predominantly non-plastic.**
On site	**Low**	**Ground conditions predominantly medium plasticity.**

This data is sourced from the British Geological Survey.

Natural ground subsidence - Running sands



17.2 Running sands

Records within 50m	1

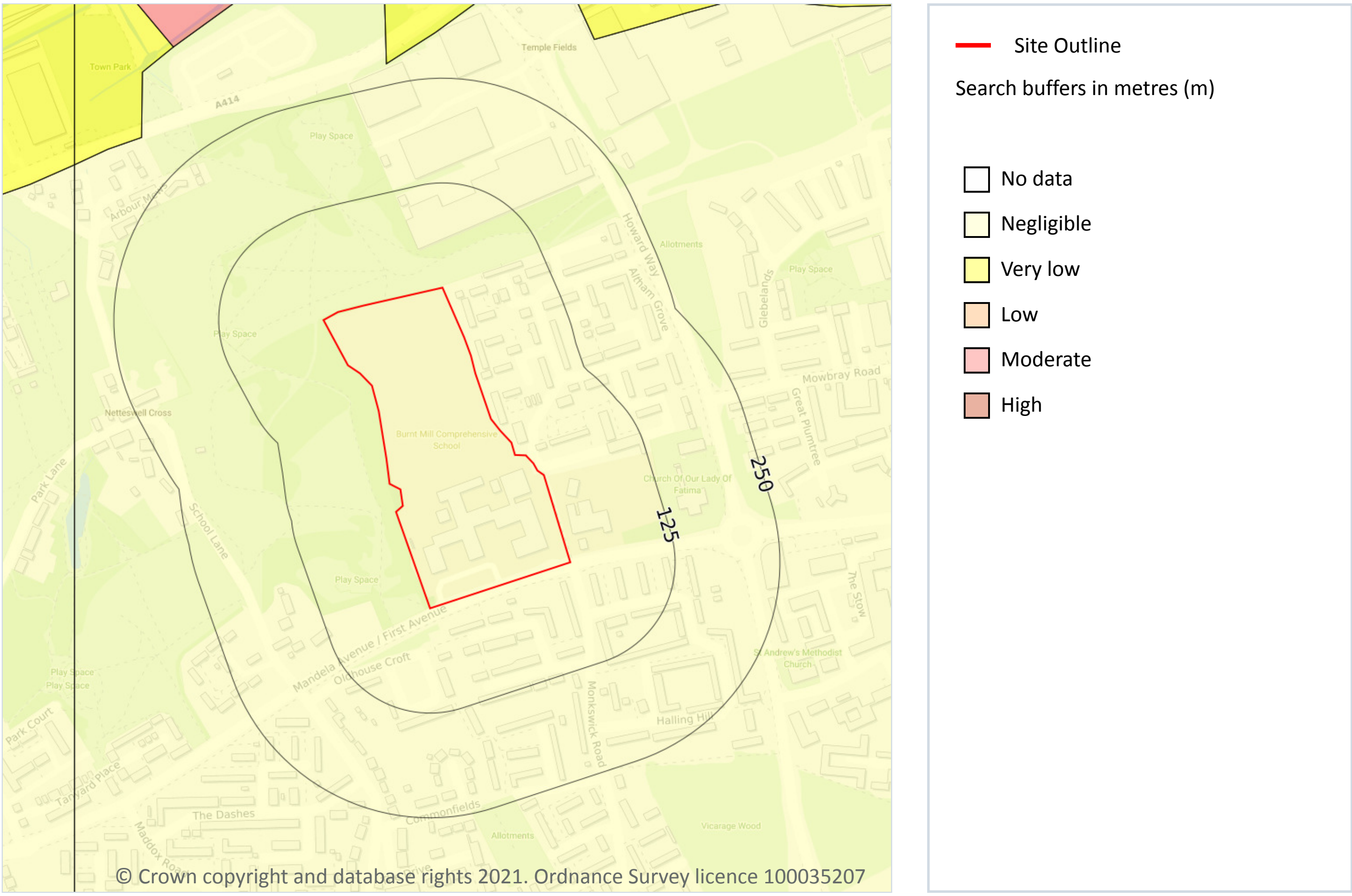
The potential hazard presented by rocks that can contain loosely-packed sandy layers that can become fluidised by water flowing through them. Such sands can 'run', removing support from overlying buildings and causing potential damage.

Features are displayed on the Natural ground subsidence - Running sands map on **page 87**

Location	Hazard rating	Details
On site	**Very low**	**Running sand conditions are unlikely. No identified constraints on land use due to running conditions unless water table rises rapidly.**

This data is sourced from the British Geological Survey.

Natural ground subsidence - Compressible deposits



17.3 Compressible deposits

Records within 50m	1

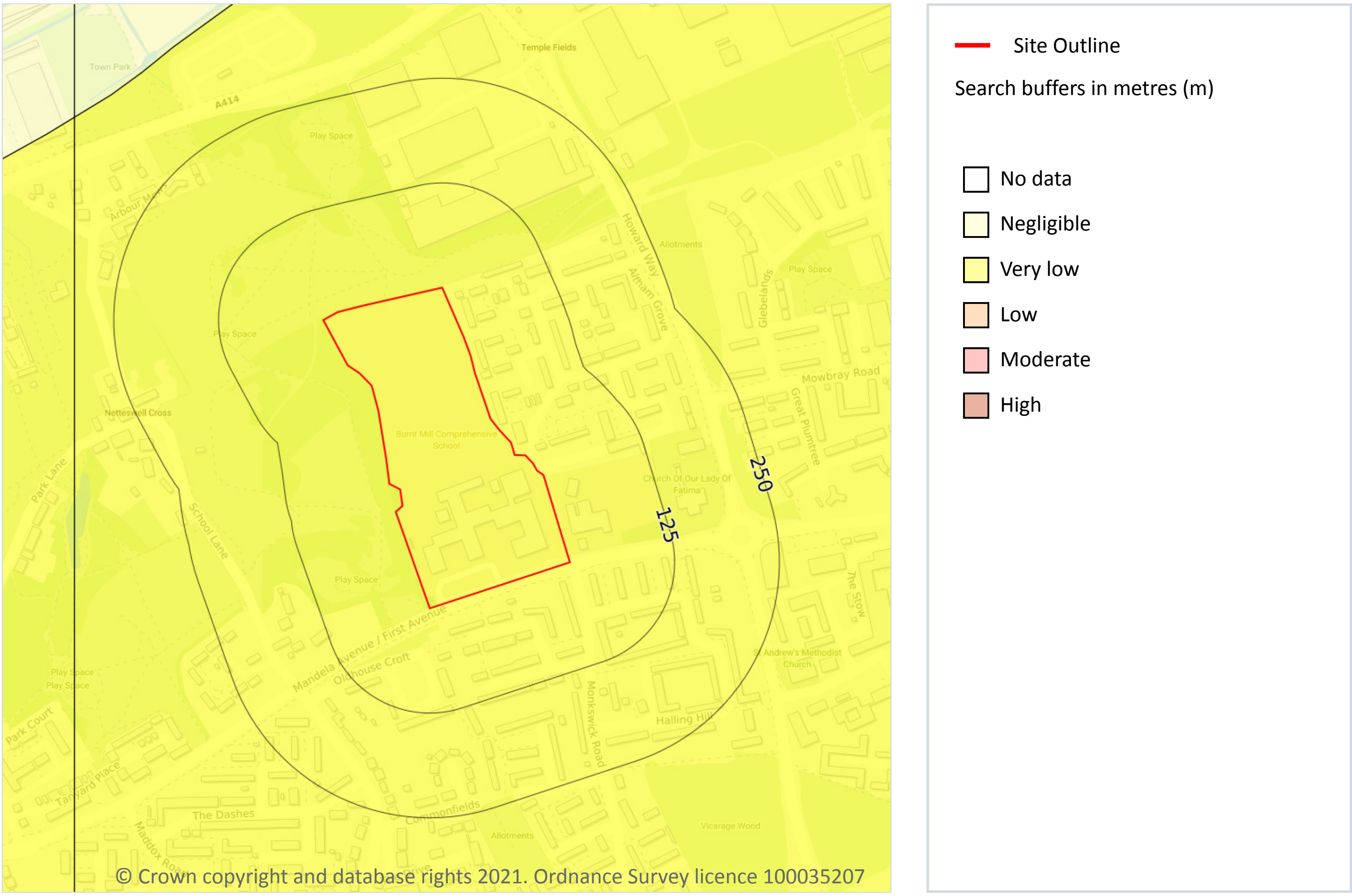
The potential hazard presented by types of ground that may contain layers of very soft materials like clay or peat and may compress if loaded by overlying structures, or if the groundwater level changes, potentially resulting in depression of the ground and disturbance of foundations.

Features are displayed on the Natural ground subsidence - Compressible deposits map on **page 88**

Location	Hazard rating	Details
On site	**Negligible**	**Compressible strata are not thought to occur.**

This data is sourced from the British Geological Survey.

Natural ground subsidence - Collapsible deposits



17.4 Collapsible deposits

Records within 50m	1

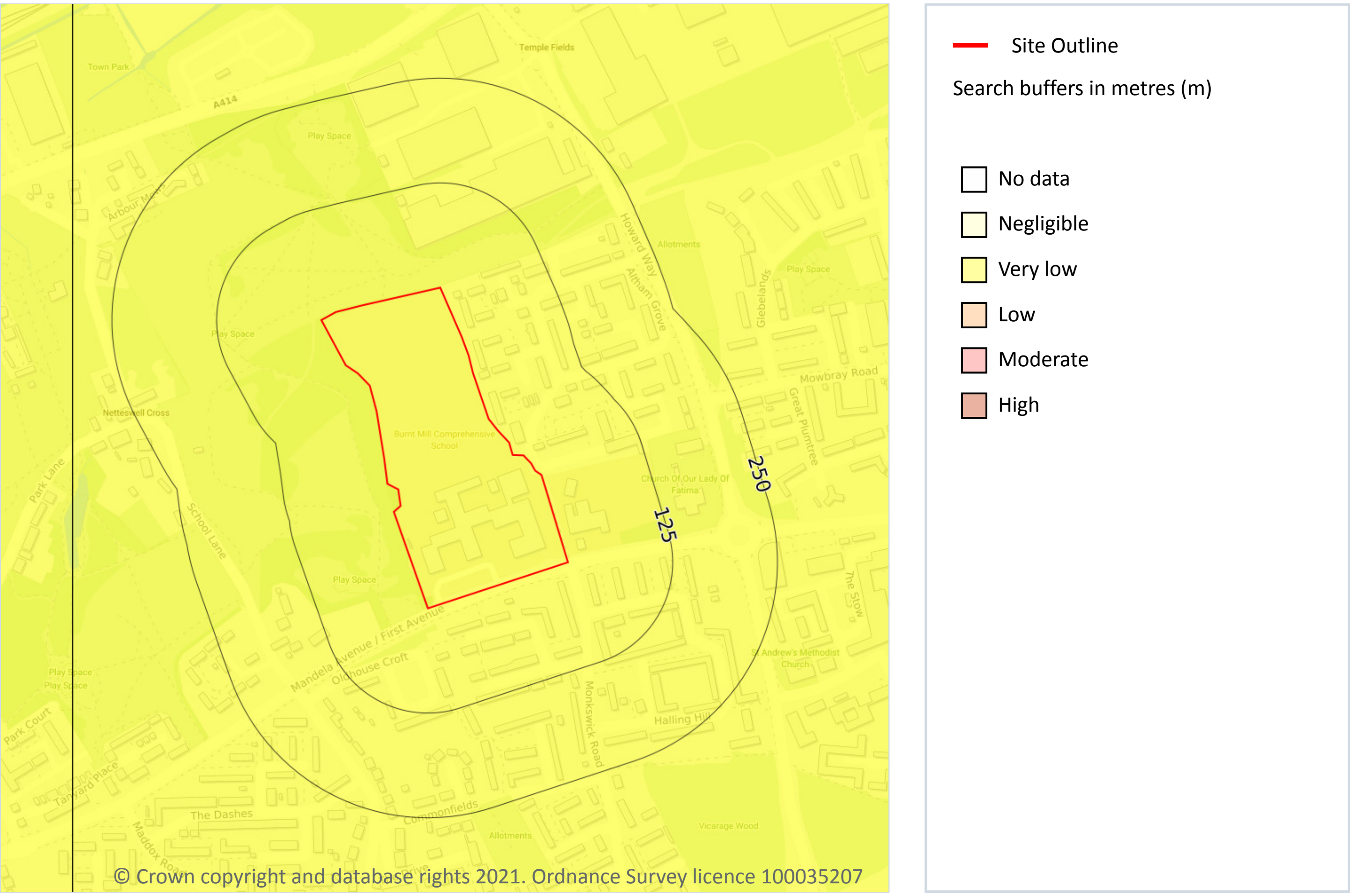
The potential hazard presented by natural deposits that could collapse when a load (such as a building) is placed on them or they become saturated with water.

Features are displayed on the Natural ground subsidence - Collapsible deposits map on **page 89**

Location	Hazard rating	Details
On site	**Very low**	**Deposits with potential to collapse when loaded and saturated are unlikely to be present.**

This data is sourced from the British Geological Survey.

Natural ground subsidence - Landslides



17.5 Landslides

Records within 50m	1

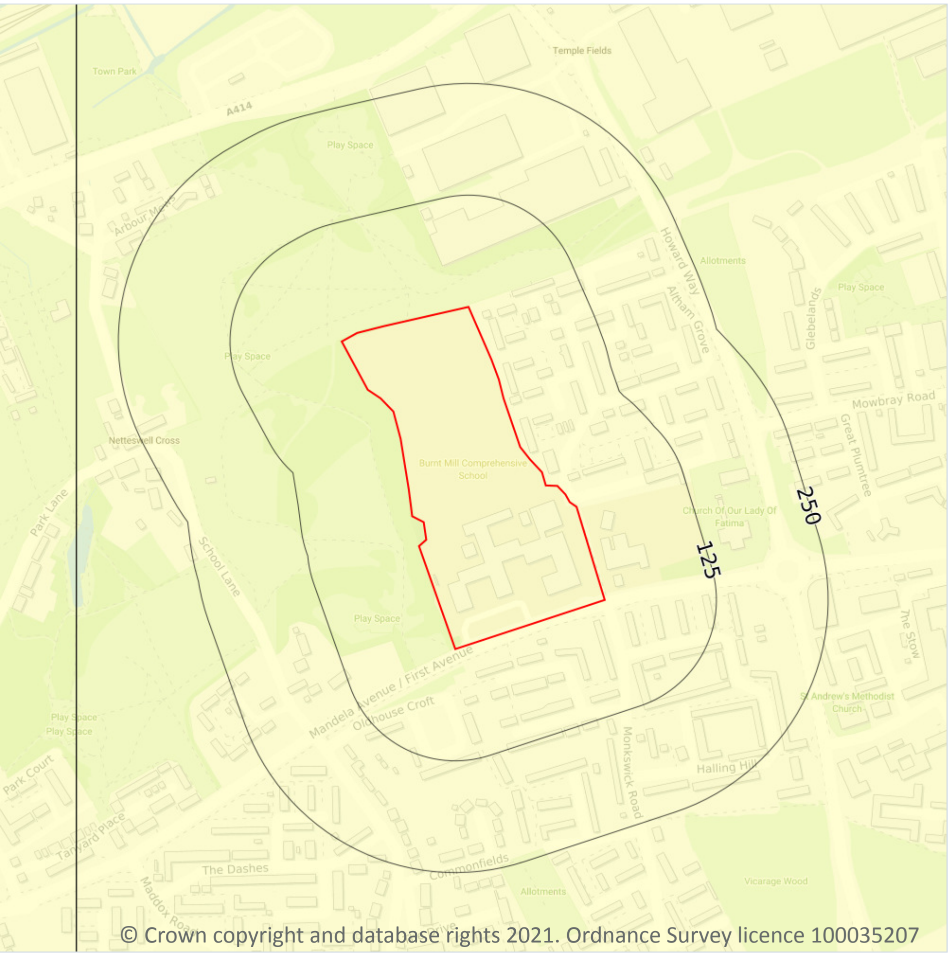
The potential for landsliding (slope instability) to be a hazard assessed using 1:50,000 scale digital maps of superficial and bedrock deposits, combined with information from the BGS National Landslide Database and scientific and engineering reports.

Features are displayed on the Natural ground subsidence - Landslides map on **page 90**

Location	Hazard rating	Details
On site	**Very low**	**Slope instability problems are not likely to occur but consideration to potential problems of adjacent areas impacting on the site should always be considered.**

This data is sourced from the British Geological Survey.

Natural ground subsidence - Ground dissolution of soluble rocks



— Site Outline

Search buffers in metres (m)

☐ No data

☐ Negligible

☐ Very low

☐ Low

☐ Moderate

☐ High

17.6 Ground dissolution of soluble rocks

Records within 50m	1

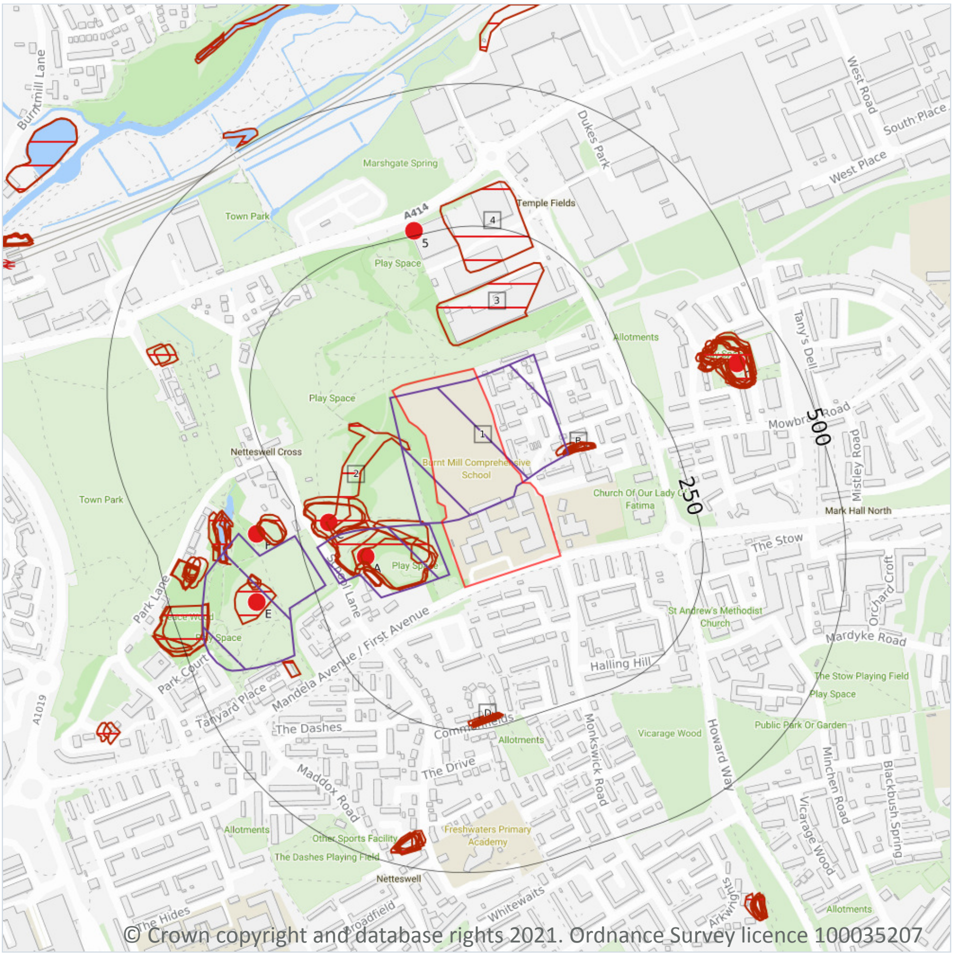
The potential hazard presented by ground dissolution, which occurs when water passing through soluble rocks produces underground cavities and cave systems. These cavities reduce support to the ground above and can cause localised collapse of the overlying rocks and deposits.

Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on **page 91**

Location	Hazard rating	Details
On site	**Negligible**	**Soluble rocks are either not thought to be present within the ground, or not prone to dissolution. Dissolution features are unlikely to be present.**

This data is sourced from the British Geological Survey.

18 Mining, ground workings and natural cavities



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▬ Site Outline

Search buffers in metres (m)

▤ Natural cavities (Area)

● Natural cavities (Point)

● BritPits

▤ Surface ground workings

▥ Underground workings

▧ Historical Mineral Planning Areas

● Mining Cavities

Non Coal Mining

▨ Sporadic underground mining of restricted extent possible

▨ Localised small scale underground mining possible

▨ Small scale mining possible

▨ Underground mining known or likely within or in close proximity

▨ Underground mining known within or in very close proximity

18.1 Natural cavities

Records within 500m	0

Industry recognised national database of natural cavities. Sinkholes and caves are formed by the dissolution of soluble rock, such as chalk and limestone, gulls and fissures by cambering. Ground instability can result from movement of loose material contained within these cavities, often triggered by water.

This data is sourced from Stantec UK Ltd.

18.2 BritPits

Records within 500m	**6**

BritPits (an abbreviation of British Pits) is a database maintained by the British Geological Survey of currently active and closed surface and underground mineral workings. Details of major mineral handling sites, such as wharfs and rail depots are also held in the database.

Features are displayed on the Mining, ground workings and natural cavities map on **page 92**

ID	Location	Details	Description
A	146m W	Name: Netteswell Cross Gravel Pits Address: Netteswell Cross, HARLOW, Essex Commodity: Sand & Gravel Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
C	193m W	Name: Netteswell Cross Gravel Pits Address: Netteswell Cross, HARLOW, Essex Commodity: Sand & Gravel Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
5	258m N	Name: Marshgate Gravel Pit Address: Mark Hall North, HARLOW, Essex Commodity: Sand & Gravel Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
F	320m W	Name: Netteswell Cross Gravel Pits Address: Netteswell Cross, HARLOW, Essex Commodity: Sand & Gravel Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
E	352m W	Name: Netteswell Cross Gravel Pits Address: Netteswell Cross, HARLOW, Essex Commodity: Sand & Gravel Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority

ID	Location	Details	Description
G	412m NE	Name: Mark Hall Gravel Pit Address: HARLOW, Essex Commodity: Sand & Gravel Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority

This data is sourced from the British Geological Survey.

18.3 Surface ground workings

Records within 250m	**24**

Historical land uses identified from Ordnance Survey mapping that involved ground excavation at the surface. These features may or may not have been subsequently backfilled.

Features are displayed on the Mining, ground workings and natural cavities map on **page 92**

ID	Location	Land Use	Year of mapping	Mapping scale
A	27m W	Unspecified Pits	1938	1:10560
A	28m W	Unspecified Ground Workings	1980	1:10000
2	32m SW	Unspecified Ground Workings	1980	1:10000
A	32m W	Unspecified Pits	1947	1:10560
A	36m W	Unspecified Pit	1955	1:10560
3	46m N	Unspecified Pit	1955	1:10560
B	68m NE	Pond	1880	1:10560
B	76m NE	Ponds	1874	1:10560
B	79m NE	Ponds	1896	1:10560
B	79m NE	Ponds	1955	1:10560
B	81m NE	Ponds	1923	1:10560
B	83m NE	Ponds	1947	1:10560
B	85m NE	Ponds	1923	1:10560
C	134m W	Unspecified Pit	1955	1:10560
A	134m W	Unspecified Pit	1923	1:10560
A	135m W	Unspecified Pit	1923	1:10560

ID	Location	Land Use	Year of mapping	Mapping scale
A	135m W	Unspecified Pit	1923	1:10560
A	136m W	Unspecified Pit	1955	1:10560
4	169m N	Unspecified Heap	1955	1:10560
D	225m S	Pond	1880	1:10560
D	227m S	Pond	1923	1:10560
D	228m S	Pond	1874	1:10560
D	229m S	Pond	1895	1:10560
D	232m S	Pond	1897	1:10560

This is data is sourced from Ordnance Survey/Groundsure.

18.4 Underground workings

Records within 1000m	**0**

Historical land uses identified from Ordnance Survey mapping that indicate the presence of underground workings e.g. mine shafts.

This is data is sourced from Ordnance Survey/Groundsure.

18.5 Historical Mineral Planning Areas

Records within 500m	**3**

Boundaries of mineral planning permissions for England and Wales. This data was collated between the 1940s (and retrospectively to the 1930s) and the mid 1980s. The data includes permitted, withdrawn and refused permissions.

Features are displayed on the Mining, ground workings and natural cavities map on **page 92**

ID	Location	Site Name	Mineral	Type	Planning Status	Planning Status Date
1	**On site**	**Hill House**	**Sand and gravel**	**Surface mineral working**	**Refused**	**Not available**
A	19m W	Hill House	Sand and gravel	Surface mineral working	Valid	Not available
E	229m W	Hill House	Sand and gravel	Surface mineral working	Valid	Not available

This data is sourced from the British Geological Survey.

18.6 Non-coal mining

Records within 1000m	**1**

The potential for historical non-coal mining to have affected an area. The assessment is drawn from expert knowledge and literature in addition to the digital geological map of Britain. Mineral commodities may be divided into seven general categories - vein minerals, chalk, oil shale, building stone, bedded ores, evaporites and 'other' commodities (including ball clay, jet, black marble, graphite and chert).

Features are displayed on the Mining, ground workings and natural cavities map on **page 92**

ID	Location	Name	Commodity	Class	Likelihood
-	909m E	Not available	Chalk	C	Small scale underground mining may have occurred; mine adits, shafts and tunnels may be present. Potential for localised difficult ground conditions are at a level where they should be considered

This data is sourced from the British Geological Survey.

18.7 Mining cavities

Records within 1000m	**0**

Industry recognised national database of mining cavities. Degraded mines may result in hazardous subsidence (crown holes). Climatic conditions and water escape can also trigger subsidence over mine entrances and workings.

This data is sourced from Stantec UK Ltd.

18.8 JPB mining areas

Records on site	**0**

Areas which could be affected by former coal and other mining. This data includes some mine plans unavailable to the Coal Authority.

This data is sourced from Johnson Poole and Bloomer.

18.9 Coal mining

Records on site	**0**

Areas which could be affected by past, current or future coal mining.

This data is sourced from the Coal Authority.

18.10 Brine areas

Records on site	**0**

The Cheshire Brine Compensation District indicates areas that may be affected by salt and brine extraction in Cheshire and where compensation would be available where damage from this mining has occurred. Damage from salt and brine mining can still occur outside this district, but no compensation will be available.

This data is sourced from the Cheshire Brine Subsidence Compensation Board.

18.11 Gypsum areas

Records on site	**0**

Generalised areas that may be affected by gypsum extraction.

This data is sourced from British Gypsum.

18.12 Tin mining

Records on site	**0**

Generalised areas that may be affected by historical tin mining.

This data is sourced from Groundsure.

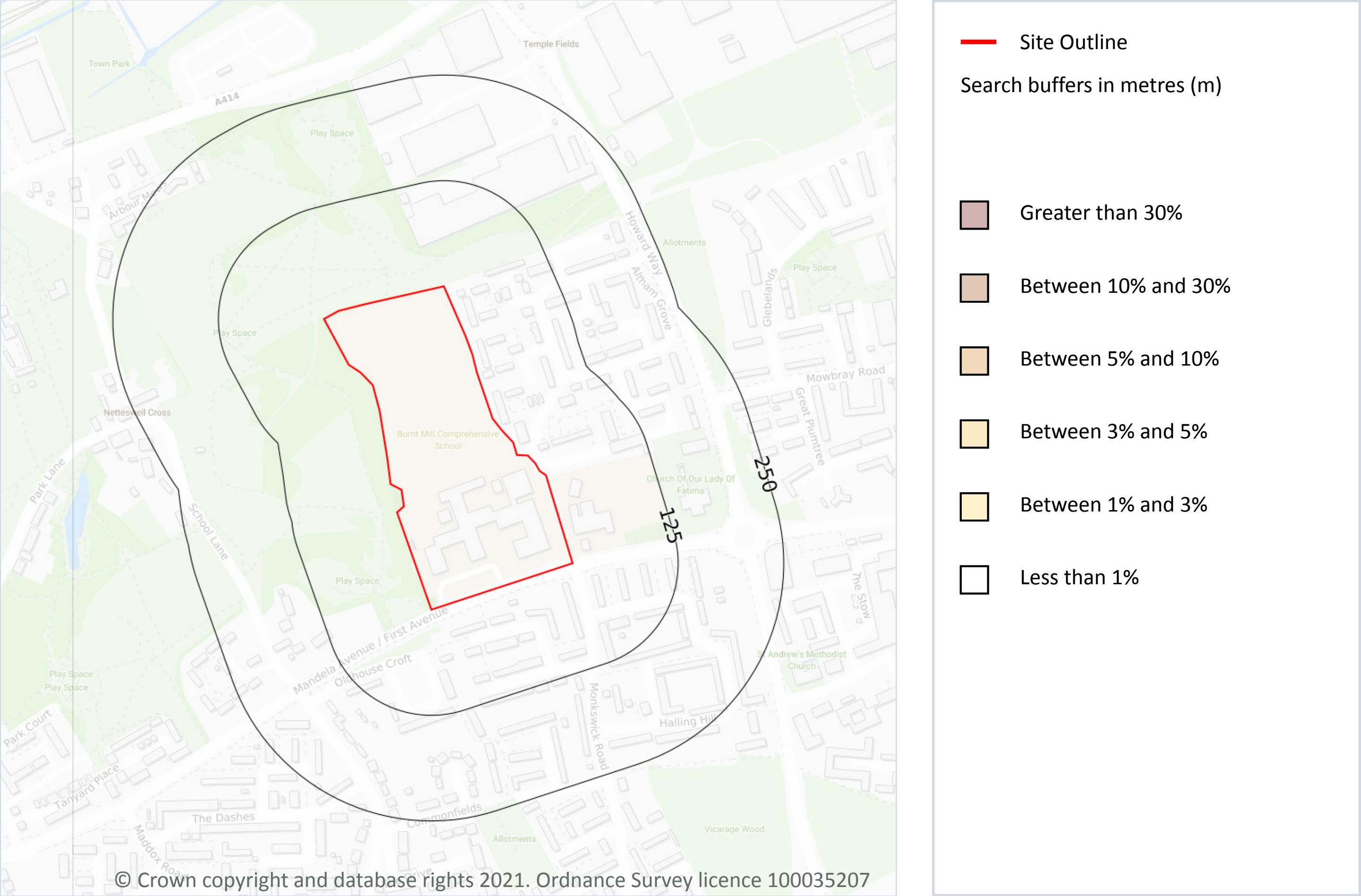
18.13 Clay mining

Records on site	**0**

Generalised areas that may be affected by kaolin and ball clay extraction.

This data is sourced from the Kaolin and Ball Clay Association (UK).

19 Radon



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19.1 Radon

Records on site	1

Estimated percentage of dwellings exceeding the Radon Action Level. This data is the highest resolution radon dataset available for the UK and is produced to a 75m level of accuracy to allow for geological data accuracy and a 'residential property' buffer. The findings of this section should supersede any estimations derived from the Indicative Atlas of Radon in Great Britain. The data was derived from both geological assessments and long term measurements of radon in more than 479,000 households.

Features are displayed on the Radon map on **page 98**

Location	Estimated properties affected	Radon Protection Measures required
On site	**Less than 1%**	**None****

This data is sourced from the British Geological Survey and Public Health England.

20 Soil chemistry

20.1 BGS Estimated Background Soil Chemistry

Records within 50m **9**

The estimated values provide the likely background concentration of the potentially harmful elements Arsenic, Cadmium, Chromium, Lead and Nickel in topsoil. The values are estimated primarily from rural topsoil data collected at a sample density of approximately 1 per 2 km^2. In areas where rural soil samples are not available, estimation is based on stream sediment data collected from small streams at a sampling density of 1 per 2.5 km^2; this is the case for most of Scotland, Wales and southern England. The stream sediment data are converted to soil-equivalent concentrations prior to the estimation.

Location	Arsenic	Bioaccessible Arsenic	Lead	Bioaccessible Lead	Cadmium	Chromium	Nickel
On site	**15 - 25 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**30 - 45 mg/kg**
On site	**15 - 25 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**30 - 45 mg/kg**
On site	**15 - 25 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**30 - 45 mg/kg**
On site	**15 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**15 mg/kg**
On site	**15 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**15 mg/kg**
On site	**15 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**15 mg/kg**
On site	**15 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**15 mg/kg**
3m SE	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
33m NE	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 mg/kg

This data is sourced from the British Geological Survey.

20.2 BGS Estimated Urban Soil Chemistry

Records within 50m	**0**

Estimated topsoil chemistry of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc and bioaccessible Arsenic and Lead in 23 urban centres across Great Britain. These estimates are derived from interpolation of the measured urban topsoil data referred to above and provide information across each city between the measured sample locations (4 per km^2).

This data is sourced from the British Geological Survey.

20.3 BGS Measured Urban Soil Chemistry

Records within 50m	**0**

The locations and measured total concentrations (mg/kg) of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc in urban topsoil samples from 23 urban centres across Great Britain. These are collected at a sample density of 4 per km^2.

This data is sourced from the British Geological Survey.

21 Railway infrastructure and projects

21.1 Underground railways (London)

Records within 250m	**0**

Details of all active London Underground lines, including approximate tunnel roof depth and operational hours.

This data is sourced from publicly available information by Groundsure.

21.2 Underground railways (Non-London)

Records within 250m	**0**

Details of the Merseyrail system, the Tyne and Wear Metro and the Glasgow Subway. Not all parts of all systems are located underground. The data contains location information only and does not include a depth assessment.

This data is sourced from publicly available information by Groundsure.

21.3 Railway tunnels

Records within 250m	**0**

Railway tunnels taken from contemporary Ordnance Survey mapping.

This data is sourced from the Ordnance Survey.

21.4 Historical railway and tunnel features

Records within 250m	**0**

Railways and tunnels digitised from historical Ordnance Survey mapping as scales of 1:1,250, 1:2,500, 1:10,000 and 1:10,560.

This data is sourced from Ordnance Survey/Groundsure.

21.5 Royal Mail tunnels

Records within 250m	**0**

The Post Office Railway, otherwise known as the Mail Rail, is an underground railway running through Central London from Paddington Head District Sorting Office to Whitechapel Eastern Head Sorting Office. The line is 10.5km long. The data includes details of the full extent of the tunnels, the depth of the tunnel, and the depth to track level.

This data is sourced from Groundsure/the Postal Museum.

21.6 Historical railways

Records within 250m	0

Former railway lines, including dismantled lines, abandoned lines, disused lines, historic railways and razed lines.

This data is sourced from OpenStreetMap.

21.7 Railways

Records within 250m	0

Currently existing railway lines, including standard railways, narrow gauge, funicular, trams and light railways.

This data is sourced from Ordnance Survey and OpenStreetMap.

21.8 Crossrail 1

Records within 500m	0

The Crossrail railway project links 41 stations over 100 kilometres from Reading and Heathrow in the west, through underground sections in central London, to Shenfield and Abbey Wood in the east.

This data is sourced from publicly available information by Groundsure.

21.9 Crossrail 2

Records within 500m	0

Crossrail 2 is a proposed railway linking the national rail networks in Surrey and Hertfordshire via an underground tunnel through London.

This data is sourced from publicly available information by Groundsure.

21.10 HS2

Records within 500m	0

HS2 is a proposed high speed rail network running from London to Manchester and Leeds via Birmingham. Main civils construction on Phase 1 (London to Birmingham) of the project began in 2019, and it is currently anticipated that this phase will be fully operational by 2026. Construction on Phase 2a (Birmingham to Crewe) is anticipated to commence in 2021, with the service fully operational by 2027. Construction on Phase 2b (Crewe to Manchester and Birmingham to Leeds) is scheduled to begin in 2023 and be operational by 2033.

This data is sourced from HS2 ltd.

Data providers

Groundsure works with respected data providers to bring you the most relevant and accurate information. To find out who they are and their areas of expertise see https://www.groundsure.com/sources-reference.

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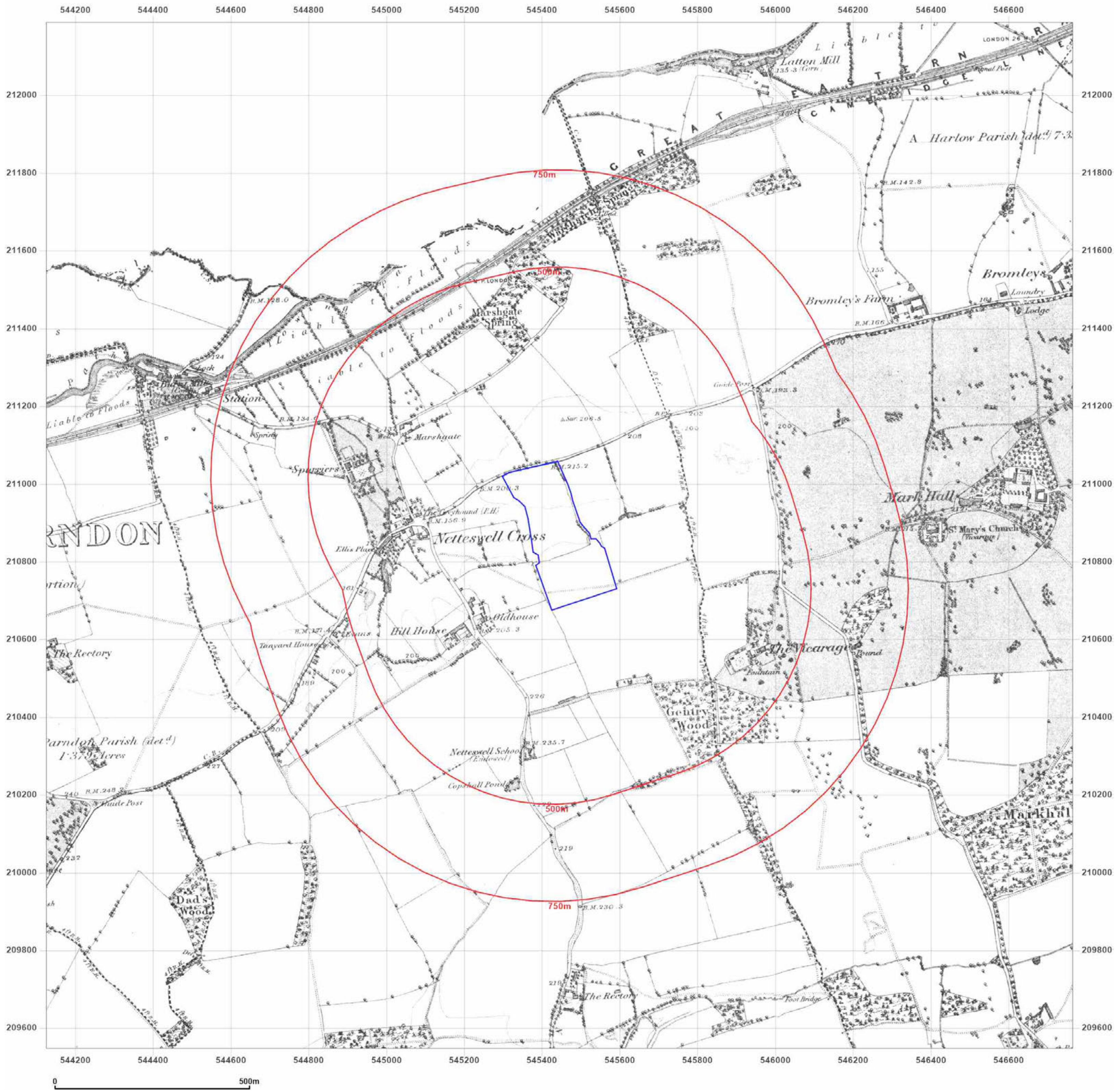
Appendix III



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Report Ref: EMS-735683_957173
Grid Ref: 545444, 210867

Map Name: County Series

Map date: 1874

Scale: 1:10,560

Printed at: 1:10,560

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Surveyed 1874
Revised 1874
Edition N/A
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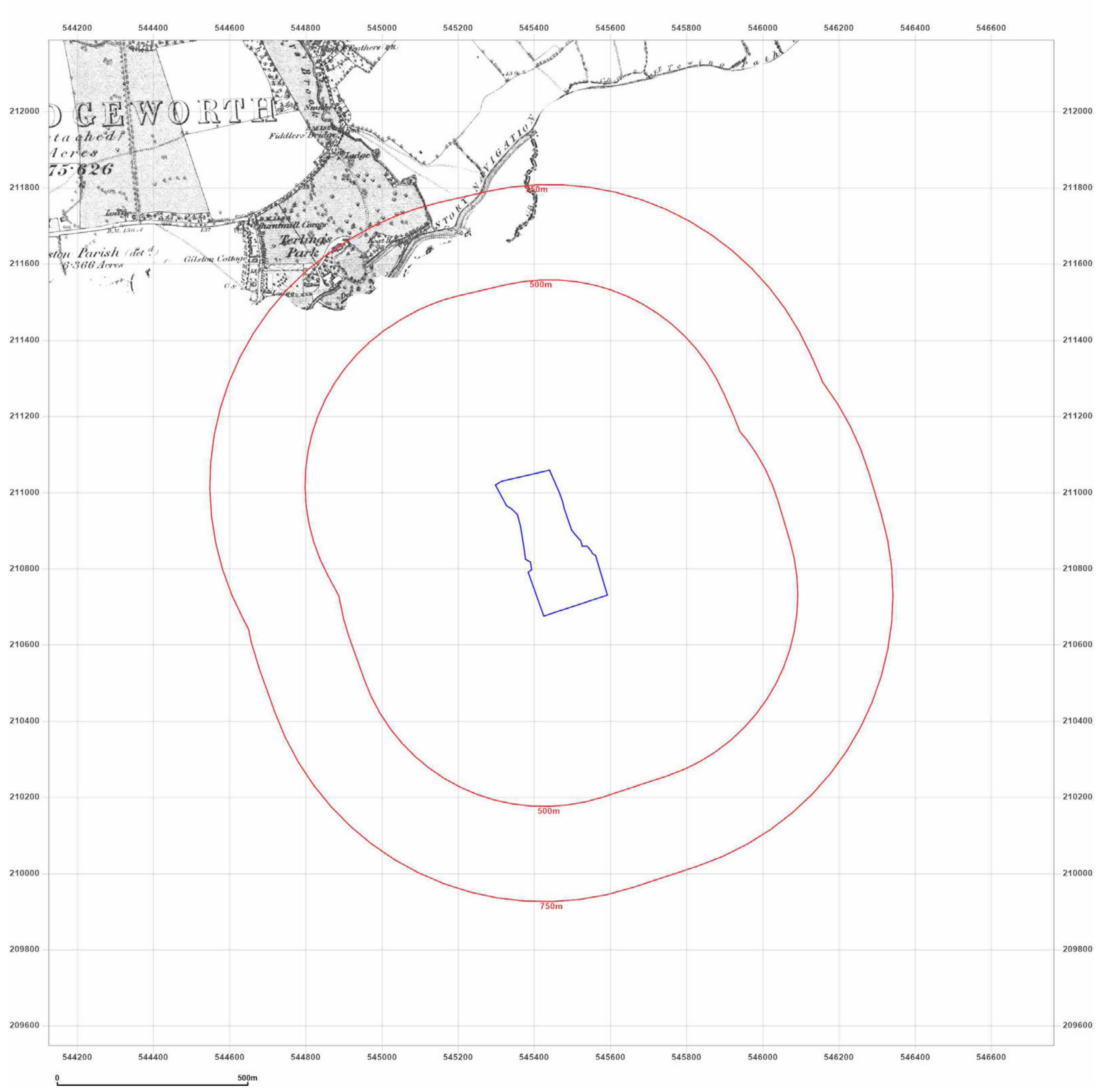

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Printed at:	1:10,560

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Surveyed 1880
Revised N/A
Edition 1883
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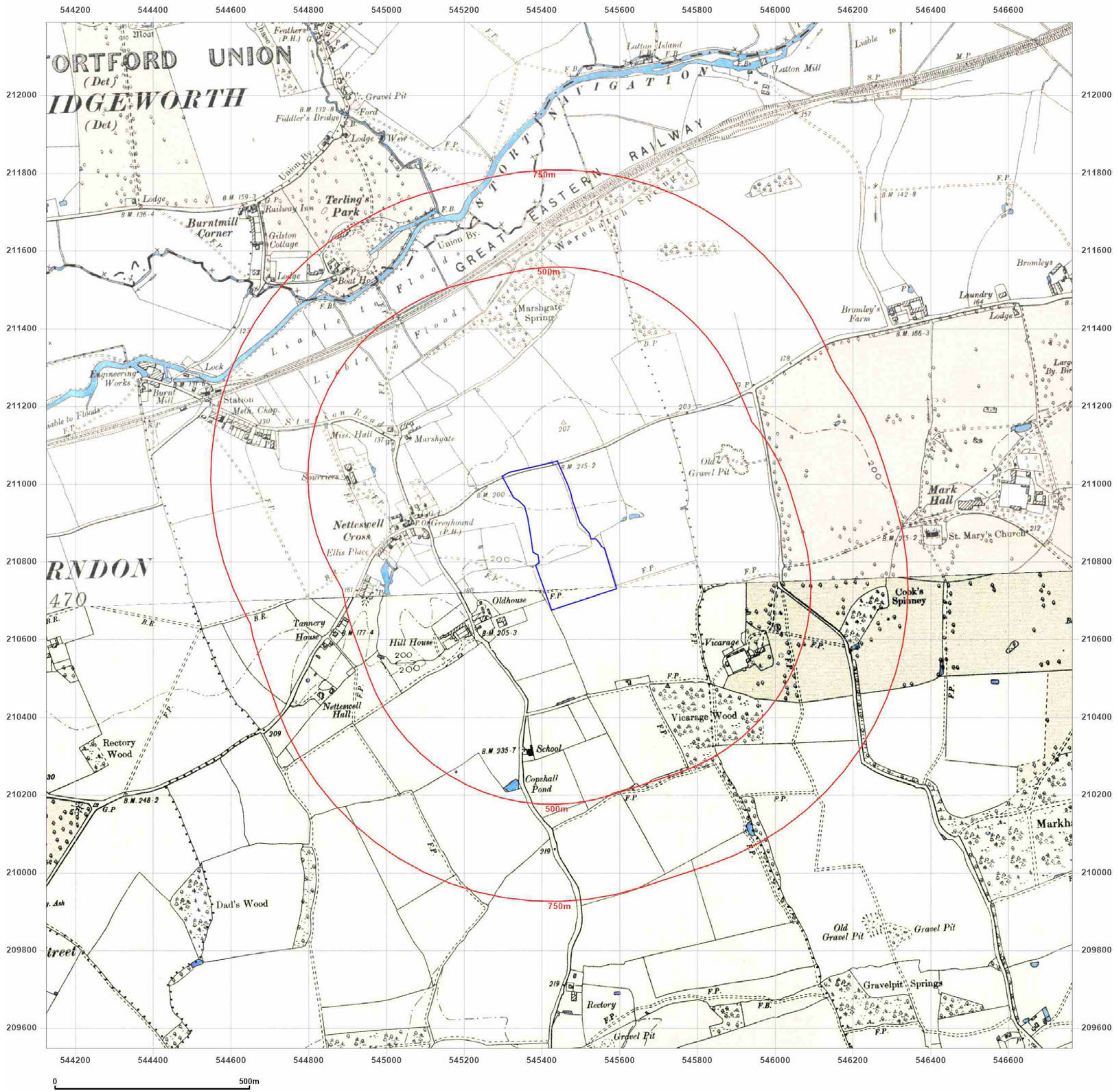

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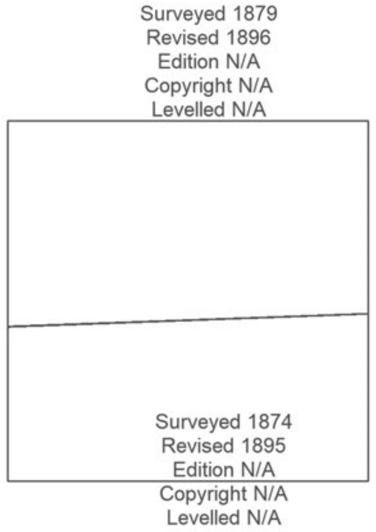

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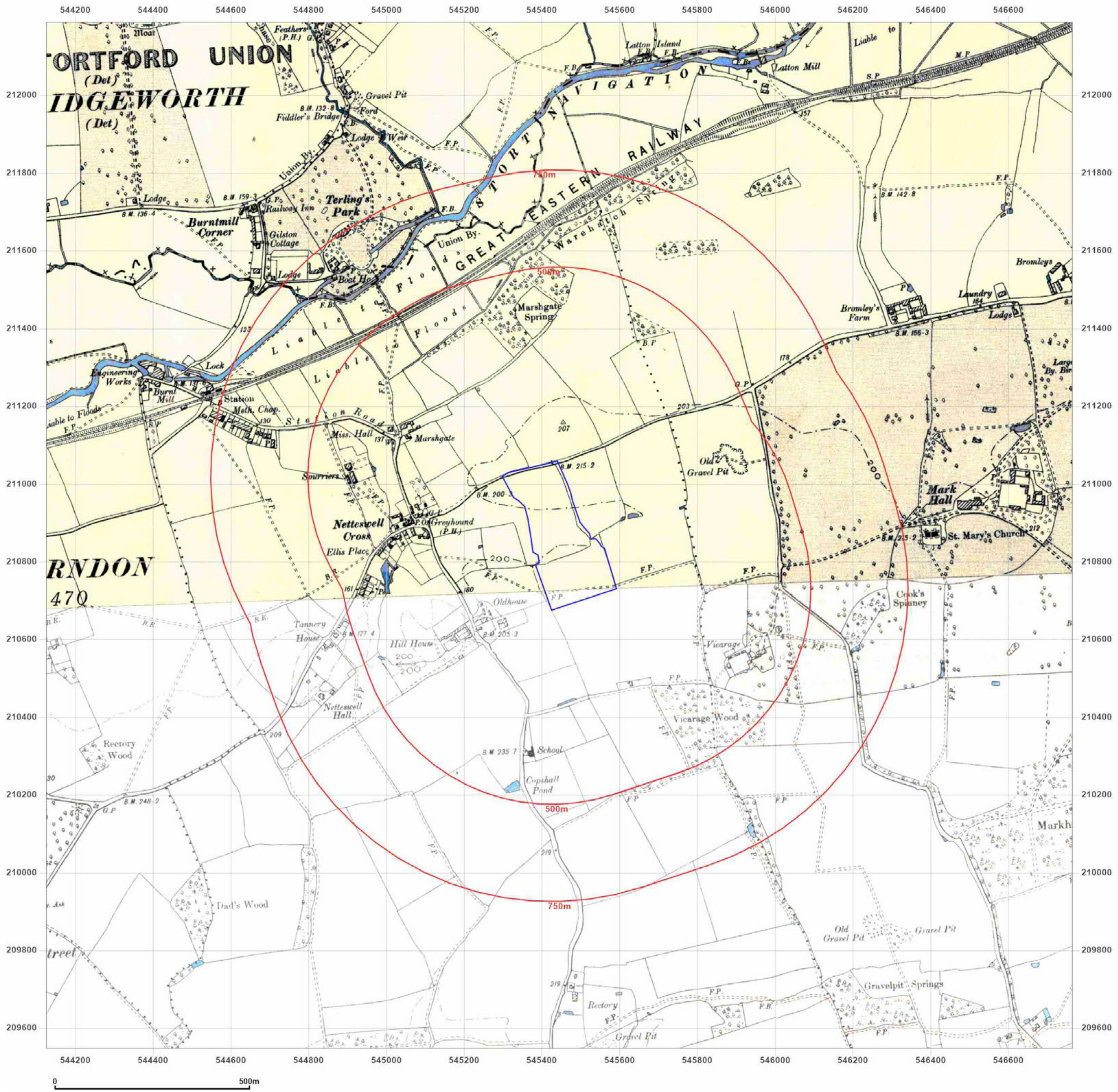

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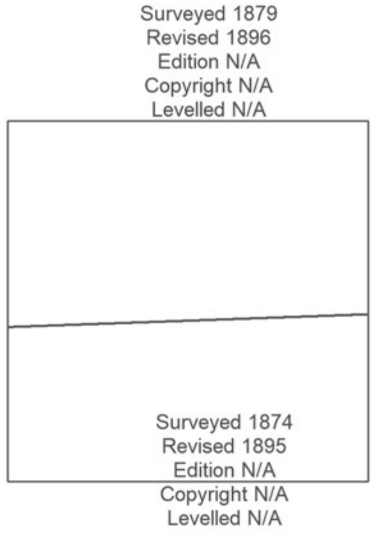

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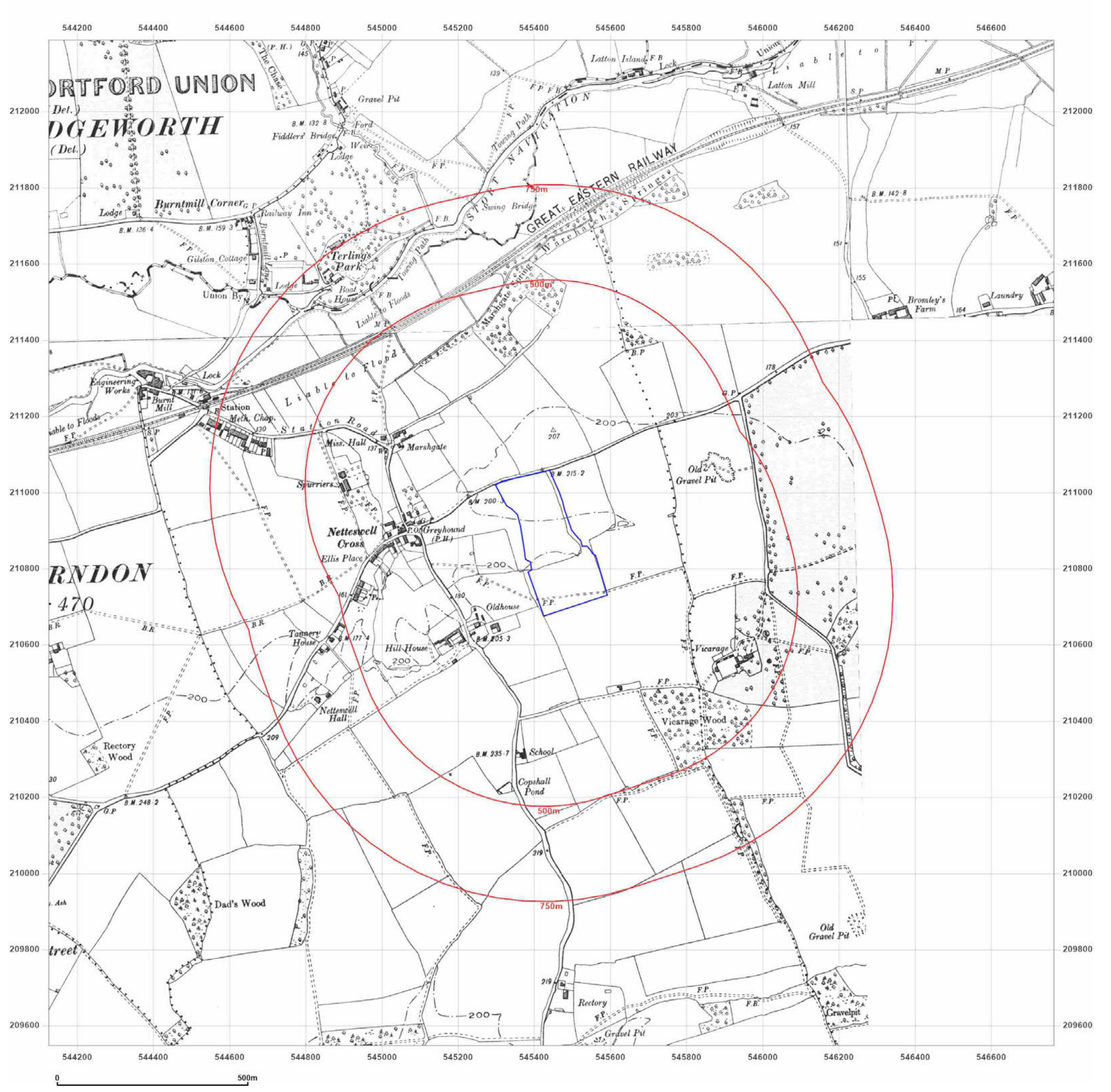

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Printed at:	1:10,560

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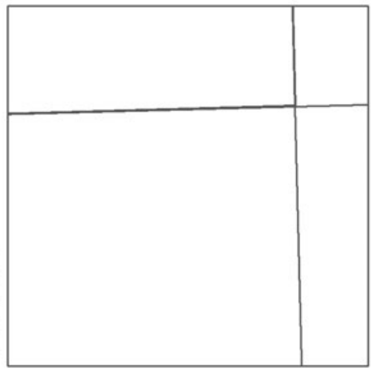
Surveyed 1879
Revised 1899
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1878
Revised 1899
Edition N/A
Copyright N/A
Levelled N/A



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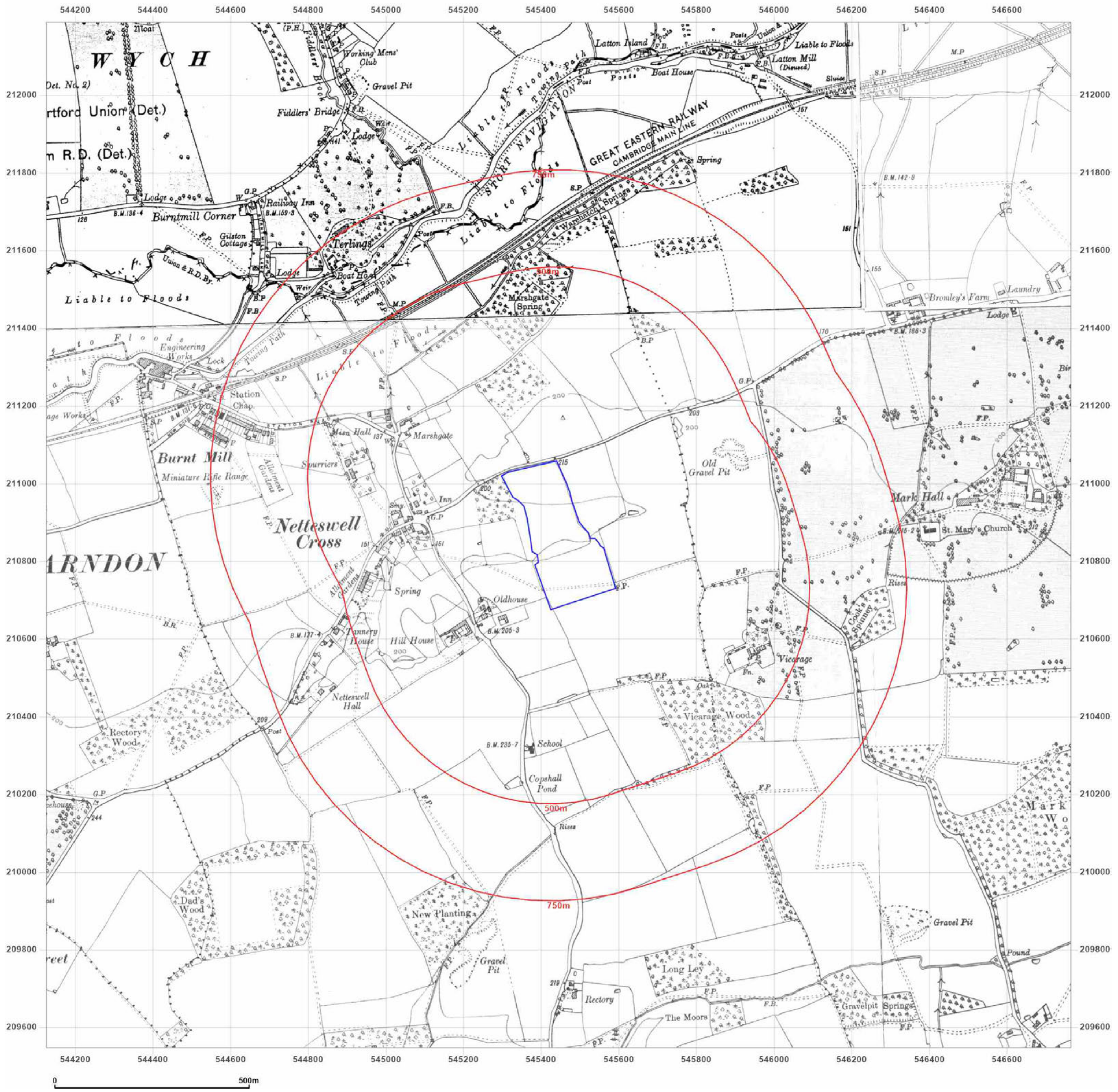

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Report Ref: EMS-735683_957173
Grid Ref: 545444, 210867

Map Name: County Series

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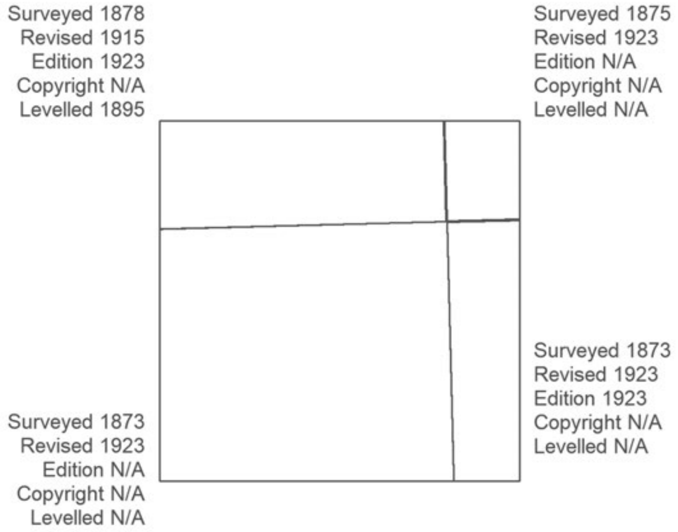

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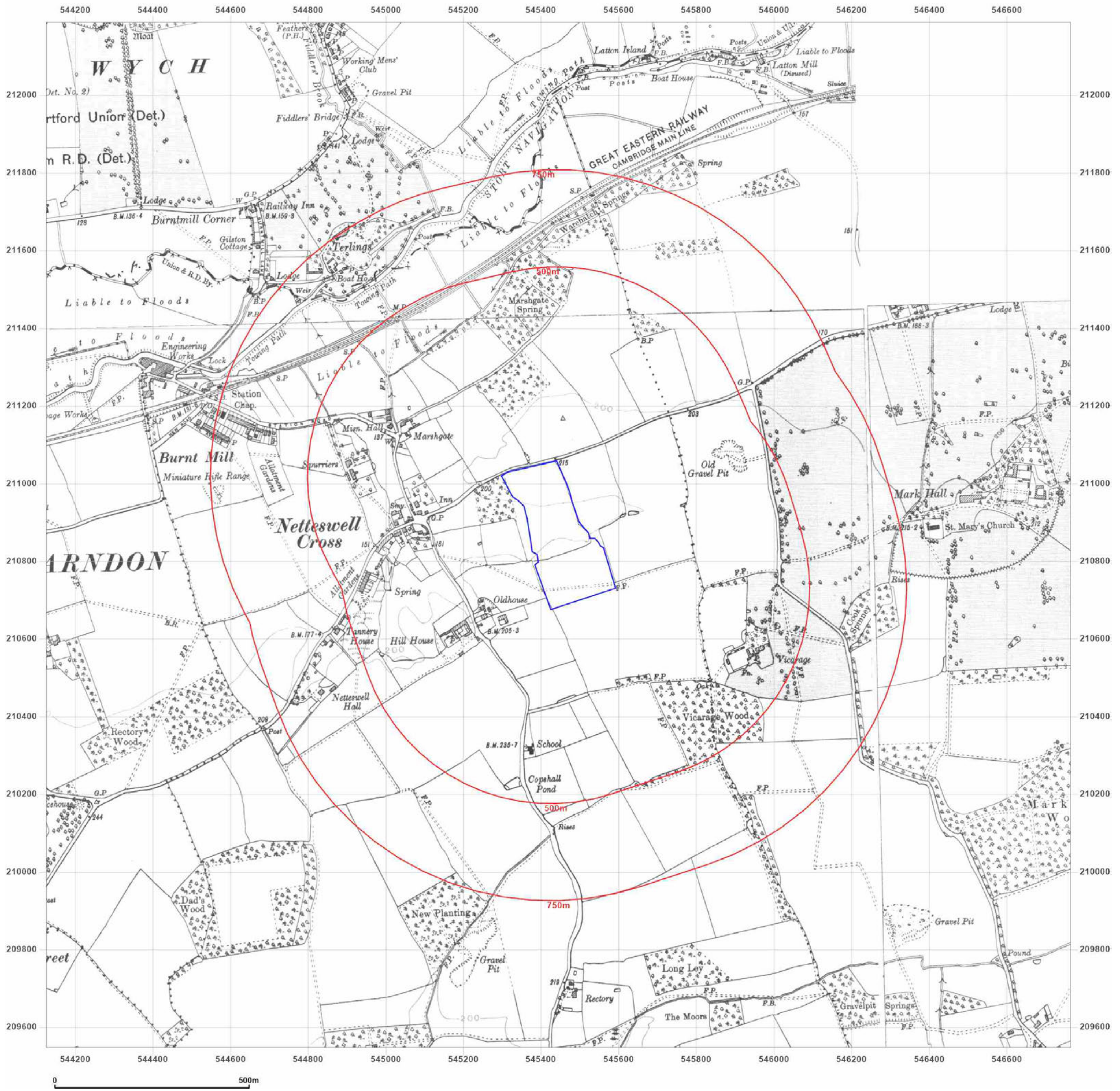

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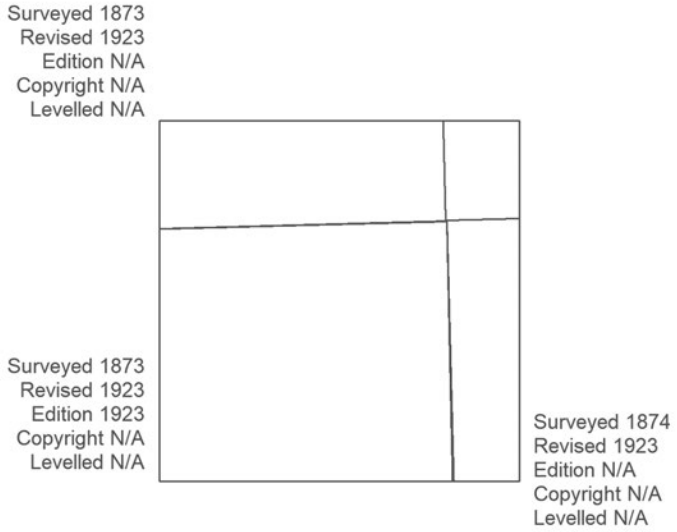

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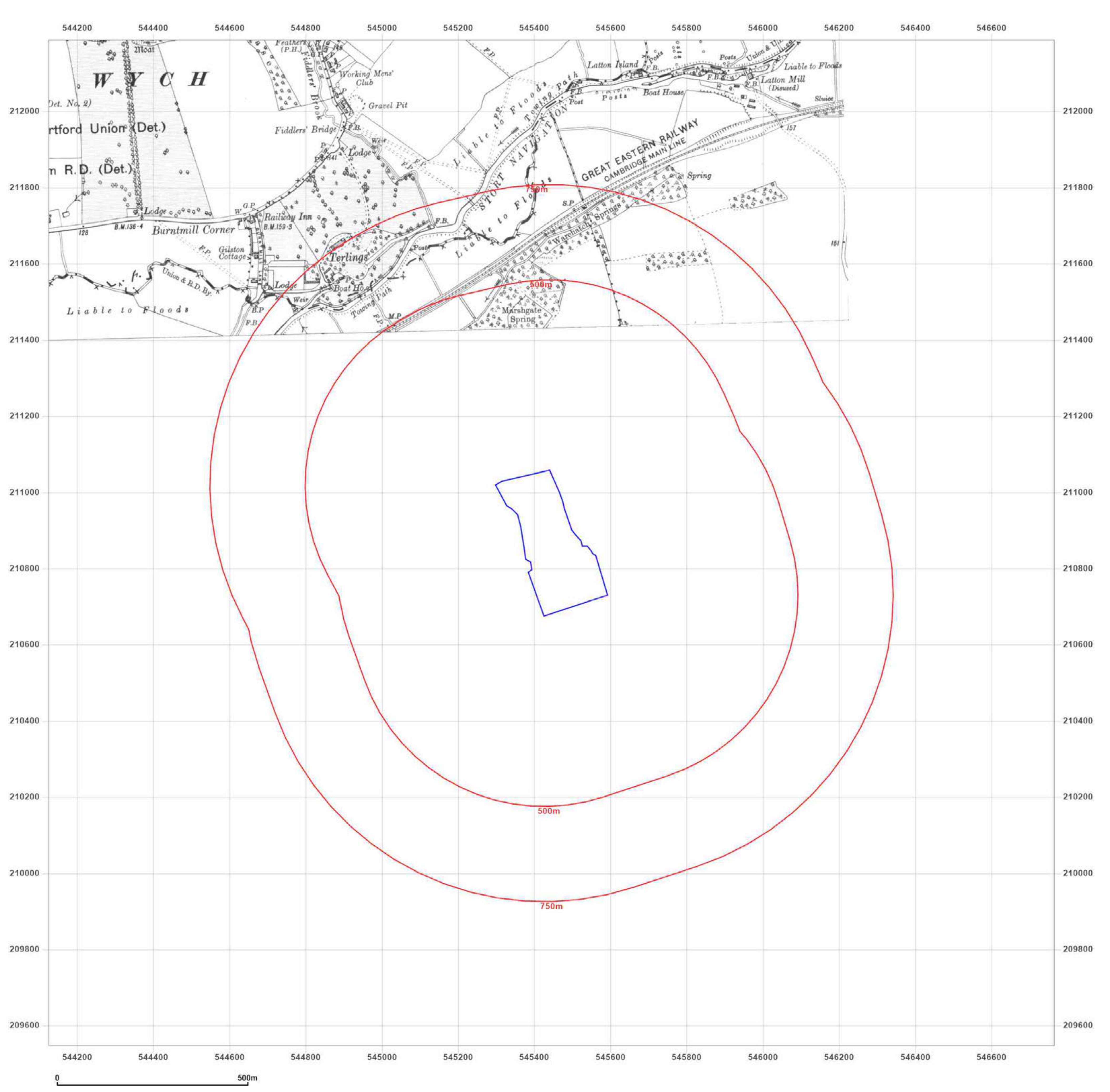

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Map Name: County Series

Map date: **1923**

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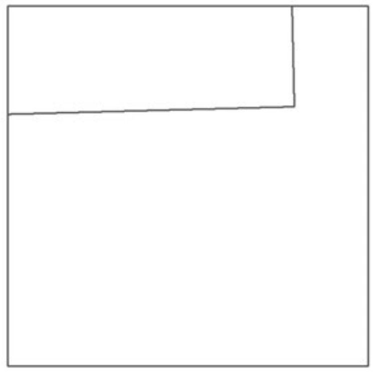
Revised 1923
Edition 1923
Copyright N/A
Levelled N/A



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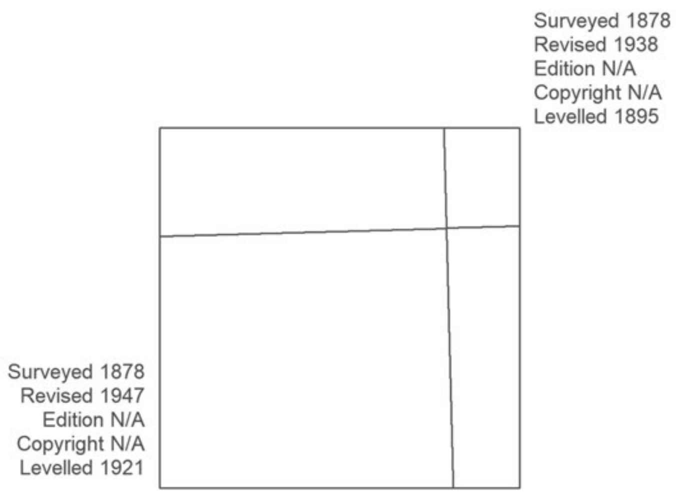

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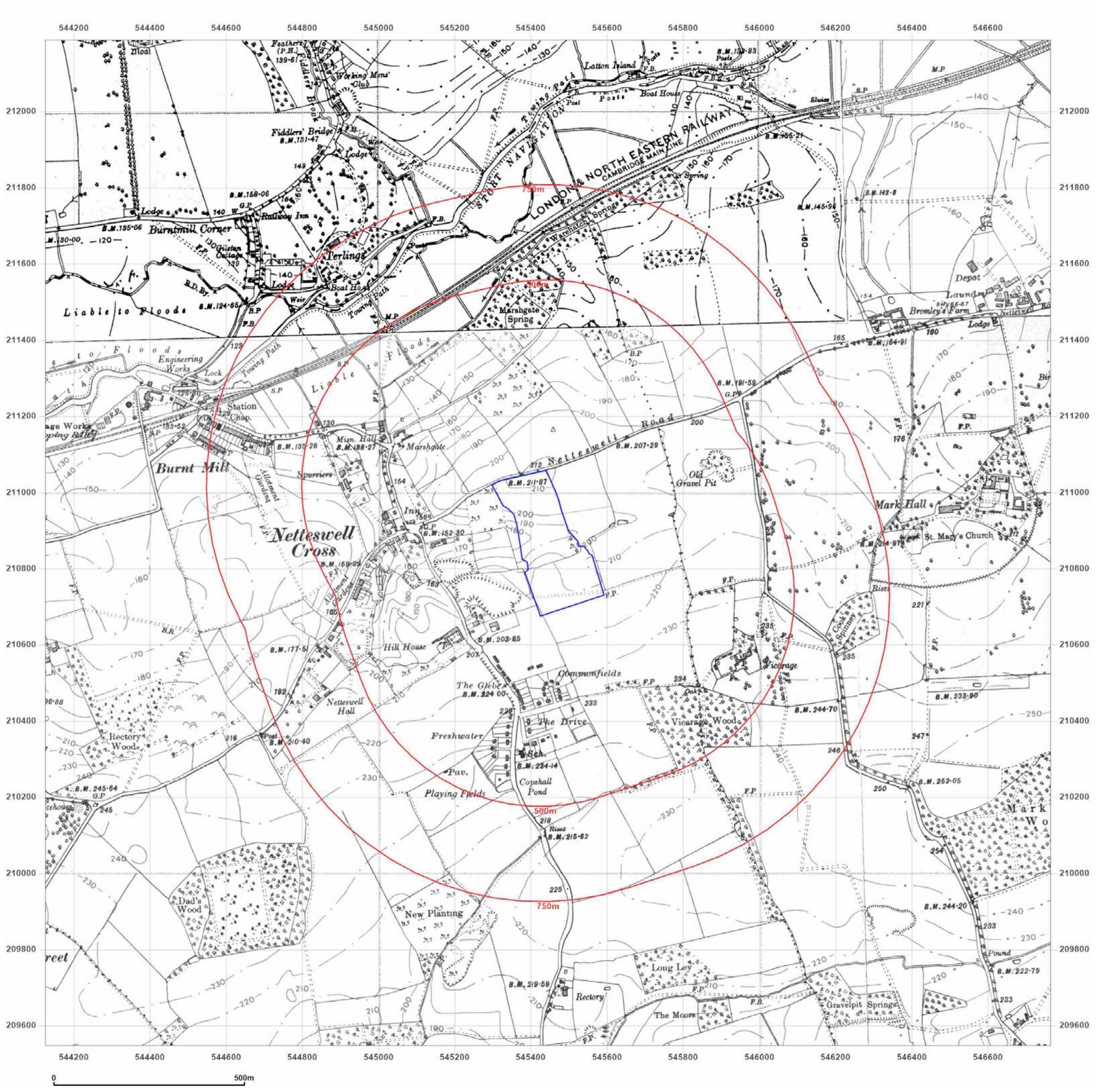

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Report Ref:	EMS-735683_957173
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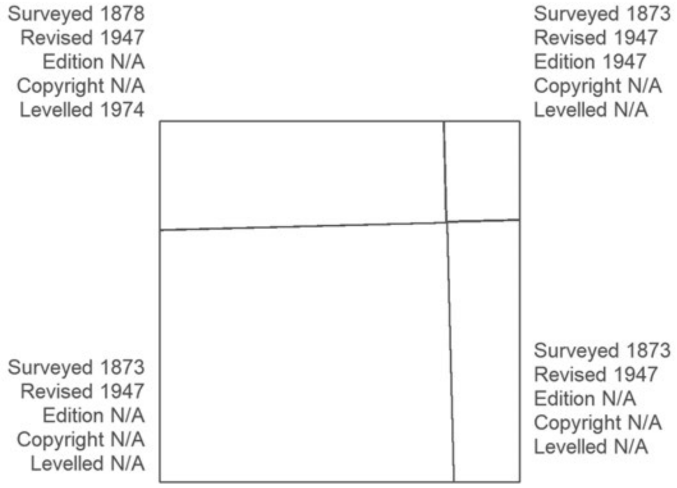

Surveyed 1878
Revised 1947
Edition N/A
Copyright N/A
Levelled 1974

Surveyed 1873
Revised 1947
Edition 1947
Copyright N/A
Levelled N/A

Surveyed 1873
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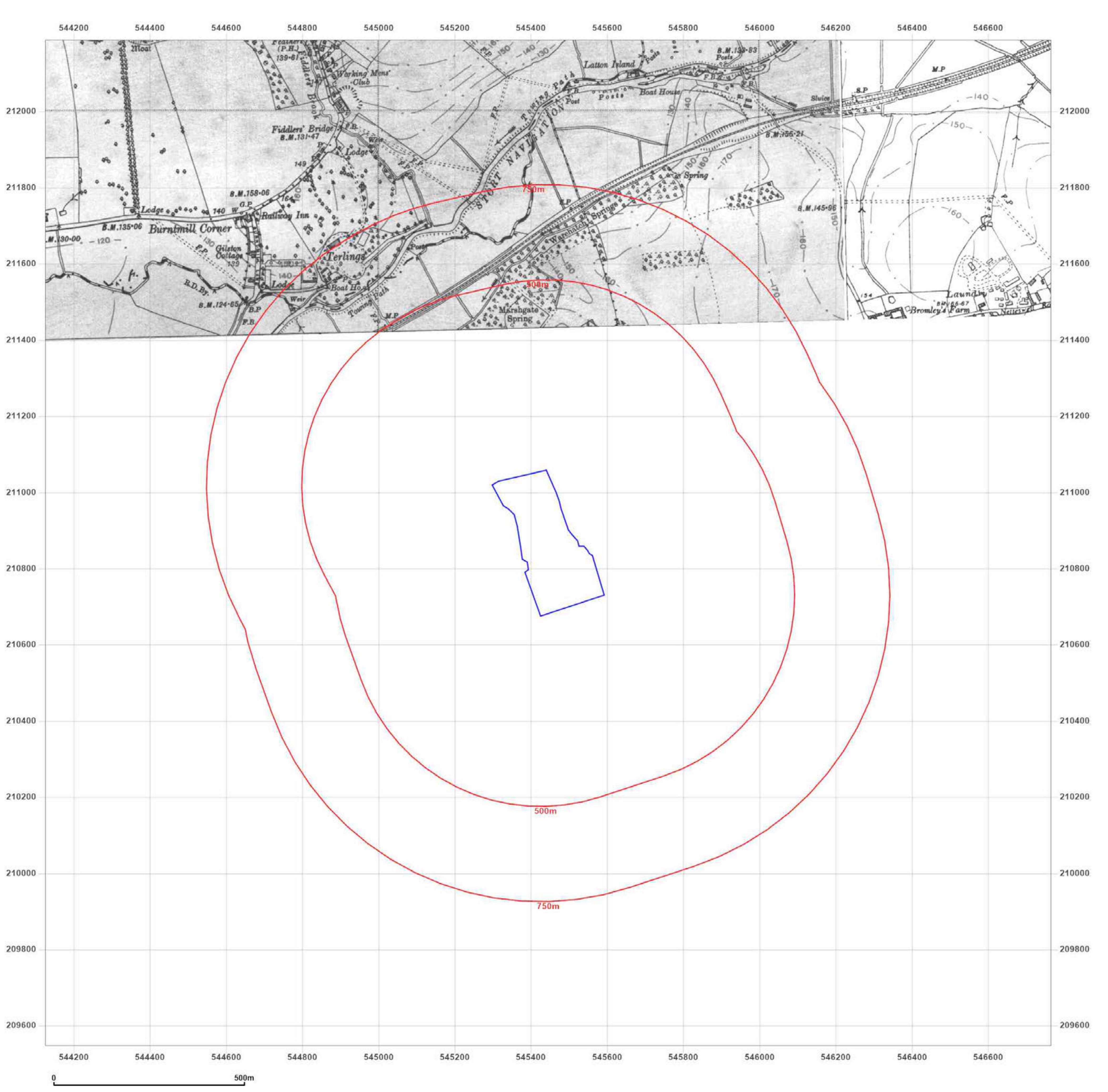

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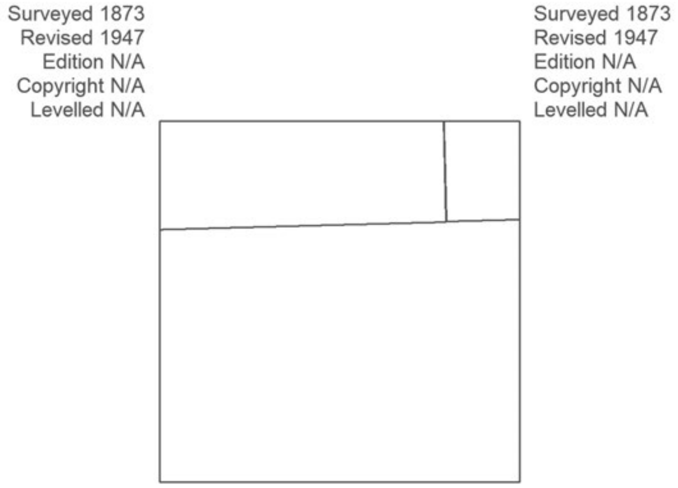

Surveyed 1873
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Edition N/A
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Surveyed 1873
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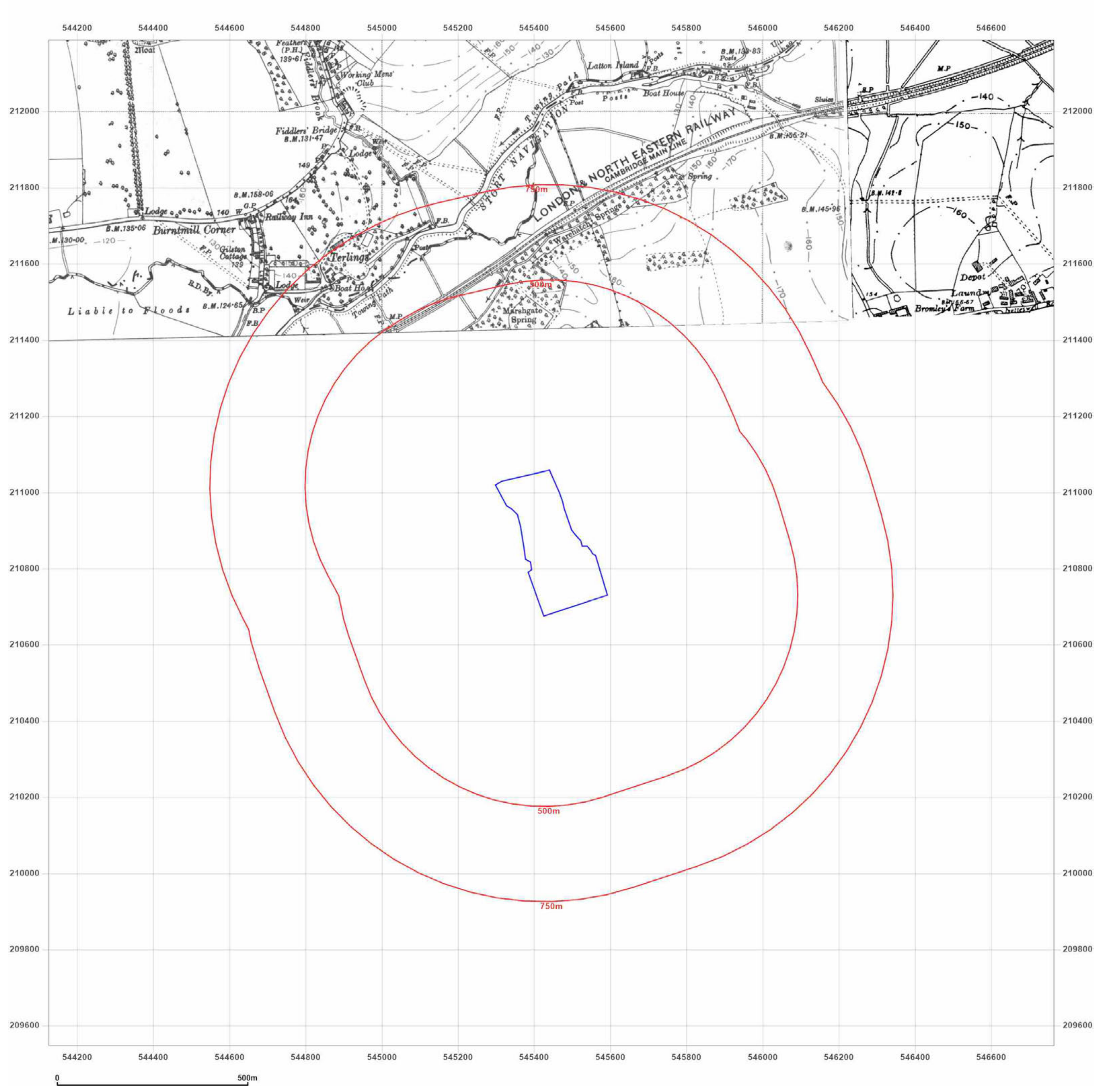

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Grid Ref:	545444, 210867
Map Name:	County Series
Map date:	**1947-1948**
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Printed at:	1:10,560

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Surveyed 1873
Revised 1947
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1878
Revised 1948
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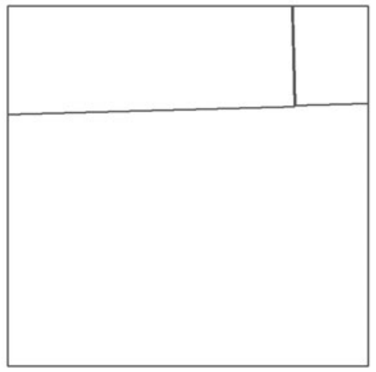
Copyright N/A
Levelled 1947



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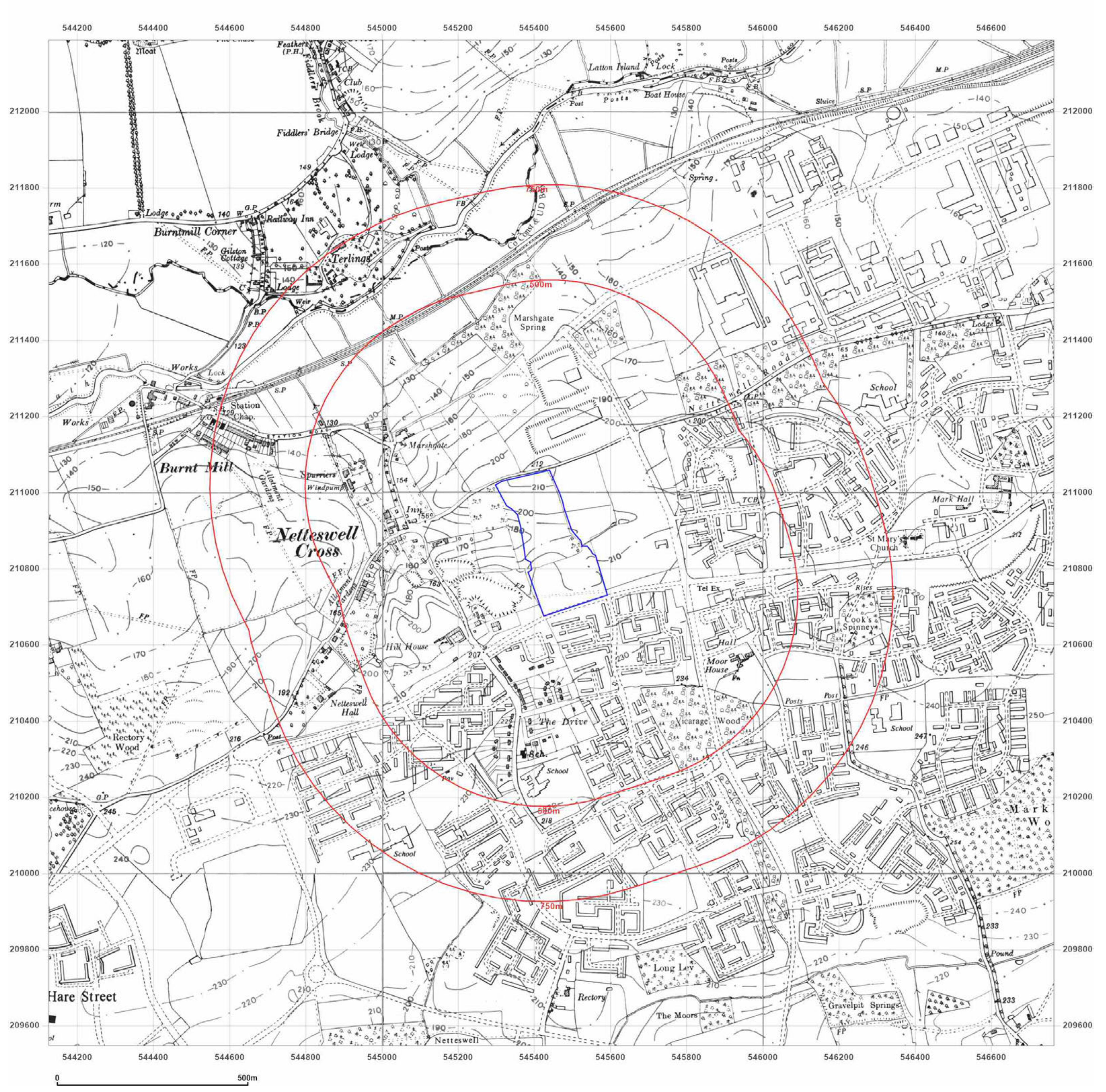

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Surveyed 1951
Revised 1951
Edition N/A
Copyright 1960
Levelled N/A

Surveyed 1955
Revised 1955
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1955
Revised 1955
Edition N/A
Copyright 1960
Levelled N/A

Surveyed N/A
Revised 1959
Edition N/A
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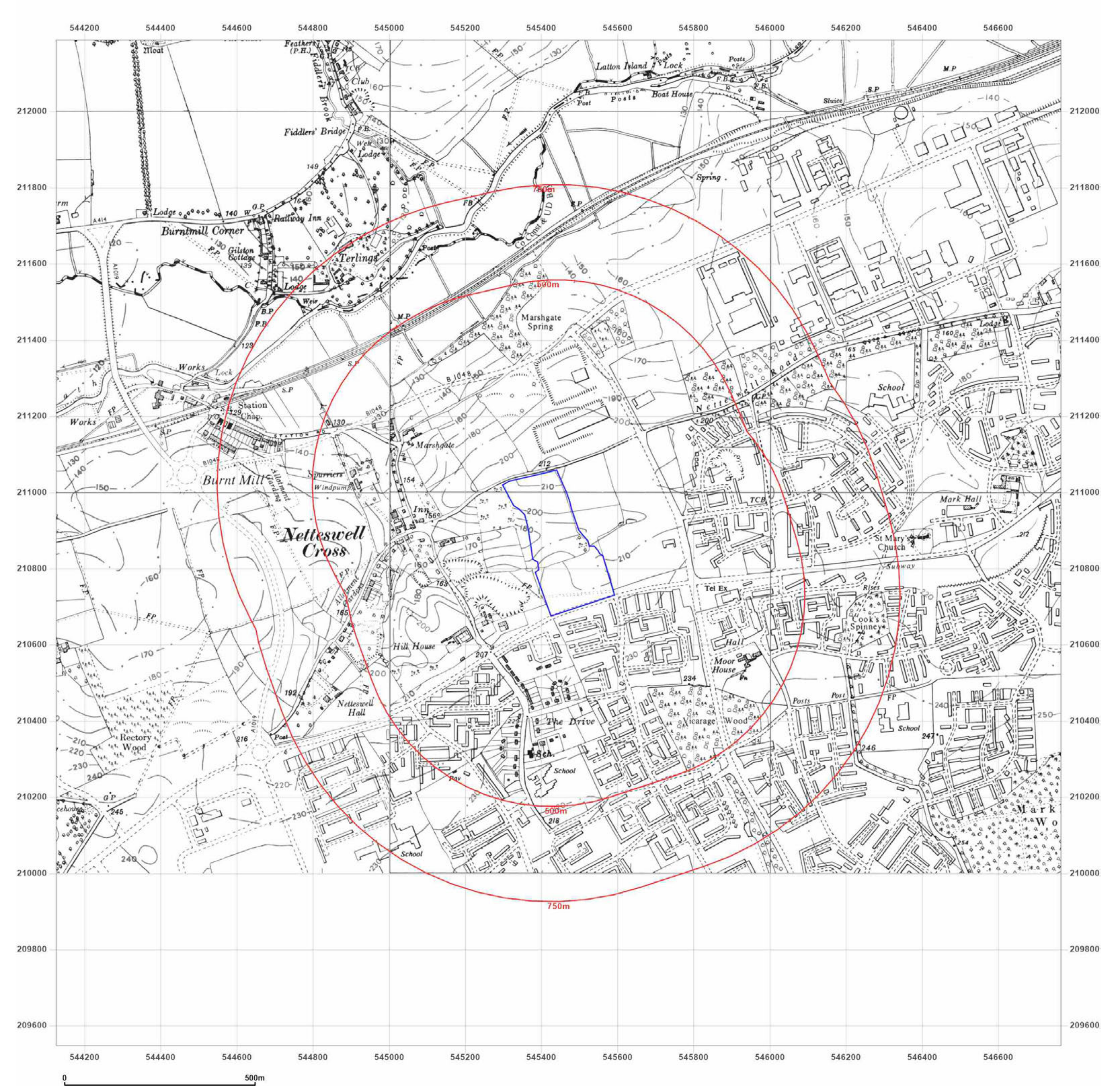
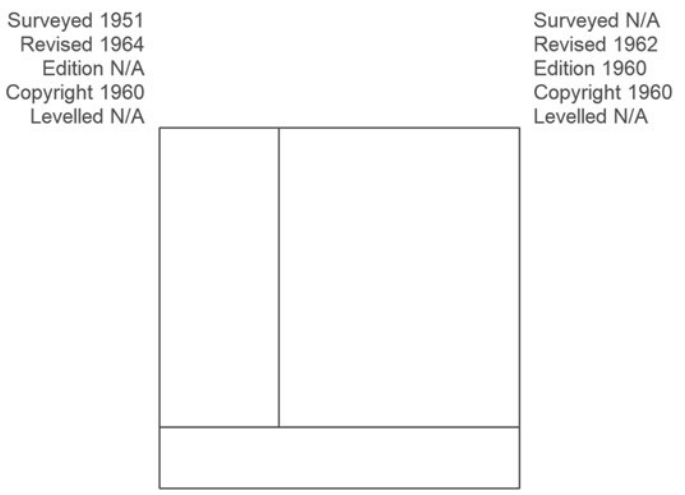


Site Details:

Burnt Mill Academy,First
Avenue,Harlow,CM20 2NR

Client Ref:	EMS_735683_957173
Report Ref:	EMS-735683_957173
Grid Ref:	545444, 210867

Map Name:	Provisional
Map date:	**1962-1964**
Scale:	1:10,560
Printed at:	1:10,560



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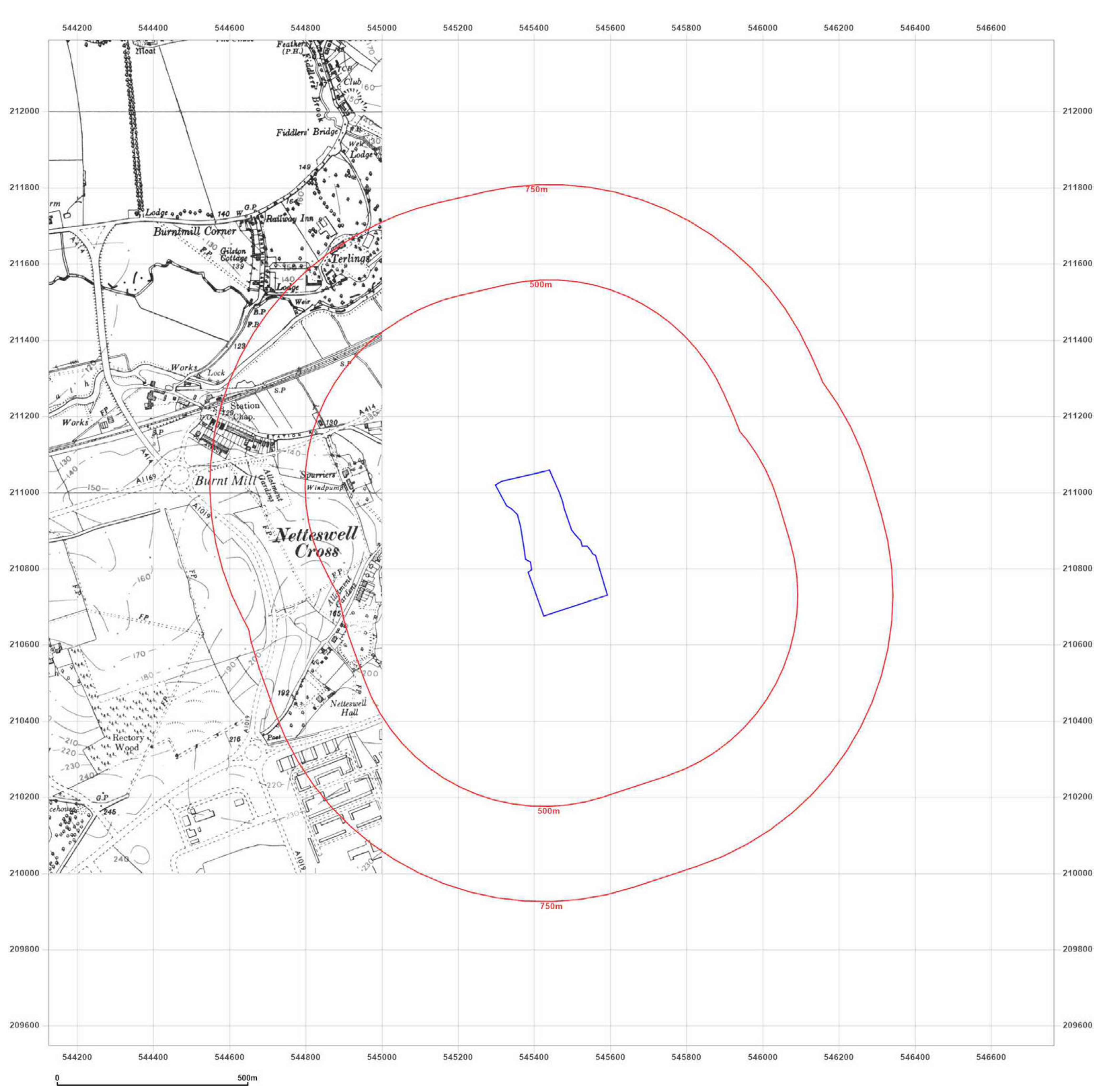

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Site Details:

Burnt Mill Academy,First
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Client Ref: EMS_735683_957173
Report Ref: EMS-735683_957173
Grid Ref: 545444, 210867

Map Name: Provisional

Map date: 1979

Scale: 1:10,560

Printed at: 1:10,560

N
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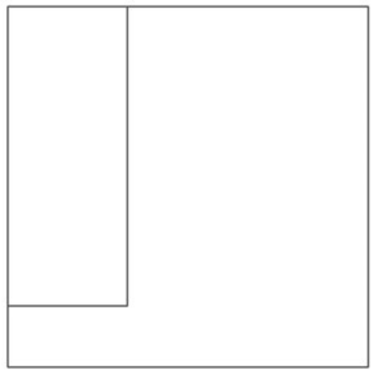
Surveyed 1951
Revised 1951
Edition N/A
Copyright 1979
Levelled N/A



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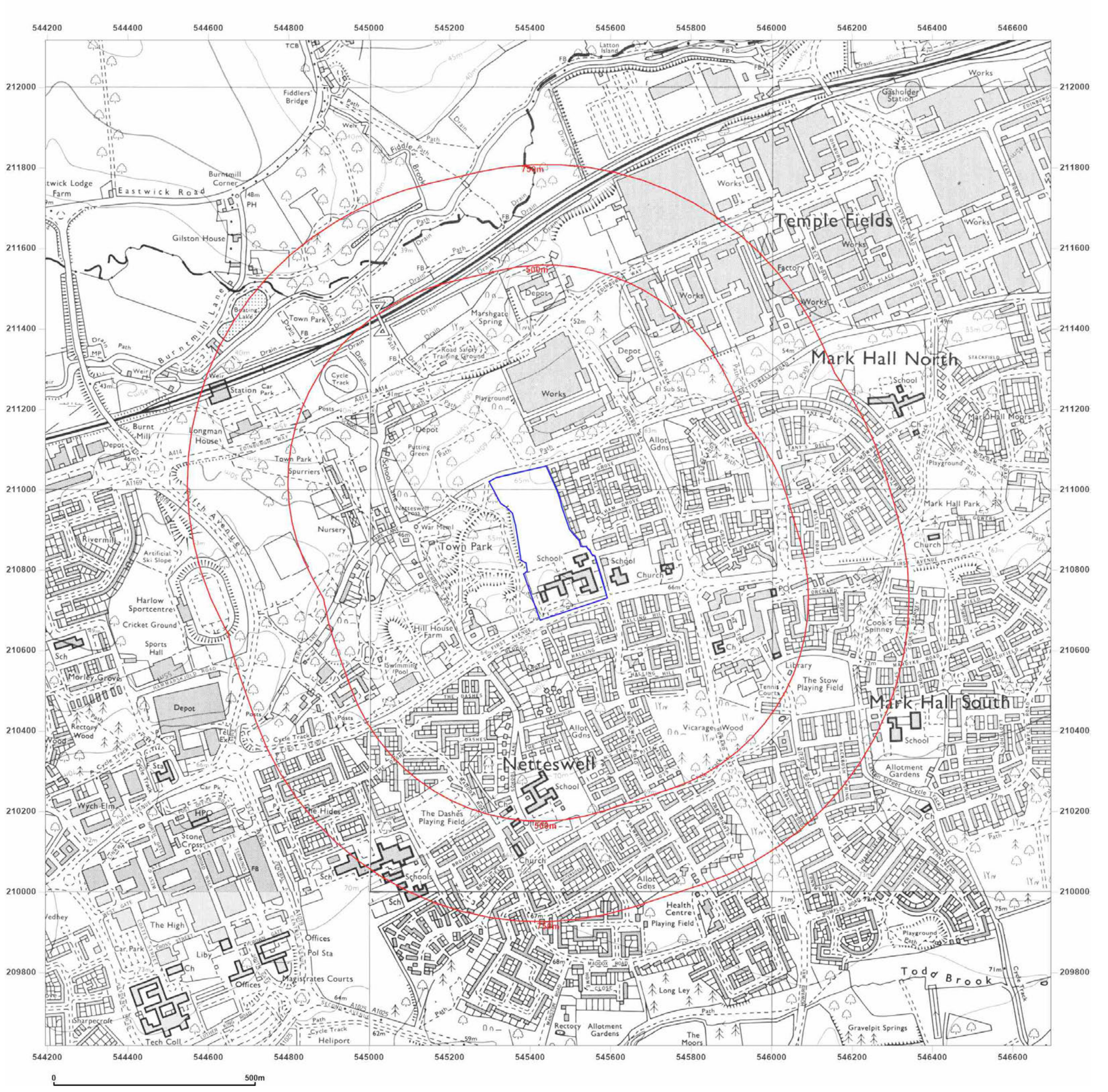

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Site Details:

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Avenue,Harlow,CM20 2NR

Client Ref:	EMS_735683_957173
Report Ref:	EMS-735683_957173
Grid Ref:	545444, 210867

Map Name:	National Grid
Map date:	**1980**
Scale:	1:10,000
Printed at:	1:10,000

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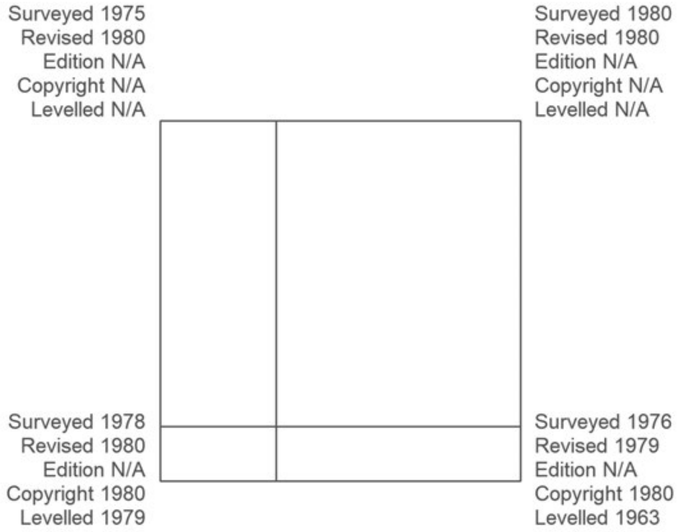

Surveyed 1975
Revised 1980
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1980
Revised 1980
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1978
Revised 1980
Edition N/A
Copyright 1980
Levelled 1979

Surveyed 1976
Revised 1979
Edition N/A
Copyright 1980
Levelled 1963

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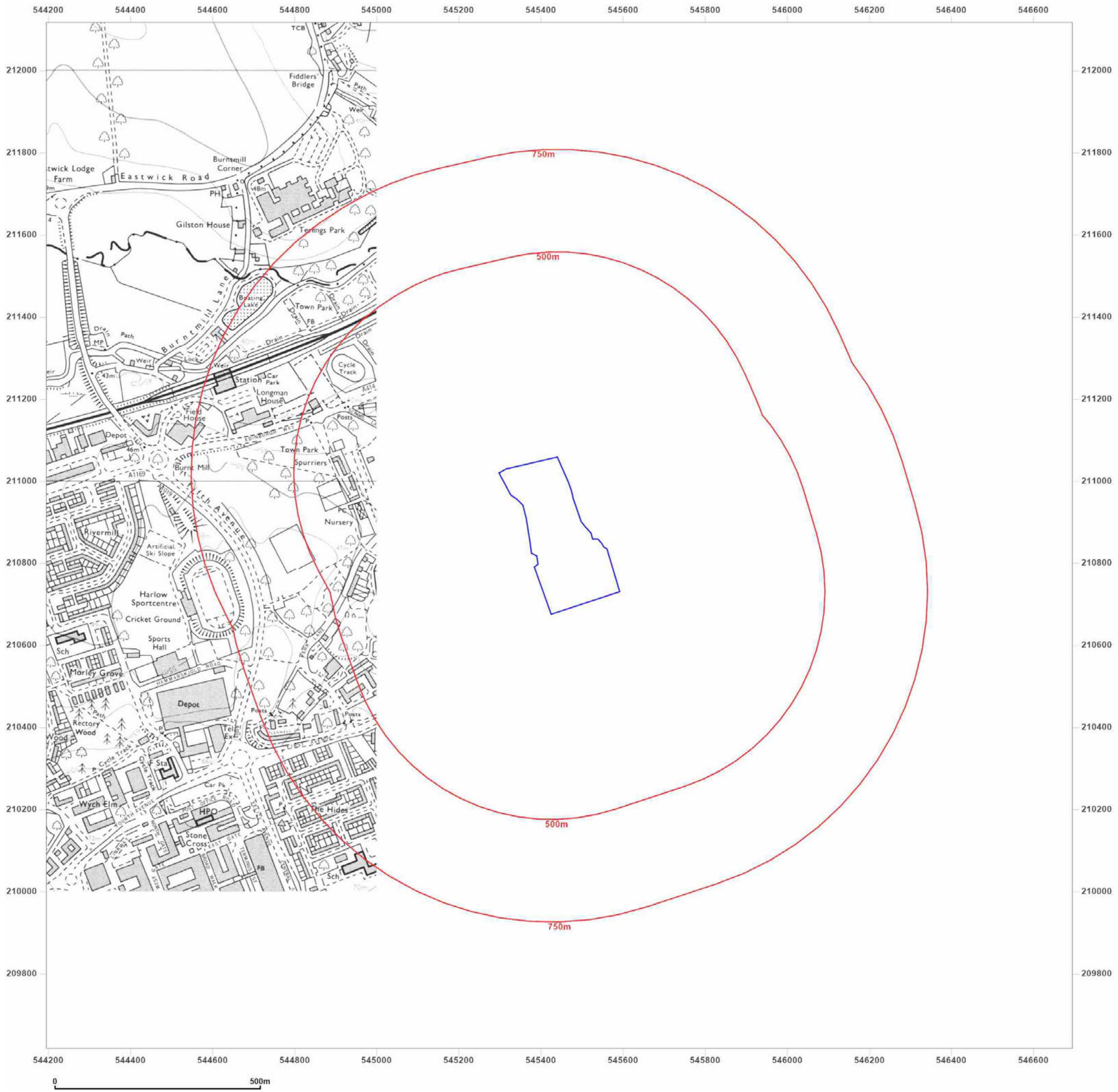

Site Details:

Burnt Mill Academy,First Avenue,Harlow,CM20 2NR

Client Ref:	EMS_735683_957173
Report Ref:	EMS-735683_957173
Grid Ref:	545444, 210867

Map Name:	National Grid
Map date:	**1992**
Scale:	1:10,000
Printed at:	1:10,000

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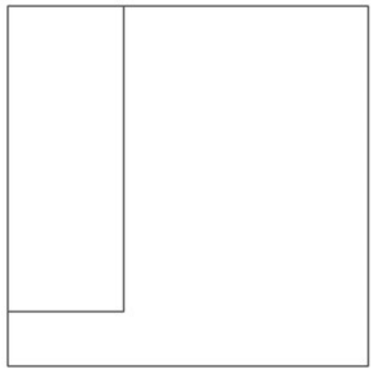
Surveyed 1975
Revised 1992
Edition N/A
Copyright N/A
Levelled N/A



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Client Ref: EMS_735683_957173
Report Ref: EMS-735683_957173
Grid Ref: 545444, 210867

Map Name: National Grid

Map date: 2001

Scale: 1:10,000

Printed at: 1:10,000

2001

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Site Details:

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Client Ref: EMS_735683_957173
Report Ref: EMS-735683_957173
Grid Ref: 545444, 210867

Map Name:	National Grid
Map date:	**2010**
Scale:	1:10,000
Printed at:	1:10,000

N
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2010

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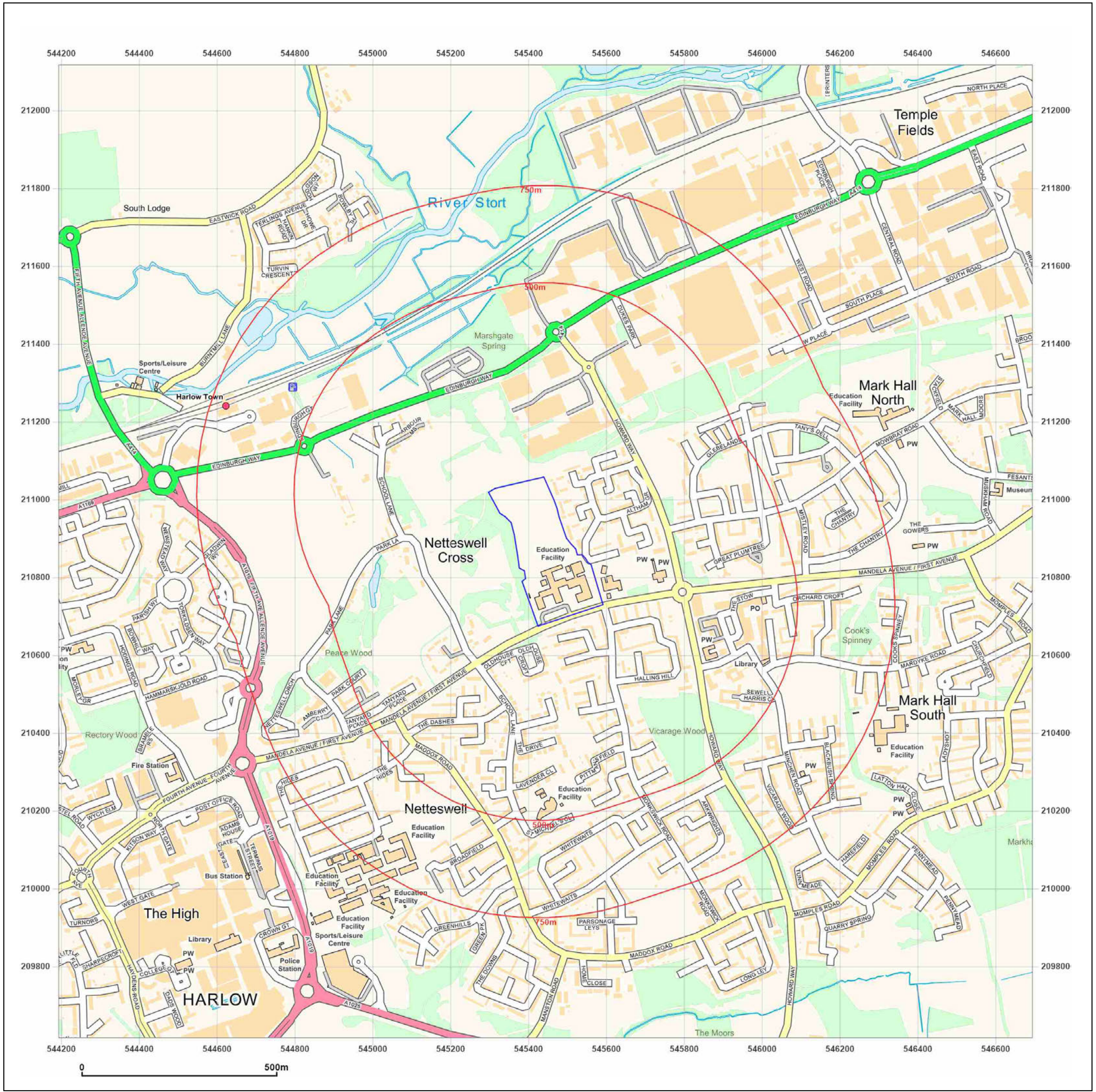

Site Details:

Burnt Mill Academy,First Avenue,Harlow,CM20 2NR

Client Ref:	EMS_735683_957173
Report Ref:	EMS-735683_957173
Grid Ref:	545444, 210867

Map Name:	National Grid
Map date:	**2021**
Scale:	1:10,000
Printed at:	1:10,000

N
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2021

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Site Details:

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Client Ref: EMS_735683_957173
Report Ref: EMS-735683_957173_1250_1_1
Grid Ref: 545444, 210617

Map Name: National Grid

Map date: **1964-1966**

Scale: 1:1,250

Printed at: 1:2,000

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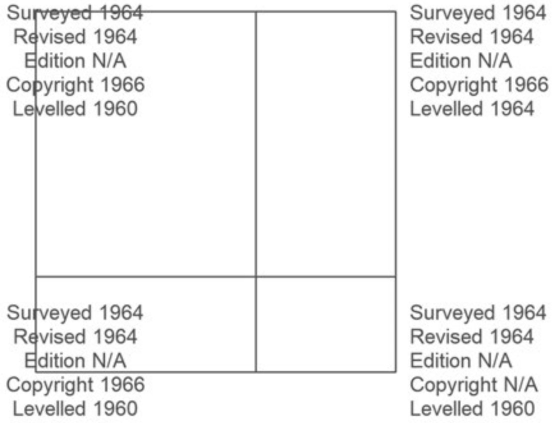

Surveyed 1964
Revised 1964
Edition N/A
Copyright 1966
Levelled 1960

Surveyed 1964
Revised 1964
Edition N/A
Copyright 1966
Levelled 1964

Surveyed 1964
Revised 1964
Edition N/A
Copyright 1966
Levelled 1960

Surveyed 1964
Revised 1964
Edition N/A
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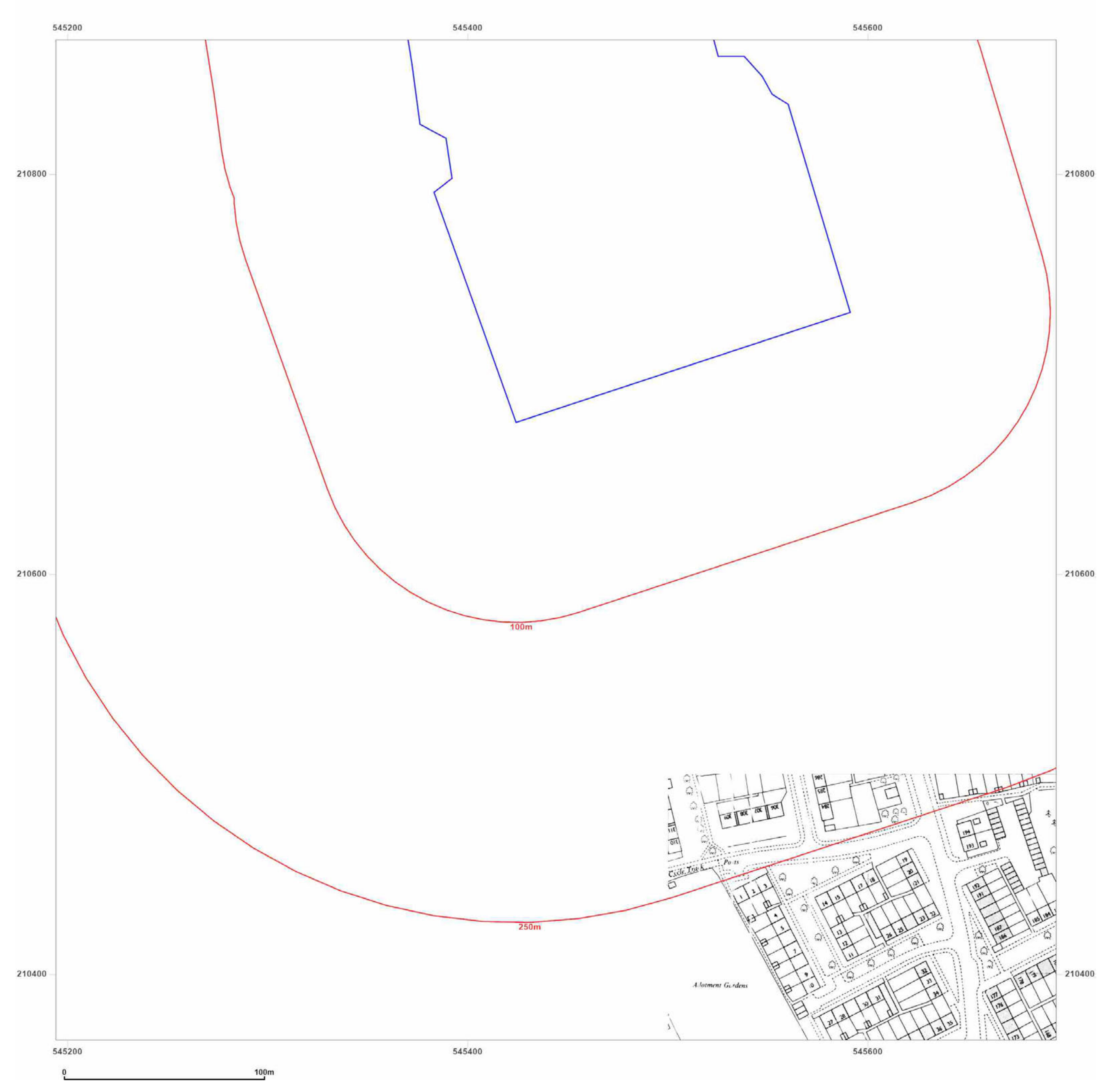


Site Details:

Burnt Mill Academy,First
Avenue,Harlow,CM20 2NR

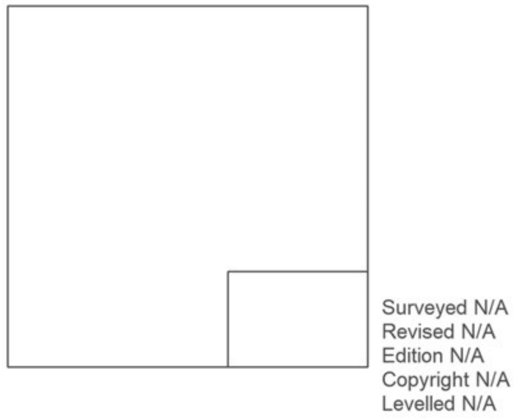
Client Ref: EMS_735683_957173
Report Ref: EMS-735683_957173_1250_1_1
Grid Ref: 545444, 210617

Map Name: National Grid

Map date: **1966**

Scale: 1:1,250

Printed at: 1:2,000



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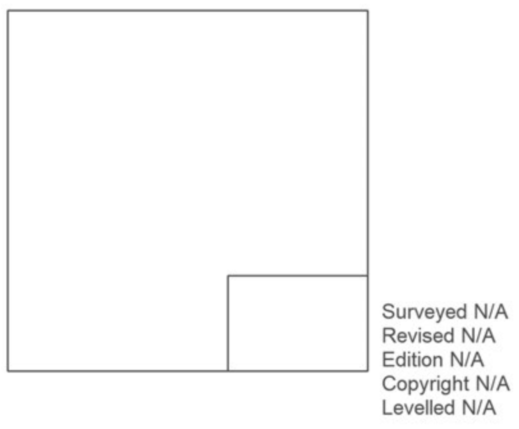
Client Ref:	EMS_735683_957173
Report Ref:	EMS-735683_957173_1250_1_1
Grid Ref:	545444, 210617

Map Name:	National Grid
Map date:	**1966**
Scale:	1:1,250
Printed at:	1:2,000



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Site Details:

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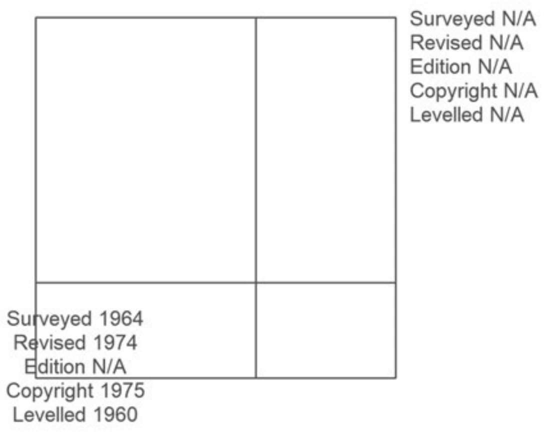
Client Ref:	EMS_735683_957173
Report Ref:	EMS-735683_957173_1250_1_1
Grid Ref:	545444, 210617

Map Name:	National Grid
Map date:	**1974-1975**
Scale:	1:1,250
Printed at:	1:2,000



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Client Ref:	EMS_735683_957173
Report Ref:	EMS-735683_957173_1250_1_1
Grid Ref:	545444, 210617

Map Name:	National Grid
Map date:	**1978**
Scale:	1:1,250
Printed at:	1:2,000

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Revised N/A
Edition N/A
Copyright N/A
Levelled N/A

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Site Details:

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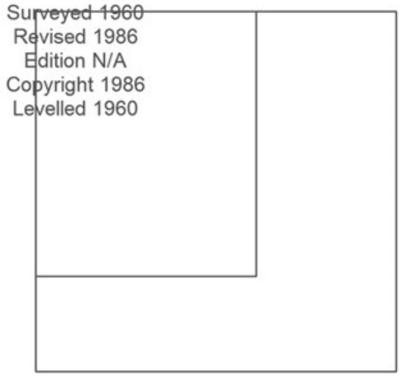
Client Ref:	EMS_735683_957173
Report Ref:	EMS-735683_957173_1250_1_1
Grid Ref:	545444, 210617

Map Name:	National Grid
Map date:	**1986**
Scale:	1:1,250
Printed at:	1:2,000



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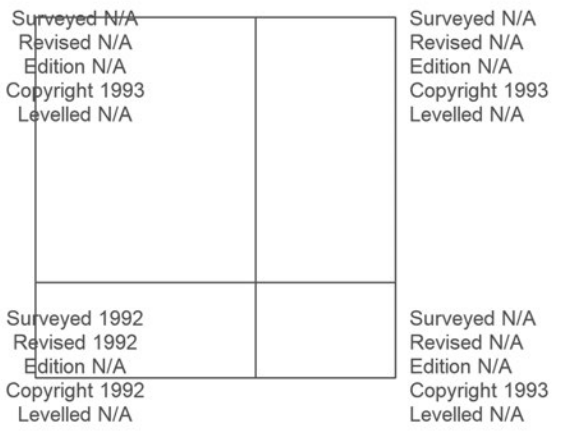
Client Ref:	EMS_735683_957173
Report Ref:	EMS-735683_957173_1250_1_1
Grid Ref:	545444, 210617

Map Name:	National Grid
Map date:	**1992-1993**
Scale:	1:1,250
Printed at:	1:2,000



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Site Details:

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Client Ref:	EMS_735683_957173
Report Ref:	EMS-735683_957173_1250_1_1
Grid Ref:	545444, 210617
Map Name:	National Grid
Map date:	**1993**
Scale:	1:1,250
Printed at:	1:2,000

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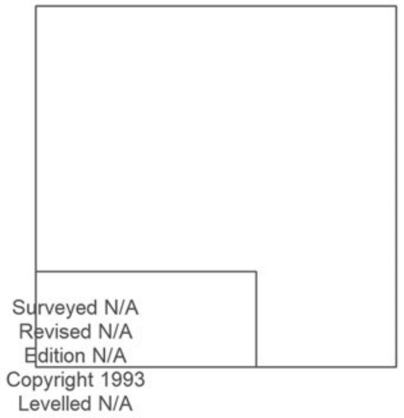

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Client Ref: EMS_735683_957173
Report Ref: EMS-735683_957173_1250_1_2
Grid Ref: 545444, 211117

Map Name: National Grid

Map date: **1965-1966**

Scale: 1:1,250

Printed at: 1:2,000

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Surveyed 1964 Revised 1964 Edition N/A Copyright 1966 Levelled 1960	Surveyed 1964 Revised 1964 Edition N/A Copyright 1966 Levelled 1964

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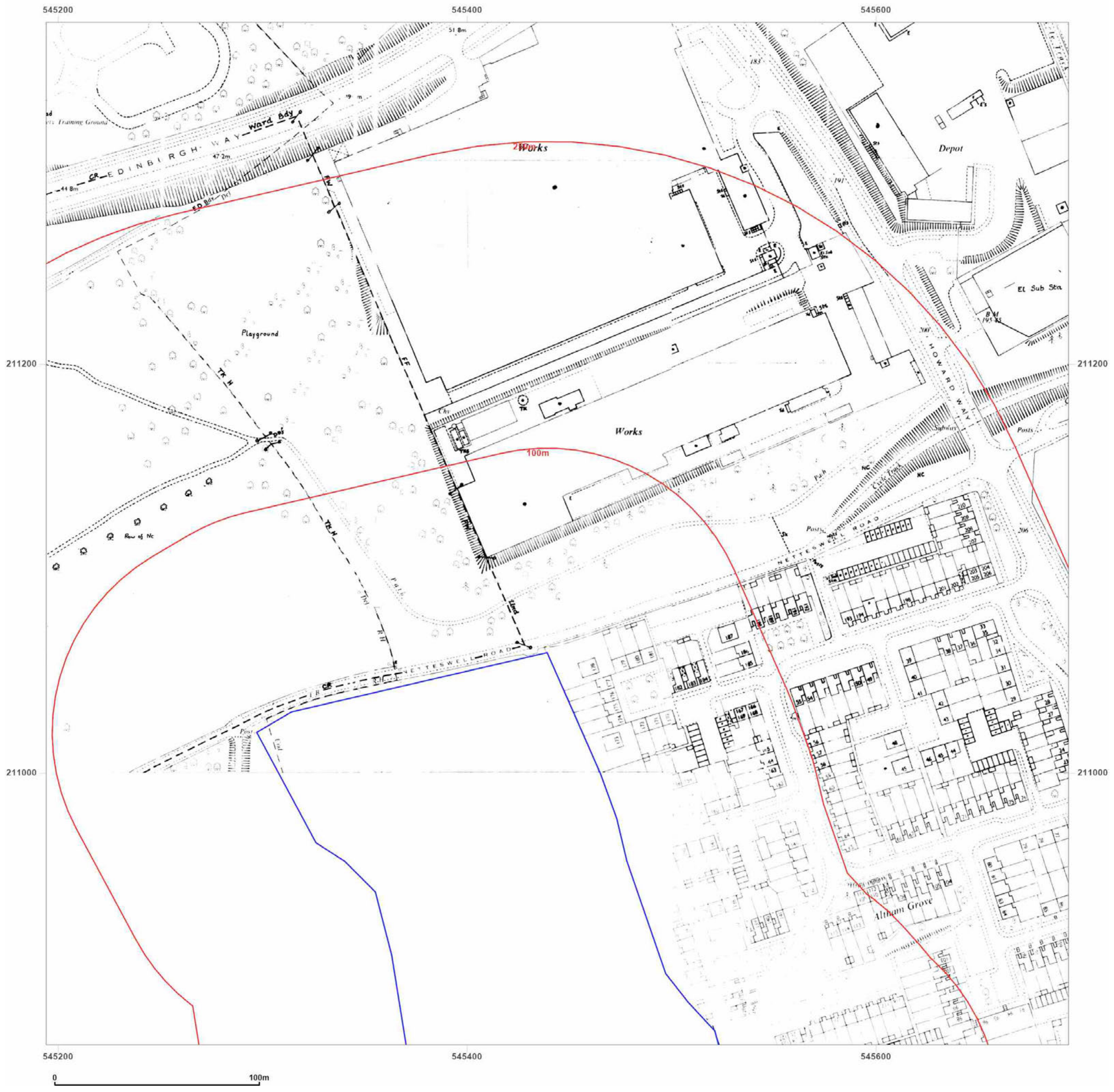

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Site Details:

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Client Ref: EMS_735683_957173
Report Ref: EMS-735683_957173_1250_1_2
Grid Ref: 545444, 211117

Map Name: National Grid

Map date: **1974-1977**

Scale: 1:1,250

Printed at: 1:2,000

N
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Surveyed N/A
Revised N/A
Edition N/A
Copyright N/A
Levelled N/A

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Revised N/A
Edition N/A
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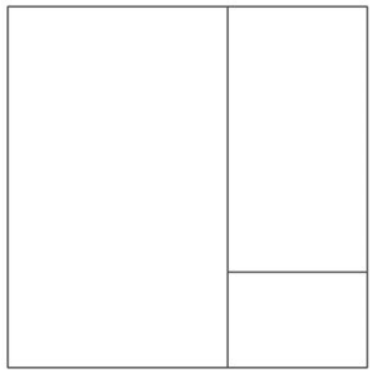
Client Ref: EMS_735683_957173
Report Ref: EMS-735683_957173_1250_1_2
Grid Ref: 545444, 211117

Map Name:	National Grid
Map date:	**1976-1978**
Scale:	1:1,250
Printed at:	1:2,000



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Edition N/A
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Revised N/A
Edition N/A
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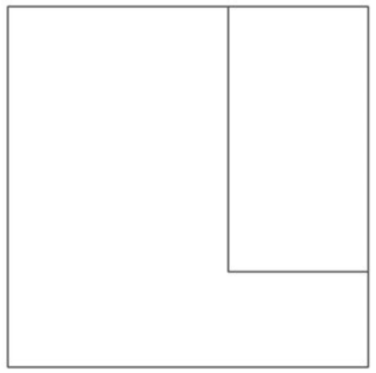
Client Ref:	EMS_735683_957173
Report Ref:	EMS-735683_957173_1250_1_2
Grid Ref:	545444, 211117
Map Name:	National Grid
Map date:	**1978**
Scale:	1:1,250
Printed at:	1:2,000



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Edition N/A
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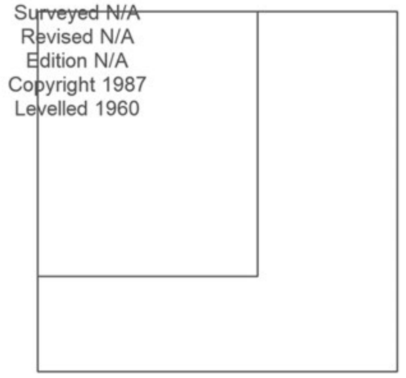
Client Ref: EMS_735683_957173
Report Ref: EMS-735683_957173_1250_1_2
Grid Ref: 545444, 211117

Map Name: National Grid

Map date: **1987**

Scale: 1:1,250

Printed at: 1:2,000



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Site Details:

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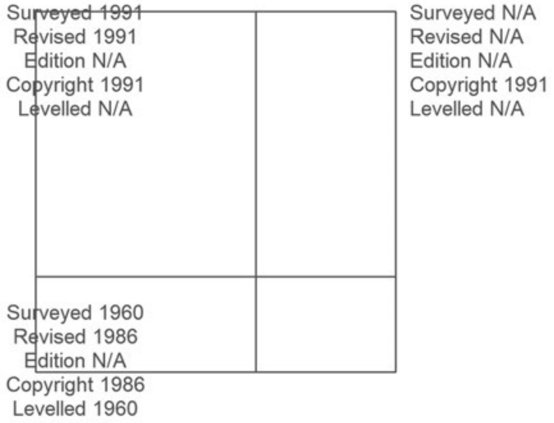
Client Ref:	EMS_735683_957173
Report Ref:	EMS-735683_957173_1250_1_2
Grid Ref:	545444, 211117

Map Name:	National Grid
Map date:	**1986-1991**
Scale:	1:1,250
Printed at:	1:2,000



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Client Ref: EMS_735683_957173
Report Ref: EMS-735683_957173_1250_1_2
Grid Ref: 545444, 211117

Map Name: National Grid

Map date: **1991-1993**

Scale: 1:1,250

Printed at: 1:2,000

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Surveyed N/A
Revised N/A
Edition N/A
Copyright 1991
Levelled 1960

Surveyed N/A
Revised N/A
Edition N/A
Copyright 1993
Levelled N/A

Surveyed N/A
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Site Details:

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Client Ref:	EMS_735683_957173
Report Ref:	EMS-735683_957173_1250_1_2
Grid Ref:	545444, 211117
Map Name:	National Grid
Map date:	**1993**
Scale:	1:1,250
Printed at:	1:2,000

N
W E
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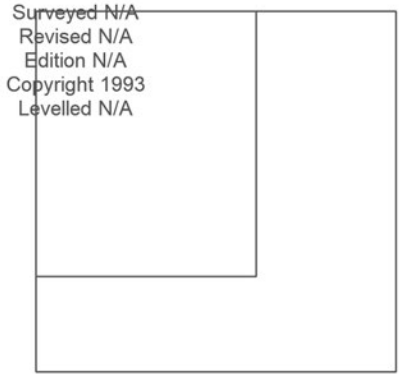

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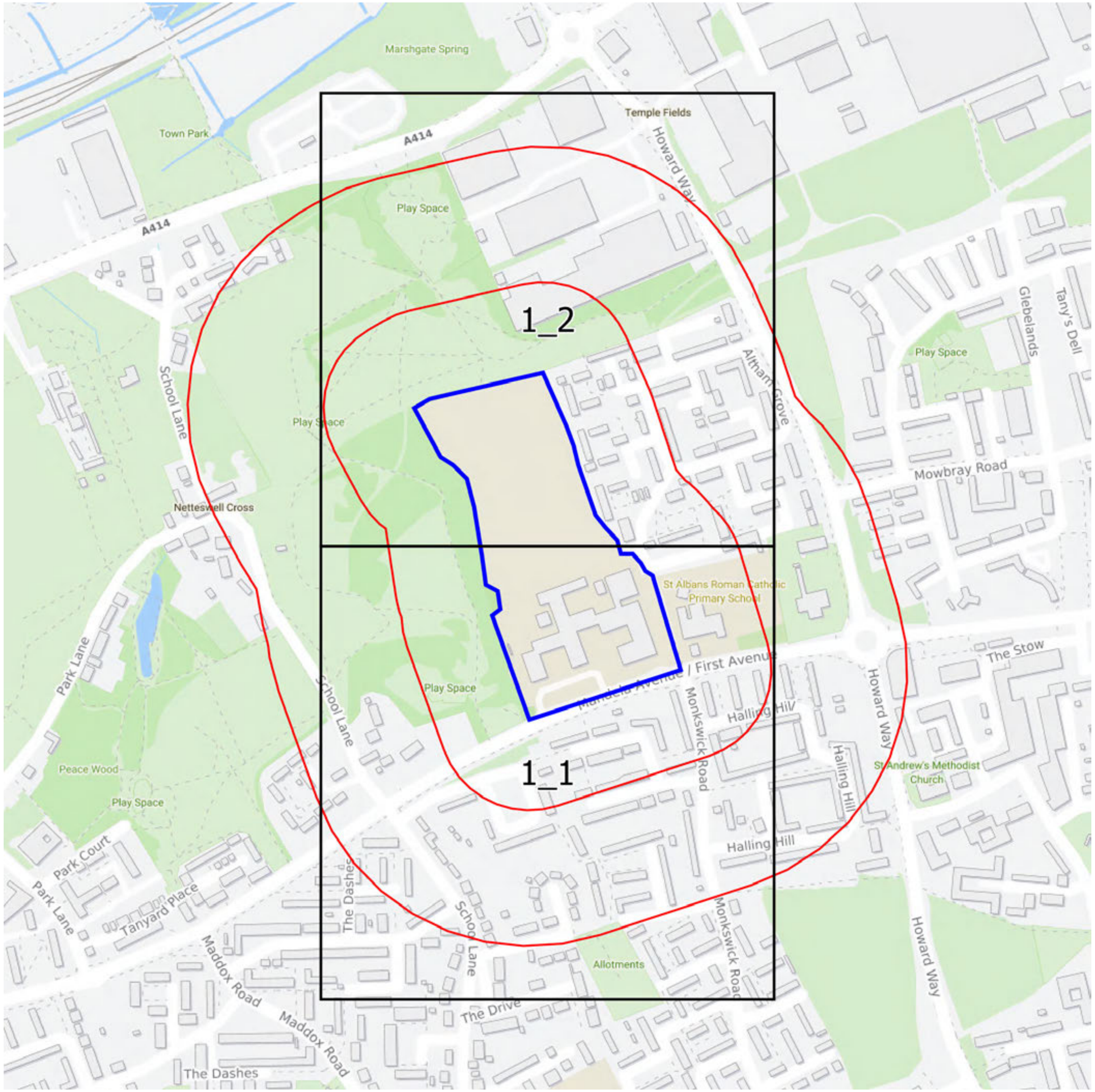

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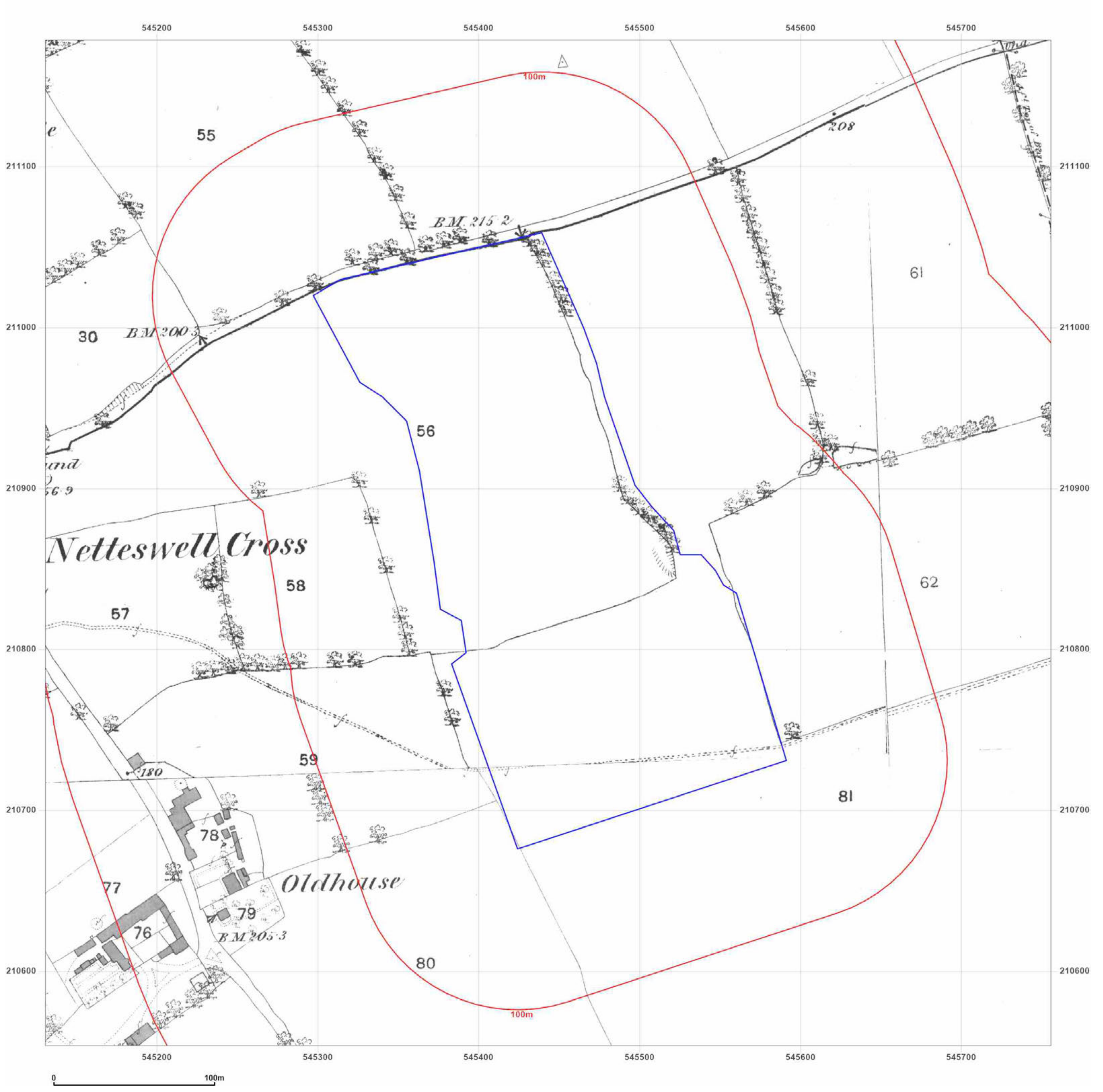

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Burnt Mill Academy,First
Avenue,Harlow,CM20 2NR

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Report Ref:	EMS-735683_957173_2500
Grid Ref:	545443, 210866

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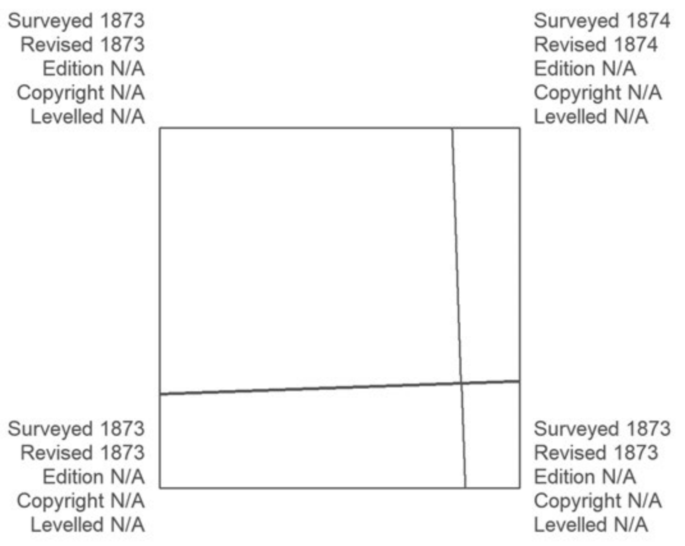

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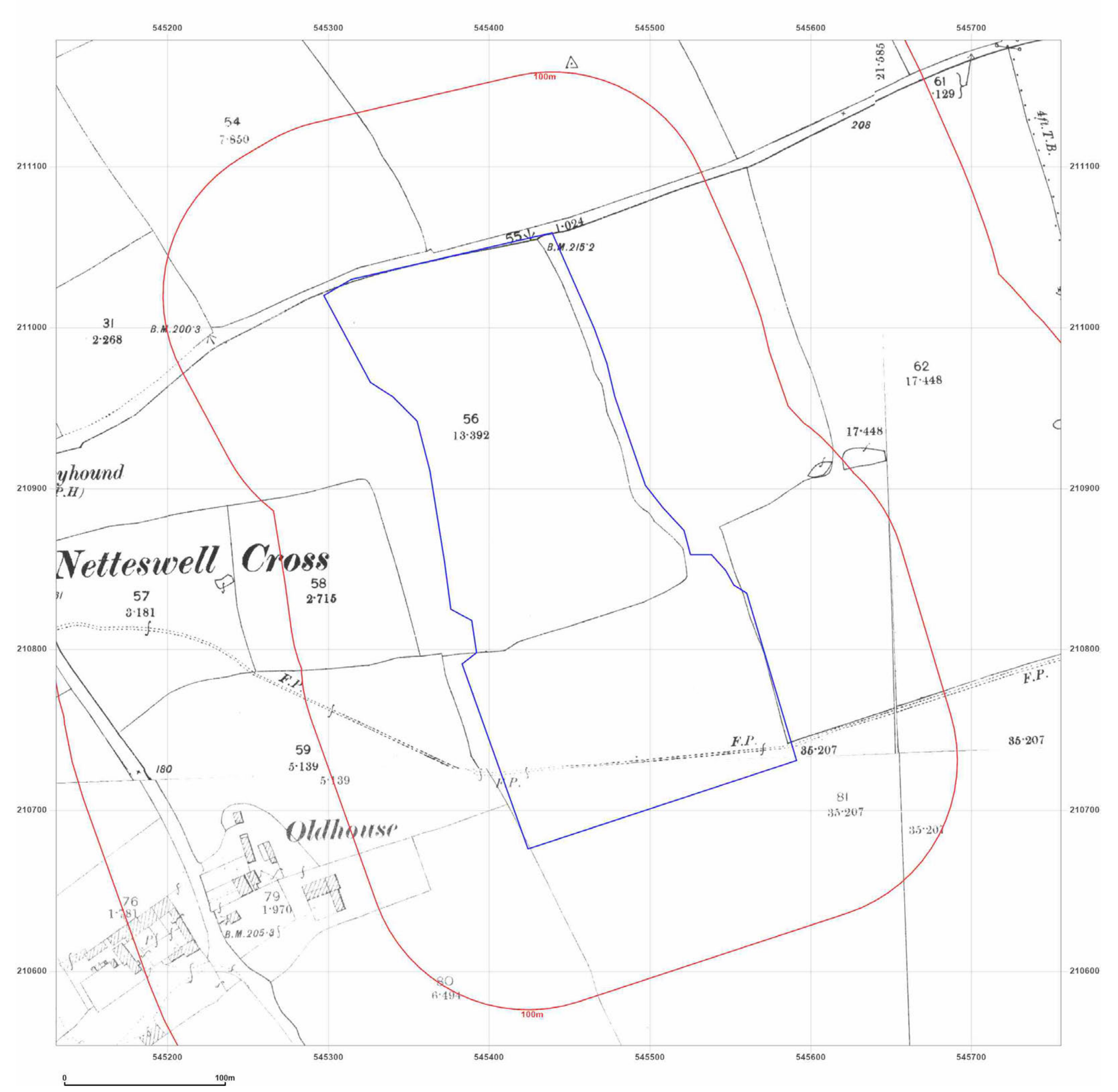

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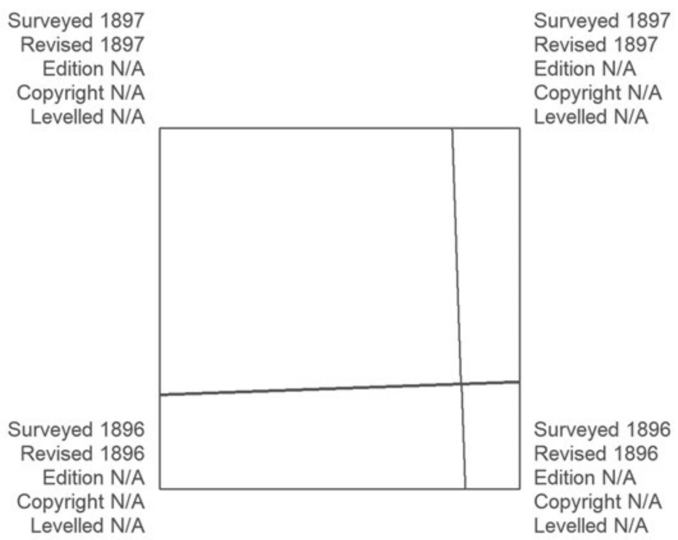

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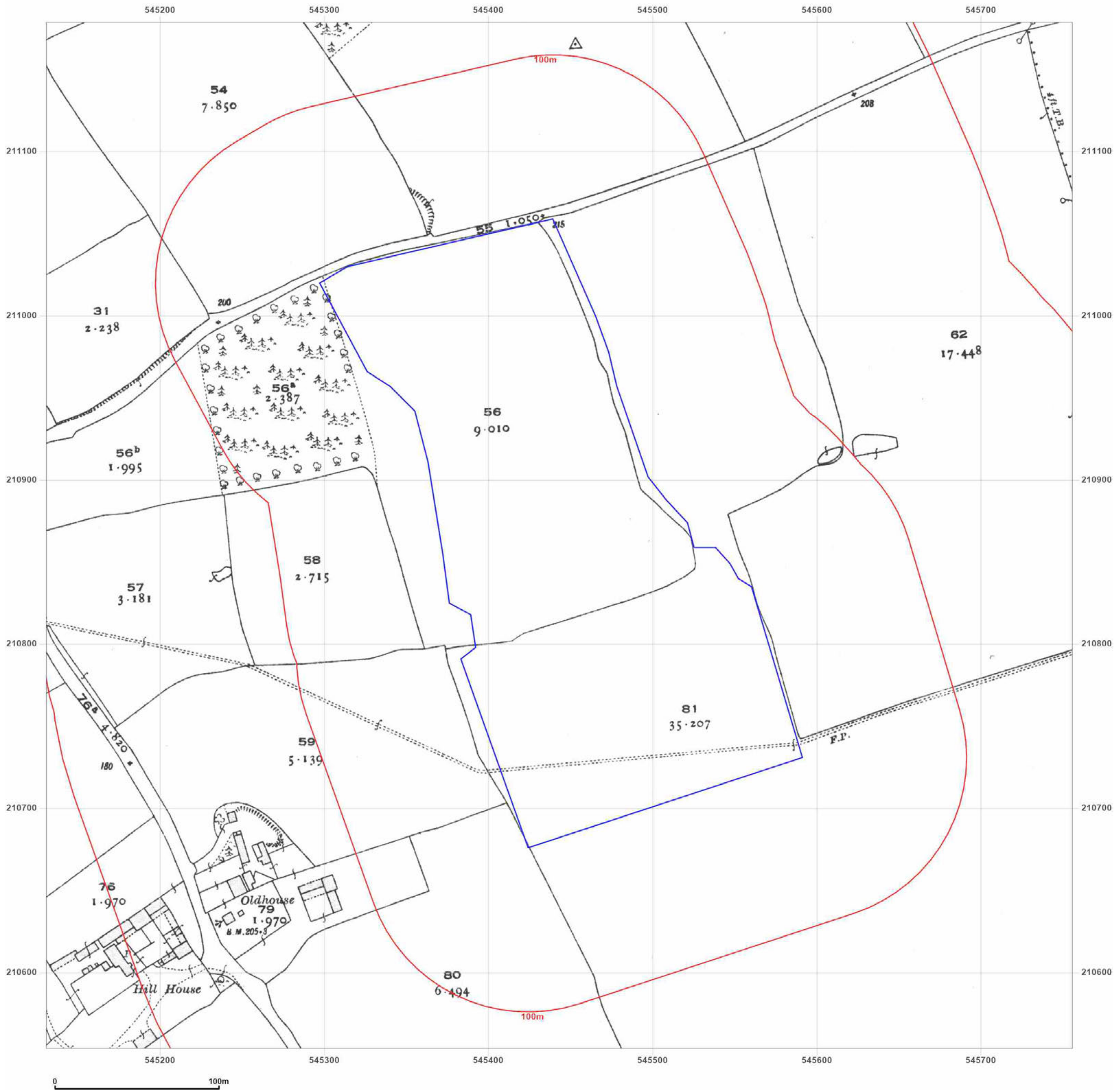

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Client Ref:	EMS_735683_957173
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Grid Ref:	545443, 210866

Map Name:	County Series
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Surveyed 1920
Revised 1920
Edition N/A
Copyright N/A
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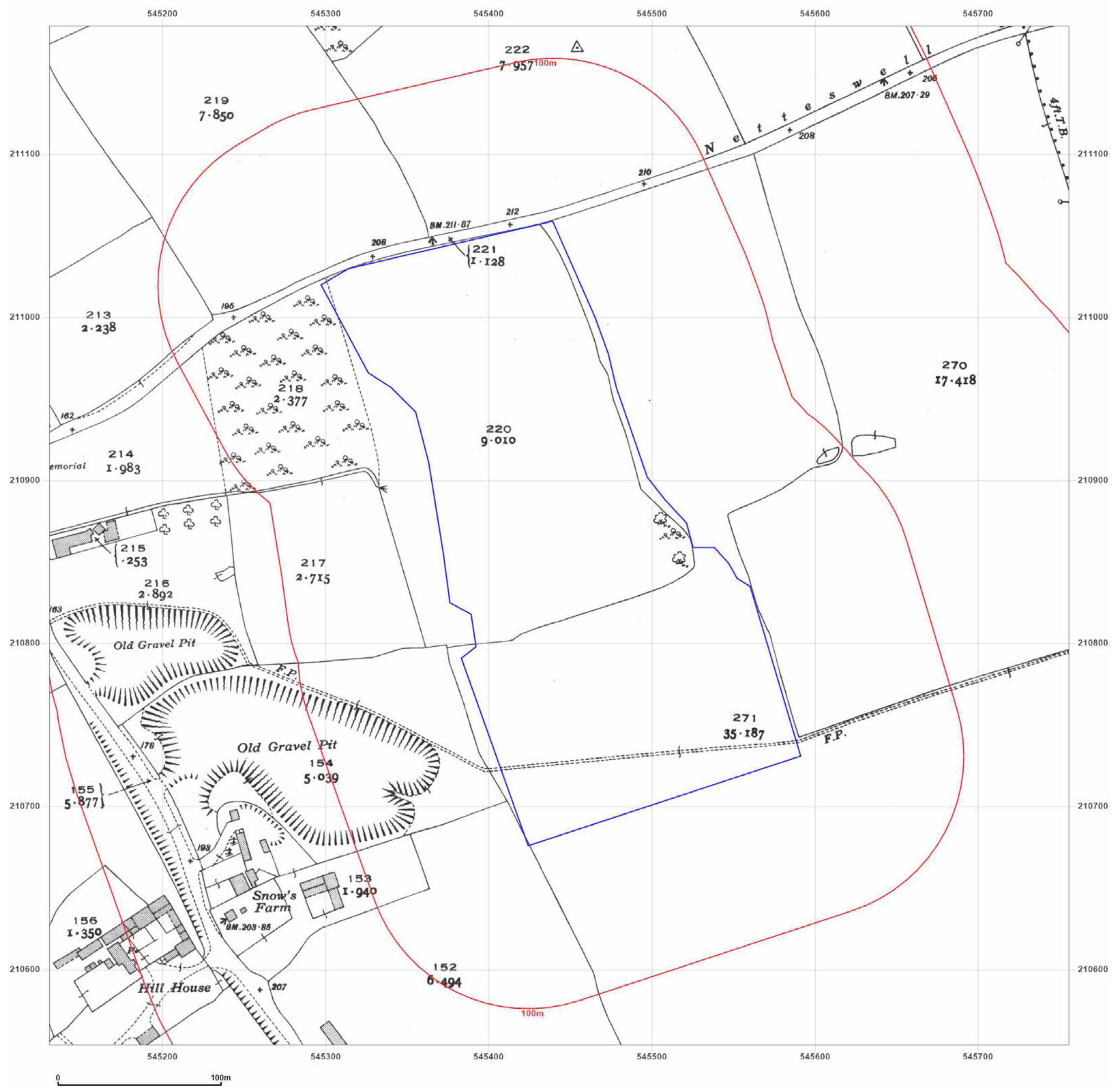

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Client Ref:	EMS_735683_957173
Report Ref:	EMS-735683_957173_2500
Grid Ref:	545443, 210866

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Client Ref: EMS_735683_957173
Report Ref: EMS-735683_957173_2500
Grid Ref: 545443, 210866

Map Name: National Grid

Map date: **1964-1965**

Scale: 1:2,500

Printed at: 1:2,500

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Appendix IV

Appendix IV
Basis for Contaminated Land Qualitative Risk Assessment

The following Contaminated Land Risk Assessment methodology is based on CIRIA C552 (2001) *Contaminated Land Risk Assessment – A Guide to Good Practice*, in order to quantify potential risk via **risk estimation** and **risk evaluation**, which can be adopted at the Phase I (Desk Study) stage. This will then determine an overall risk category which can be used to identify potential investigation or remedial actions. This methodology uses qualitative descriptors and therefore is a qualitative approach based on desk information. The risk assessment should be refined following receipt of ground investigation data.

The methodology requires the classification of:

- the magnitude of the **consequence** (severity) of a risk occurring, and
- the magnitude of the **probability** (likelihood) of a risk occurring.

The potential consequences of contamination risks occurring at this Site are classified in accordance with Table IV-1 below, which is adapted from the CIRIA guidance.

Table IV-1: Classification of Consequence

Classification	Definition of Consequence
Severe	Short-term (acute) risks to human health likely to result in “significant harm” as defined by the Environmental Protection Act 1990, Part IIA. Short-term risk of pollution of sensitive water resource. Catastrophic damage to buildings/property. A short-term risk to a particular ecosystem, or organism forming part of such an ecosystem.
Medium	Chronic damage to Human Health (significant harm as defined in DEFRA, 2012). Pollution of sensitive water resources. A significant change in a particular ecosystem, or organism forming part of such an ecosystem.
Mild	Pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services (“significant harm” as defined in the DEFRA, 2012). Damage to sensitive buildings/structures/services or the environment.
Minor	Harm, though not necessarily significant harm, which may result in a financial loss, or expenditure to resolve. Non-permanent health effects to human health (easily prevented by means such as personal protective clothing etc.). Easily repairable effects of damage to buildings, structures and services.

Source: CIRIA C552

The probability of contamination risks occurring at this Site will be classified in accordance with Table IV-2 below from the CIRIA guidance. Note that for each category, it is assumed that a pollution linkage exists. Where a pollution linkage does not exist, the likelihood is zero, as is the risk.

Table IV-2: Classification of Probability

Classification	Definition of Probability
High Likelihood	There is a pollutant linkage and an event that appears very likely in the short term and almost inevitable over the long term or there is evidence at the receptor of harm or pollution.
Likely	There is a pollution linkage and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term.
Low Likelihood	There is a pollutant linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a longer period such an event would take place, and is less likely in the shorter term.
Unlikely	There is a pollutant linkage but circumstances are such that it is improbable that an event would occur even in the very long term.

For each possible pollution linkage (source-pathway-receptor) identified, the potential risk can be evaluated based upon the following probability x consequence matrix shown in Table IV-3.

Table IV-3: Overall Contamination Risk Matrix

		Consequence			
		Severe	Medium	Mild	Minor
Probability	High likelihood	Very high risk	High risk	Moderate risk	Moderate/Low risk
	Likely	High risk	Moderate risk	Moderate/Low risk	Low risk
	Low likelihood	Moderate risk	Moderate/low risk	Low risk	Very low risk
	Unlikely	Moderate/Low risk	Low risk	Very low risk	Very low risk

Based upon this, CIRIA C552 present definitions of the risk categories, together with the investigatory and remedial actions that are likely to be necessary in each case, as in Table IV-4. These risk categories apply to each pollutant linkage, not simply to each hazard or receptor.

Table IV-4: Definition of Risk Categories and Likely Actions Required

Risk Category	Definition and likely actions required
Very high	There is a high probability that severe harm could arise to a designated receptor from an identified hazard, OR, there is evidence that severe harm to a designated receptor is currently happening. This risk, if realised, is likely to result in a substantial liability. Urgent investigation (if not undertaken already) and remediation are likely to be required.
High	Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation (if not undertaken already) is required and remedial works may be necessary in the short term and are likely over the longer term.
Moderate	It is possible that harm could arise to a designated receptor from an identified hazard. However, if [it] is relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild. Investigation (if not already undertaken) is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer term.
Low	It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised would at worst be relatively mild.
Very Low	There is a low possibility that harm could rise to a receptor. In the event of such harm being realised it is not likely to be severe.

Appendix V

Client: MACE Group

Date: 09.11.2021

Project: C3825

Site: Burnt Mill Academy

Photo No: 01

Comments: A view of the front of the school and the main reception. Level changes are present to the right of the picture and the redundant chimney can been seen in the background.

Client: MACE Group

Date: 09.11.2021

Project: C3825

Site: Burnt Mill Academy

Photo No: 02

Comments: A view along the front of the school and the main car park. Varied deciduous trees can be seen along the southern boundary of the site.

Client: MACE Group

Date: 09.11.2021

Project: C3825

Site: Burnt Mill Academy

Photo No: 03

Comments: The main electrical substation located to the western boundary of the site.

Client: MACE Group

Date: 09.11.2021

Project: C3825

Site: Burnt Mill Academy

Photo No: 04

Comments: The main hard landscaping play area located to the western section of the site. The all weather canopy is present in the background.

Client: MACE Group

Date: 09.11.2021

Project: C3825

Site: Burnt Mill Academy

Photo No: 05

Comments: The boundary between the main school buildings and the playing fields. The change in topographical level can be seen on either side of the conifer hedge.

Client: MACE Group

Date: 09.11.2021

Project: C3825

Site: Burnt Mill Academy

Photo No: 06

Comments: The new electrical substation located adjacent to the MUGA pitch.

Appendix VI

Laura Jones

From: Stuart Athol <stuart.athol@harlow.gov.uk>
Sent: 08 November 2021 09:48
To: Laura Jones
Subject: RE: Request for Environmental Search - Contaminated Land - Burnt Mill Academy
Attachments: Capture.PNG

Hi

Responses in red below.

Kind regards

Stuart Athol
Principal Environmental Health Officer
Environment & Planning
Environmental Health
Tel: 01279 446104
Fax: 01279 446639
Visit our website www.harlow.gov.uk
Follow us on twitter @HarlowCouncil
Harlow Council, Civic Centre, The Water Gardens, Harlow, Essex, CM20 1WG

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www.essex.gov.uk/coronavirus
www.gov.uk/coronavirus

Working together for Harlow

From: Laura Jones [mailto:laura.jones@hspconsulting.com]
Sent: 08 November 2021 09:38
To: Stuart Athol
Subject: RE: Request for Environmental Search - Contaminated Land - Burnt Mill Academy

HI Stuart,

Thank you for coming back to me.

Would it be possible to get a response to the below questions?

Are any sites located within 250m designated as Part IIA Contaminated Land? No

Does the Local Authority hold any records relating to Landfills within 250m of the site? *See attached*

If historical landfills are present we would be particularly interested in any details relating to the wastes deposited, age of the wastes, extents of the landfill, any details of gas monitoring undertaken particularly any perimeter gas monitoring results. Only known details in the attached

*Does the Local Authority hold any records relating to pollution incidents at the site?*No

Please provide details of any Part A(2) or Part B Environmental Permits (formerly LAAPC/LAPPC authorisations) licensed to the site or to adjoining properties See https://www.harlow.gov.uk/environment-and-animals/pollution/environmental-permit-holders

I would be grateful if you could confirm whether or not the Site is on your list of prioritised sites under Part 2A No *and, if so, what priority it is considered to be?*

Also, please could you advise if you are aware of any previous intrusive investigations and/or remediation at the Site (or any significant contaminated land issues in the surrounding area)? None known

*Has the site been identified for inspection or further review under the Council's Contaminated Land Strategy (or other Part IIA undertaking)?*No *If so, please describe*
the priority status/risk ranking of the site and the likely timescale for any further scrutiny of the site.

Are there any known contamination issues associated with the site or in the near vicinity e.g. in terms of former or current contaminative site uses, leaks or spills of any oil/chemical substances etc.? None known *If there have been any intrusive investigations at the site or near vicinity, please provide dates and titles of any reports and confirm whether the reports are publicly available.*

The red line boundary is attached. The search area is for the red line boundary which is around the main school site.

Many thanks,

Laura

Laura Jones
HSP Consulting
Senior Geo-Environmental Engineer
Mobile : 07813457794
Switch: 01773 535555

From: Stuart Athol <stuart.athol@harlow.gov.uk>
Sent: 08 November 2021 09:24
To: Laura Jones <laura.jones@hspconsulting.com>
Subject: RE: Request for Environmental Search - Contaminated Land - Burnt Mill Academy

Hi

As searches for this type of enquiry are normally quite simple there is no charge. If you let me have your questions along with the location map again I would then be in a position to say if there would be a charge.

Regards

Stuart Athol
Principal Environmental Health Officer
Environment & Planning
Environmental Health
Tel: 01279 446104
Fax: 01279 446639
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Follow us on twitter @HarlowCouncil
Harlow Council, Civic Centre, The Water Gardens, Harlow, Essex, CM20 1WG

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www.harlow.gov.uk/coronavirus
www.essex.gov.uk/coronavirus
www.gov.uk/coronavirus

Harlow Council
Working together for Harlow

From: Laura Jones [mailto:laura.jones@hspconsulting.com]
Sent: 05 November 2021 15:14
To: Environmental Health
Cc: Norezrin Shafii
Subject: Request for Environmental Search - Contaminated Land - Burnt Mill Academy

Good Afternoon,

The purpose of this email is to request an environmental search for a site I am looking at within your borough. Please find attached the red line boundary for the main school site and below is the site address.

Site Address: Burnt Mill Academy, First Avenue, Harlow, CM20 2NR

I am in the process of completing a geo-environmental Phase I desk study and preliminary risk assessment and have been advised to raise an environmental search for the site as part of this process as the council may hold additional information on the potentially contaminative uses.

I presume there will be an associated cost for undertaking this search. Could you please advise what this cost will be?

If you require any additional information to provide the environmental search for the site, please let me know.

Many thanks,

Laura

Laura Jones
BSc (Hons), FGS
Senior Geo-Environmental Engineer
Mobile: 07813457794
Switch: 01773 535555

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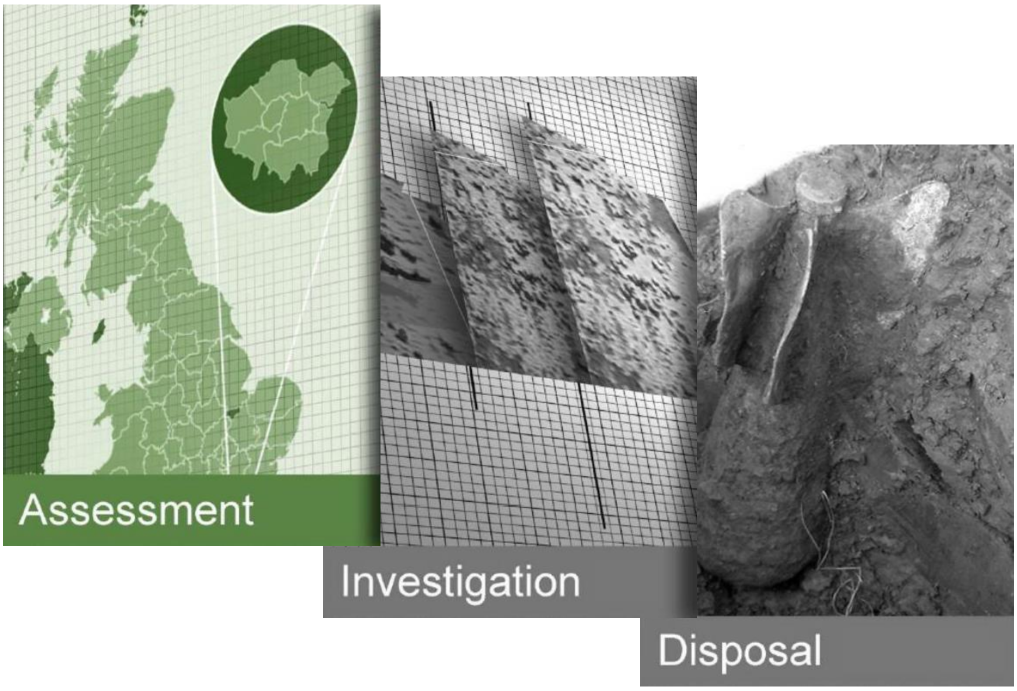
Appendix VII



Burnt Mills Academy - UXO Desk Study & Risk Assessment

Drafted by	James Major
Checked by	Abi Newton
Authorised by	Stefan Lang

Document Title **UXO Desk Study & Risk Assessment**
Document Ref. **P11211-21-R1**
Revision **A**
Project Location **Burnt Mills Academy**
Client **HSP Consulting**
Date **12th November 2021**

UXO DESK STUDY & RISK ASSESSMENT

EXECUTIVE SUMMARY

Key findings: No significant sources of Unexploded Ordnance (UXO) hazard have been identified.

Key actions: Proceed with works.

UXO Hazard Assessment

No records have been found indicating that the Site was bombed and no other significant sources of UXO hazard have been identified on the Site.

Given this, it is considered that the Site has a low UXO hazard level, as shown in the following Figure, reproduced as Figure 4 in the main report.

The UXO hazard zone plan of the Site is also given in the accompanying P11211-21-R1-MAP01-A.

UXO hazard zone plan of the Site

Source: OpenStreetMap *Not to Scale*

Legend	Very Low	🟩	Low	🟩	Moderate	🟧
	High	🟥	Very High	🟪	Site boundary	—

The main findings of the report are summarised below.

- No records of bombing or military activity on the Site during World War One (WWI) have been found.
- During World War Two (WWII) the main strategic targets in the vicinity of the Site included military airfields, military camps and transport infrastructure.

- No records have been found indicating that the Site was bombed during WWII. Records indicate that the nearest High Explosive (HE) bomb fell approximately 0.2km west of the Site on the 16th November 1940. This was recorded as an Unexploded Bomb (UXB) and removed.
- No records of military activity on the Site post-WWII have been found.

Data Confidence Level

The findings of this report were based on good corroborative evidence of the military activity and bombing on the Site.

Proposed Works

No information has been provided on the proposed works.

For the purposes of this risk assessment, it is assumed that works on the Site may include intrusive ground investigations, excavations and piling.

Risk Assessment

The Table below, reproduced as Table 4 in the main report, provides a UXO risk assessment for the proposed works on the Site.

Further details on the methodology for the risk assessment are provided in Section 7.2 of the main report.

UXO risk assessment for the Site

Potential UXO Hazard	Anticipated Works	PE	PD	P = PE x PD	Likelihood	Severity	Risk Rating	UXO Risk
UXB	Shallow Excavations	1	1	1	1	5	5	Low
	Deep Excavations	1	1	1	1	5	5	Low
	Boreholes/Piling	1	1	1	1	4	4	Low
Other UXO	Shallow Excavations	1	1	1	1	4	4	Low
	Deep Excavations	1	1	1	1	4	4	Low
	Boreholes/Piling	1	1	1	1	3	3	Low
PE (Probability of Encounter), PD (Probability of Detonation), P (Overall Probability)								
Shallow Excavations defined as <1.0m below ground level (bgl.)								

Risk Mitigation Plan

The Table below, reproduced as Table 5 in the main report, summarises the UXO risk for proposed works on the Site and recommended actions.

Summary of UXO risk and mitigation recommendations

Proposed Works	UXO Risk	Recommended Mitigation
Excavations	🟩	**Proceed with works** – if additional comfort is required to address the residual UXO hazard, a formal UXO awareness briefing can be provided.
Boreholes/Piling	🟩	**Proceed with works**

In summary, no additional measures are considered essential to reduce the UXO risk on the Site to As Low As is Reasonably Practicable (ALARP).

What Do I Do Next?

If you have any comments or require further assistance, contact us via phone (01993 886682) or email (uxo@zetica.com) and we can help.

If you have requirements to identify other buried hazards (such as mapping utilities or obstructions) we can provide these surveys.

If proposed works on the Site change, or additional works are planned, contact Zetica for a re-assessment of the UXO risk and the risk mitigation requirements.

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Accompanying GIS Data

P11211-21-R1-MAP01-A (UXO Desk Study)

ABBREVIATIONS

AA	Anti-Aircraft
ALARP	As Low As Reasonably Practicable
ARP	Air Raid Precaution
AXO	Abandoned Explosive Ordnance
BD	Bomb Disposal
BDO	Bomb Disposal Officer
BDU	Bomb Disposal Unit
CMD	Conventional Munitions Disposal
DAB	Delayed Action Bomb
DCLG	Department of Communities and Local Government
EO	Explosive Ordnance
EOC	Explosive Ordnance Clearance
EOR	Explosive Ordnance Reconnaissance
ERW	Explosive Remnants of War
ESA	Explosive Substances and Articles
FFE	Free From Explosives
HAA	Heavy Anti-Aircraft
HE	High Explosive
HSE	Health and Safety Executive
IB	Incendiary Bomb
IED	Improvised Explosive Device
IEDD	Improvised Explosive Device Disposal
JSEODOC	Joint Services EOD Operations Centre
LAA	Light Anti-Aircraft
MoD	Ministry of Defence
OB	Oil Bomb
PM	Parachute Mine
PUCA	Pick Up and Carry Away
RAF	Royal Air Force
TEP	Time Expired Pyrotechnics
UXAA	Unexploded Anti-Aircraft
UXB	Unexploded Bomb
UXO	Unexploded Ordnance
WWI	World War One
WWII	World War Two

UXO DESK STUDY & RISK ASSESSMENT

Please read: Zetica has colour coded each paragraph. Paragraphs with black text on a white background are paragraphs that provide site-specific information or information specifically researched as part of this project.

Boxed paragraphs in a dark green text with a green background are paragraphs providing general information and, where appropriate, links to online resources giving further detail. These are all available at www.zeticauxo.com. If you cannot gain access to these resources, Zetica can forward them on request.

1 INTRODUCTION

1.1 Project Outline

Zetica Ltd was commissioned by HSP Consulting to carry out a detailed Unexploded Ordnance (UXO) Desk Study and Risk Assessment for an area of approximately 1.1 hectares (ha) off First Ave Mandela Ave, Harlow, Essex (the 'Site').

The aim of this report is to gain a fair and representative view of the UXO hazard for the Site and its immediate surrounding area in accordance with the Construction Industry Research and Information Association (CIRIA) C681 'Unexploded Ordnance (UXO), a Guide for the Construction Industry'.

Where appropriate, this hazard assessment includes:

- Likelihood of ordnance being present.
- Type of ordnance (size, filling, fuze mechanisms).
- Quantity of ordnance.
- Potential for live ordnance.
- Probable location.
- Ordnance condition.

It should be noted that some military activity providing a source of UXO hazard may not be recorded and therefore there cannot be any guarantee that all UXO hazards affecting the Site have been identified in this report.

1.2 Sources of Information

Zetica Ltd researched the military history of the Site and its surrounding area using a range of information sources. The main sources of information are detailed in the following sections and referenced at the end of this report.

1.2.1 Zetica Ltd Defence Related Site Records

Zetica Ltd's in-house records were consulted, including reference books and archived materials from past work in the region. Relevant documents have been cited within the bibliography of this report.

1.2.2 Zetica Ltd Bombing Density Records and Maps

Reference has been made to the Zetica Ltd bomb risk maps located on Zetica's website (http://zeticauxo.com/downloads-and-resources/risk-maps/)

1.2.3 Ministry of Defence and Government Records

Government departments and units within the Ministry of Defence (MoD) were approached for information of past and present military activity in the area. These included the Department of Communities and Local Government (DCLG) records of abandoned bombs.

1.2.4 Other Historical Records, Maps and Drawings

Numerous reference documents including historical maps, aerial photographs and drawings have been consulted from sources such as the National Archives, the US National Archives & Records Administration (NARA), the Imperial War Museum (IWM), Historic England and the Defence of Britain Project.

The British Geological Survey (BGS) was consulted for borehole information.

1.2.5 Local Authority Records

Information was obtained from Essex County Council.

1.2.6 Local Record Offices and Libraries

Essex Record Office was consulted for records.

1.2.7 Local Historical and Other Groups

Local history groups and archaeological bodies were consulted, including the Essex Historic Environment Record (HER).

1.3 Data Confidence Level

In general, there is a high level of confidence in the researched information sources used for this report.

Due to Covid-19 restrictions, access to Historic England has also been limited during the writing of this report. As such, Zetica has relied on aerial photography gathered for previous project in the area, in addition to readily available historical aerial photography where necessary.

2 THE SITE

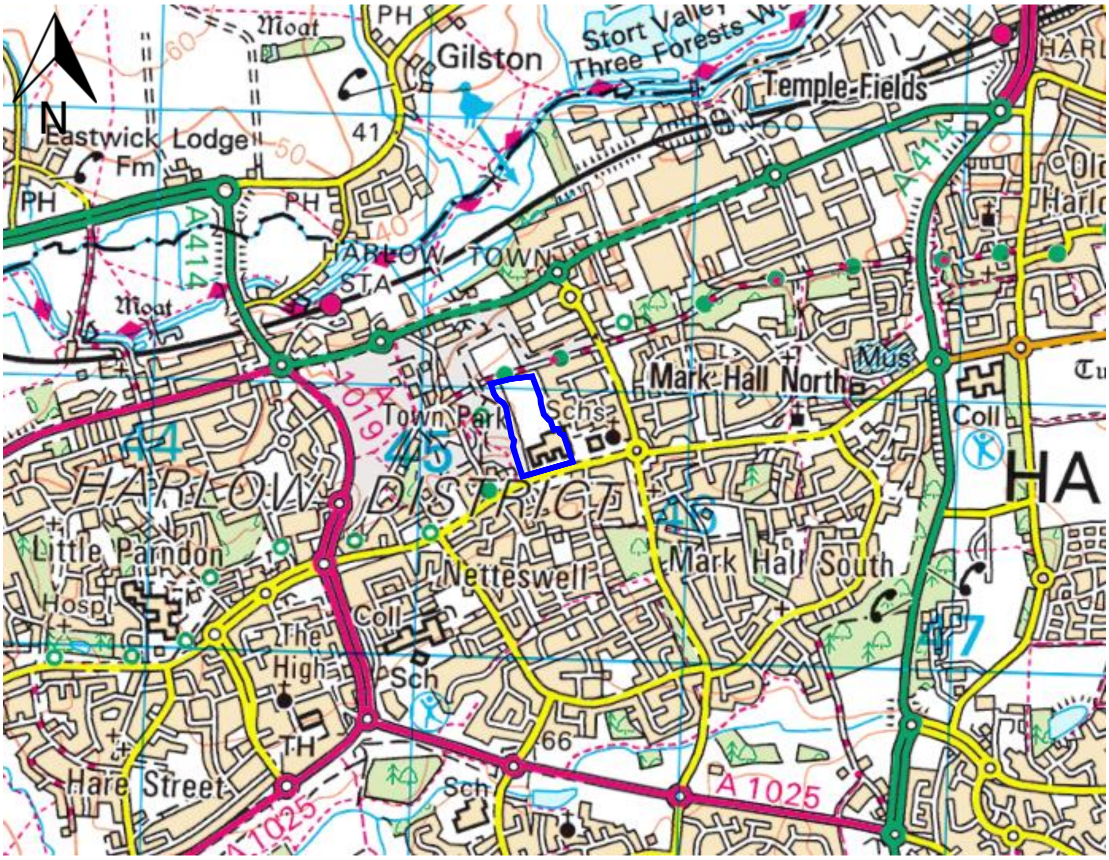
2.1 Site Location

The Site is centred on Ordnance Survey National Grid Reference (OSNGR) TL 454105. It is located approximately 1.6km northeast of Harlow centre.

The Site comprises of open ground, hardstanding ground and several school buildings. It is bounded to the north by Netteswell Road, west by open ground, east by residential buildings and south by First Ave Mandela Avenue.

Figure 1 is a Site location map and Plate 1 is a recent aerial photograph of the Site.

Figure 1 Site location map



Source: © Crown Copyright 2021. Reproduced by permission of Ordnance Survey *Not to Scale*

Legend	Site boundary ▬

Plate 1 Recent aerial photograph of the Site

Source: Google Earth *Not to Scale*

Legend	Site boundary ▬

3 MILITARY ACTIVITY

The following sections outline the recorded military activity in the vicinity of the Site. The potential UXO hazard from World War One (WWI) and World War Two (WWII) bombing is detailed in Section 4.

Each sub-section provides hyperlinks to further information on potential sources of UXO hazard. These are also available at www.zeticauxo.com. If you cannot gain access to these resources, Zetica can forward them on request.

3.1 Defences

For further information on military defences, and the potential UXO hazards associated with them, follow the links below:

- Anti-Aircraft Guns
- Anti-Invasion Defences
- Barrage Balloons
- Bombing Decoys
- Home Guard
- Mined Locations
- Mortar & Gun Emplacements
- Pillboxes

No military defences have been identified on the Site. The nearest are described below.

3.1.1 Anti-Aircraft Guns

Records indicate that during WWI there were 4No. Anti-Aircraft (AA) batteries within 10km of the Site. The nearest was located at Great Parndon (TL 436088), approximately 2.6km southwest of the Site. It was armed with 1No. 3-inch (”) gun.

Records indicate that during WWII there was 1No. Heavy AA (HAA) battery within 10km of the Site. The nearest was located at North Weald (TL 497050), approximately 7km southesat of the Site. Its armaments are unknown.

The nearest recorded WWII AA shell incidents to the Site are described below.

15th October 1940

1No. AA shell fell on an open ground, Netteswell Road, within approximately 0.1km west of the Site. This was recorded as UXAA and disposed of on the 17th March 1941.

19th February 1944

1No. AA shell fell in a field northwest of Bromley Farm, approximately 0.7km east of the Site.

1No. AA shell fell on open ground of St Mary’s Church, approximately 0.8km east of the Site.

26th May 1944

1No. AA shell fell on open ground near Burnt Mill, Little Parndon Road, approximately 0.8km west-northwest of the Site.

Potential UXO Hazard

Given its location on one of the main Luftwaffe flightpaths into London, many AA shells were fired in Essex during WWII and the potential for a UXAA shell to have fallen on the Site unnoticed cannot be totally discounted.

Shells can be found anywhere within a wide radius of a WWII HAA gun battery (see Appendix 2.3).

3.1.2 Bombing Decoys

The nearest recorded bombing decoy was located at Nazeing (TL 421055), approximately 6.1km southwest of the Site.

Bombing decoys are not considered to provide a source of UXO hazard to the Site.

3.2 Military Airfields

For further information on military airfields, and the potential UXO hazards associated with them, follow the link below:

- Military Airfields

No records of any military airfields on or in close proximity to the Site have been found.

During WWI, the nearest military airfield was Royal Flying Corps (RFC) North Weald (TL 487044), approximately 6.9km southeast of the Site. The airfield was primarily used by No. 39 Home Defence Squadron flying Bristol F.2B fighter aircraft.

It remained in use as a military airfield after WWI and operated as a fighter base during WWII.

The nearest recorded operational airfield during WWII was RAF Hunsdon (TL 426139), located approximately 3.9km northwest of the Site.

This was established in 1941 for Fighter Command and was initially occupied by No. 85 Squadron. RAF Hunsdon was subsequently used as a base for fighter aircraft undertaking night air raid attacks in France and Germany.

Other units based at the airfield provided support for bomber aircraft undertaking long-range missions.

The last squadrons left RAF Hunsdon in May 1945. The airfield was put into care and maintenance before being closed on 6th August 1947 and was eventually sold off in 1960 for use in agriculture.

Military airfields are not considered to provide a source of UXO hazard to the Site.

3.3 Aircraft Crashes

For further information on military aircraft crashes, and the potential UXO hazards associated with them, follow the link below:

- Aircraft Crashes

No records of any aircraft crashes on or in close proximity to the Site have been found.

3.4 Explosives Factories, Munitions Depots and Disposal Areas

For further information on explosives factories, munitions depots and disposal areas, and the potential UXO hazards associated with them, follow the links below:

- Explosives Factories
- Munitions Depots
- Munitions Disposal Areas

No records of any explosives factories, munitions depots or munitions disposal areas on or in close proximity to the Site have been found.

3.5 Firing Ranges and Military Training Areas

For further information on firing ranges and military training areas, and the potential UXO hazards associated with them, follow the links below:

- Artillery Ranges
- Bombing Ranges
- Military Training Areas
- Small Arms Ranges

No records of any firing ranges or military training areas on or in close proximity to the Site have been found.

3.6 Other Military Establishments

No other military establishments have been identified on or in close proximity to the Site.

4 BOMBING

4.1 WWI Bombing

For further information on WWI bombing in the UK, and the potential UXO hazard associated with it, see Appendix 2.1. Alternatively, use the following link.

- WWI Bombing

No records have been found indicating that the Site was bombed during WWI.

4.2 WWII Bombing

For further information on WWII bombing in the UK, and the potential UXO hazard associated with it, see Appendix 2.2. Alternatively, use the following link.

- WWII Bombing

No records have been found indicating that the Site was bombed during WWII. Details of WWII bombing in the vicinity of the Site are provided in the following sections.

4.2.1 Bombing in West Essex

From prior to the declaration of war in 1939, Britain was subject to reconnaissance flights by the Luftwaffe which was building up a photographic record of potential targets.

Operational RAF airfields, including RAF North Weald, constituted the most significant targets in the West Essex region, and were subject to heavy bombing in an attempt by the Luftwaffe to weaken Britain's fighter defence.

Due to West Essex's proximity to London, the region was subjected to frequent 'tip and run' raids and jettisoned bombs throughout WWII.

Bombing of civilian targets in the Rural District (RD) of Epping began as early as August 1940, though the heaviest raids in the region were concentrated on RAF North Weald during the Battle of Britain in the summer of 1940.

After being subjected to frequent air raids between September 1940 and June 1941, the region only experienced sporadic bombing raids during 1942 and 1943.

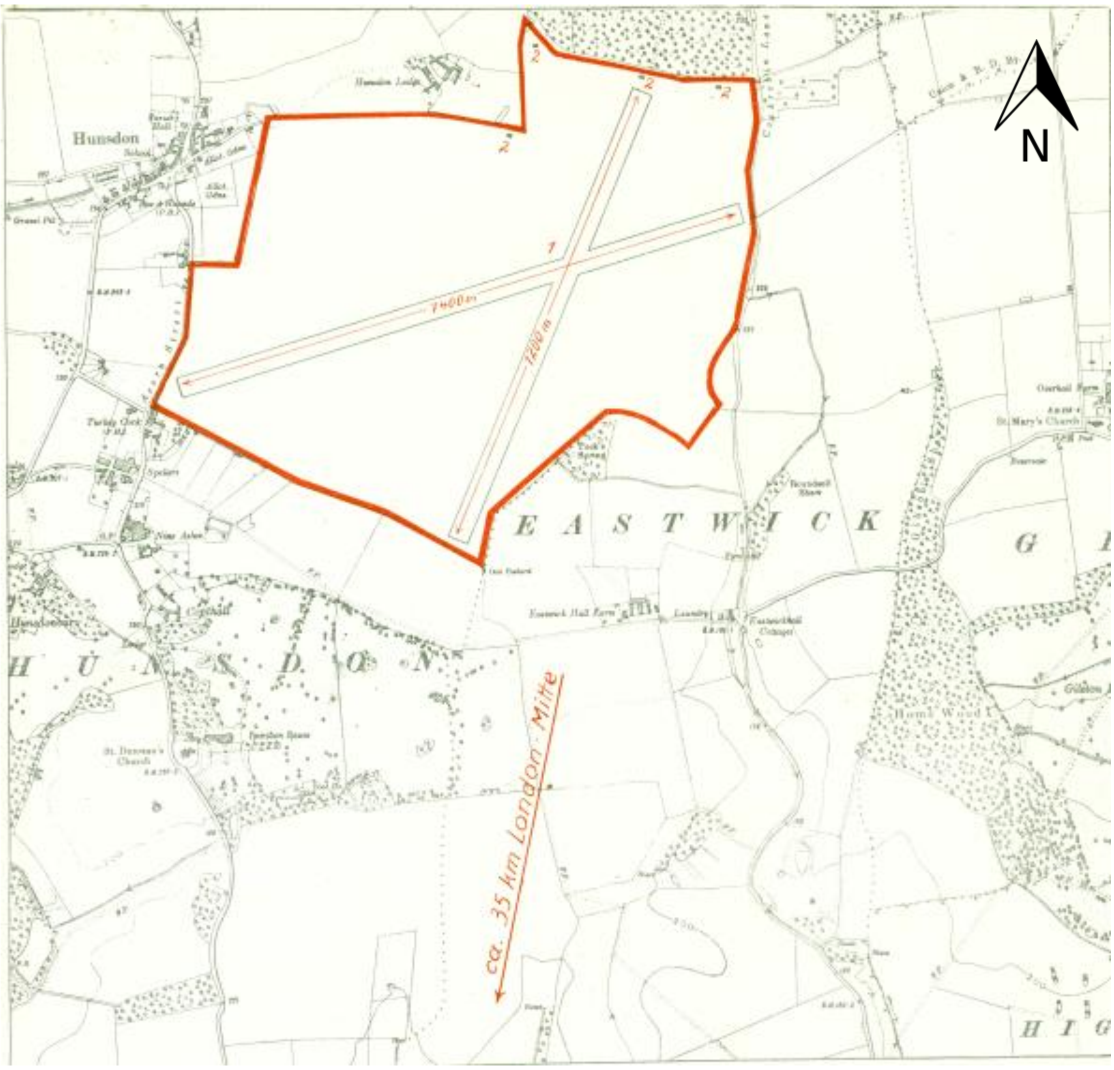
Manned bomber raids returned to the region in the first few months of 1944. The V1 (Pilotless Aircraft) offensive against England began in June 1944 and in September 1944 V2s (Long Range Rockets) were launched against the region.

4.2.2 Strategic Targets

The Site was located in a predominately rural region which contained few potential strategic targets. Other potential strategic targets further from the Site included military airfields, such as RAF Hudson, RAF North Weald and RAF Sawbridgeworth, military camps and transport infrastructure.

Figure 2 is a Luftwaffe target plan of RAF Hudson dated the 2nd January 1941, located approximately 3.9km northwest of the Site.

Figure 2 Luftwaffe target plan of RAF Hudson, 2nd January 1941



Source: NARA *Not to Scale*

4.2.3 Bombing Densities and Incidents

Table 1 gives details of the overall bombing statistics recorded for the Local Authority Districts of the Site (highlighted by bold text) and surrounding districts. These were categorised as Rural Districts (RD), Urban Districts (UD), Municipal or Metropolitan Boroughs (MB) and County Boroughs (CB). WWII bomb density levels are defined below:

<5 bombs per 405ha is a Very Low regional bombing density.

5-15 bombs per 405ha is Low.

15-50 bombs per 405ha is Moderate.

50-250 bombs per 405ha is High.

>250 bombs per 405ha is Very High.

Table 1 Bombing statistics

Area	Bombs Recorded				
	High Explosive	Parachute Mines	Other	Total	Bombs per 405ha (1000 acres)
Epping RD	**1,329**	**29**	**40**	**1,398**	**40.1**
Epping UD	126	5	3	134	90.1
Hoddensdon UD	336	4	16	363	81.9
Sawbridgeworth UD	76	1	0	77	20.7
Ongar RD	1,009	70	82	1,161	24.6
Ware UD	13	0	3	16	11.8
Dunmow RD	755	14	16	785	10.8
Braughing RD	310	12	9	331	7.2

Note that Table 1 excludes the figures for V1s (Pilotless Aircraft or Flying Bombs), V2s (Long Range Rockets) and Incendiary Bombs (IBs). Discrepancies between this list and other records, such as bomb clearance records, demonstrate that this data is likely to under-represent actual bombing.

Details of the nearest recorded bombing incidents to the Site are given in the following section. Appendix 5 provides further details of recorded bombing incidents in the immediate vicinity of the Site.

18th September 1940

1No. bomb (Type unspecified) fell on a sand pit south of Netteswell Cross, approximately 0.2km west of the Site.

9th October 1940

1No. HE bomb fell on footpath west of allotments, Park Lane, approximately 0.3km west of the Site. This was recorded as an Unexploded Bomb (UXB).

16th November 1940

2No. HE bomb fell on open ground, Netteswell Road, approximately 0.2km west of the Site. These were recorded as UXBs and was disposed of on the 15th April 1941.

9th December 1940

8No. HE bombs fell on the junction of Nettleswell Road and Latton Road, approximately 0.3km east of the Site. 2No. of these were recorded as UXB and disposed of on the 9th December 1940.

19th February 1944

1No. 50kg HE bomb fell on an open field, Netteswell Road, approximately 0.3km northeast of the Site. This was recorded as UXB and removed on 2nd March 1944.

1No. IB fell on Latton Vicarage, approximately 0.3km southeast of the Site.

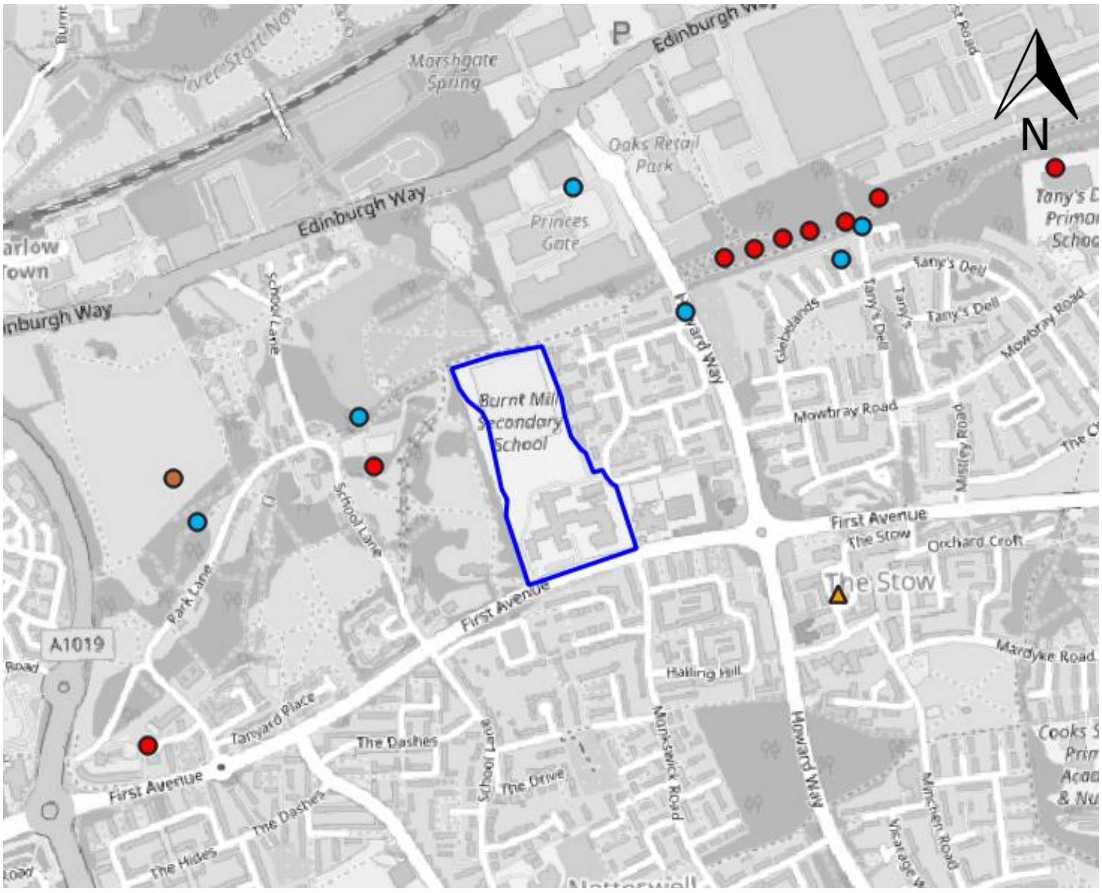
It should be noted that during WWII, many UXB were mapped and subsequently removed as and when conditions and demands on Bomb Disposal teams allowed. Their removal was not always accurately recorded and sometimes records were later destroyed. In practice, most UXB were probably removed and only a much smaller number were actually registered as officially abandoned bombs.

Figure 3 is a map showing the approximate location of recorded bomb impacts in the immediate vicinity of the Site. IBs shown are indicative of larger numbers of similar devices that fell within the given area.

The map has been compiled from a number of different sources, including air raid incident reports, historical aerial photographs and bomb census maps.

The bomb map is also given in the accompanying P11211-21-R1-MAP01-A.

Figure 3 Compiled bomb impact map for the vicinity of the Site

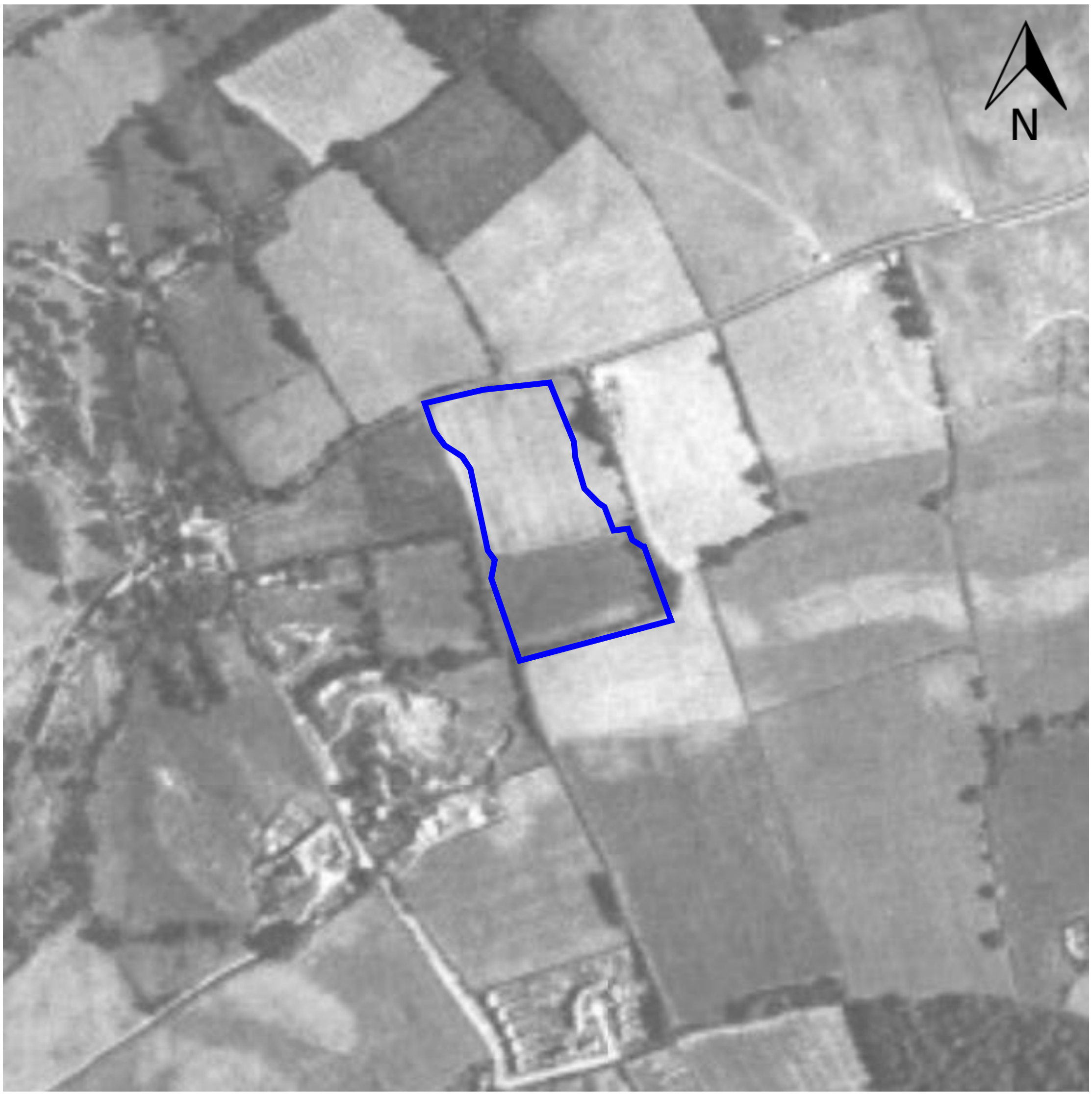


Source: OpenStreetMap *Not to Scale*

Legend	Site boundary ▬	HE bomb ●	UXB ●	DAB ●	IBs ▲

Plate 2 is an aerial photograph dating from circa 1945. No bomb damage has been identified on the Site.

Plate 2 Aerial photograph, c. 1945



Source: Geoinformation Group

Not to Scale

Legend	Site boundary ━

Potential UXO Hazard

No records have been found indicating that the Site was bombed and no bomb damage has been identified on the Site on historical aerial photography.

WWII bombing is not considered to provide a source of UXO hazard to the Site.

4.2.4 Geology and Bomb Penetration Depths

It is important to consider the geological materials present at the time that a bomb was dropped in order to establish its maximum penetration depth.

At the time of writing, no Site-specific ground investigation data was available.

British Geological Survey (BGS) 1:50,000 Sheet 240, Epping (Solid and Drift) and BGS borehole records from nearby investigations have been consulted to get an indicative overview of the Site geology.

Tables 2 and 3 below provide estimates of maximum bomb penetration depths for areas of the Site underlain by Glaciofluvial Deposits, and for the areas of the Site underlain by the Lowestoft Formation.

The geology for the central part of the Site is understood to consist of topsoil and made ground, over chalk and clay of the Lowestoft Formation, overlying the London Clay Formation.

Table 2 provides an estimate of average maximum bomb penetration depths for the central part of the Site assuming WWII ground conditions of 0.5m of topsoil, over 8m clay of over 2m of sand and gravel, overlying more than 20m of stiff to very stiff clay.

Table 2 Estimated average maximum bomb penetration depths (central part of the Site)

Estimated average bomb penetration depths for anticipated geology		
Bomb Weight	50kg	6.5m
	250kg	9.0m
	500kg	14.5m

The geology for the northern and southern parts of the Site is understood to consist of topsoil and made ground, over Glaciofluvial Deposits of sand and gravel, overlying the London Clay Formation.

Table 3 provides an estimate of average maximum bomb penetration depths for parts of the Site assuming WWII ground conditions of 0.5m of topsoil, over 7m of soft to firm clay, over 5m of sand and gravel, overlying more that 20m of stiff to very stiff clay.

Table 3 Estimated average maximum bomb penetration depths (northern and southern parts of the Site)

Estimated average bomb penetration depths for anticipated geology		
Bomb Weight	50kg	6.0m
	250kg	8.0m
	500kg	10.0m

These calculations can be refined on receipt of Site-specific information.

The estimated bomb penetration depths given in Tables 2 and 3 are from the WWII ground level and are based on the following assumptions:

a) High level release of the bomb resulting in an impact velocity of 260m/s (>5,000m altitude).

b) A strike angle of 10 to 15 degrees to the vertical.

c) That the bomb is stable, both in flight and on penetration.

d) That no retarding units are fitted to the bomb.

e) That the soil type is homogenous.

A high altitude release of a bomb will result in ground entry at between 10° and 15° to the vertical with the bomb travelling on this trajectory until momentum is nearly lost. The bomb will then turn abruptly to the horizontal before coming to rest. The distance between the centre of the entry hole and the centre of the bomb at rest is known as the 'offset'. A marked lateral movement from the original line of entry is common.

Low-level attacks may have an impact angle of 45° or more, which will frequently lead to a much greater amount of offset movement during soil penetration.

The average offset is one third of the penetration depth, i.e. an offset of 2m may be expected for a 50kg bomb in dry silts and clays. If hard standings or Made Ground were present during WWII, bomb penetration depths would have been significantly reduced but offset distances may have been up to four times greater.

5 EXPLOSIVE ORDNANCE CLEARANCE ACTIVITIES

Official UK bombing statistics have been compiled from both British and German sources. There were differences in the way the figures were originally reported and collated which has led to discrepancies in the summary data.

Based on data from 1939 to 1945, War Office statistics indicate that 200,195No. HE bombs exploded within Great Britain. Additionally, 25,195No. HE bombs (representing 11%) were recorded as UXBs. However, records from the Royal Engineers who were responsible for bomb disposal at the time indicate that as of 27th February 1946 upwards of 45,000No. UXBs were disposed of.

On average 8.5% of UXBs later self-exploded. In some cases the bombs had delayed action fuzes or were never intended to explode, their purpose being to cause inconvenience and fear. Given the discrepancy in records and the fact that UXBs are still being found unexpectedly, it is clear that the original figures are understated and provide only an approximation of the number of potential UXBs in the UK.

War Office statistics also show that between October 1940 and May 1941 most of the UXBs (93%) were either 50kg or 250kg. It should be noted that details of the recovery and the size of the UXB were not always accurately reported.

The larger WWII UXBs are often difficult to recover due to both penetration depths and the presence of two or more fuzes, combined with more sensitive fillings of explosive mixtures including Amatol and Trialen.

5.1 Abandoned Bombs

For further information on abandoned bombs, and the potential UXO hazard associated with them, follow the link below:

- Abandoned Bombs

No records have been found indicating that any officially abandoned bombs are located on the Site.

5.2 EOC Tasks

Zetica holds records of the following post-WWII EOC task having taken place in the vicinity of the Site.

22nd March 2012

1No. 25kg mortar bomb was discovered at the River Mill Industrial Estate in Harlow, approximately 1.6km northeast of the Site. It was removed and destroyed.

6 UXO HAZARD ASSESSMENT

6.1 UXO Hazard Level

The definitions for the levels of UXO hazard are provided below.

Definitions of UXO Hazard Level for a Site	
Hazard Level	**Definition**
Very Low	There is positive evidence that UXO is not present, e.g. through physical constraints or removal.
Low	There is no positive evidence that UXO is present, but its occurrence cannot be totally discounted.
Moderate	There is positive evidence that ordnance was present or that other uncharted ordnance may be present as UXO.
High	There is positive evidence that UXO is present.
Very High	As high, but requires immediate or special attention due to the potential hazard.

No records have been found indicating that the Site was bombed and no other significant sources of UXO hazard have been identified on the Site.

Given this, it is considered that the Site has a low UXO hazard level, as shown in Figure 4.

The UXO hazard zone plan of the Site is also given in the accompanying P11211-21-R1-MAP01-A.

Figure 4 UXO hazard zone plan of the Site

Source: OpenStreetMap *Not to Scale*

Legend	Very Low	🟩	Low	🟩	Moderate	🟧
	High	🟥	Very High	🟪	Site boundary	━

7 UXO RISK ASSESSMENT

7.1 Proposed Works

No information has been provided on the proposed works.

For the purposes of this risk assessment, it is assumed that works on the Site may include intrusive ground investigations, excavations and piling.

7.2 Risk Assessment Methodology

A UXO risk assessment has been undertaken for the proposed works, taking into consideration the identified UXO hazard.

Firstly, the probability of encountering UXO (PE) has been considered and rated for the different construction techniques, as detailed below.

Probability of Encounter (PE)	**Rating**
Frequent, highly likely, almost certain.	5
Probable, more likely to happen than not.	4
Occasional, increased chance or probability.	3
Remote, unlikely to happen but could.	2
Improbable, highly unlikely.	1
Impossible	0

Secondly, the probability of detonating a UXO (PD) has been considered and rated for the different construction techniques, as detailed below.

Probability of Detonation (PD)	**Rating**
Frequent, highly likely, almost certain.	5
Probable, more likely to happen than not.	4
Occasional, increased chance or probability.	3
Remote, unlikely to happen but could.	2
Improbable, highly unlikely.	1
Impossible	0

Next, the probability of encountering and detonating the UXO (PE x PD) have been used to generate an overall likelihood rating (P).

P = PE x PD	**LIKELIHOOD of Encounter and Detonation**	**Rating**
21 to 25	Frequent, highly likely, almost certain.	5
16 to 20	Probable, more likely to happen than not.	4
6 to 15	Occasional, increased chance or probability.	3
2 to 5	Remote, unlikely to happen but could.	2
1	Improbable, highly unlikely.	1
0	Impossible	0
P ranges from 25, a certainty of UXO being encountered and detonated on the Site by engineering activity, to 0, a certainty that UXO does not occur on the Site and will not be detonated by engineering activity.		

The likelihood of encountering and detonating UXO during site works is multiplied by the severity of such an event occurring (P x S), in order to provide a risk level using the following matrix.

Severity (S)	**Rating**
Multiple fatalities	5
Major injury, long term health issues, single fatality.	4
Minor injury, short term health issues, no fatalities.	3
First aid case but no lost time or ill health.	2
Minor injuries, no first aid.	1
No injuries.	0

UXO Risk Matrix							
	SEVERITY (S)						
LIKELIHOOD (P)		**5**	**4**	**3**	**2**	**1**	**0**
	5	**25**	**20**	**15**	**10**	**5**	**0**
	4	**20**	**16**	**12**	**8**	**4**	**0**
	3	**15**	**12**	**9**	**6**	**3**	**0**
	2	**10**	**8**	**6**	**4**	**2**	**0**
	1	**5**	**4**	**3**	**2**	**1**	**0**
	0	**0**	**0**	**0**	**0**	**0**	**0**

7.3 UXO Risk Level

The UXO risk assessment for proposed works on the Site is given in Table 4.

Table 4 UXO risk assessment for the Site

Potential UXO Hazard	**Anticipated Works**	**PE**	**PD**	**P = PE x PD**	**Likelihood**	**Severity**	**Risk Rating**	**UXO Risk**
UXB	Shallow Excavations	1	1	1	1	5	5	**Low**
	Deep Excavations	1	1	1	1	5	5	**Low**
	Boreholes/Piling	1	1	1	1	4	4	**Low**
Other UXO	Shallow Excavations	1	1	1	1	4	4	**Low**
	Deep Excavations	1	1	1	1	4	4	**Low**
	Boreholes/Piling	1	1	1	1	3	3	**Low**
PE (Probability of Encounter), PD (Probability of Detonation), P (Overall Probability)								
Shallow Excavations defined as <1.0m below ground level (bgl.)								

8 RISK MITIGATION PLAN

Key findings: No significant sources of UXO hazard have been identified.

Key actions: Proceed with works.

8.1 UXO Risk Summary

Table 5 summarises the UXO risk for proposed works on the Site and recommended actions.

Table 5 Summary of UXO risk and mitigation recommendations

Proposed Works	UXO Risk	Recommended Mitigation
Excavations	🟩	**Proceed with works** – if additional comfort is required to address the residual UXO hazard, a formal UXO awareness briefing can be provided.
Boreholes/Piling	🟩	**Proceed with works**

In summary, no additional measures are considered essential to reduce the UXO risk on the Site to As Low As is Reasonably Practicable (ALARP).

8.2 Risk Mitigation Techniques

Should you wish to provide staff involved in excavations with increased awareness regarding the potential (albeit low) for UXO encounter, this can be done through a formal briefing.

8.2.1 UXO Awareness Briefing

Typically ~1hour in duration, these briefings will be expected to provide site workers with:-

- Background to the potential UXO hazards that could be encountered.
- Awareness of how the UXO hazard could present a risk.
- Knowledge of what to do in the event that a suspect item is encountered.

The briefing is to be provided along with back-up materials such as UXO awareness posters, emergency contact numbers and other background information to assist site workers in becoming familiar with what potential UXO can look like.

The materials can also be used by key staff to pass on the relevant points of the induction to others who visit or work on the Site.

By providing the UXO awareness briefing, it ensures that in the unlikely event that UXO is encountered:-

- All site staff take appropriate action.
- A support mechanism and points of contact are established.
- The likelihood of harm to people or property is reduced.
- Significant delays to site work are prevented.

8.3 What Do I Do Next?

If you have any comments or require further assistance, contact us via phone (01993 886682) or email (uxo@zetica.com) and we can help.

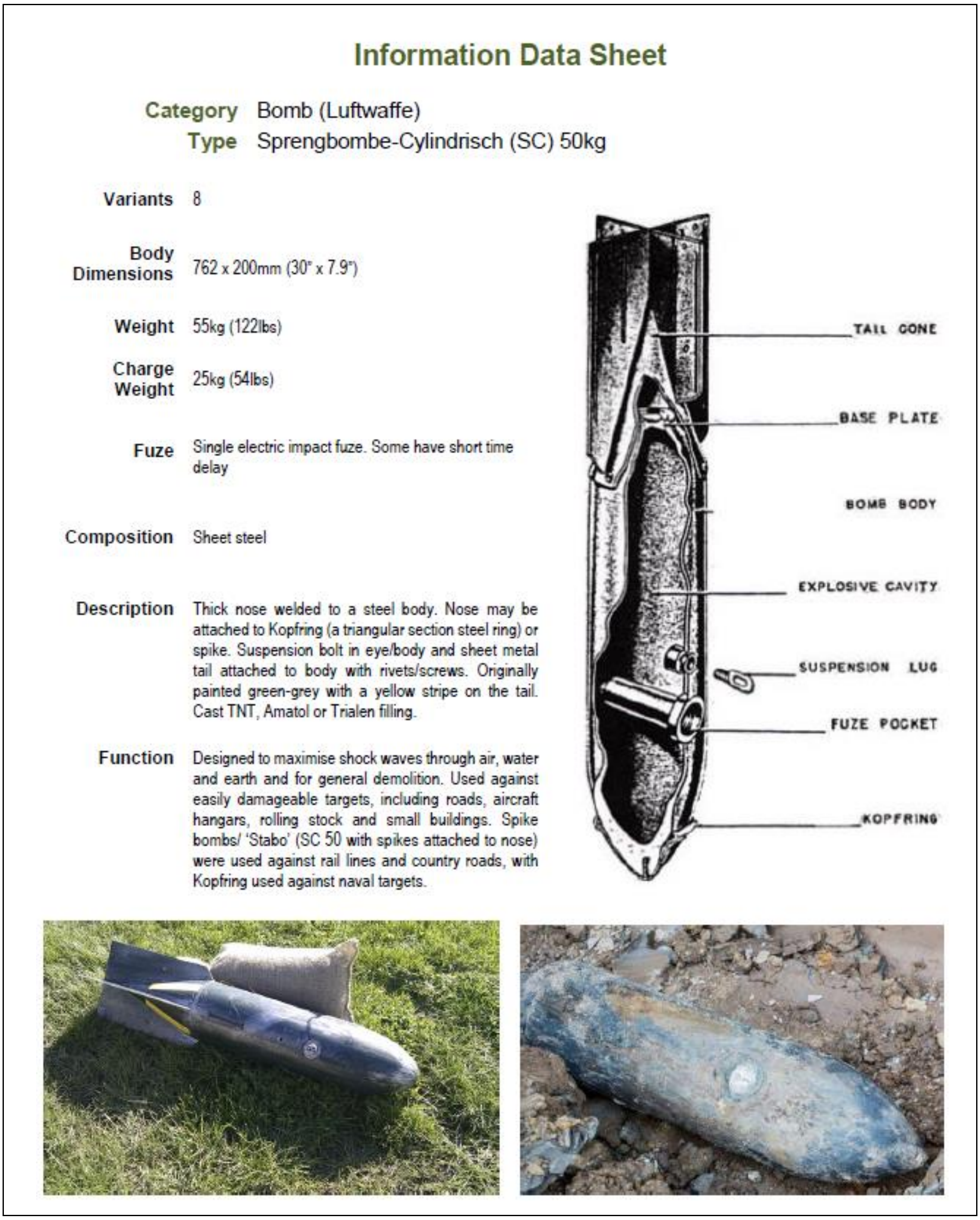
If you have requirements to identify other buried hazards (such as mapping utilities or obstructions) we can provide these surveys.

If proposed works on the Site change, or additional works are planned, contact Zetica for a re-assessment of the UXO risk and the risk mitigation requirements.

APPENDICES

Appendix 1 Anticipated Ordnance Types

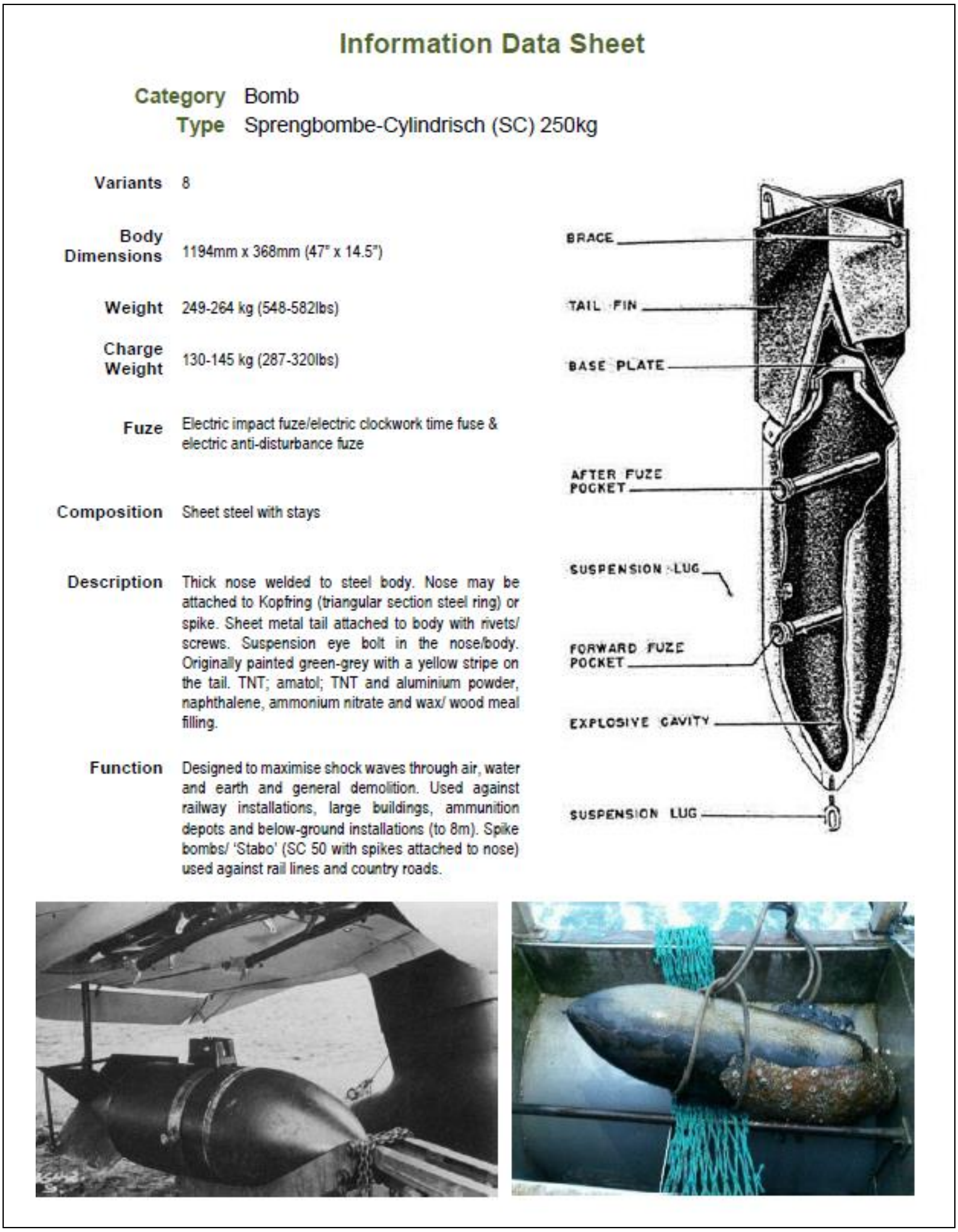
The probability of encountering UXO on the Site is considered to be low. As with any similar site in the UK, there is always a background risk of finding ordnance and potential types to be encountered are detailed below. For a more comprehensive set of ordnance data sheets, see http://zeticauxo.com/downloads-and-resources/ordnance-data-sheets/.



Information Data Sheet

Category Bomb (Luftwaffe)
Type Sprengbombe-Cylindrisch (SC) 50kg

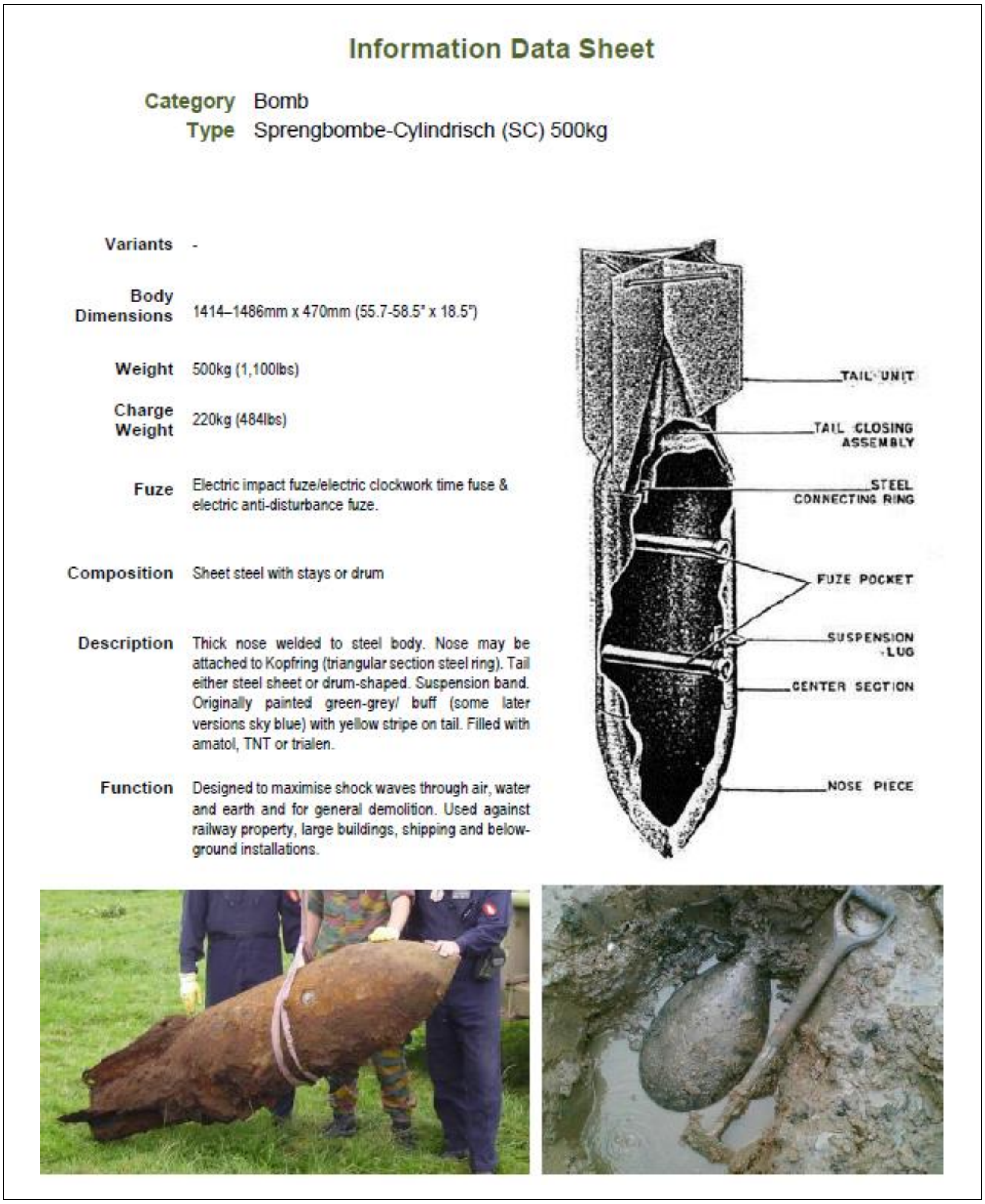
Variants	8
Body Dimensions	762 x 200mm (30" x 7.9")
Weight	55kg (122lbs)
Charge Weight	25kg (54lbs)
Fuze	Single electric impact fuze. Some have short time delay
Composition	Sheet steel
Description	Thick nose welded to a steel body. Nose may be attached to Kopfring (a triangular section steel ring) or spike. Suspension bolt in eye/body and sheet metal tail attached to body with rivets/screws. Originally painted green-grey with a yellow stripe on the tail. Cast TNT, Amatol or Trialen filling.
Function	Designed to maximise shock waves through air, water and earth and for general demolition. Used against easily damageable targets, including roads, aircraft hangars, rolling stock and small buildings. Spike bombs/ 'Stabo' (SC 50 with spikes attached to nose) were used against rail lines and country roads, with Kopfring used against naval targets.



Information Data Sheet

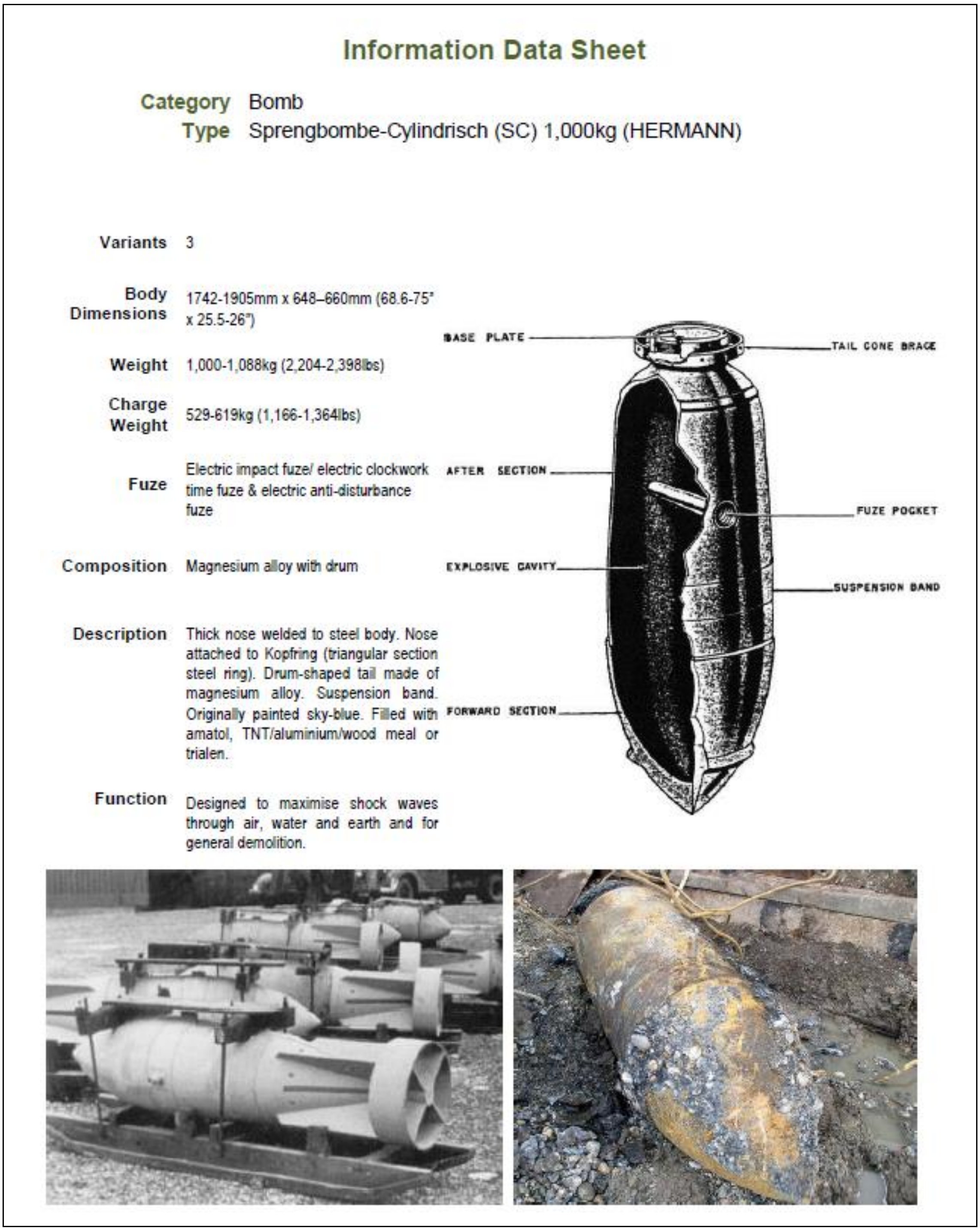
Category Bomb
Type Sprengbombe-Cylindrisch (SC) 250kg

Variants	8
Body Dimensions	1194mm x 368mm (47" x 14.5")
Weight	249-264 kg (548-582lbs)
Charge Weight	130-145 kg (287-320lbs)
Fuze	Electric impact fuze/electric clockwork time fuse & electric anti-disturbance fuze
Composition	Sheet steel with stays
Description	Thick nose welded to steel body. Nose may be attached to Kopfring (triangular section steel ring) or spike. Sheet metal tail attached to body with rivets/ screws. Suspension eye bolt in the nose/body. Originally painted green-grey with a yellow stripe on the tail. TNT; amatol; TNT and aluminium powder, naphthalene, ammonium nitrate and wax/ wood meal filling.
Function	Designed to maximise shock waves through air, water and earth and general demolition. Used against railway installations, large buildings, ammunition depots and below-ground installations (to 8m). Spike bombs/ 'Stabo' (SC 50 with spikes attached to nose) used against rail lines and country roads.



Information Data Sheet

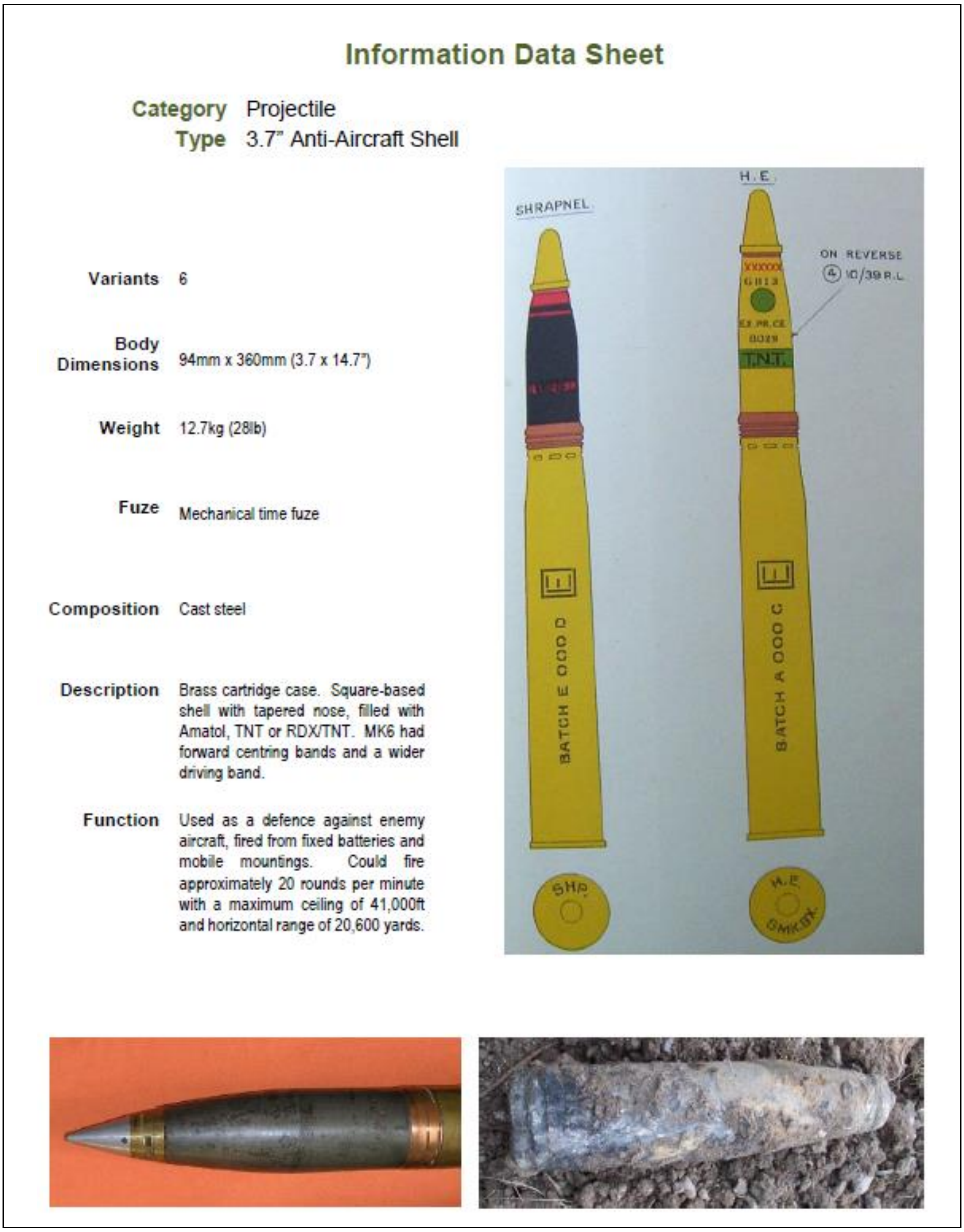
Category	Bomb
Type	Sprengbombe-Cylindrisch (SC) 500kg
Variants	-
Body Dimensions	1414–1486mm x 470mm (55.7-58.5" x 18.5")
Weight	500kg (1,100lbs)
Charge Weight	220kg (484lbs)
Fuze	Electric impact fuze/electric clockwork time fuse & electric anti-disturbance fuze.
Composition	Sheet steel with stays or drum
Description	Thick nose welded to steel body. Nose may be attached to Kopfring (triangular section steel ring). Tail either steel sheet or drum-shaped. Suspension band. Originally painted green-grey/ buff (some later versions sky blue) with yellow stripe on tail. Filled with amatol, TNT or trialen.
Function	Designed to maximise shock waves through air, water and earth and for general demolition. Used against railway property, large buildings, shipping and below-ground installations.



Information Data Sheet

Category Bomb
Type Sprengbombe-Cylindrisch (SC) 1,000kg (HERMANN)

Variants	3
Body Dimensions	1742-1905mm x 648–660mm (68.6-75" x 25.5-26")
Weight	1,000-1,088kg (2,204-2,398lbs)
Charge Weight	529-619kg (1,166-1,364lbs)
Fuze	Electric impact fuze/ electric clockwork time fuze & electric anti-disturbance fuze
Composition	Magnesium alloy with drum
Description	Thick nose welded to steel body. Nose attached to Kopfring (triangular section steel ring). Drum-shaped tail made of magnesium alloy. Suspension band. Originally painted sky-blue. Filled with amatol, TNT/aluminium/wood meal or trialen.
Function	Designed to maximise shock waves through air, water and earth and for general demolition.



Information Data Sheet

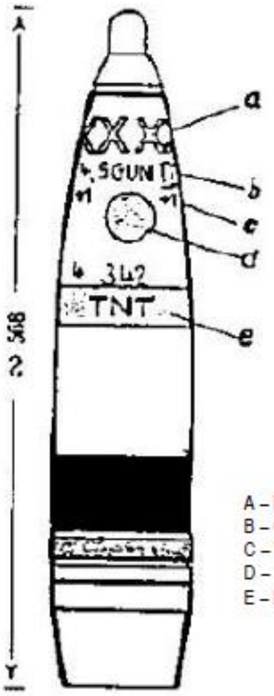
Category Projectile
Type 3.7" Anti-Aircraft Shell

Variants	6
Body Dimensions	94mm x 360mm (3.7 x 14.7")
Weight	12.7kg (28lb)
Fuze	Mechanical time fuze
Composition	Cast steel
Description	Brass cartridge case. Square-based shell with tapered nose, filled with Amatol, TNT or RDX/TNT. MK6 had forward centring bands and a wider driving band.
Function	Used as a defence against enemy aircraft, fired from fixed batteries and mobile mountings. Could fire approximately 20 rounds per minute with a maximum ceiling of 41,000ft and horizontal range of 20,600 yards.

Information Data Sheet

Category Projectile
Type 4.5” Shell (Mark II – Anti-Aircraft)

Variants	-
Body Dimensions	114mm x 566mm (4.5” x 21.9”)
Weight	24.9kg (55lb)
Fuze	Mechanical time fuze
Composition	Cast steel
Description	Square-based, tapered-nosed shell filled with TNT or Amatol. Steel casing, rotating band of either copper or gilding metal located 3.5” in front of the base end with single groove.
Function	Used as field artillery and adapted for use in anti-aircraft defence from fixed batteries. Rate of fire of 8 rounds per minute, maximum ceiling of 44,000ft and horizontal range of 22,800 yards.



A – Missile Identification
B – Gun and Bullet Type
C – Weight
D – Smoke pot
E – Explosives Ring



Appendix 2 Sources of UXO Hazard

The sections below provide background information on the potential sources of UXO hazard (albeit low) affecting the Site. For a more comprehensive set of UXO information sheets, see http://zeticauxo.com/downloads-and-resources/uxo-information-sheets/.

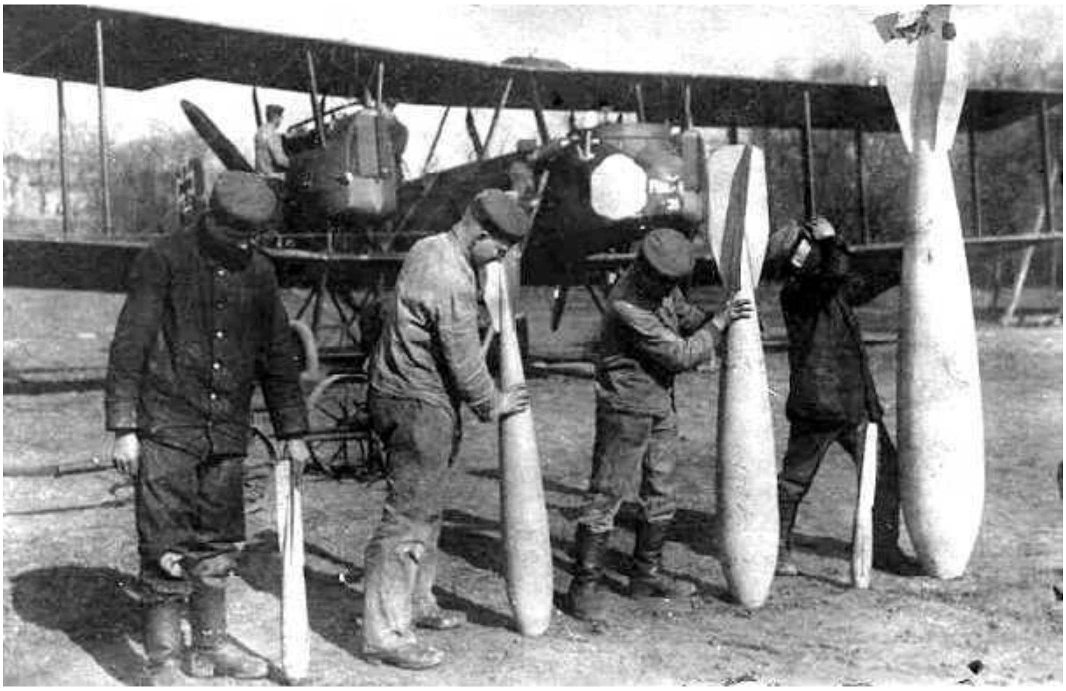
Appendix 2.1 WWI Bombing

It is not generally realised that during World War One (WWI) significant bombing took place across some areas of the UK. An estimated 9,000No. German bombs were dropped on Britain during the course of 51No. airship and 52No. aircraft raids. It was the first time that strategic aerial bombardment had been used. More than 1,400No. people were killed during these raids.

Most air raids were carried out on London and Southeast England. Areas along the East Coast were also targeted regularly due to their proximity to the European continent. Bombing raids further inland were rare and West England and Wales were out of reach for German aircraft of the time.

Aerial bombing during WWI initially relied on visual aiming, with bombsights not developed until later in the war. The inaccuracy inherent in this method meant that bombs often fell some way from their intended targets.

The first recorded raid against England occurred on the 21st December 1914 when 2No. high explosive bombs fell near the Admiralty Pier at Dover. Zeppelin raids intensified during 1915 and 1916, with aircraft raids becoming more frequent after 1917. The last raid of WWI took place on the 19th May 1918, when 38 Gotha and 3 Giant aircraft bombed London and surrounding districts, dropping a total of more than 2,500lbs of bombs.



The potential of coming across an Unexploded Bomb (UXB) from WWI is far less likely than a WWII UXB given the lower bombing densities during raids in the Great War.

Some areas which were subjected to sustained bombing raids, such as parts of London and coastal towns, recorded a higher number of UXB. In these areas, where there has been no significant development for the last century, the potential of a UXB remaining from WWI cannot be totally discounted.

Appendix 2.2 WWII Bombing

Bombing raids began in the summer of 1940 and continued until the end of WWII. Bombing densities generally increased towards major cities or strategic targets such as docks, harbours, industrial premises, power stations and airfields. In addition to London, industrial cities and ports, including Birmingham, Coventry, Southampton, Liverpool, Hull and Glasgow, were heavily targeted, as well as seaside towns such as Eastbourne and cathedral cities such as Canterbury.

The German bombing campaign saw the extensive use of both High Explosive (HE) bombs and Incendiary Bombs (IBs). The most common HE bombs were the 50kg and 250kg bombs, although 500kg were also used to a lesser extent. More rarely 1,000kg, 1,400kg and 1,800kg bombs were dropped.

The HE bombs tended to contain about half of their weight in explosives and were fitted with one or sometimes two fuzes. Not all HE bombs were intended to explode on impact. Some contained timing mechanisms where detonation could occur more than 70 hours after impact.

Incendiary devices ranged from small 1kg thermite filled, magnesium bodied Incendiary Bombs (IBs) to a 250kg ‘Oil Bomb’ (OB) and a 500kg ‘C300’ IB. In some cases the IBs were fitted with a bursting charge. This exploded after the bomb had been alight for a few minutes causing burning debris to be scattered over a greater area. The C300 bombs were similar in appearance to 500kg HE bombs, although their design was sufficiently different to warrant a specially trained unit of the Royal Engineers to deal with their disposal.

Anti-Personnel (AP) bombs and Parachute Mines (PMs) were also deployed. 2No. types of anti-personnel bombs were in common use, the 2kg and the 12kg bomb. The 2kg bomb could inflict injury across an area up to 150m away from the impact. PMs (which were up to 4m in length) could be detonated either magnetically or by noise/vibration.

Anti-shipping parachute mines were commonly dropped over navigable rivers, dockland areas and coastlines. The Royal Navy was responsible for ensuring that the bombs were made safe. Removal and disposal was still the responsibility of the Bomb Disposal Unit of the Royal Engineers.

In 1944, the Germans introduced new weapons; the V1, a ‘flying bomb’ and guided missile, and the V2, a ballistic missile rocket that travelled at such speed that no one could see or hear its approach. London was the main target for these attacks.

WWII bomb targeting was inaccurate, especially in the first year of the war. A typical bomb load of 50kg HE bombs mixed with IBs which was aimed at a specific location might not just miss the intended target but fall some considerable distance away.

It is understood that the local Civil Defence authorities in urban areas had a comprehensive system for reporting bomb incidents and dealing with any Unexploded Bombs (UXB) or other UXO. In more rural areas, fewer bombing raids occurred. It is known that Air Raid Precaution (ARP) records under-represent the number and frequency of bombs falling in rural and coastal areas. Bombs were either released over targets or as part of ‘tip and run’ raids where bomber crews would drop their bombs to avoid anti-aircraft fire or Allied fighter aircraft on the route to and from other strategic targets. Bombs dropped as a result of poor targeting or ‘tip and run’ raids on rural and coastal areas often went unrecorded or entered as ‘fell in open country’ or ‘fell in the sea’. The Luftwaffe are thought to have dropped approximately 75,000 tons of bombs on Britain throughout the Second World War and an estimated 11% of all bombs dropped during the war failed to detonate.

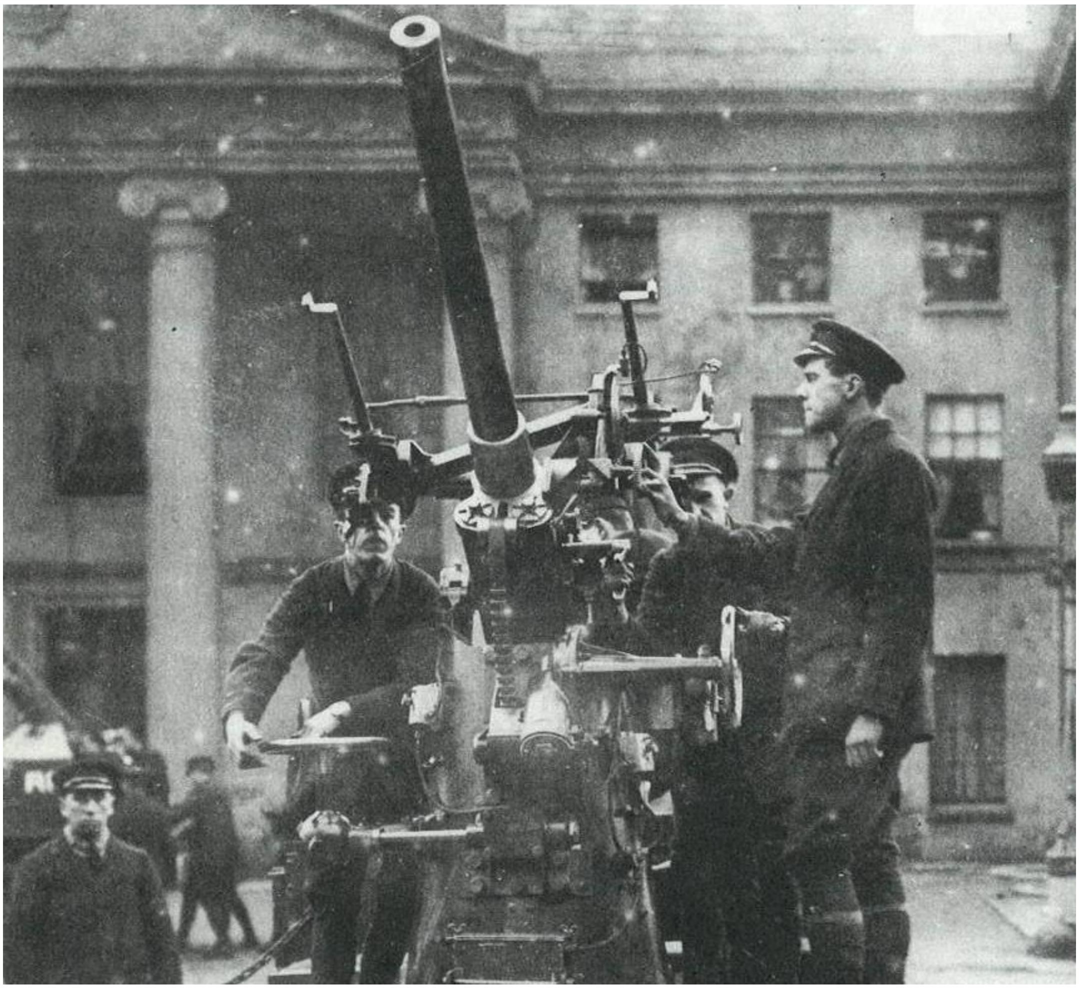
The potential for a UXB hazard to exist on a site depends on a variety of factors. Were there strategic targets in the surrounding area? Was the site bombed? Could a UXB impact have been missed? Even in rural areas, the potential for UXB cannot be totally discounted and therefore it is essential that detailed local bombing records are obtained when assessing the UXB hazard on any site.

Appendix 2.3 Anti-Aircraft Guns

As aerial bombardment first began during WWI, Anti-Aircraft (AA) gun batteries were established were gradually established throughout much of England to counter German bombing raids. By June 1916, there were approximately 271No. AA guns and 258No. searchlight installations defending London alone.

Common AA defences during WWI included 3-inch, 75 millimetre, 6-pounder and 1-pounder guns. Many of these guns were mobile, being mounted on lorry chassis. They were driven about following the course of an airship and fired from any area of open land.

During WWI, Unexploded AA (UXAA) shells, could land up to 13km from the firing point, although more typically fell within 10km.



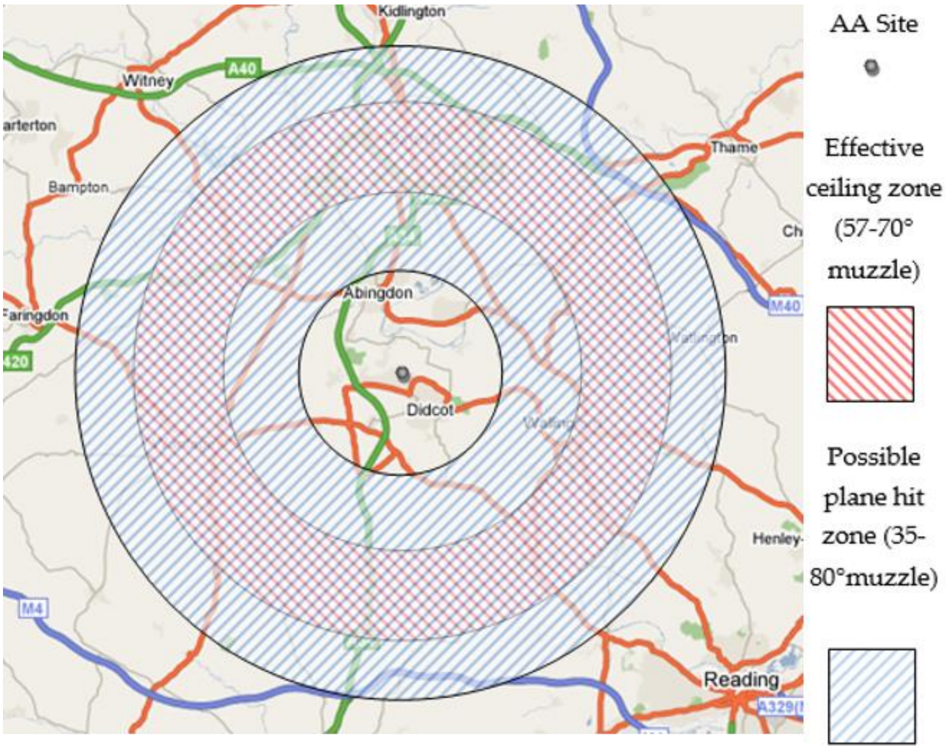
AA gun batteries were used extensively during WWII to counter the threat posed by enemy aircraft. In many instances, AA shells caused damage to Allied territory and in some areas caused significant numbers of civilian fatalities.

During WWII, AA shells could land up to 27km from the firing point, although more typically fell within 15km. These could be distributed over a wide area.

3No. types of AA batteries existed:

- **Heavy Anti-Aircraft (HAA)** batteries of large guns (typically 3.7", 4.5" and 5.25" calibre) designed to engage high flying bomber aircraft. These tended to be relatively permanent gun emplacements.
- **Light Anti-Aircraft (LAA)** weaponry, designed to counter low flying aircraft. These were often mobile and were moved periodically to new locations around strategic targets such as airfields. They typically fired 40mm shells and machine gun ammunition.
- **Rocket batteries (ZAA)** firing 3" or 3.7" AA rockets with a maximum altitude of 5,800m and a ground range of 9km were typically permanent emplacements.

Unexploded AA (UXAA) shells were a common occurrence during WWII. As the figure below demonstrates, shells were unlikely to fall in the immediate vicinity of a gun battery but in the surrounding area. This would be dependent upon the angle of fire and the flight height of the attacking aircraft.



AA batteries were deliberately targeted by the Luftwaffe and therefore areas surrounding a gun battery may have a greater risk of UXB being present.

Munitions stores were also established around AA batteries. These stored the shells for the batteries and small arms ammunition for troops manning the position. Such stores were typically removed at the end of WWII, although some disposal may have occurred in the immediate vicinity of the gun battery.

Appendix 3 Recent UXO Finds

UXO finds in the UK are a regular occurrence, although they almost never result in an accidental detonation.

It is still important to note that explosives rarely lose effectiveness with age. In some instances, mechanisms such as fuzes and gaines can become more sensitive and more prone to detonation, regardless of whether the device has been submersed in water or embedded in silt, clay or similar materials.

The effects of an accidental UXO detonation are usually extremely fast, often catastrophic and invariably traumatic to any personnel involved. Such occurrences are largely restricted to current theatres of war and overseas minefields, with occasional events in mainland Europe.

The sections below provide a brief summary of recent significant UXO finds in the UK. To keep up to date with the latest UXO finds, visit http://zeticauxo.com/news/.

On the 11th February 2018, 1No. 500kg UXB was found in King George V Dock in London, resulting in the temporary closure of the adjacent London City Airport. The UXB was freed from a silt bed and towed along the River Thames to Shoeburyness where it was destroyed in a controlled explosion.

On the 20th May 2018, a 1,000kg German sea mine washed ashore at Elmer beach near Bognor Regis, West Sussex. A 1 mile exclusion zone was enforced before an EOD team towed the device out to sea for a controlled explosion.

On the 10th July 2018, a suspected 1,000kg German UXB was found by scuba divers near Teignmouth Pier in Devon. The UXB was towed out into open sea by a RN EOD team for a controlled explosion.

On the 30th August 2018, a 2,000lb German PM was trawled up by a fishing vessel off Mersea in Essex. The PM was moved to an area of open sea where it was destroyed in a controlled explosion by a RN EOD team.

On the 21st January 2019 a suspected 1,000lb torpedo was brought into Brixham Harbour by a fishing trawler. It was towed back out to sea and destroyed by a Naval EOD team.

On the 14th March 2019 an unexploded pipe mine was found at the former RAF Manston airfield near Ramsgate, Kent. It was destroyed in a controlled explosion.

On the 23rd May 2019 a 250kg German UXB was found by workers on a building site at Kingston University in London. The UXB could not be safely removed and was consequently destroyed in situ by an EOD team.

On the 7th June 2019 a 50kg German fragmentation UXB was found at a building site in Kings Hill at the former RAF West Malling airfield. It was destroyed in a controlled explosion by an EOD team the following day. On the 26th September 2019 another 50kg German UXB was found at Kings Hill and was destroyed in a controlled explosion the next day.

On the 20th September 2019 a suspected 250kg German UXB was found on a construction site in Bordon, Hampshire. It was destroyed in a controlled explosion by an EOD team.

On the 3rd February 2020, a 500kg German UXB was found on a building site in Soho, London. It was removed by an EOD team.

On the 22nd and 23rd February 2020, storms uncovered 16No. items of UXO on beaches near Southend-on-Sea in Essex, prompting a race to locate, identify and dispose of each item before they were lost to incoming tides. They were destroyed in-situ by a Royal Navy EOD team.

On the 5th March 2020, several items of historic unexploded ordnance was uncovered at Sandwich Bay in Kent and investigated by a Royal Logistics Corps EOD team. A similar event occurred in the same area in 2016.

On the 18th April 2020, a 500lb British UXB was discovered by a farmer near Drayton in Oxfordshire. The area had been used as an RAF practice bombing range during WWII and after an in-situ disposal was completed the item was found to have contained no explosives.

On the 4th May 2020, a UXB was discovered by builders at Kings Hill on the former RAF West Malling airfield, the fourth found since 2017. It was destroyed in a controlled explosion.

On the 21st July 2020, more than 100No. items of UXO were washed ashore at Eskmeals beach in Cumbria. An army EOD team attended the site and confirmed they had come from the nearby MoD Eskmeals Range. Whilst many items were found to be inert, those which contained explosives were destroyed in-situ.

On the 19th September 2020, 2No. anti-submarine torpedoes were uncovered on Sand Bay near Weston-super-Mare, Somerset. Both items were confirmed to be ‘test’ devices and destroyed in-situ by a Royal Navy EOD team.

On the 1st December 2020, a research vessel discovered an unexploded marine mine containing 350kg of explosives in Wemyss Bay in the Firth of Clyde. RN divers investigated the item and destroyed it.

On the 25th December 2020, a UXB was found on Eastney Beach, Hampshire. An army EOD team closed the beach and carried out a controlled explosion of the item.

On the 26th February 2021, a 1,000kg German “Hermann” UXB was discovered by builders at Exeter University campus (see plate below). It was investigated and detonated in-situ following the evacuation of nearby properties and University halls of residence.

Appendix 4 Glossary and Definitions

Abandoned Explosive Ordnance (AXO)	Abandoned Explosive Ordnance is explosive ordnance that has not been used during an armed conflict, that has been left behind or disposed of by a party to an armed conflict, and which is no longer under control of that party. Abandoned explosive ordnance may or may not have been primed, fuzed, armed or otherwise prepared for use.
Close Combat Munitions	Items of ordnance thrown, propelled or placed during land warfare, to include grenades, mortars, projectiles, rockets and land mines.
Demil	Derived from the term 'Demilitarisation', it refers to the break down and the recycling or disposal of ordnance components.
Detonation	The high-speed chemical breakdown of an energetic material producing heat, pressure, flame and a shock wave.
Device	This term is used for any component, sub-assembly or completed ordnance, which may or may not have an explosive risk. It can apply to detonators, primers, gaines, fuzes, shells or bombs.
Explosive	The term explosive refers to compounds forming energetic materials that under certain conditions chemically react, rapidly producing gas, heat and pressure. Obviously, these are extremely dangerous and should only be handled by qualified professionals.
Explosive Ordnance (EO)	Explosive Ordnance is all munitions containing explosives, nuclear fission or fusion materials and biological and chemical agents. This includes bombs and warheads, guided and ballistic missiles, artillery, mortar, rocket, small arms ammunition, mines, torpedoes, depth charges, pyrotechnics, cluster bombs & dispensers, cartridge & propellant actuated devices, electro-explosive devices, clandestine & improvised explosive devices, and all similar or related items or components explosive in nature.
Explosive Ordnance Clearance (EOC)	Explosive Ordnance Clearance is a term used to describe the operation of ordnance detection, investigation, identification and removal, with EOD being a separate operation.
Explosive Ordnance Disposal (EOD)	Explosive Ordnance Disposal is the detection, identification, on-site evaluation, rendering safe, recovery and final disposal of unexploded explosive ordnance.
Explosive Ordnance Reconnaissance (EOR)	Explosive Ordnance Reconnaissance is the detection, identification and on-site evaluation of unexploded explosive ordnance before Explosive Ordnance Disposal.
Explosive Remnants of War (ERW)	Explosive Remnants of War are Unexploded Ordnance (UXO) and Abandoned Explosive Ordnance (AXO), excluding landmines.

Explosive Substances and Articles (ESA)	Explosive substances are solid or liquid substances (or a mixture of substances), which are either: • capable by chemical reaction in itself of producing gas at such a temperature and pressure and at such a speed as to cause damage to the surroundings. • designed to produce an effect by heat, light, sound, gas or smoke, or a combination of these as a result of a non-detonative, self-sustaining, exothermic reaction. Explosive article is an article containing one or more explosive substances.
Fuze	A fuze is the part of an explosive device that initiates the main explosive charge to function. In common usage, the word fuze is used indiscriminately, but when being specific (and in particular in a military context), fuze is used to mean a more complicated device, such as a device within military ordnance.
Gaine	Small explosive charge that is sometimes placed between the detonator and the main charge to ensure ignition.
Geophysical survey	A geophysical survey is essentially a range of methods that can be used to detect objects or identify ground conditions without the need for intrusive methods (such as excavation or drilling). This is particularly suited to ordnance as disturbance of ordnance items is to be avoided where ever possible.
Gold line	This is the estimated limit of blast damage from an explosive storage magazine. It usually means that development within this zone is restricted.
High Explosive	Secondary explosives (commonly known as High Explosives (HE)) make up the main charge or filling of an ordnance device. They are usually less sensitive than primary explosives. Examples of secondary explosives are: Nitro glycerine (NG), Trinitrotoluene (TNT), AMATOL (Ammonia nitrate + TNT), Gunpowder (GP), and Cyclotrimethylenetrinitramine (RDX).
Munition	Munition is the complete device charged with explosives, propellants, pyrotechnics, initiating composition, or nuclear, biological or chemical material for use in military operations, including demolitions. This includes those munitions that have been suitably modified for use in training, ceremonial or non-operational purposes. These fall into three distinct categories:- • inert - contain no explosives whatsoever. • live - contain explosives and have not been fired. • blind - have fired but failed to function as intended.

Primary Explosive	Primary explosives are usually extremely sensitive to friction, heat, and pressure. These are used to initiate less sensitive explosives. Examples of primary explosives are: Lead Azide, Lead Styphnate, and Mercury Fulminate. Primary explosive are commonly found in detonators.
Propellants	Propellants provide ordnance with the ability to travel in a controlled manner and deliver the ordnance to a predetermined target. Propellants burn rapidly producing gas, pressure and flame. Although usually in solid form they can be produced in liquid form. Examples of propellants are: Ballistite often found in a flake form and Cordite used in small arms ammunition.
Pyrotechnic	A pyrotechnic is an explosive article or substance designed to produce an effect by heat, light, sound, gas or smoke, or a combination of any of these, as a result of non-detonative, self-sustaining, exothermic chemical reactions.
Small Arms Ammunition (SAA)	SAA includes projectiles around 12mm or less in calibre and no longer than approximately 100mm. They are fired from a variety of weapons, including rifles, pistols, shotguns and machine guns.
Unexploded Anti-Aircraft (UXAA) Shell	UXAA shells are army ordnance commonly containing HE, though they can also contain pyrotechnic compounds that produce smoke. Most commonly, these were 3.7” and 4.5” HE shells, although they ranged from 2” to 5.25” calibre.
Unexploded Bomb (UXB)	UXB is a common term for unexploded air-dropped munitions.
Unexploded Ordnance (UXO)	UXO is explosive ordnance that has been either primed, fuzed, armed or prepared for use and has been subsequently fired, dropped, launched, projected or placed in such a manner as to present a hazard to operations, persons or objects and remains unexploded either by malfunction or design.
V1	The Vergeltungswaffe-1, V-1, also designated Fieseler Fi 103/FZG-76, known colloquially in English as the Flying Bomb, Buzz Bomb or Doodlebug, was the first guided missile used in WWII and the forerunner of today's cruise missile.
V2	The Vergeltungswaffe 2 (V-2) (‘Reprisal Weapon 2’) was the first ballistic missile. It was used by the German Army primarily against Belgian and British targets during the later stages of WWII. The V-2 was the first man-made object launched into space, during test flights that reached an altitude of 189km (117 miles) in 1944.

Appendix 5 WWII Bombing Incident List

30th August 1940

6No. HE bombs fell on open fields near Eastwick, approximately 1.6km northwest of the Site**.**

3rd September 1940

1No. HE bomb fell on open ground near Bromley Farm, approximately 0.9km east-northeast of the Site.

Several IBs fell on open ground near St Mary's Churchyard, approximately 2.8km east of the Site.

1No. IB fell on open ground near High House Estate, approximately 3km east of the Site.

11th September 1940

1No. HE bomb fell on the rear garden of Norman's Shop, Market Street, Harlow, approximately 1.7km east of the Site. This was recorded as UXB.

18th September 1940

1No. bomb (Type unspecified) fell on a sand pit south of Netteswell Cross, approximately 0.2km west of the Site.

21st September 1940

1No. HE bomb fell on St John's Avenue, approximately 2.2km east of the Site.

5th October 1940

2No. HE bombs fell on New Hall Farm, Newhall, approximately 2.2km southeast of the Site.

9th October 1940

1No. HE bomb fell on footpath west of allotments, Park Lane, approximately 0.3km west of the Site. This was recorded as an UXB.

16th October 1940

Several IBs fell on Little Parndon, approximately 1.3km west of the Site.

1No. Oil Bomb (OB) fell on Harlow Common, approximately 3.1km southeast of the Site.

16th November 1940

2No. HE bomb fell on open ground, Netteswell Road, approximately 0.2km west of the Site. These was recorded as UXB and was disposed of on 15th April 1941.

29th November 1940

1No. Delayed Action Bomb (DAB) fell on open ground west of Nettleswell Cross, approximately 0.5km west of the Site.

Several IBs fell on open ground north of Passmores, Nettleswell, approximately 2km southwest of the Site.

Several IBs fell on Harlow Railway Station, approximately 2km northeast of the Site.

9th December 1940

8No. HE bombs fell on the junction of Nettleswell Road and Latton Road, approximately 0.3km east of the Site. 2No. of these were recorded as UXB and disposed of on 9th December 1940.

Several IBs fell on the junction of Latton Street and Nettleswell Road, approximately 0.6km east of the Site.

1No. HE bomb fell on bungalows, Potter Street, approximately 2.1km southeast of the Site.

Several IBs fell on St John's Avenue, approximately 2.2km east of the Site.

3No. IBs fell on The Elm, Old Road, approximately 2.4km east-northeast of the Site.

17th April 1941

1No. HE bomb fell on open ground near Netteswell Hall, approximately 0.6km west-southwest of the Site.

10th February 1943

1No. 1000kg HE bomb fell on open field near Kennels, approximately 2km east of the Site. This was recorded as UXB.

12th August 1943

2No. 500kg HE bombs fell on an open field, Hare Street, approximately 1.7km southwest of the Site. These were recorded as UXB.

10th December 1943

2No. 1000kg HE bombs fell on open field southeast of Kennels, London Road, approximately 2.4km southeast of the Site. These were recorded as UXB.

19th February 1944

1No. 50kg HE bomb fell on open field, Netteswell Road, approximately 0.3km northeast of the Site. This was recorded as UXB and removed on the 2nd March 1944.

1No. IB fell on Latton Vicarage, approximately 0.3km southeast of the Site.

8No. 50kg HE bombs fell on open ground near Bromley Farm, Netteswell Road, between approximately 0.8km east and 1.2km northeast of the Site. These were recorded as UXB and removed on the 2nd March 1944.

12th April 1944

1No. IB fell on open field north of Bromleys, Netteswell Road, approximately 1.7km northeast of the Site. This was recorded as Unexploded Incendiary Bomb (UXIB).

19th April 1944

Several IBs fell on Netteswell Common, approximately 1km south of the Site.

Several IBs fell on Newhall Farm, approximately 2km east of the Site.

Several IBs fell on Linford End, Great Parndon, approximately 2.1km southeast of the Site.

24th July 1944

1No. V1 fell on open ground east of Netteswell Rectory, approximately 1km south of the Site.

23rd November 1944

1No. V1 fell on a field near Hubbard's Hall, approximately 2.7km east-southeast of the Site.

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Appendix C HSP Consulting Phase 2 Report

PHASE II GEO-ENVIRONMENTAL ASSESSMENT REPORT

Burnt Mill Academy, Harlow

HSP2022-C3825-G-GPII-601 - FINAL

May 2022

CIVIL | STRUCTURAL | GEOTECHNICAL & ENVIRONMENTAL | TRAFFIC AND TRANSPORT

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Phase II Geo-Environmental Assessment Report

This report was produced by HSP Consulting Engineers Ltd for MACE Group Ltd on behalf of the Department for Education as the Phase II Geo-environmental Assessment Report for Burnt Mill Academy to identify possible areas of contamination and provide an assessment of potential ground related development constraints to inform a feasibility study.

This report may not be used by any person other than MACE Group Ltd on behalf of the Department for Education and must not be relied upon by any other party without the explicit written permission of HSP Consulting Engineers Ltd. In any event, HSP Consulting Engineers Ltd accepts no liability for any costs, liabilities or losses arising as a result of the use or reliance upon the contents of this report by any person other than MACE Group Ltd and the Department of Education.

All parties to this report do not intend any of the terms of the Contracts (Rights of Third Party Act 1999) to apply to this report. Please note that this report does not purport to provide definitive legal advice.

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Executive Summary

HSP Consulting has been commissioned by MACE Group Ltd to provide a Phase II Geo-environmental Assessment report providing information on likely constraints to the development of the site, parameters for design and recommendations for any mitigation measures should they be required.

The site is currently occupied by Burnt Mill Academy and associated playing fields, outdoor space and car parking. The site is rectangular in shape and is approximately 5.52Ha in area. The approximate National Grid Reference for the centre of the site is (NGR) 545445, 210863. The development proposals include the demolition of the existing buildings upon the site and the construction of a three storey ‘super’ block in the south western section of the site, a single storey sports centre and swimming pool in the south eastern section of the site and a two storey admin block will be located in the centre of the southern half of the site. In order to accommodate the construction works two, two-storey temporary classroom blocks will be located in the centre of the site.

The ground investigation comprised twelve windowless sample boreholes to a maximum depth of 5.00m begl and four cable percussion boreholes to a maximum depth of 15.00m begl. The geology of the site comprises topsoil and made ground deposits overlying superficial Glaciofluvial Deposits or superficial deposits belonging to the Lowestoft Formation over bedrock deposits of the London Clay Formation.

For the proposed buildings within the south of the site, where higher loadings will be required (proposed three storey teaching block and proposed swimming pool) it is recommended a piled foundation solution is adopted with piles extending into the competent Lowestoft Formation deposits anticipated below 13m begl. Any piling solution would need to be designed and warranted by a specialist subcontractor. It is recommended the foundation options are reviewed once the layout and loadings have been finalised.

Traditional foundations may be considered for lightly loaded structures in the south of the site but would need further confirmation of the ground conditions beneath the proposed building footprints following demolition works. At this stage, minimum foundation depths would need to be in the region of 1.0m to 1.5m begl within the granular superficial deposits, designed to a net allowable bearing pressure of 100kN/m^2 to limit total settlements to less than 25mm and differential settlements to acceptable limits. Deepening of foundations should be limited to 2.0m begl and pad sizes maintained to a maximum 2m x 2m due to lower strength deposits encountered from 4m begl.

For the proposed temporary buildings within the centre of the site, traditional foundations are unlikely to be feasible due to the depth of Made Ground and lower strength cohesive deposits at shallow depths. For this area of the site a raft foundation could be considered.

The screening process for on-site human health receptors show that the GACs, representative of minimal risk for a residential without home grown produce setting were exceeded for Lead and Arsenic in two samples of natural ground. As the GACs based on a residential without home grown produce end use are precautionary a SSAC for Arsenic was generated to allow further assessment. The SSAC generated for Arsenic is higher than the concentrations exhibited in the natural ground samples tested and therefore the risk to the human health of the end user is acceptably low and no further mitigation measures will be required. The depth of the elevated Lead concentration (2.20m begl) is considered to not pose a risk to the human health of the end user.

Ground gas monitoring has been undertaken on four occasions. The results of monitoring, indicates that elevated concentrations of methane and carbon dioxide have been recorded within two boreholes, WS02 and WS10a. WS02 and WS10a are located within the central section of the site where the proposed two storey temporary classrooms will be located during the construction phase of this project. As no elevated gas concentrations have been recorded within any of the other exploratory hole locations across the site it is recommended to zone the site and treat the area of the temporary classrooms in the centre of the site separately to the main development area in the southern third of the site. Comparison of the results from WS02 and WS10a, with Table 2 of BS8485:2015 + A1:2019 indicates that this area of the site falls into a Characteristic Situation 2 and therefore ground gas protection measures will be required as part of the temporary classroom development located within the central section of the site.

The results of monitoring, within the remaining exploratory locations indicates that methane has not been recorded above the monitoring devices minimum level of detection (<0.1% by volume in air). Carbon dioxide has been recorded at concentrations up to a maximum 4.6% by volume in air. Steady state gas flows have been recorded up to a maximum of 0.1/hr. From the results above, the maximum steady state gas screening value for the site is 0.0046 l/hr. Comparison of these results with Table 2 of BS8485:2015 + A1:2019 indicates that the site falls into a Characteristic Situation 1 and therefore ground gas protection measures will be not required as part of the main school development located within the southern section of the site.

The results of sulphate and pH testing carried out on selected soil samples taken during this investigation indicate it is appropriate to adopt a basic Design Sulphate Class of DS-1 together with and Aggressive Chemical Environment for Concrete (ACEC) of AC-1s.

Based on the results to date it is considered that standard PE and PVC are unlikely to be suitable for water supply pipes across the site area, however, confirmation should be sought from utility providers.

The executive summary contains an overview of key findings and conclusions. However, no reliance should be placed on the executive summary until the whole of the report has been read. Other sections of the report may contain information which puts into context the findings noted within the executive summary.

1. Introduction

1.1 Background

This report has been prepared to support a feasibility study and at present it is understood that the development proposals include the demolition of the existing buildings upon the site and the construction of a three storey ‘super’ block in the south west of the site, a single storey sports centre and swimming pool in the south east of the site and a two storey admin block will be located in the centre of the southern half of the site. Car parking will remain in the south of the site and playing fields in the northern half of the site will not be altered. In order to accommodate the construction works two, two-storey temporary classroom blocks will be located in the centre of the site.

1.2 Client Brief & Scope

HSP Consulting has been commissioned by MACE Group Ltd to undertake an intrusive ground investigation at the site to investigate the existing ground conditions and provide information on likely constraints to development, preliminary parameters for design and recommendations for any mitigation measures to support a feasibility study.

The report presents the following information:

- a summary of the previous Geo-environmental Reports (Section 1.5 below),
- details of the ground investigation undertaken and the ground conditions encountered,
- details and results of the geotechnical testing and contamination analysis,
- recommendations for mitigating constraints to the proposed development where appropriate and providing preliminary parameters for foundation design.

Where applicable, the fieldwork was undertaken in accordance with BS5930:2015+A1:2020 Code of Practice for Ground Investigations and BS10175:2011+A2:2017 Investigation of Potentially Contaminated Sites.

1.3 Report Objectives

The objectives of this report are to:

- establish the geological and hydrogeological conditions using existing available/published information.
- summarise available information and identify site specific geotechnical and environmental hazards which may place a constraint upon the proposed site use.
- produce an updated Conceptual Site Model identifying potential pollution linkages between sources of contamination, pathways and receptors.

1.4 Limitations

The recommendations made in this report are based on the findings of the intrusive ground investigation undertaken between the 26th November 2021 (windowless sample boreholes) and the 14th – 18th February 2022 (cable percussive boreholes and window sample boreholes) by HSP Consulting Engineers Ltd.

1.5 Previous Reports

HSP Consulting Engineers Ltd have previously produced a Phase I Desk Study Report for the site, details of which can be found below:

- HSP Consulting Engineers Limited, Burnt Mill Academy - Phase I Geo-Environmental Desk Study Report, November 2021, Ref: HSP2021-C3825-G-GI-392. (Ref 1.)

2. Review of Existing Information & Geoenvironmental Setting

2.1 The Site

2.1.1 Location

The site is located off First Avenue, approximately 1km northeast of Harlow town centre. The approximate National Grid Reference for the centre of the site is (NGR) 545445, 210863. A Site Location Plan is included in Appendix I.

2.1.2 Description

The site is rectangular in shape and is approximately 5.52Ha in area. The red line boundary, included within Appendix I, provided by MACE is included in Appendix I, although it should be noted the 'Separate Site Area' shown within the park, to the north and separated from the school site by a public footpath, is not included within the feasibility study boundary.

Access is gained off First Avenue to the south of the site. A second vehicular access is located off Altham Grove on the eastern boundary. The site boundaries along the southern, southeast and southwest of the site are all marked by green paladin fencing. The northwest, northern and north-eastern boundaries of the site are marked by wooden fencing and hedgerows.

The site is currently occupied by Burnt Mill Academy and associated playing fields. The school buildings are all located in the southern third of the site and are a mixture of 2 to 4 storey predominantly CLASP design buildings with flat roofs, a steel framed double height sports hall with a pitched roof and a single storey clad modular building. A chimney and plant room are located within one of the buildings in the east of the site. The premises management team indicate the chimney and solid fuel boiler are no longer in use as the buildings are heated using mains gas and to the best of their knowledge there are no fuel storage tanks present on site.

The built area of the site is split level, with levels of approximately 65mAOD at the entrance (southern boundary) reducing to approximately 61.5mAOD at the rear north eastern corner of the buildings. The changes in level are marked by steps, ramps, slopes and retaining walls. The levels across the playing fields rise gently from approx. 61.5mAOD in the south western corner to approximately 64.75mAOD at the north eastern boundary. A steep downward slope is present along part of the north eastern boundary of the site to accommodate the change in level between the playing field and the rear gardens of neighbouring properties. Levels information is taken from the topographical survey of the site.

The external areas between the school buildings are hard surfaced with limited areas of soft landscaping. A small playground / netball court is located to the east of the main buildings and a large hard surfaced play area with a weather canopy is located at the rear of the main school buildings in the west.

Two car parks with asphalt surfacing are present on site. One is located in the southwestern corner of the site and extends along the western boundary and the second one is irregular in shape adjacent to the southern boundary. An electricity substation is located adjacent to the western boundary of the site within a fenced off area of the car park.

Grassed playing fields are present in the northern two thirds of the site. At the time of the site walkover rugby and football pitches were marked out on the playing fields. A MUGA/hard courts area is present in the south east quadrant of the sports area. A small electrical substation is located adjacent to the MUGA pitch.

Anecdotal evidence gathered during the walkover with the premises manager indicates that potential asbestos containing materials have been buried under part of the schools playing field. No exact location was provided during the walkover but it is understood to be adjacent to the eastern boundary of the site.

2.1.3 Surrounding Land Use

The main features of interest identified are:

North:	A footpath with parkland beyond. An industrial estate is present 60m to the northeast of the site.
East:	Residential houses and associated gardens off Altham Grove.
South:	First Avenue / Mandela Avenue with residential properties and gardens beyond.
West:	Harlow Town Park with Harlow Skate Park and a Scout HQ.

2.1.4 Proposed End Use

The development proposals include the demolition of the existing buildings upon the site and the construction of a three storey ‘super’ block in the south west of the site, a single storey sports centre and swimming pool in the south east of the site and a two storey admin block will be located in the centre of the southern half of the site. Car parking will remain in the south of the site and playing fields in the northern half of the site will not be altered. In order to accommodate the construction works two, two-storey temporary classroom blocks will be located in the centre of the site.

2.2 Geology

2.2.1 Made Ground

BGS mapping does not indicate any Made Ground on the site. However, given the existing development on the site and evidence of terracing, some Made Ground should be expected.

2.2.2 Superficial Deposits

BGS mapping indicates that superficial Glaciofluvial deposits (Sand and Gravel) are expected to be encountered in the south and north of the site. No formal description has been provided by the BGS.

BGS mapping indicates that superficial Lowestoft Formation deposits of Till are expected to be encountered in the centre of the site. Described by the BGS as ‘*The Lowestoft Formation forms an extensive sheet of chalky till, together with outwash sands and gravels, silts and clays. The till is characterised by its chalk and flint content. The carbonate content of the till* *matrix is about 30%, and tills within the underlying Happisburgh Formation have less than 20%.'*

2.2.3 Bedrock Geology

BGS bedrock mapping indicates the site is underlain by the London Clay Formation comprising Clay, Silt and Sand, described by the BGS as '*The London Clay mainly comprises bioturbated or poorly laminated, blue-grey or grey-brown, slightly calcareous, silty to very silty clay, clayey silt and sometimes silt, with some layers of sandy clay. It commonly contains thin courses of carbonate concretions ('cementstone nodules') and disseminated pyrite. It also includes a few thin beds of shells and fine sand partings or pockets of sand, which commonly increase towards the base and towards the top of the formation. At the base, and at some other levels, thin beds of black rounded flint gravel occurs in places. Glauconite is present in some of the sands and in some clay beds, and white mica occurs at some levels.*

2.3 Pertinent Site Sensitivity Information

Based on the information collated for the desk study, the geo-environmental setting of the site is summarised as follows:

- The site was undeveloped and shown as two fields on the First Edition OS Mapping. Burnt Mill Comprehensive School with associated hardstanding and playing field is recorded on site from the mid 1960's with the gradual addition of buildings and hard play areas on subsequent map editions.
- Historically the surrounding land use has been agricultural with mixed land use predominantly residential and leisure and industrial development to the north of the site from the mid 1950's onwards.
- The site is not located within a Coal Mining Reporting Area. There are two records of BGS Mineral Site within a 250m radius of the site. The closest record is Netteswell Cross Gravel Pits located 146m west of site with commodities of sand and gravel. The pit has ceased to extract minerals.
- There are no records of Active, Recent or Historical Landfill Sites recorded within a 250m radius of the site. The Local Authority records for 'A Site of Potential Land Contamination: Gravel pit infilled, mounded up and landscaped, now part of Town Park' 123m to the west are also referred to in response to a request for information on records of landfills within 250m of the site.
- The superficial geology is classified as Secondary A Aquifer in the north and south of site and Secondary Undifferentiated Aquifer in the centre of site. The bedrock geology is classified as an Unproductive Aquifer. The site is not located in a Source Protection Zone and there are no current groundwater abstraction licences within 1000m of the site.
- The site is not within an Environment Agency Zone 2 or Zone 3 floodplain. The site is shown at risk from surface water flooding at isolated locations in the north and also in the centre of the site. The site is at moderate risk of groundwater flooding.
- No radon protection measures are required.

- A Detailed UXO Risk Assessment has been undertaken by Zetica Limited (Ref: P11211-21-R1) which has concluded that the risk to the site from UXO is Low.

Based on the above, the environmental sensitivity of the site can be considered to be Low at this stage.

3. Fieldwork & Factual Information

The intrusive works were carried out between the 26th November 2021 (windowless sample boreholes) and the 14th – 18th February 2022 (cable percussive boreholes and window sample boreholes) by HSP Consulting Engineers Ltd. Where applicable, the fieldwork was undertaken in accordance with BS5930:2015 + A1:2020 Code of Practice for Ground Investigations (Ref. 6) and BS10175:2011+A2:2017 Investigation of Potentially Contaminated Sites (Ref. 8).

The exploratory holes were positioned to provide general coverage across the site of the proposed development to provide information for foundation design and obtain representative soil samples for geotechnical and geo-environmental analysis.

3.1 Exploratory Methods

The exploratory methods are detailed in the table below.

Table 1 – Exploratory Methods

Type	Quantity	Maximum Depth (m)	Details
Windowless Sampling Borehole	12	5.00	WS01 to WS12
Cable Percussive	4	15.00	CP01 - CP04

The exploratory holes were logged and sampled by an Engineer from HSP Consulting Ltd and the logs are presented in Appendix II. The exploratory hole locations are shown on the Ground Investigation Layout Plan presented in Appendix III. WS10 was terminated at shallow depth due to an obstruction and relocated to WS10a.

Fragmentary bulk disturbed and undisturbed samples were recovered from materials revealed within all the exploratory holes. Geo-environmental samples, placed in plastic tubs and glass jars supplied by the laboratory, were also obtained specifically for chemical analysis. The samples were taken to UKAS accredited laboratories for further examination and testing.

3.2 In-situ Testing

3.2.1 Standard Penetration Tests

Standard Penetration Tests (SPTs) were carried out at 1.00m intervals in the windowless sample and cable percussive boreholes to 5.00m depth and every 1.50m thereafter within the cable percussive boreholes. The SPTs were undertaken in accordance with EN ISO 22476-2 2005: A1 2011 and the results are included on the appended borehole logs (Appendix II).

3.3 Laboratory Testing

The laboratory testing schedules were prepared by HSP Consulting Ltd.

3.3.1 Geotechnical Testing

Geotechnical testing has been scheduled to be undertaken by a UKAS accredited laboratory as part of the works at the site:

- Natural Moisture Contents
- Plasticity Index
- Particle Size Distribution

The laboratory testing is being undertaken by Kiwa CMT Testing (UKAS accredited, laboratory No.0529) and Professional Soils Laboratory (UKAS accredited, laboratory No. 4043) in accordance with BS1377:1990 using calibrated equipment specifically for the British Standard. The results available at this stage are included within Appendix V.

3.3.2 Chemical Analysis

The geo-environmental samples retained specifically for chemical analysis were stored in cooled containers until delivery to the laboratory by courier.

Chemical analysis was scheduled on twenty-five soil samples for the presence of a selected suite of potential contaminants as outlined in the tables below:

Table 2a – Chemical Analysis

Exploratory Hole Location & Depth	Sample Description	Exploratory Hole Location & Depth	Sample Description
WS01, 0.05m	MADE GROUND[5]	WS06, 0.40m	MADE GROUND[1,2,3]
WS01, 0.70m	MADE GROUND[1,2,3]	WS07, 0.10m	TOPSOIL[1,2,3]
WS01, 1.00m	CLAY[1,4]	WS08, 0.90m	CLAY[1,2,4]
WS02, 0.05m	TOPSOIL[1,2,3]	WS09, 0.75m	SAND and GRAVEL[1,2,4]
WS02, 1.00m	SAND[1,4]	WS10a, 0.30m	MADE GROUND[1,2,3]
WS02, 2.00m	CLAY[4]	WS10a, 1.00m	CLAY[4]
WS03, 0.25m	CLAY[1,2,3]	WS10a, 1.50m	CLAY[1,2]
WS03, 2.20m	CLAY[1,2]	WS11, 0.90m	SAND and GRAVEL[1,2,4]
WS03, 1.00m	CLAY[4]	WS11, 1.50m	SAND and GRAVEL[4]
WS04, 0.80m	SAND and GRAVEL[1,2]	WS12, 0.30m	MADE GROUND[1,2]
WS04, 2.00m	SAND[4]	WS12, 0.60m	MADE GROUND[1,2,3]
WS05, 0.15m	MADE GROUND[1,2,3]	WS12, 1.90m	MADE GROUND[4]
WS05, 0.80m	SAND[1,2]		

[1] HSP Standard Suite, [2] Organic Matter, [3] Asbestos Screen, [4] BRE Sulphate Suite, [5]Double Ratio Plot

Table 2b – HSP Standard Chemical Analysis Suite

Metals	Cadmium	Chromium (III & VI)	Copper
	Lead	Mercury	Nickel
	Zinc		
Semi Metals and Non-metals	Arsenic	Boron	Selenium
Others	pH		
Inorganic Chemicals	Cyanide	Sulphate	Sulphide
Organic Chemicals	PAH (US EPA 16)	TPH (CWG)	Phenol

The contamination analysis was carried out by Chemtest Ltd (UKAS accredited, laboratory No. 2183) between the 1st and 7th December 2021 and 21st and 25th February 2022 for the samples obtained during the windowless sampling. The results are presented in Appendix IV.

3.4 Ground Conditions

3.4.1 Published Geology

The published geology indicates superficial Glaciofluvial deposits (Sand and Gravel) are expected to be encountered in the south and north of the site and superficial Lowestoft Formation (Till) is expected in the centre of the site. Bedrock geology is expected to comprise the London Clay Formation, as described in section 2.2.3 above.

3.4.2 Ground Conditions on site or General Geology & Revealed Strata

The exploratory hole data generally confirms the published information with Made Ground overlying superficial Glaciofluvial and Lowestoft Formation deposits. Bedrock deposits belonging to the London Clay Formation were not proven. The strata generally comprises:

Table 3 – Encountered Ground Conditions

Strata		Depth Range (mbegl)	Max Thickness (m)	Description
Anthropogenic	TOPSOIL	G.L – 0.50	0.50	Grass over brown sandy slightly gravelly clayey TOPSOIL with rootlets and quartzite.
	MADE GROUND	G.L – 0.15	0.15	Grey asphalt concrete.
		0.15 – 0.40	0.25	Grey yellow crushed stone subbase.
		0.10 – 0.45	0.35	Red brown gravelly slightly clayey Sand with gravels of brick, sandstone and ceramic.
		0.20 – 0.50	0.3	Crushed red brick. (WS10 only).
		0.40 – 0.95	0.50	Blue grey sandy slightly gravelly Clay with gravels of brick, concrete and flint.
		0.20 – 1.20	1.00	Brown slightly gravelly clay with rare brick and concrete fragments.
		1.00 – 2.50	1.50	Dark grey slightly gravelly Clay. Gravels are of asphalt and chalk.
Superficial	LOWESTOFT FORMATION	0.20 – 1.20	1.00	Orange brown clayey slightly gravelly SAND. Gravels are flint.
		0.10 – 5.00	4.90	Orange brown sandy slightly gravelly CLAY. Gravels are flint.
		2.40 – 3.20	0.80	Brown slightly gravelly CLAY. Gravels are flint and quartzite.
		3.20 – 5.00	1.80	Grey mottled brown CLAY with gravels of flint, mudstone and chalk.
	GLACIOFLUVIAL DEPOSITS	0.28 – 1.40	1.12	Brown slightly gravelly CLAY. Gravels are flint and quartzite.
		0.20 – 4.30	4.10	Orange brown clayey SAND and GRAVEL. Gravels are flint.
		0.30 – 5.00	4.70	Brown clayey gravelly SAND. Gravels are flint.
		3.00 – 6.40	3.40	Brown SAND and GRAVEL.
		4.40 – 9.90	5.50	Brown SAND.
		9.90 – 13.00	3.10	Brown SAND and GRAVEL.
		10.00 – 15.00	5.00	Brown silty SAND with occasional gravels of flint and quartzite.

	LOWESTOFT FORMATION	11.10 – 12.10	1.00	Grey mottled brown CLAY with gravels of flint, mudstone and chalk.
		12.10 – 15.00	2.90	Grey brown CLAY with occasional chalk gravels.

3.5 Groundwater Levels

Two groundwater strikes were recorded during advancement of the windowless sample boreholes or cable percussive boreholes. A strike was recorded within WS02 at 1.50m begl and at 11.50m begl within CP02. The strikes are perched water entries where a granular horizon sits above a layer of fine deposits.

Groundwater monitoring has been undertaken on one occasion to date. Groundwater has been recorded within the monitoring installations between a depth of 0.76m begl and 4.98m begl.

3.6 Hazardous Ground Gas Monitoring

Dual use gas and groundwater monitoring installations were constructed within four of the windowless sample boreholes in November 2021 (WS01, WS02, WS03 and WS04) and three of the windowless sample boreholes in February 2022 (WS09, WS10a and WS11). Each well has been constructed using 50mm diameter HDPE pipe. All of the borehole installations have a 6mm pea gravel surround to the slotted pipe with a bentonite seal above and a gas tap. The covers are cemented flush with ground level and are round lockable stopcock covers.

HSP Consulting uses a GFM 430 Gas Analyser. Prior to its use a calibration check can be performed against gas readings in air. It is recommended that this check is undertaken once on each day the analyser is used. Annual calibration is undertaken on the unit and a copy of this certificate has been included within Appendix VI.

The results of the ground gas monitoring are discussed in Section 5.4 below.

3.7 Visual and Olfactory Evidence of Contamination

No visual and olfactory evidence of contamination was noted in the majority of the exploratory hole arisings during the ground investigation. Dark brown staining and a slight organic odour was recorded within WS02 between 3.75m begl and 4.00m begl.

4. Geotechnical Assessment

4.1 Detailed Ground Model

For the purpose of this foundation assessment the information gained from the window sample and cable percussive boreholes were utilised. The borehole logs are presented in Appendix II.

4.1.1 Topsoil and Subsoil

Topsoil was encountered within ten of the exploratory boreholes and generally comprised of soft brown sandy slightly gravelly CLAY with frequent rootlets and gravels of quartzite. Topsoil deposits were encountered up to a maximum depth of 0.50m begl. The base of all topsoil materials were penetrated.

4.1.2 Made Ground Deposits

Made Ground was encountered within seven of the exploratory boreholes to a maximum depth of 2.50m begl. The deposits generally comprised grey asphalt concrete overlying red brown gravelly slightly clayey sandy sub-base. Deposits of blue grey sandy slightly gravelly Clay fill with gravels of brick, concrete and flint were encountered to a maximum depth of 1.20m begl.

Deeper Made Ground deposits were encountered within WS12 to a maximum depth of 2.50m begl. These deposits comprised dark grey slightly gravelly Clay with gravels of brick, concrete, asphalt and chalk. The base of all Made Ground deposits were penetrated.

4.1.3 Lowestoft Formation

Superficial deposits belonging to the Lowestoft Formation were encountered within eleven of the exploratory boreholes to a maximum depth of 15.00m begl. The Lowestoft Formation is subordinate within the Glaciofluvial Deposits and as such has been encountered at shallow depths above Glaciofluvial Deposits and at depth beneath Glaciofluvial Deposits.

The deposits comprised bands of loose orange brown clayey slightly gravelly SAND, soft to firm brown gravelly CLAY and firm grey mottled brown CLAY to a depth of 5.00m begl. These deposits were encountered within boreholes located within the central section of the site.

Deeper deposits belonging to the Lowestoft Formation were recorded within CP01, CP02 and CP03 beneath the Glaciofluvial Deposits from a depth of 11.10m begl. These deposits comprised stiff brown Clay with occasional gravels of chalk, mudstone and quartzite. The deposits were recorded within boreholes located within the southern and central thirds of the site.

The base of the Lowestoft Formation deposits was not penetrated.

4.1.4 Glaciofluvial Deposits

Superficial Glaciofluvial Deposits were encountered within eleven of the exploratory holes to a maximum depth of 15.00m begl. These boreholes were located in the southern and central thirds of the site.

The deposits comprised bands of soft to firm brown slightly gravelly CLAY, loose to medium dense orange brown clayey SAND and GRAVEL, loose to medium dense brown clayey gravelly SAND. The base of the Glaciofluvial Deposits were only penetrated within a number of the locations at CP01, CP02 and CP04.

4.1.5 London Clay Formation

Bedrock deposits belonging to the London Clay Formation were not proven within any of the exploratory holes.

4.1.6 In-situ Testing and Assessment

A series of Standard Penetration Tests (SPT's) undertaken within the boreholes. The following tables summarise the N values at depth across the site within the natural strata for the windowless sample and cable percussive boreholes within the two separate superficial geologies that were encountered on site. The SPT 'N' value at 1.00m within WS06 (made ground) has been discounted.

Table 4a – SPT N Values – Lowestoft Formation

Depth (m)	Range of 'N' Values	Mean 'N' Value	Description
1.00	6 - 13	10*	CLAY / SAND
2.00	4 - 9	6*	CLAY
3.00	7 -29	16*	
4.00	7 - 32	18*	
5.00	8 -32	21*	
12.00	34	34	CLAY
13.50	50	50	
15.00	50	50	

* Indicates values rounded up

Table 4b – SPT N Values – Glaciofluvial Deposits

Depth (m)	Range of 'N' Values	Mean 'N' Value	Description
1.00	8 – 50	30	CLAY / SAND & GRAVELS
2.00	10 - 50	30*	
3.00	7 - 28	17*	SAND & GRAVELS
4.00	4 – 17	10*	
5.00	0 – 30	10	
6.00	9 – 12	11*	SAND & GRAVELS / SAND
7.50	10 – 12	11	SAND
9.00	10 - 16	13	SAND & GRAVELS
10.50	10 – 24	15*	
12.00	13 – 17	15	
13.50	19	19	SAND
15.00	14	14	

* Indicates values rounded up

Ten plasticity index and moisture content tests have been undertaken in the laboratory on disturbed samples of the fine deposits obtained from the windowless sample and cable percussion boreholes. Tables 5 and 6 below show the results of the testing for the two superficial geologies: Lowestoft Formation and Glaciofluvial Deposits.

Table 5 - Plasticity and Volume Change Potential – Lowestoft Formation

Sample Ref:	Laboratory Material Descriptions	LL (%)	PL (%)	PI (%)	% retained 425µm	Modified PI (%)*	Soil Class	MC (%)
WS01, 1.50m	*Brown slightly gravelly sandy CLAY.*	47	22	25	98	25*	CI	16
WS02, 3.00m	*Brown slightly gravelly sandy CLAY.*	48	23	25	97	25*	CI	21
WS03, 0.50m	*Brown gravelly sandy CLAY.*	41	22	19	89	17*	CI	22
WS10a, 0.70m	*Greenish brown sandy very clayey GRAVEL*	28	12	16	66	11*	CL	13.2
WS10a, 1.70m	*Greyish brown slightly sandy gravelly CLAY*	35	17	18	44	8*	CI/CL	20.7
CP03, 1.20 – 1.65m	*Brown slightly gravelly CLAY*	34	15	19	8	17	CL	21.6

* Indicates values rounded up

The results generally indicate compliance with the definition of soils of low (CL) to intermediate (CI) plasticity after the classification system of BS5930: 2015 + A1:2020 for samples from the Lowestoft Formation. The samples are generally considered to be of low volume change potential, with two samples of medium volume change potential in accordance with the National House Building Council (NHBC) Standards, Chapter 4.2: 2007.

Table 6 - Plasticity and Volume Change Potential – Glaciofluvial Deposits

Sample Ref:	Laboratory Material Descriptions	LL (%)	PL (%)	PI (%)	% retained 425µm	Modified PI (%)*	Soil Class	MC (%)
WS07, 0.70m	*Brown clayey very sandy GRAVEL*	35	16	19	83	16*	CL/CI	9.4
WS08, 1.70m	*Yellowish brown clayey SAND and GRAVEL.*	Non Plastic			74	Non Plastic		11.7
CP01, 2.50 – 3.00m	*Orange slightly gravelly sandy CLAY*	29	13	16	17	13	CL	17.7
CP04, 1.20 – 1.65m	*Brown slightly gravelly slightly sandy CLAY*	30	15	15	19	12	CL	12.3

The results generally indicate compliance with the definition of soils of low (CL) to intermediate (CI) plasticity after the classification system of BS5930: 2015 + A1:2020 for samples from the Glaciofluvial Deposits. The samples are generally considered to be of low volume change potential, in accordance with the National House Building Council (NHBC) Standards, Chapter 4.2: 2007. One sample was recorded as Non Plastic.

4.2 Earthworks

At this stage, proposed development levels are unknown, however it is anticipated that some reprofiling will be required for the proposed development to accommodate any new buildings.

Natural near surface soil arisings generated on site may be suitable for use as engineered fill, subject to appropriate testing and assessment. Should materials prove to be suitable, placement and compaction would need to be strictly controlled and supervised. Project programming should consider the ‘earthworks window’ (prevailing dry & warm climatic conditions) as the soil materials will be susceptible to softening during periods of wet weather and will be easily damaged by site traffic and deterioration at times of heavy rainfall.

4.3 Excavations

Excavations to proposed formation level for new foundations and infrastructure should be feasible using standard excavation plant and equipment. Random and potentially severe falls should be anticipated from the faces of near vertically sided unsupported excavations carried out at the site. Where personnel are required to enter near vertically sided excavations, it is considered that full support should be provided to the full depth of all excavations.

It is recommended that all support systems are continually assessed by fully trained or experienced personnel.

Two groundwater strikes were recorded during advancement of the windowless sample boreholes or cable percussive boreholes. A strike was recorded within WS02 at 1.50m begl and at 11.50m begl within CP02. The strikes are perched water entries where a granular horizon sits above a layer of fine deposits.

Groundwater monitoring has been undertaken on five occasions to date. Groundwater has been recorded within the monitoring installations between a depth of 0.76m begl and 4.98m begl.

It should be noted that groundwater levels may vary due to seasonal variations or other effects. Should groundwater entries be encountered at the site during groundwork operations, traditional sump and pump dewatering is likely to be sufficient.

4.4 Foundations

The current proposals for the site (drawing ref 2000006123, A, 13 dated 17th November 2021) are for demolition of existing buildings and construction of three new buildings in the south of the site. The proposed buildings currently comprise a, three storey block in the south west, a single storey sports centre and swimming pool in the southeast and a two storey admin block in the centre. In order to accommodate the construction works two, two-storey temporary classroom blocks will be located in the centre of the site. The scheme is currently at feasibility stage and subject to change. Should development plans alter, a geo-environmental engineer from HSP should be consulted to review the foundations options.

For the purpose of this foundation assessment, the information gained from the window sample and cable percussion boreholes have been utilised.

Based on the ground conditions encountered, in the south of the site (existing school buildings) variable depth Made Ground has been recorded and proved to 0.2m and 1.2m begl. Underlying the Made Ground materials were superficial deposits which were predominately granular in composition varying in strength (very loose to medium dense/dense) both laterally and vertically, becoming a very stiff clay below 13m begl.

In the centre of the site (existing playing fields and hard court) variable depth Made Ground has been recorded and proved to 0.2m and 2.5m begl, underlying the Made Ground were superficial deposits which were cohesive in composition varying in strength (soft to very stiff) both laterally and vertically, the base of the superficial deposits has not been proven in this area.

All foundations will need to be taken below any topsoil and Made Ground materials as these are not considered a suitable founding stratum.

For the proposed buildings within the south of the site, where higher loadings will be required (proposed three storey teaching block and proposed swimming pool) it is recommended a piled foundation solution is adopted with piles extending into the competent Lowestoft Formation deposits anticipated below 13m begl. Any piling solution would need to be designed and warranted by a specialist subcontractor. It is recommended the foundation options are reviewed once the layout and loadings have been finalised.

Traditional foundations may be considered for lightly loaded structures in the south of the site but would need further confirmation of the ground conditions beneath the proposed building footprints following demolition works. At this stage, minimum foundation depths would need to be in the region of 1.0m to 1.5m begl within the granular superficial deposits, designed to a net allowable bearing pressure of 100kN/m^2 to limit total settlements to less than 25mm and differential settlements to acceptable limits. Deepening of foundations should be limited to 2.0m begl and pad sizes maintained to a maximum 2m x 2m due to lower strength deposits encountered from 4m begl.

Foundations would need to be locally deepened through any organic, soft/loose, disturbed or filled ground. Where fine-grained and granular deposits are encountered at the base of any footings, consideration should be given to the inclusion of mesh reinforcement at the top and bottom of foundations to reduce the potential for differential settlements to occur.

Consideration could be given to ground improvement (vibro replacement stone columns) to improve the lower strength granular deposits noted at depths between 4m and 5m begl to allow reinforced shallow spread foundations designed to a net allowable bearing pressure of 125 – 150kN/m^2, subject to confirmation by a specialist subcontractor and would be dependent on the strength of the deposits below 5m begl which would need to be assessed further and the completion of the gas monitoring.

For the proposed temporary buildings within the centre of the site, traditional foundations are unlikely to be feasible due to the depth of Made Ground and lower strength cohesive deposits at shallow depths. For this area of the site a raft foundation could be considered.

Foundations (and ground floor slabs) should be designed in accordance with NHBC Standards Chapter 4.2 Building near Trees (Ref. 9) where foundations are within influencing distance of proposed or existing trees in accordance with the requirements for soils of medium volume change potential.

4.5 Ground Floor Slab

A suspended floor slab is recommended due to the depth of Made Ground and in conjunction with a piled foundation solution.

Where traditional foundations are proposed (south of site), a suspended floor slab is required due to the necessity of ground gas protection measures to accommodate a Characteristic Situation 2 scenario.

4.6 Concrete Classification

The results of sulphate and pH testing carried out on selected soil samples taken to date during this investigation have been compared with the recommendations outlined in BRE Special Digest 1, Part 1: 2005.

The guidelines given in BRE Special Digest 1 are based upon a site classification relating to its previous usage. It is considered appropriate to define this site as a ‘brownfield’ location for the purposes of concrete classification.

On the basis of the above, it is considered appropriate to adopt a basic Design Sulphate Class of DS-1 together with and Aggressive Chemical Environment for Concrete (ACEC) of AC-1s for all samples.

4.7 Pavement Design

No testing has been undertaken at this stage. It is recommended that in-situ CBR testing should be undertaken at finished levels when proposed development plans have been finalised.

4.8 Infiltration Drainage

Two groundwater strikes were recorded during advancement of the windowless sample boreholes or cable percussive boreholes. A strike was recorded within WS02 at 1.50m begl and at 11.50m begl within CP02. The strikes are perched water entries where a granular horizon sits above a layer of fine deposits.

Infiltration testing has not been undertaken as part of this investigation to date. Based on the soil encountered on site, the use of infiltration drainage for the disposal of surface water may be feasible where shallow coarse soils have been encountered. It is recommended that testing in accordance with BRE 365 – Soakaway Design is undertaken once the design proposals have been confirmed.

5. Environmental Assessment

5.1 Introduction

The approach to the human health risk assessment reported here follows the principals given in the Land Contamination Risk Management (LCRM) Guidance, i.e. application of the following assessment hierarchy:

- Tier 1 risk screening by establishment of potential pollutant linkages, i.e. the preliminary conceptual site model (PCSM), or
- Tier 2 generic quantitative assessment using generic assessment criteria (GACs) that represent 'acceptably low' risk, or
- Tier 3 quantitative risk assessment using site specific assessment criteria (SSACs) that represent 'unacceptable risk', or where generic assessment criteria are not available, or they are not applicable to the CSM.

The results of laboratory analysis have been screened against GACs including the Defra Category 4 Screening Levels (C4SL) and LQM and CIEH S4ULs for Human Health Risk Assessment (Copyright Land Quality Management Limited reproduced with permission; Publication Number S4UL3180. All rights reserved). (Refs 10 and 11 respectively).

In the absence of a standard scenario for a school environment the standard exposure scenario of residential without home grown produce has been used to identify potential exposure pathways for human health receptors. Controlled water, flora and fauna and property receptors have also been included within the CSM. Our Tier 2 HHRAs for school sites are screened against the GACs representative of minimal risk for residential without home grown produce end use, we believe this to be appropriate based on the precautionary principle the LCRM guidance advocates.

It should be noted that organic contamination (PAH, TPH and BTEX) have been screened against the GAC for 2.5% Soil Organic Matter (SOM).

The assessment of PAHs is undertaken using the surrogate marker approach; recommended by Health Protection Agency (2010) guidance, providing the PAH profile is sufficiently similar to the coal tars tested by Culp et al (1998). Where PAH profile is not sufficiently coal tar like the TEF method is adopted using the LQM and CIEH S4ULs. Prior to assessment a PAH profile is generated for all samples analysed for PAH using the LQM PAH Profiling Tool v1.3, the graphical output is presented in Appendix IV.

5.2 Assessment of Soil Analysis Results

Twenty-five samples, as detailed in section 3.3.2, were scheduled for analysis from the development area. Eighteen of these samples were scheduled to provide a basis for characterising the soils to outline the potential impacts on human health and any environmental receptors from any contamination found.

The screening process for on-site human health receptors show that the GACs, representative of minimal risk for a residential without home grown produce setting were exceeded for Lead and Arsenic.

Details of the exceedances can be seen in Table 6 below. The results for the remaining contaminants of concern were below the screening criteria for individual contaminant concentrations.

Table 7 – GAC Exceedances

Contaminant	GAC (mg/kg)	No. of exceedances	Concentration (mg/kg), sampling location and depth (m)
Lead	310[1]	1	330 WS03 – 2.20m
Arsenic	40[1]	1	50 WS04 – 0.80m

[1] C4SL

The elevations detailed within Table 6, are all located within Made Ground deposits recorded across the site.

A Site Specific Assessment Criteria (SSAC) has been generated for Arsenic using the CLEA 1.071 model (Ref. 20), the output is presented in Appendix VIII. The oral SSAC of 66mg/kg for Arsenic is higher than the concentration exhibited in the samples tested and therefore the risk to the human health of the end user is acceptably low.

Due to the depth of the elevated Lead concentration being at 2.20m begl it can be considered not a risk to the human health of the end user. A shallower sample at 0.25m begl from the same location exhibited concentrations of Lead below the GAC, therefore further mitigating the risk. Should the surface levels in the area of WS03 be reduced as part of the development and the materials brought to surface further consideration should be given to the elevated concentration of Lead. This should be reviewed in greater detail by a geo-environmental engineer from HSP Consulting once plans and final levels have been confirmed.

Eight Made Ground soil samples were submitted for an asbestos screen and identification. No asbestos has been identified.

5.3 Human Health Mitigation

The concentrations of potential contaminants recorded at the site indicates an acceptably low risk and therefore mitigation measures are not required as part of the development.

Should any obvious evidence of unexpected contamination be encountered during the redevelopment works it should be reported to HSP so that an inspection can be made and appropriate sampling and assessment work be carried out.

Appropriate health and safety precautions should be adopted during any excavation works to avoid exposure to potentially contaminated soils and dust.

The approval of the local Environmental Health Officer should be sought with respect to the soil contamination assessment and mitigation proposals.

5.4 Ground Gas Risk Assessment

Ground gas concentrations have been monitored on four occasions in order to obtain an indication of the ground gas regime at the site. The results of the ground gas monitoring are presented in Appendix VI.

The results of monitoring indicates that elevated concentrations of methane and carbon dioxide have been recorded within two boreholes, WS02 and WS10a with a maximum steady state methane concentration of 10.6% by volume in air and maximum steady state carbon dioxide concentrations of 5.7% by volume in air. Steady state gas flows have been recorded ranging from 0.1l/hr to 4.9l/hr in WS02. Methane concentrations within the remaining boreholes were below the limits of detection, together with Carbon Dioxide concentrations recorded between 0.3% and 4.5% volume in air and steady state gas flows recorded up to a maximum of 0.1l/hr.

WS02 and WS10a are located within the central section of the site where the proposed two storey temporary classrooms will be located during the construction phase of this project. No elevated gas concentrations have been recorded within any of the other exploratory hole locations across the site, therefore it is recommended that the site is zoned and the area of temporary classrooms in the centre of the site is treated separately to the main development area in the southern third of the site.

From the results above, the maximum steady state gas screening value for WS02 and WS10a is 0.519l/hr. The results from WS02 and WS10a have been assessed in line with the guidance provided in BS8485:2015 + A1:2019 Code of Practice of the design of protective measures for methane and carbon dioxide ground gas for new buildings (Ref 15) and CIRIA Document C665 'Assessing Risks Posed by Hazardous Ground Gases to Buildings' (Ref 16). Comparison of these results with Table 2 of BS8485:2015 + A1:2019 indicates that the site falls into a Characteristic Situation 2 and therefore ground gas protection measures will be required as part of the temporary classroom development located within the central section of the site.

The results from the remaining boreholes in the southern third of the site indicate a maximum steady state gas screening value for the site is 0.0045 l/hr. Comparison of these results with Table 2 of BS8485:2015 + A1:2019 indicates that the site falls into a Characteristic Situation 1 and therefore ground gas protection measures will be not required as part of the main school development located within the southern section of the site.

Depleted oxygen levels were observed within a number of the boreholes during the monitoring. This poses a risk of asphyxiation to construction and maintenance workers in confined spaces such as excavations or manhole chambers. A confined spaces risk assessment should be carried out prior to working in any buried structures or excavations.

5.5 Water Supply

The environmental testing for the site has been compared to the following document in order to assess the most appropriate pipe material that should be used upon the site for mains water supply:

> 'Guidance for the selection of water supply pipes to be used in Brownfield sites – UK Water Industry Research – Ref: 10/WM/03/21.' (Ref 19).

Elevated PAH concentrations were identified within two Made Ground samples within WS05 at 0.15m begl and WS10a at 0.30m begl. Based on the chemical analysis report it is considered specialist materials in the form of barrier pipe are likely to be required for water supply pipes within these areas. it is considered that specialist materials are unlikely to be required for water supply pipes across the remainder of the site.

Additional testing may be required by the water authority to confirm the most appropriate pipe material. Once the route of any supply pipes in known it is recommended further guidance is sought from the utility providers.

5.6 Waste Classification

The results of the chemical testing have been assessed using web-based software for classifying hazardous waste, HazWasteOnline^{TM}. The materials tested are likely to be classified as non-hazardous waste. The results are included in Appendix VII.

Please note the above classification provides an indication of how the material should be classified for removal off site; however, this should be used at your approved waste handler's discretion and further testing may be required prior to any offsite disposal.

5.7 Updated Conceptual Site Model

The PCSM and Summary of plausible pollutant linkages was produced by undertaking a Source-Pathway-Receptor analysis of the site using readily available online information and previous reports. Based on the findings of this and the site investigation the updated conceptual site model has been updated and is presented in the table below.

Table 8 - Updated Conceptual Site Model.

Source	Pathway	Receptor	Consequence	Probability	Risk	Comments
On site **S1:** Historical and Contemporary land use: Made ground associated with development of the school site and terracing of playing fields and potential buried Asbestos Containing Materials. **S2:** Historical and Contemporary land use: Electrical substations. **S3:** Historical and Contemporary land use: Farmland and maintained sports pitches **Off site** **S4:** Historical and Contemporary land use: Made ground, landfill (old gravel pit) and infilled ponds.	**P1:** Human uptake pathways	**R1:** End Users **R2:** Construction and maintenance workers	Mild	Low	Low	The screening process for on-site human health receptors show that the GACs and SSAC, representative of minimal risk for a residential without home grown produce setting were not exceeded within the shallow soils. Due to the depth of the elevated Lead concentration being at 2.20m begl it can be considered not a risk to the human health of the end user. Should the surface levels in the area of WS03 be reduced as part of the development and the materials brought to surface further consideration should be given to the elevated concentration of Lead. The risk is considered to be LOW.
	P2: Horizontal and vertical migration of contaminants through potentially permeable soils and rocks. **P3:** Migration of contaminants along preferential pathways (man- made). **P4:** Surface runoff.	**R3:** Controlled Water: Secondary A and Secondary Undifferentiated Aquifer **R4:** Controlled Water: Surface Water	Mild	Low	Low	The bedrock geology is classified as Unproductive Aquifer and the superficial deposits as Secondary A Aquifer and Secondary Undifferentiated Aquifer. The site is not located within a Source Protection Zone. There are no groundwater abstraction licences within 1km of the site. Marginal exceedances of Arsenic and Lead were encountered within two locations on site. The risk to controlled waters are considered to be LOW.
	P5: Vertical and lateral migration of ground gases and/or vapour.	**R1:** End Users	Mild	Low Likelihood	Low	*Ground gas monitoring has confirmed a CS2 classification for the temporary classrooms located within the centre of the site, therefore this area of the site will require ground gas protection measures. The remainder of the site is classified as a CS1. Ground gas mitigation will not be required for any new buildings located within the southern section of the site. The risk is considered to be LOW where gas protection measures are adopted

S5: Historical and Contemporary land use: Unidentified works, garage and depot.	**P2:** Horizontal and vertical migration of contaminants through potentially permeable soils and rocks. **P3:** Migration of contaminants along preferential pathways (man- made). **P4:** Surface runoff. **P5:** Vertical and lateral migration of ground gases and/or vapour.	**R1:** End Users **R2:** Construction and maintenance workers **R4:** Property, services and substructures **R5:** Adjacent Residential Properties	Mild	Unlikely	Very Low	Testing indicates the soils are unlikely to be aggressive to concrete and it is considered appropriate to adopt a basic Design Sulphate Class of DS-1 together with an Aggressive Chemical Environment for Concrete (ACEC) of AC-1. The risk is considered to be VERY LOW. The chemical analysis of the soils indicates specialist materials are likely to be required for water supply pipes at the site where placed within natural strata. Should pipes be laid within shallow Made Ground deposits within the locality of WS05 and WS10a will be required to be barrier pipes. However, confirmation of supply pipes should be sought from utility providers. Provided the correct pipe selection is made the risk is considered to be VERY LOW. see * for comments on ground gas
	P6: Root uptake.	**R6:** Proposed Flora and fauna	Mild	Unlikely	Very Low	Site won soils (topsoil/subsoil) may be suitable as a planting medium. Where soils are to be used in soft landscaped areas they will need to be compliant with BS:3882:2015 and have the appropriate testing to confirm suitability. The risk of uptake to proposed flora and fauna is considered to be VERY LOW.

6. References

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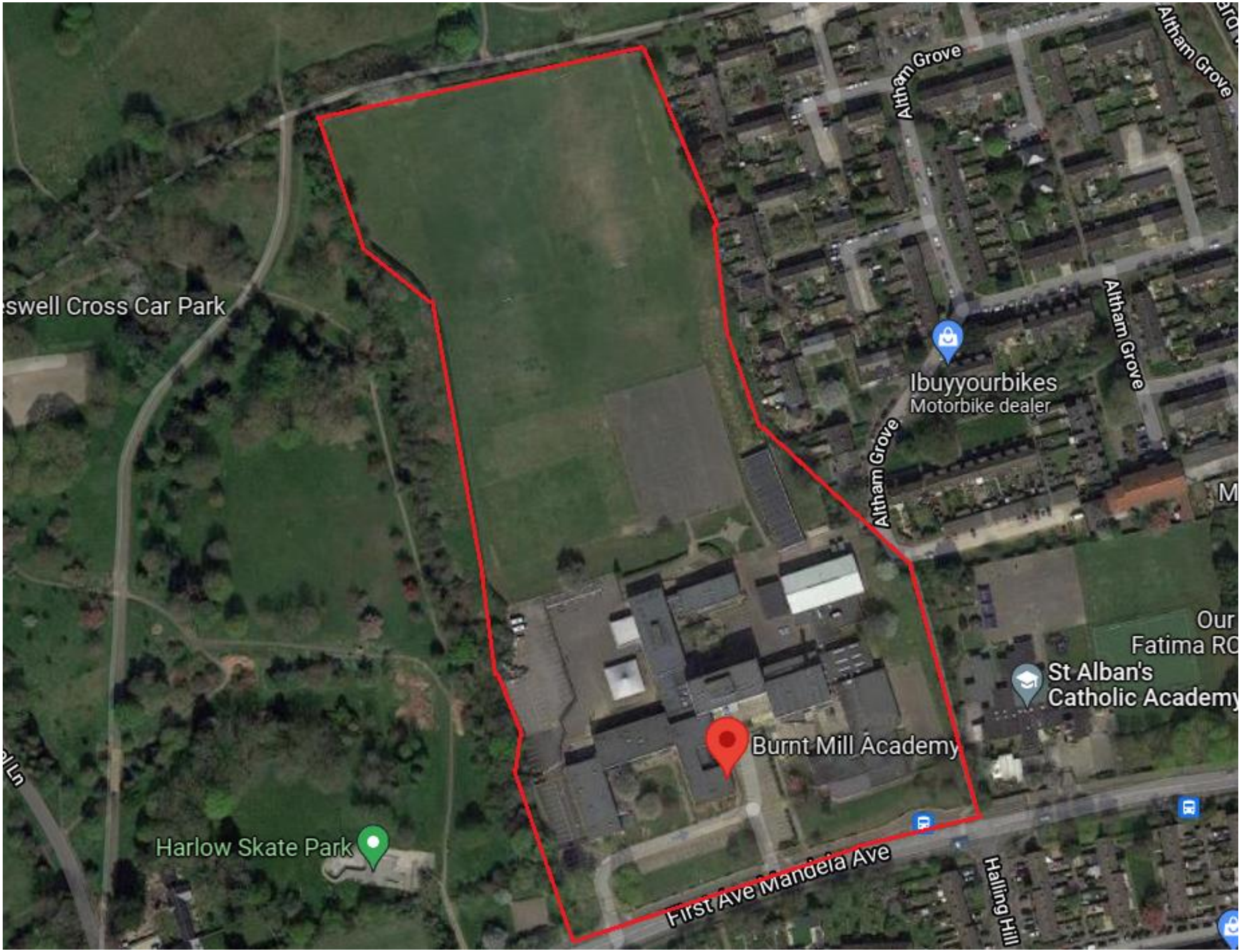
Appendix I



DO NOT SCALE

N

NOTES:

- Site Boundary

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CLIENT:
MACE Group

PROJECT:
Burnt Mill Academy

TITLE:
Site Location Plan

SCALE@SIZE : NTS	ISSUE: FINAL
DESIGN/DRAWN : LEJ	DATE: November 2021
PROJECT No: C3825	DRAWING No: 001

— SITE BOUNDARY

—○— FENCING + GATES

- - - DEMOLITION GIFA m2

🟦 PROPOSED NEW BUILD
8FE INC SPORTS CENTRE 8627 m2
SWIMMING POOL 789 m2
UP BUILD 532 m2
TRUST CENTRAL ADMIN 380 m2
TEMPS FOR PARTIAL DEMO 1942 m2 TBC
TEMPS FOR HCC BULGE 1885 m2

🟦 EXISTING BLOCK
RETAIN ELEC INTAKE
RELOCATE CADETS
RELOCATE CATERING POD

🟩 MUGA 3000 m2

🟦 2 NO. 3G ASTROTURF 14840 m2
INC FENCING + FLOODLIGHTING

🟨 HARD PLAY
8FE INC. NURTURE 3411 m2
BUILD UP 290 m2

🟫 ACCESS & CARPARK 4350 m2

🟩 SOFT PLAY
8FE INC. NURTURE 1527 m2
BUILD UP 237 m2

🟩 PLANTING EMBANKMENT 730 m2

🟩 PLANTING BEDS 320 m2

🟧 PATHWAYS INCLUDING
STEPS, RAMP, AMPHI-THEATRE
+ REFUSE ENCLOSURE 5456 m2
+ TEMPS PATHWAYS 1188 m2

🟧 ACCESS, DROP OFF + PARKING
INC. MARKINGS + ELEC CHARGING POINTS
4350 m2

🟪 CYCLE SHELTER FOR
200 NO.

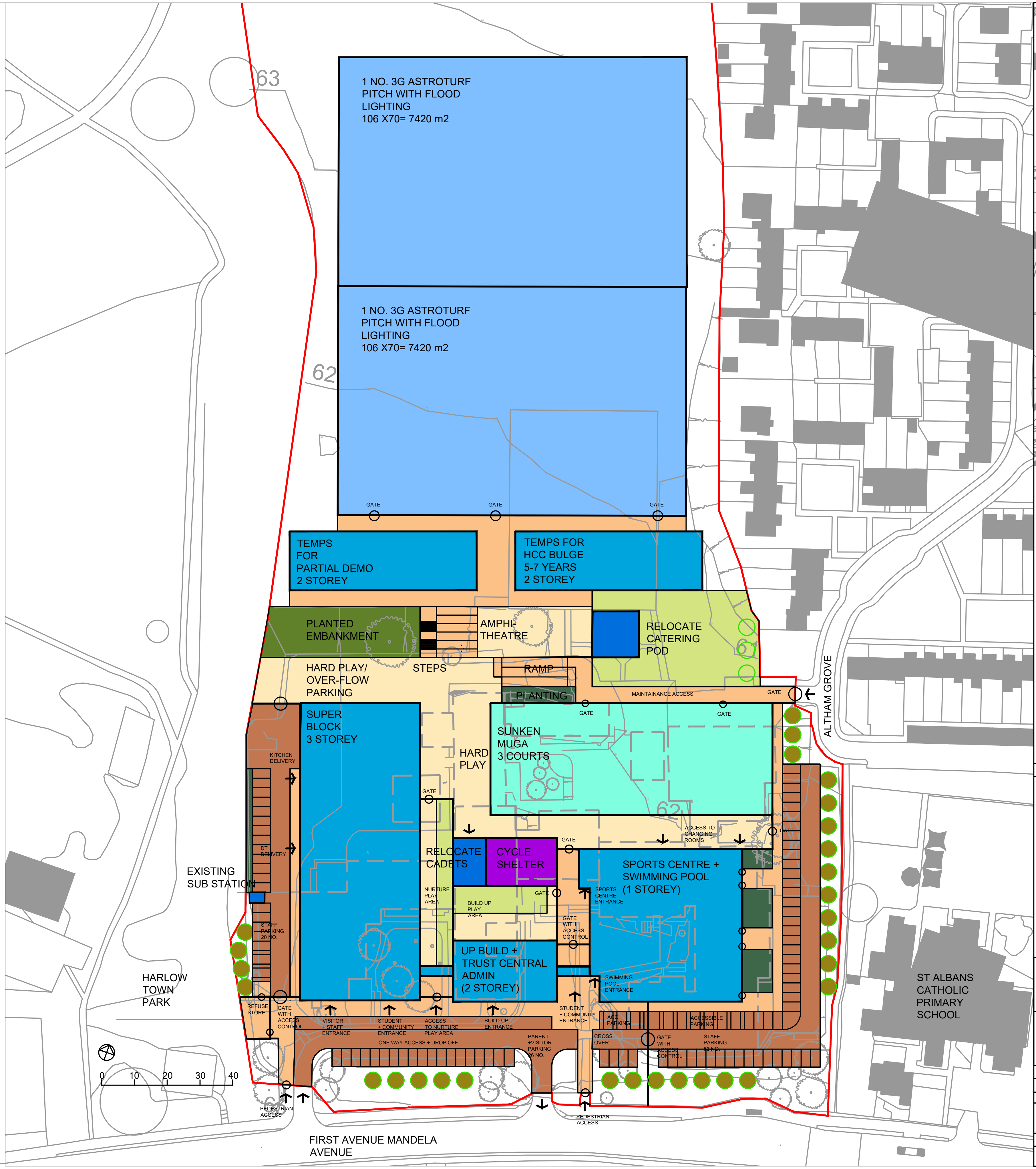
●●● NEW TREES INC. TOP SPOIL

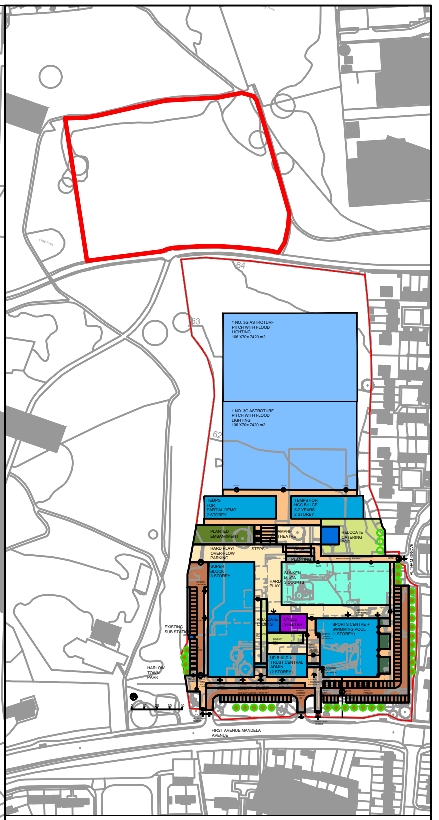
REMOVE 16 NO. TREES

3NO. IRRIGATION POINTS

MAKE GOOD CONTRACTOR'S ACCESS +
COMPOUND

ALLOW FOR RETAINING WALLS TO SUNKEN
MUGA + RAMP+ STEPS ETC.





Rev	By	Description	Date	CHK'D
-	-	-	-	

mace

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PROJECT
HARLOW
BURNT MILL ACADEMY
SRP ROUND 2- FEASIBILITY REPORT

DRAWING TITLE
CONTROL OPTION
PROPOSED SITE PLAN

DRAWN BY	AC	DATE	17/11/2021
CHECKED	-	SCALE:	1:1250

PROJECT No.	DISCI. Code.	SEQ. No.	REV:
2000006123	A	13	-

LBH ASSET CODE ASSET_NO

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Appendix II

Borehole Log

Project Name: Burnt Mill Academy	Project No. C3825	Co-ords: 545420.00 - 210707.00	Borehole No. **CP01** Sheet 1 of 2
Location: Harlow		Level: 65.14	Hole Type CP
			Scale 1:50
Client: MACE Group		Dates: 14/02/2022 - 15/02/2022	Logged By DRILLER

Well	Water Strikes	**Samples and In Situ Testing**			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.10	D		0.15	64.99		MADE GROUND comprising black asphalt concrete.
		0.30	D					
		0.40	D		0.40	64.74		MADE GROUND comprising grey yellow crushed stone subbase.
		0.40 - 1.00	B					Firm brown grey gravelly CLAY. [GLACIOFLUVIAL DEPOSITS].
		1.20		N=13 (2,2/3,3,4,3)				
		1.60	D		1.60	63.54		Stiff brown CLAY. [GLACIOFLUVIAL DEPOSITS].
		1.60 - 2.00	B					
		2.00		N=35 (3,6/8,8,9,10)				
					2.20	62.94		Dense clayey SAND and GRAVEL. [GLACIOFLUVIAL DEPOSITS].
		2.50 - 3.00	B					
		3.00	D		3.00	62.14		Medium dense SAND and GRAVEL. [GLACIOFLUVIAL DEPOSITS].
		3.00		N=28 (3,4/6,7,7,8)				
		4.00		N=17 (2,3/4,4,5,4)				
		5.00		N=16 (3,3/3,4,5,4)				
		6.40	D		6.40	58.74		Loose to medium dense coarse brown SAND. [GLACIOFLUVIAL DEPOSITS].
		7.50		N=12 (1,2/2,3,3,4)				
		9.00		N=14 (2,2/3,3,4,4)				
		9.90	D		9.90	55.24		Loose SAND and GRAVEL.. [GLACIOFLUVIAL DEPOSITS].

Continued on next sheet

Remarks
1. Borehole was terminated upon achieving required depth.

hsp consulting

Borehole Log

Borehole No.
CP01
Sheet 2 of 2

Project Name:	Burnt Mill Academy	Project No. C3825	Co-ords:	545420.00 - 210707.00	Hole Type CP
Location:	Harlow		Level:	65.14	Scale 1:50
Client:	MACE Group		Dates:	14/02/2022 - 15/02/2022	Logged By DRILLER

Well	Water Strikes	**Samples and In Situ Testing**			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		10.50		N=10 (1,2/2,3,2,3)				
		11.10	D		11.10	54.04		Stiff brown gravelly CLAY. Gravels are fine to coarse angular to subrounded chalk, mudstone and quartzite. [LOWESTOFT FORMATION].
		11.50 - 12.00	B					
		12.00		N=34 (3,4/7,8,9,10)				
					12.10	53.04		Very stiff grey CLAY with occasional fine to coarse angular to subrounded chalk and mudstone. [LOWESTOFT FORMATION].
		12.50	D					
		13.50		N=50 (3,7/50 for 275mm)				
		15.00		40 (6,10/40 for 290mm)	15.00	50.14		End of borehole at 15.00 m

Remarks
1. Borehole was terminated upon achieving required depth.

AGS

hsp consulting

Borehole Log

Borehole No.
CP02
Sheet 1 of 2

Project Name: Burnt Mill Academy	Project No. C3825	Co-ords: 545495.00 - 210750.00	Hole Type CP
Location: Harlow		Level: 64.21	Scale 1:50
Client: MACE Group		Dates: 15/02/2022 - 16/02/2022	Logged By DRILLER

Well	Water Strikes	**Samples and In Situ Testing**			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.15	64.06		MADE GROUND comprising black asphalt concrete.	
		0.30 - 1.00 0.40	B D		0.30	63.91		MADE GROUND comprising grey crushed stone subbase.	
								MADE GROUND comprising brown gravelly CLay with fragments of brick.	1
		1.20		50 (6,10/50 for 295mm)	1.20	63.01		Medium dense brown clayey SAND and GRAVEL. [GLACIOFLUVIAL DEPOSITS].	
		1.50 - 2.00	B						
		2.00		N=30 (3,5/6,8,8,8)	2.00	62.21		Medium dense brown SAND and GRAVEL. [GLACIOFLUVIAL DEPOSITS].	2
		3.00		N=20 (3,4/4,5,6,5)					3
		4.00		N=13 (2,2/3,3,4,3)					4
		5.00		N=12 (2,3/2,3,4,3)					5
		6.00 6.00 - 6.45 6.10	 B D	N=12 (1,2/2,3,4,3)	6.10	58.11		Medium dense coarse brown SAND. [GLACIOFLUVIAL DEPOSITS].	6
									7
		7.50		N=10 (1,2/1,2,3,4)				*....becoming loose.*	
									8
		9.00		N=12 (2,2/2,3,3,4)	9.00	55.21		Medium dense brown silty coarse SAND. [GLACIOFLUVIAL DEPOSITS].	9
		9.70	D		9.70	54.51		Medium dense brown SAND and GRAVEL. [GLACIOFLUVIAL DEPOSITS].	
		10.00 - 10.50	B						10

Continued on next sheet

Remarks
1. Borehole was terminated upon achieving required depth.

AGS

hsp consulting

Borehole Log

Project Name: Burnt Mill Academy	Project No. C3825	Co-ords: 545495.00 - 210750.00	Borehole No. **CP02** Sheet 2 of 2
			Hole Type CP
Location: Harlow		Level: 64.21	Scale 1:50
Client: MACE Group		Dates: 15/02/2022 - 16/02/2022	Logged By DRILLER

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		10.50		N=24 (2,4/5,6,6,7)				
		10.60 10.60 - 11.00	D B		10.60	53.61		Firm to stiff brown silty CLAY. [GLACIOFLUVIAL DEPOSITS].
		11.00	D		11.00	53.21		Firm brown CLAY. [GLACIOFLUVIAL DEPOSITS].
	▼							
		11.50 11.50 - 12.00	D B		11.50	52.71		Medium dense brown SAND and GRAVEL. [GLACIOFLUVIAL DEPOSITS].
		12.00		N=13 (2,2/3,3,4,3)				
		13.00	D		13.00	51.21		Very stiff grey brown CLAY with occasional Chalk pieces and gravels of mudstone and quartzite. [LOWESTOFT FORMATION].
		13.50		50 (5,10/15,16,19,)				
		15.00	D		15.00	49.21		End of borehole at 15.00 m
		15.00		50 (8,12/50 for 230mm)				

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Remarks
1. Borehole was terminated upon achieving required depth.

AGS

Borehole Log

Borehole No.	**CP03**	Sheet 1 of 2	
Project Name: Burnt Mill Academy	Project No. C3825	Co-ords: 545414.00 - 210811.00	Hole Type CP
Location: Harlow		Level: 64.07	Scale 1:50
Client: MACE Group		Dates: 16/02/2022 - 17/02/2022	Logged By DRILLER

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.00 - 0.50	B		0.10	63.97		MADE GROUND comprising black asphaly concrete.
		0.50	D		0.50	63.57		MADE GROUND comprising ashy stone and brick fill.
		0.50 - 1.00	B					Firm brown silty CLAY. [GLACIOFLUVIAL DEPOSITS].
		1.20		N=27 (2,4/6,6,7,8)	1.20	62.87		Stiff brown gravelly CLAY. [GLACIOFLUVIAL DEPOSITS].
		2.00		N=33 (4,6/7,7,9,10)	2.00	62.07		Dense brown clayey SAND and GRAVEL. [GLACIOFLUVIAL DEPOSITS].
					2.30	61.77		Medium dense SAND and GRAVEL. [GLACIOFLUVIAL DEPOSITS].
		2.50 - 3.00	B					
		3.00		N=20 (2,4/5,4,5,6)				
		4.00	D					
		4.00		N=12 (2,3/2,3,4,3)				
		5.00		N=13 (2,2/3,3,4,3)				
		5.70	D		5.70	58.37		Medium dense coarse brown SAND with occasional gravels. [GLACIOFLUVIAL DEPOSITS].
		6.00		N=11 (1,2/2,3,3,3)				
		6.00 - 6.45	B					
		7.50		N=10 (2,2/2,3,2,3)				
		8.40	D		8.40	55.67		Loose to medium dense SAND and GRAVEL. [GLACIOFLUVIAL DEPOSITS].
		9.00		N=10 (1,2/2,3,2,3)				
		9.00 - 9.50	B					
		10.00	D		10.00	54.07		Continued on next sheet

Remarks
1. Borehole was terminated upon achieving required depth.

hsp consulting

Borehole Log

Borehole No.
CP03
Sheet 2 of 2

Project Name: Burnt Mill Academy	Project No. C3825	Co-ords: 545414.00 - 210811.00	Hole Type CP
Location: Harlow		Level: 64.07	Scale 1:50
Client: MACE Group		Dates: 16/02/2022 - 17/02/2022	Logged By DRILLER

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Medium dense brown silty SAND with occasional gravels. [GLACIOFLUVIAL DEPOSITS].
		10.50 10.50 - 10.95	B	N=13 (2,3/3,3,3,4)				
		12.00		N=17 (2,3/4,4,4,5)				
		13.50		N=19 (3,4/4,5,5,5)				
		14.50 14.50 - 14.95	D	N=14 (2,2/3,3,4,4)				
					15.00	49.07		End of borehole at 15.00 m

Remarks
1. Borehole was terminated upon achieving required depth.

AGS

hsp consulting

Borehole Log

Project Name: Burnt Mill Academy	Project No. C3825	Co-ords: 545523.00 - 210726.00	Borehole No. **CP04** Sheet 1 of 2
Location: Harlow		Level: 64.90	Hole Type CP
Client: MACE Group		Dates: 17/02/2022 - 18/02/2022	Scale 1:50
			Logged By DRILLER

Well	Water Strikes	**Samples and In Situ Testing**			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.00 - 1.00	B					Topsoil over stone gravelly fill.
		0.20	D					
		1.20	D		1.20	63.70		Dense brown gravelly CLAY. [GLACIOFLUVIAL DEPOSITS].
		1.20		N=25 (3,4/5,6,6,8)				
		1.20 - 1.65	B					
		1.60	D		1.60	63.30		Dense SAND and GRAVEL. [GLACIOFLUVIAL DEPOSITS].
		2.00		N=50 (6,10/50 for 295mm)				
		2.00 - 2.45	B					
		3.00		N=15 (3,4/4,3,3,5)				*....becoming Medium Dense to Loose.*
		4.00		N=11 (2,2/3,2,3,3)				
		5.00		N=8 (1,1/2,2,2,2)				
		5.60	D		5.60	59.30		Loose brown coarse SAND. [GLACIOFLUVIAL DEPOSITS].
		6.00		N=9 (1,1/2,2,2,3)				
		6.00 - 6.45	B					
		7.50		N=12 (1,2/2,3,3,4)				
		7.50 - 7.95	D					
		8.20	D		8.20	56.70		Medium brown SAND. [GLACIOFLUVIAL DEPOSITS].
		8.50 - 9.00	B					
		9.00		N=16 (2,3/3,4,4,5)				
		9.00 - 9.45	D					
		10.00	D		10.00	54.90		

Continued on next sheet

Remarks
1. Borehole was terminated upon achieving required depth.

Borehole Log

Borehole No.
CP04
Sheet 2 of 2

Project Name: Burnt Mill Academy	Project No. C3825	Co-ords: 545523.00 - 210726.00	Hole Type CP
Location: Harlow		Level: 64.90	Scale 1:50
Client: MACE Group		Dates: 17/02/2022 - 18/02/2022	Logged By DRILLER

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Medium dense brown silty SAND. [GLACIOFLUVIAL DEPOSITS].
		10.50 10.50 - 11.00	 B	N=12 (1,2/2,3,4,3)	10.40	54.50		Medium dense SAND and GRAVEL. [GLACIOFLUVIAL DEPOSITS].
		12.00		N=16 (2,2/3,4,5,4)				
		12.70	D		12.70	52.20		Stiff brown silty gravelly CLAY. Gravels are fine to coarse angular to subrounded chalk and mudstone. [LOWESTOFT FORMATION].
		13.00 - 13.50	B					
		13.50 13.50	D	N=50 (5,8/50 for 295mm)	13.50	51.40		Stiff grey CLAY with occasional fragments of Chalk. [LOWESTOFT FORMATION].
		15.00 15.00	D	N=50 (3,10/50 for 255mm)	15.00	49.90		End of borehole at 15.00 m

Remarks
1. Borehole was terminated upon achieving required depth.

Borehole Log

Borehole No.	**WS01**	Sheet 1 of 1	
Project Name:	Burnt Mill Academy	Project No. C3825	
Co-ords:	545430.00 - 210812.00	Hole Type	WS
Location:	Harlow	Level:	64.16
Scale	1:50		
Client:	MACE Group	Dates:	26/11/2021 -
Logged By	H.Daley		

Samples and In Situ Testing

Depth (m)	Type	Results
0.05	ES	
0.70	ES	
1.00	T	
1.00		N=12 (4,2/2,4,3,3)
1.50	B	
2.00		N=30 (7,9/9,8,8,5)
3.00		N=18 (5,4/5,5,4,4)
4.00		N=7 (3,2/2,1,2,2)
5.00		N=1 (0,0/0,0,1,0)

Depth (m)	Level (m)	Stratum Description
0.10	64.06	MADE GROUND - grey asphalt concrete.
0.45	63.71	MADE GROUND - red brown gravelly slightly clayey Sand. Sand is fine to coarse. Gravel is sub angular to sub rounded of brick, sandstone and ceramic.
0.95	63.21	MADE GROUND - blue grey sandy slightly gravelly Clay. Sand is fine to coarse. Gravel is sub angular to subrounded brick, concrete and flint.
1.90	62.26	Firm orange brown sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to subrounded flint. [LOWESTOFT FORMATION].
4.30	59.86	Dense to medium dense orange brown clayey SAND and GRAVEL. Sand is fine to coarse. Gravel is sub angular to subrounded flint. [GLACIOFLUVIAL DEPOSITS]. *....becoming loose.*
5.00	59.16	Very loose clayey gravelly SAND. Sand is fine to coarse. Gravel is sub angular to subrounded flint. [GLACIOFLUVIAL DEPOSITS].

End of borehole at 5.00 m

Remarks

1. Borehole was terminated upon reaching target depth of 5.00m begl.

Borehole Log

Project Name: Burnt Mill Academy	Project No. C3825	Co-ords: 545424.00 - 210905.00	Borehole No. **WS02** Sheet 1 of 1
			Hole Type WS
Location: Harlow		Level: 61.98	Scale 1:50
Client: MACE Group		Dates: 26/11/2021 -	Logged By H.Daley

Water Strikes	Samples and In Situ Testing Depth (m)	Type	Results	Depth (m)	Level (m)
	0.05	ES		0.10	61.88
				0.20	61.78
	1.00		N=10 (5,6/4,2,2,2)		
▼	1.20	B		1.20	60.78
	2.00	TJ			
	2.00		N=4 (0,1/1,1,1,1)		
	3.00		N=7 (1,2/1,2,2,2)		
	4.00		N=7 (1,1/2,1,2,2)		
	5.00		N=8 (3,2/2,1,2,3)	5.00	56.98

Stratum Description

MADE GROUND - grass overlying brown sandy slightly gravelly clayey Topsoil. Sand is fine to coarse. Gravel is angular to subrounded flint.

MADE GROUND - brown sandy slightly gravelly Clay. Sand is fine to coarse. Gravel is angular to subrounded flint.

Loose orange brown clayey slightly gravelly SAND. Sand is fine to coarse. Gravel is angular to subrounded flint. [LOWESTOFT FORMATION].

Soft grey brown sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded chalk. [LOWESTOFT FORMATION].

......dark brown staining and organic odour.

End of borehole at 5.00 m

Remarks
1. Borehole was terminated upon reaching target depth of 5.00m begl. 2. Groundwater was encountered at 1.50m begl.

Borehole Log

Project Name: Burnt Mill Academy	Project No. C3825	Co-ords: 545387.00 - 210848.00	Borehole No. **WS03** Sheet 1 of 1
Location: Harlow		Level: 61.43	Hole Type WS
			Scale 1:50
Client: MACE Group		Dates: 26/11/2021 -	Logged By H.Daley

Well	Water Strikes	**Samples and In Situ Testing**			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10	61.33		MADE GROUND - grass overlying brown sandy slightly gravelly clayey Topsoil. Sand is fine to coarse. Gravel is angular to subrounded flint.
		0.25	ES					
		0.50	B					
					0.75	60.68		Soft to firm orange brown sandy slightly gravelly CLAY. Gravels are angular to sub angular flint. [LOWESTOFT FORMATION].
		1.00	TJ		1.00	60.43		Loose orange brown clayey slightly gravelly SAND. Sand is fine to coarse. Gravel is angular to subrounded flint. [LOWESTOFT FORMATION].
		1.00		N=6 (1,1/0,2,2,2)				
		2.00		N=4 (0,1/1,1,1,1)				
		2.20	ES					
		3.00		N=19 (7,9/7,6,4,2)				
					3.50	57.93		Soft grey brown sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded chalk. [LOWESTOFT FORMATION]. ...... *dark black staining and organic odour.* ....*becoming stiff.*
		4.00		N=10 (2,1/2,2,3,3)	4.00	57.43		Loose orange brown clayey SAND and GRAVEL. Sand is fine to coarse. Gravel is subangular to subrounded sandstone. [GLACIOFLUVIAL DEPOSITS].
		5.00		N=16 (2,4/4,4,4,4)	5.00	56.43		FIrm becoming stiff grey brown sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded chalk. [LOWESTOFT FORMATION]. ...... *dark black staining and organic odour.*

End of borehole at 5.00 m

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Remarks

1. Borehole was terminated upon reaching target depth of 5.00m begl.

AGS

Borehole Log

Project Name: Burnt Mill Academy	Project No. C3825	Co-ords: 545419.00 - 210733.00	Borehole No. **WS04** Sheet 1 of 1
			Hole Type WS
Location: Harlow		Level: 64.51	Scale 1:50
Client: MACE Group		Dates: 26/11/2021 -	Logged By H.Daley

Well	Water Strikes	Samples and In Situ Testing Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
					0.10	64.41		MADE GROUND - grey asphalt concrete.
					0.20	64.31		MADE GROUND - organic brown sandy cobbles. Sand is fine to coarse, Cobbles are angular concrete and brick.
		0.80	ES					Dense orange brown clayey SAND and GRAVEL. Sand is fine to coarse. Gravel is sub angular to subrounded flint. [GLACIOFLUVIAL DEPOSITS].
		1.00		N=25 (9,9/7,7,6,5)				
					1.20	63.31		Medium dense organic brown slightly gravelly SAND. Sand is fine to coarse. Gravel is angular to subrounded flint. [GLACIOFLUVIAL DEPOSITS].
		2.00	TJ					
		2.00		N=14 (3,3/2,4,4,4)				
		2.30	B					
		3.00		N=14 (3,3/3,4,3,4)				
		4.00		N=4 (1,0/0,1,1,2)				*.....becoming loose.*
		5.00		N=6 (2,2/1,1,2,2)	5.00	59.51		End of borehole at 5.00 m

Remarks

1. Borehole was terminated upon reaching target depth of 5.00m begl.

Borehole Log

Project Name: Burnt Mill Academy	Project No. C3825	Co-ords: 545435.00 - 210798.00	Borehole No. **WS05** Sheet 1 of 1
			Hole Type WS
Location: Harlow		Level: 64.37	Scale 1:50
Client: MACE Group		Dates: 26/11/2021 -	Logged By H.Daley

Well	Water Strikes	Samples and In Situ Testing Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
		0.15	ES		0.10	64.27		MADE GROUND - grey asphalt concrete.
					0.30	64.07		MADE GROUND - red brown mottled black sandy slightly clayey gravelly Sand. Sand is fine to coarse. Gravel is angular to subrounded of asphalt concrete, brick, sandstone and concrete.
		0.80	ES					Loose to medium dense orange brown slightly gravelly SAND. Sand is fine to coarse. Gravel is sub angular to subrounded flint and sandstone. [GLACIOFLUVIAL DEPOSITS].
		1.00	B					
		1.00		N=8 (2,2/2,2,2,2)				
		2.00		N=13 (3,2/3,3,3,4)				
		3.00		N=20 (4,5/5,5,5,5)				
		4.00		N=13 (6,5/3,3,2,5)				
		5.00		N=30 (12,9/9,7,7,7)	5.00	59.37		End of borehole at 5.00 m

Remarks

1. Borehole was terminated upon reaching target depth of 5.00m begl.

Borehole Log

Project Name: Burnt Mill Academy	Project No. C3825	Co-ords: 545399.00 - 210803.00	Borehole No. **WS06** Sheet 1 of 1
Location: Harlow		Level: 63.85	Hole Type WS
			Scale 1:50
Client: MACE Group		Dates: 26/11/2021 -	Logged By H.Daley

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10	63.75		MADE GROUND - grey asphalt concrete.
		0.40	ES		0.40	63.45		MADE GROUND - red brown gravelly slightly clayey Sand. Sand is fine to coarse. Gravel is sub angular to sub rounded of brick, sandstone and ceramic.
					0.80	63.05		MADE GROUND - blue grey sandy slightly gravelly Clay. Sand is fine to coarse. Gravel is sub angular to subrounded brick, concrete and flint.
		1.00		N=19 (5,5/5,4,5,5)				Medium dense orange brown clayey SAND and GRAVEL. Sand is fine to coarse. Gravel is sub angular to subrounded flint. [GLACIOFLUVIAL DEPOSITS].
		2.00		N=10 (4,3/2,3,2,3)				
		2.30	B					
		3.00		N=7 (3,2/2,1,2,2)				*.....becoming loose.*
					3.40	60.45		Loose clayey gravelly SAND. Sand is fine to coarse. Gravel is sub angular to subrounded flint. [GLACIOFLUVIAL DEPOSITS].
		4.00		N=4 (2,1/1,1,1,1)				
		5.00		N=5 (2,1/1,2,1,1)	5.00	58.85		End of borehole at 5.00 m

Remarks

1. Borehole was terminated upon reaching target depth of 5.00m begl.

Borehole Log

Project Name: Burnt Mill Academy	Project No. C3825	Co-ords: 545517.00 - 210751.00	Borehole No. **WS07** Sheet 1 of 1
Location: Harlow		Level: 63.51	Hole Type WS
			Scale 1:50
Client: MACE Group		Dates: 15/02/2022 -	Logged By NS

Well	Water Strikes	**Samples and In Situ Testing**			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
▨		0.10 - 0.20	ES		0.28	63.23	▩	MADE GROUND - Grass over dark brown slightly sandy slightly gravelly Clay with frequent roots and rootlets and rare brick fragments. Sand is fine and gravels are of rounded fine to coarse flint and quartzite.
▨					0.50	63.01	▤	Very soft brown slightly gravelly CLAY. Gravel is rounded fine to coarse of flint and quartzite. [LOWESTOFT FORMATION].
▨		0.70 - 1.00 1.00	B	 50 (10,11/50 for 255mm)	1.00	62.51	▒	Very dense brown clayey SAND and GRAVEL. Sand is fine to coarse and gravel is rounded fine to coarse flint and quartzite. [GLACIOFLUVIAL DEPOSITS].

End of borehole at 1.00 m

Remarks

1. Borehole was terminated upon refusal at 1.00m begl.

Borehole Log

Borehole No.	**WS08**	Sheet 1 of 1	
Project Name: Burnt Mill Academy	Project No. C3825	Co-ords: 545475.00 - 210732.00	Hole Type WS
Location: Harlow		Level: 65.13	Scale 1:50
Client: MACE Group		Dates: 15/02/2022 -	Logged By NS

Well	Water Strikes	**Samples and In Situ Testing**			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
▨					0.50	64.63	▨	Grass over very soft dark brown slightly sandy slightly gravelly clayey TOPSOIL with frequent roots and rootlets. Sand is fine and gravels are round fine flint and quartzite..
▨		0.90 - 1.00 1.00	ES	N=6 (1,1/1,2,1,2)	1.40	63.73	○—	Soft brown slightly gravelly CLAY. Gravel is rounded fine to medium flint and quartzite. [LOWESTOFT FORMATION].
▨					1.65	63.48	⁘	Medium dense pale grey slightly gravelly SAND. Sand is medium, gravel is rounded fine flint and quartzite. [GLACIOFLUVIAL DEPOSITS].
▨		1.70 - 2.00 2.00	B	50 (25 for 95mm/50 for 285mm)	2.00	63.13	⁘	Very dense grey brown clayey SAND and GRAVEL. Sand is medium, gravels are rounded fine to medium flint and quartzite. [GLACIOFLUVIAL DEPOSITS].
								End of borehole at 2.00 m

Remarks
1. Borehole was terminated at 2.00m begl due to refusal.

Borehole Log

Project Name: Burnt Mill Academy	Project No. C3825	Co-ords: 545441.00 - 210717.00	Borehole No. **WS09** Sheet 1 of 1
Location: Harlow		Level: 65.18	Hole Type WS Scale 1:50
Client: MACE Group		Dates: 15/02/2022 -	Logged By NS

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.30	64.88		Grass over very soft dark brown slightly sandy slightly gravelly clayey TOPSOIL with frequent roots and rootlets. Sand is fine and gravels are round fine flint and quartzite..
		0.75 - 0.85	ES		0.70	64.48		Soft brown slightly gravelly CLAY. Gravel is rounded fine to medium flint and quartzite. [LOWESTOFT FORMATION].
		1.00		N=47 (8,8/8,13,10,16)	1.00	64.18		Dense grey brown clayey SAND and GRAVEL. Sand is medium, gravels are rounded fine to medium flint and quartzite. [GLACIOFLUVIAL DEPOSITS].
		1.00 - 1.20	B					
					1.60	63.58		Dense grey brown fine SAND.[GLACIOFLUVIAL DEPOSITS].
		2.00		N=50 (25 for 145mm/50 for 265mm)	2.00	63.18		Very dense grey brown clayey SAND and GRAVEL. Sand is medium, gravels are rounded fine to medium flint and quartzite. [GLACIOFLUVIAL DEPOSITS].

End of borehole at 2.00 m

Remarks

1. Borehole was terminated at 2.00m begl due to refusal

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Borehole Log

Project Name: Burnt Mill Academy	Project No. C3825	Co-ords: 545490.00 - 210874.00	Borehole No. **WS10** Sheet 1 of 1
			Hole Type WS
Location: Harlow		Level: 61.53	Scale 1:50
Client: MACE Group		Dates: 15/02/2022 -	Logged By NS

Well	Water Strikes	**Samples and In Situ Testing** Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
▨					0.20	61.33	▨	Grass over very soft dark brown slightly sandy slightly gravelly clayey TOPSOIL with frequent roots and rootlets. Sand is fine and gravels are round fine flint and quartzite.
▨					0.50	61.03	▨	Crushed red brick.
								End of borehole at 0.50 m

1 2 3 4 5 6 7 8 9 10

Remarks
1. Borehole was terminated at 0.50m begl due to brick obstruction.

AGS

hsp consulting

Borehole Log

Borehole No.	**WS10A**
Sheet 1 of 1	
Project Name:	Burnt Mill Academy
Project No.	C3825
Co-ords:	545495.00 - 210869.00
Hole Type	WS
Location:	Harlow
Level:	61.49
Scale	1:50
Client:	MACE Group
Dates:	15/02/2022 -
Logged By	NS

Samples and In Situ Testing

Depth (m)	Type	Results
0.30 - 0.40	ES	
0.70 - 1.00	B	
1.00		N=13 (2,2/2,4,4,3)
1.00 - 1.20	D	
1.50 - 1.70	B	
2.00		N=9 (2,1/2,2,2,3)
3.00		N=8 (2,2/2,2,2,2)
4.00		N=14 (2,3/3,3,4,4)
5.00		N=27 (4,4/6,7,7,7)

Depth (m)	Level (m)	Stratum Description
0.30	61.19	Grass over very soft dark brown slightly sandy slightly gravelly clayey TOPSOIL with frequent roots and rootlets. Sand is fine and gravels are round fine flint and quartzite.
0.40	61.09	MADE GROUND comprising dark grey concrete cobbles.
2.40	59.09	Firm brown slightly gravelly slightly sandy CLAY. Gravel is rounded fine to medium flint and quartzite. [LOWESTOFT FORMATION].
3.20	58.29	Soft brown slightly gravelly CLAY. Gravel is rounded fine to medium flint and quartzite. [LOWESTOFT FORMATION].
5.00	56.49	Firm grey mottled brown CLAY. [LOWESTOFT FORMATION]. *....becoming stiff CLAY.*

End of borehole at 5.00 m

1 2 3 4 5 6 7 8 9 10

Remarks

1. Borehole was terminated upon reaching target depth of 5.00m begl.

AGS

Borehole Log

Project Name: Burnt Mill Academy	Project No. C3825	Co-ords: 545562.00 - 210758.00
Location: Harlow		Level: 63.74
Client: MACE Group		Dates: 15/02/2022 -

Borehole No.	**WS11**
Sheet 1 of 1	
Hole Type	WS
Scale	1:50
Logged By	NS

Well	Water Strikes	Samples and In Situ Testing Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
					0.25	63.49		Grass over very soft dark brown slightly sandy slightly gravelly clayey TOPSOIL with frequent roots and rootlets. Sand is fine and gravels are round fine flint and quartzite..
								Dense grey brown clayey SAND and GRAVEL. Sand is medium, gravels are rounded fine to medium flint and quartzite. [GLACIOFLUVIAL DEPOSITS].
		0.90 - 1.00	ES					
		1.00		N=36 (10,12/10,7,9,10)				
		1.50 - 1.80	D					
		1.80 - 2.00	B					
		2.00		N=12 (2,2/3,3,3,3)	2.00	61.74		Medium dense brown medium SAND. [GLACIOFLUVIAL DEPOSITS]. *Limited Recovery.*
					2.60	61.14		Loose grey brown clayey SAND and GRAVEL. Sand is medium, gravels are rounded fine to medium flint and quartzite. [GLACIOFLUVIAL DEPOSITS].
		3.00		N=10 (3,3/3,2,2,3)				
		4.00		N=8 (2,1/2,1,2,3)				*Limited Recovery.*
					4.40	59.34		Very loose brown SAND. [GLACIOFLUVIAL DEPOSITS].
		5.00		N=0 (0,0/0,0,0,0)	5.00	58.74		End of borehole at 5.00 m

Remarks

1. Borehole was terminated upon reaching target depth of 5.00m begl.

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Borehole Log

Borehole No.	**WS12**	Sheet 1 of 1	
Project Name:	Burnt Mill Academy	Project No.	C3825
Co-ords:	545428.00 - 210856.00	Hole Type	WS
Location:	Harlow	Level:	61.48
Scale	1:50		
Client:	MACE Group	Dates:	15/02/2022 -
Logged By	NS		

Well	Water Strikes	**Samples and In Situ Testing**			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.06	61.42	▨	MADE GROUND - Grass over dark brown slightly sandy slightly gravelly Clay with frequent roots and rootlets and rare brick fragments. Sand is fine and gravels are of rounded fine to coarse flint and quartzite.
					0.20	61.28	▨	MADE GROUND - brown slightly gravelly CLAY. Gravel is rounded fine to medium flint and quartzite. (Reworked Diamicton).
		0.30 - 0.40	ES					
		0.60 - 0.80	ES					
		1.00		N=8 (3,2/1,2,2,3)	1.00	60.48	▨	MADE GROUND - dark brown slightly gravelly clay with rare brick and concrete fragments. Gravel is rounded fine to medium flint.
		1.90 - 2.00	D					
		2.00		N=7 (1,1/1,2,2,2)				
					2.50	58.98	▨	MADE GROUND - dark grey slightly gravelly Clay. Gravels are rounded fine asphalt and chalk.
		3.00		N=29 (3,3/5,6,8,10)				
		4.00		N=32 (5,5/6,6,9,11)				
		5.00		N=32 (5,5/5,8,9,10)	5.00	56.48	▤	Stiff to very stiff pale grey mottled brown CLAY with rare fragments of chalk. [LOWESTOFT FORMATION].
								End of borehole at 5.00 m

Remarks

1. Borehole was terminated upon reaching target depth of 5.00m begl.

AGS

Appendix III

Legend

◉	WS#	Proposed window sample borehole
◐	CP#	Proposed cable percussive borehole

GENERAL NOTES

1. Do not scale.

5. All dimensions shown are in millimetres unless noted otherwise.

6. This drawing is based on SKY Revolutions Drawing Number, SRL21636 Rev B, Topographical Survey, dated 25/11/21.

7. All survey information is provided by the surveying company and HSP cannot accept any liability for any discrepancies there in. All survey information to be verified on site by contractor. Should discrepancies be identified, HSP to be notified immediately.

REV	BY	DATE	DETAILS	CKD
P02	IA	29.11.21	Revised survey added (contours added)	LJ
P01	IA	11.11.21	First revision	LJ

STATUS S2 - INFORMATION

CLIENT

Mace Group

PROJECT

Burnt Mill Academy,
Harlow

TITLE

Ground Investigation
Layout Plan

hsp consulting

Lawrence House, 6 Meadowbank Way, Eastwood, Nottingham, NG16 3SB
Tel: 01773 535555 www.hspconsulting.com

SCALE	PROJECT NO.	SHEET SIZE A0
1:500	C3825	

DATE	DRAWN	CHECKED
08.03.22	IA	LJ

DRAWING NO.	REV
C3825-HSP-00-00-DR-G-501	P01

Appendix IV

UKAS TESTING
2183

Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	21-42360-1		
Initial Date of Issue:	07-Dec-2021		
Client	HSP Consulting Engineers Limited		
Client Address:	Lawrence House Meadowbank Way Eastwood Nottinghamshire NG16 3SB		
Contact(s):	Laura Jones		
Project	C3825 Burnt Mill Academy		
Quotation No.:		**Date Received:**	01-Dec-2021
Order No.:		**Date Instructed:**	01-Dec-2021
No. of Samples:	14		
Turnaround (Wkdays):	5	**Results Due:**	07-Dec-2021
Date Approved:	07-Dec-2021		

Approved By:

Details: Glynn Harvey, Technical Manager

Results - Soil

Project: C3825 Burnt Mill Academy

Client: HSP Consulting Engineers Limited	**Chemtest Job No.:**				21-42360	21-42360	21-42360	21-42360	21-42360	21-42360	21-42360	21-42360	21-42360
Quotation No.:	**Chemtest Sample ID.:**				1331330	1331331	1331332	1331333	1331334	1331335	1331336	1331337	1331338
	Sample Location:				WS01	WS01	WS01	WS02	WS02	WS02	WS03	WS03	WS03
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.05	0.70	1.00	0.05	1.00	2.00	0.25	2.20	1.00
	Date Sampled:				26-Nov-2021	26-Nov-2021	26-Nov-2021	26-Nov-2021	26-Nov-2021	26-Nov-2021	26-Nov-2021	26-Nov-2021	26-Nov-2021
	Asbestos Lab:					DURHAM		DURHAM			DURHAM		
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
ACM Type	U	2192		N/A		-		-			-		
Asbestos Identification	U	2192		N/A		No Asbestos Detected		No Asbestos Detected			No Asbestos Detected		
Moisture	N	2030	%	0.020	18	21	8.3	9.0	17	17	21	21	9.0
pH	U	2010		4.0		8.3	8.6	8.2	8.4	8.3	8.2	8.1	8.9
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40		1.5	< 0.40	< 0.40	< 0.40		< 0.40	0.78	
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010		< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	0.094	< 0.010
Total Sulphur	U	2175	%	0.010			< 0.010			0.046			0.012
Sulphur (Elemental)	U	2180	mg/kg	1.0		10	3.0	3.6	1.2		16	300	
Cyanide (Free)	U	2300	mg/kg	0.50		< 0.50	2.7	< 0.50	< 0.50		< 0.50	< 0.50	
Cyanide (Total)	U	2300	mg/kg	0.50		< 0.50	3.2	< 0.50	< 0.50		< 0.50	< 0.50	
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50		14	3.2	3.4	66		7.8	100	
Sulphate (Acid Soluble)	U	2430	%	0.010			< 0.010			0.022			< 0.010
Arsenic	U	2450	mg/kg	1.0		14	13	14	11		11	7.3	
Cadmium	U	2450	mg/kg	0.10		0.41	< 0.10	0.19	0.12		< 0.10	0.18	
Chromium	U	2450	mg/kg	1.0		30	29	19	13		54	19	
Copper	U	2450	mg/kg	0.50		85	58	21	8.2		22	12	
Mercury	U	2450	mg/kg	0.10		< 0.10	< 0.10	0.13	< 0.10		< 0.10	< 0.10	
Nickel	U	2450	mg/kg	0.50		27	24	21	15		48	19	
Lead	U	2450	mg/kg	0.50		36	15	42	7.4		16	330	
Selenium	U	2450	mg/kg	0.20		0.21	< 0.20	< 0.20	< 0.20		< 0.20	< 0.20	
Zinc	U	2450	mg/kg	0.50		69	42	58	33		55	43	
Chromium (Hexavalent)	N	2490	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50		< 0.50	< 0.50	
Organic Matter	U	2625	%	0.40		3.3		1.4			0.43	1.5	
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0		< 1.0	[C] < 1.0	< 1.0	< 1.0		< 1.0	< 1.0	
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0		< 1.0	[C] < 1.0	< 1.0	< 1.0		< 1.0	< 1.0	
Aliphatic TPH >C8-C10	U	2680	mg/kg	1.0		< 1.0	[C] < 1.0	< 1.0	< 1.0		< 1.0	< 1.0	
Aliphatic TPH >C10-C12	U	2680	mg/kg	1.0		< 1.0	[C] < 1.0	< 1.0	< 1.0		< 1.0	< 1.0	
Aliphatic TPH >C12-C16	U	2680	mg/kg	1.0		< 1.0	[C] < 1.0	< 1.0	< 1.0		< 1.0	< 1.0	
Aliphatic TPH >C16-C21	U	2680	mg/kg	1.0		< 1.0	[C] < 1.0	< 1.0	< 1.0		< 1.0	< 1.0	
Aliphatic TPH >C21-C35	U	2680	mg/kg	1.0		< 1.0	[C] < 1.0	< 1.0	< 1.0		< 1.0	< 1.0	
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0		< 1.0	[C] < 1.0	< 1.0	< 1.0		< 1.0	< 1.0	
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0		< 5.0	[C] < 5.0	< 5.0	< 5.0		< 5.0	< 5.0	
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0		< 1.0	[C] < 1.0	< 1.0	< 1.0		< 1.0	< 1.0	
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0		< 1.0	[C] < 1.0	< 1.0	< 1.0		< 1.0	< 1.0	
Aromatic TPH >C8-C10	U	2680	mg/kg	1.0		< 1.0	[C] < 1.0	< 1.0	< 1.0		< 1.0	< 1.0	
Aromatic TPH >C10-C12	U	2680	mg/kg	1.0		< 1.0	[C] < 1.0	< 1.0	< 1.0		< 1.0	< 1.0	
Aromatic TPH >C12-C16	U	2680	mg/kg	1.0		< 1.0	[C] < 1.0	< 1.0	< 1.0		< 1.0	< 1.0	

Results - Soil

Project: C3825 Burnt Mill Academy

Client: HSP Consulting Engineers Limited	**Chemtest Job No.:**				21-42360	21-42360	21-42360	21-42360	21-42360	21-42360	21-42360	21-42360	21-42360
Quotation No.:	**Chemtest Sample ID.:**				1331330	1331331	1331332	1331333	1331334	1331335	1331336	1331337	1331338
	Sample Location:				WS01	WS01	WS01	WS02	WS02	WS02	WS03	WS03	WS03
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.05	0.70	1.00	0.05	1.00	2.00	0.25	2.20	1.00
	Date Sampled:				26-Nov-2021	26-Nov-2021	26-Nov-2021	26-Nov-2021	26-Nov-2021	26-Nov-2021	26-Nov-2021	26-Nov-2021	26-Nov-2021
	Asbestos Lab:					DURHAM		DURHAM			DURHAM		
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0		< 1.0	[C] < 1.0	< 1.0	< 1.0		< 1.0	< 1.0	
Aromatic TPH >C21-C35	U	2680	mg/kg	1.0		< 1.0	[C] < 1.0	< 1.0	< 1.0		< 1.0	< 1.0	
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0		< 1.0	[C] < 1.0	< 1.0	< 1.0		< 1.0	< 1.0	
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0		< 5.0	[C] < 5.0	< 5.0	< 5.0		< 5.0	< 5.0	
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0		< 10	[C] < 10	< 10	< 10		< 10	< 10	
Naphthalene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10		< 0.10	< 0.10	
Acenaphthylene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10		< 0.10	< 0.10	
Acenaphthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10		< 0.10	< 0.10	
Fluorene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10		< 0.10	< 0.10	
Phenanthrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.49	< 0.10		< 0.10	< 0.10	
Anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.12	< 0.10		< 0.10	< 0.10	
Fluoranthene	U	2700	mg/kg	0.10	1.5	< 0.10	< 0.10	0.90	< 0.10		< 0.10	< 0.10	
Pyrene	U	2700	mg/kg	0.10	6.0	< 0.10	< 0.10	0.97	< 0.10		< 0.10	< 0.10	
Benzo[a]anthracene	U	2700	mg/kg	0.10	1.6	< 0.10	< 0.10	0.48	< 0.10		< 0.10	< 0.10	
Chrysene	U	2700	mg/kg	0.10	2.9	< 0.10	< 0.10	0.68	< 0.10		< 0.10	< 0.10	
Benzo[b]fluoranthene	U	2700	mg/kg	0.10	5.6	< 0.10	< 0.10	0.59	< 0.10		< 0.10	< 0.10	
Benzo[k]fluoranthene	U	2700	mg/kg	0.10	1.6	< 0.10	< 0.10	0.48	< 0.10		< 0.10	< 0.10	
Benzo[a]pyrene	U	2700	mg/kg	0.10	5.0	< 0.10	< 0.10	0.48	< 0.10		< 0.10	< 0.10	
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.10	6.4	< 0.10	< 0.10	< 0.10	< 0.10		< 0.10	< 0.10	
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.10	2.6	< 0.10	< 0.10	< 0.10	< 0.10		< 0.10	< 0.10	
Benzo[g,h,i]perylene	U	2700	mg/kg	0.10	10	< 0.10	< 0.10	< 0.10	< 0.10		< 0.10	< 0.10	
Total Of 16 PAH's	U	2700	mg/kg	2.0	43	< 2.0	< 2.0	5.2	< 2.0		< 2.0	< 2.0	
Double Ratio Fluoranthene:Pyrene	U	2700		0.010	0.25								
Double Ratio Benzo(a)Anthracene:Chrysene	U	2700		0.010	0.55								
Benzene	U	2760	µg/kg	1.0		< 1.0	[C] < 1.0	< 1.0	< 1.0		< 1.0	< 1.0	
Toluene	U	2760	µg/kg	1.0		< 1.0	[C] < 1.0	< 1.0	< 1.0		< 1.0	< 1.0	
Ethylbenzene	U	2760	µg/kg	1.0		< 1.0	[C] < 1.0	< 1.0	< 1.0		< 1.0	< 1.0	
m & p-Xylene	U	2760	µg/kg	1.0		< 1.0	[C] < 1.0	< 1.0	< 1.0		< 1.0	< 1.0	
o-Xylene	U	2760	µg/kg	1.0		< 1.0	[C] < 1.0	< 1.0	< 1.0		< 1.0	< 1.0	
Methyl Tert-Butyl Ether	U	2760	µg/kg	1.0		< 1.0	[C] < 1.0	< 1.0	< 1.0		< 1.0	< 1.0	
Total Phenols	U	2920	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10		< 0.10	< 0.10	

Results - Soil

Project: C3825 Burnt Mill Academy

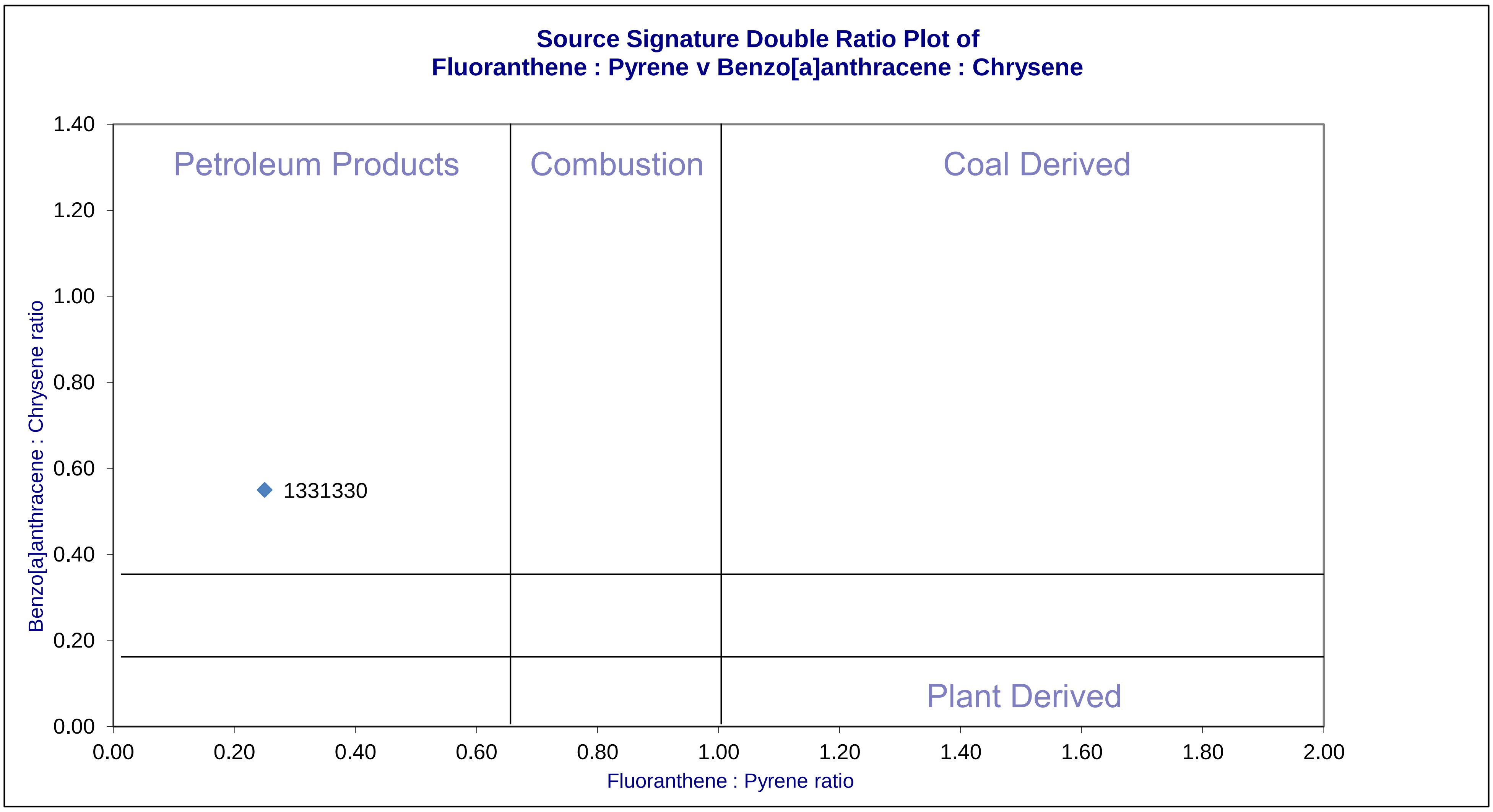
Client: HSP Consulting Engineers Limited	**Chemtest Job No.:**				21-42360	21-42360	21-42360	21-42360	21-42360
Quotation No.:	**Chemtest Sample ID.:**				1331339	1331340	1331341	1331342	1331343
	Sample Location:				WS04	WS04	WS05	WS05	WS06
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.80	2.00	0.15	0.80	0.40
	Date Sampled:				26-Nov-2021	26-Nov-2021	26-Nov-2021	26-Nov-2021	26-Nov-2021
	Asbestos Lab:						DURHAM		DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**					
ACM Type	U	2192		N/A			-		-
Asbestos Identification	U	2192		N/A			No Asbestos Detected		No Asbestos Detected
Moisture	N	2030	%	0.020	3.9	4.6	10	5.7	11
pH	U	2010		4.0	8.5	8.1	9.2	8.2	8.2
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	0.80		1.4	0.60	< 0.40
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	0.010	< 0.010	1.7	0.19	< 0.010
Total Sulphur	U	2175	%	0.010		< 0.010			
Sulphur (Elemental)	U	2180	mg/kg	1.0	< 1.0		13	< 1.0	36
Cyanide (Free)	U	2300	mg/kg	0.50	< 0.50		0.80	< 0.50	< 0.50
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50		35	7.3	1.0
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50	6.5		5.3	3.1	12
Sulphate (Acid Soluble)	U	2430	%	0.010		< 0.010			
Arsenic	U	2450	mg/kg	1.0	50		14	12	13
Cadmium	U	2450	mg/kg	0.10	0.19		< 0.10	0.21	0.54
Chromium	U	2450	mg/kg	1.0	21		26	12	26
Copper	U	2450	mg/kg	0.50	55		25	12	18
Mercury	U	2450	mg/kg	0.10	< 0.10		0.10	< 0.10	0.32
Nickel	U	2450	mg/kg	0.50	31		22	22	24
Lead	U	2450	mg/kg	0.50	12		30	7.2	38
Selenium	U	2450	mg/kg	0.20	0.20		< 0.20	< 0.20	< 0.20
Zinc	U	2450	mg/kg	0.50	82		57	55	71
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50		< 0.50	< 0.50	< 0.50
Organic Matter	U	2625	%	0.40	< 0.40		2.9	< 0.40	1.3
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0		< 1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0		< 1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	U	2680	mg/kg	1.0	< 1.0		< 1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	U	2680	mg/kg	1.0	< 1.0		< 1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	U	2680	mg/kg	1.0	< 1.0		< 1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0		< 1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	U	2680	mg/kg	1.0	< 1.0		< 1.0	< 1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0		< 1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0		< 5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0		< 1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0		< 1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	U	2680	mg/kg	1.0	< 1.0		< 1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	U	2680	mg/kg	1.0	< 1.0		< 1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	U	2680	mg/kg	1.0	< 1.0		< 1.0	< 1.0	< 1.0

Results - Soil

Project: C3825 Burnt Mill Academy

Client: HSP Consulting Engineers Limited	**Chemtest Job No.:**				21-42360	21-42360	21-42360	21-42360	21-42360
Quotation No.:	**Chemtest Sample ID.:**				1331339	1331340	1331341	1331342	1331343
	Sample Location:				WS04	WS04	WS05	WS05	WS06
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.80	2.00	0.15	0.80	0.40
	Date Sampled:				26-Nov-2021	26-Nov-2021	26-Nov-2021	26-Nov-2021	26-Nov-2021
	Asbestos Lab:						DURHAM		DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**					
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0		< 1.0	< 1.0	< 1.0
Aromatic TPH >C21-C35	U	2680	mg/kg	1.0	< 1.0		< 1.0	< 1.0	< 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0		< 1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0		< 5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10		< 10	< 10	< 10
Naphthalene	U	2700	mg/kg	0.10	< 0.10		< 0.10	< 0.10	< 0.10
Acenaphthylene	U	2700	mg/kg	0.10	< 0.10		< 0.10	< 0.10	< 0.10
Acenaphthene	U	2700	mg/kg	0.10	< 0.10		< 0.10	< 0.10	< 0.10
Fluorene	U	2700	mg/kg	0.10	< 0.10		< 0.10	< 0.10	< 0.10
Phenanthrene	U	2700	mg/kg	0.10	< 0.10		< 0.10	< 0.10	< 0.10
Anthracene	U	2700	mg/kg	0.10	< 0.10		< 0.10	< 0.10	< 0.10
Fluoranthene	U	2700	mg/kg	0.10	< 0.10		1.6	< 0.10	0.14
Pyrene	U	2700	mg/kg	0.10	< 0.10		1.8	< 0.10	0.22
Benzo[a]anthracene	U	2700	mg/kg	0.10	< 0.10		1.1	< 0.10	0.64
Chrysene	U	2700	mg/kg	0.10	< 0.10		0.99	< 0.10	0.72
Benzo[b]fluoranthene	U	2700	mg/kg	0.10	< 0.10		2.2	< 0.10	< 0.10
Benzo[k]fluoranthene	U	2700	mg/kg	0.10	< 0.10		0.87	< 0.10	< 0.10
Benzo[a]pyrene	U	2700	mg/kg	0.10	< 0.10		1.4	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.10	< 0.10		1.4	< 0.10	< 0.10
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.10	< 0.10		0.36	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2700	mg/kg	0.10	< 0.10		1.6	< 0.10	< 0.10
Total Of 16 PAH's	U	2700	mg/kg	2.0	< 2.0		13	< 2.0	< 2.0
Double Ratio Fluoranthene:Pyrene	U	2700		0.010					
Double Ratio Benzo(a)Anthracene:Chrysene	U	2700		0.010					
Benzene	U	2760	µg/kg	1.0	< 1.0		< 1.0	< 1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	< 1.0		< 1.0	< 1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0		< 1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0		< 1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0		< 1.0	< 1.0	< 1.0
Methyl Tert-Butyl Ether	U	2760	µg/kg	1.0	< 1.0		< 1.0	< 1.0	< 1.0
Total Phenols	U	2920	mg/kg	0.10	< 0.10		< 0.10	< 0.10	< 0.10

Double Ratio Plot



Sample No.	Fluoranthene	Pyrene	Benzo[a]Anthracene	Chrysene	Fluoranthene : Pyrene Ratio	Benzo[a]Anthracene : Chrysene Ratio
1331330	1.5	6.0	1.6	2.9	0.25	0.55

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request.The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1331332			WS01	26-Nov-2021	C	Plastic Tub 500g

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2180	Sulphur (Elemental) in Soils by HPLC	Sulphur	Dichloromethane extraction / HPLC with UV detection
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2325	Sulphide in Soils	Sulphide	Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N–dimethyl-p-phenylenediamine.
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

Report Information

Key	
U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

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

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

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

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

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

UKAS
TESTING
2183

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Final Report

Report No.: 22-06457-1

Initial Date of Issue: 28-Feb-2022

Client HSP Consulting Engineers Limited

Client Address:
Lawrence House
Meadowbank Way
Eastwood
Nottinghamshire
NG16 3SB

Contact(s): Laura Jones

Project C3825 Burnt Mill Academy

Quotation No.:		**Date Received:**	21-Feb-2022
Order No.:		**Date Instructed:**	21-Feb-2022
No. of Samples:	11		
Turnaround (Wkdays):	5	**Results Due:**	25-Feb-2022
Date Approved:	28-Feb-2022		

Approved By:

Details: Stuart Henderson, Technical Manager

Results - Soil

Project: C3825 Burnt Mill Academy

Client: HSP Consulting Engineers Limited				**Chemtest Job No.:**	22-06457	22-06457	22-06457	22-06457	22-06457	22-06457	22-06457	22-06457	22-06457
Quotation No.:				**Chemtest Sample ID.:**	1376492	1376493	1376494	1376495	1376496	1376497	1376498	1376499	1376500
				Sample Location:	WS07	WS08	WS09	WS10A	WS10A	WS10A	WS11	WS11	WS12
				Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):	0.10	0.90	0.75	0.30	1.00	1.50	0.90	1.50	0.30
				Bottom Depth (m):	0.20	1.00	0.85	0.40	1.10	1.70	1.00	1.60	0.40
				Date Sampled:	15-Feb-2022	15-Feb-2022	15-Feb-2022	15-Feb-2022	15-Feb-2022	15-Feb-2022	15-Feb-2022	15-Feb-2022	15-Feb-2022
				Asbestos Lab:	COVENTRY			COVENTRY					
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
ACM Type	U	2192		N/A	-			-					
Asbestos Identification	U	2192		N/A	No Asbestos Detected			No Asbestos Detected					
Moisture	N	2030	%	0.020	29	12	7.0	18	11	16	10	13	13
pH	U	2010		4.0	7.5	8.5	8.5	8.2	8.4	7.8	8.5	8.6	8.4
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	0.69	0.59	< 0.40	1.3		1.3	< 0.40		0.49
Magnesium (Water Soluble)	N	2120	g/l	0.010		< 0.010	< 0.010		< 0.010		< 0.010	< 0.010	
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	0.029	0.010	0.010	0.58	0.037	0.038	< 0.010	< 0.010	0.025
Total Sulphur	U	2175	%	0.010		0.25	0.013		0.011		0.029	< 0.010	
Sulphur (Elemental)	U	2180	mg/kg	1.0	1.2	< 1.0	< 1.0	7.6		10	< 1.0		2.2
Chloride (Water Soluble)	U	2220	g/l	0.010		< 0.010	< 0.010		< 0.010		< 0.010	< 0.010	
Nitrate (Water Soluble)	N	2220	g/l	0.010		< 0.010	< 0.010		< 0.010		< 0.010	< 0.010	
Cyanide (Free)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50		< 0.50	< 0.50		< 0.50
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50		< 0.50	< 0.50		< 0.50
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50	0.71	1.4	< 0.50	< 0.50		1.8	2.7		1.6
Ammonium (Water Soluble)	U	2220	g/l	0.01		< 0.01	< 0.01		< 0.01		< 0.01	< 0.01	
Sulphate (Acid Soluble)	U	2430	%	0.010		0.010	< 0.010		0.025		< 0.010	< 0.010	
Arsenic	U	2450	mg/kg	1.0	10	24	8.5	25		16	14		11
Cadmium	U	2450	mg/kg	0.10	0.34	0.17	< 0.10	0.45		0.35	< 0.10		< 0.10
Chromium	U	2450	mg/kg	1.0	20	30	30	41		25	31		18
Copper	U	2450	mg/kg	0.50	19	22	17	47		23	15		20
Mercury	U	2450	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.31		0.22	< 0.10		< 0.10
Nickel	U	2450	mg/kg	0.50	20	34	31	34		26	25		20
Lead	U	2450	mg/kg	0.50	29	34	12	170		36	10		11
Selenium	U	2450	mg/kg	0.20	0.32	< 0.20	< 0.20	0.30		0.36	< 0.20		< 0.20
Zinc	U	2450	mg/kg	0.50	71	79	62	160		75	62		29
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50		< 0.50	< 0.50		< 0.50
Organic Matter	U	2625	%	0.40	4.7	0.78	< 0.40	3.8		2.6	< 0.40		0.48
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0		< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0		< 1.0
Aliphatic TPH >C8-C10	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0		< 1.0
Aliphatic TPH >C10-C12	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0		< 1.0
Aliphatic TPH >C12-C16	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0		< 1.0
Aliphatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0		< 1.0
Aliphatic TPH >C21-C35	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0		< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0		< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0		< 5.0	< 5.0		< 5.0

Results - Soil

Project: C3825 Burnt Mill Academy

Client: HSP Consulting Engineers Limited	**Chemtest Job No.:**				22-06457	22-06457	22-06457	22-06457	22-06457	22-06457	22-06457	22-06457	22-06457
Quotation No.:	**Chemtest Sample ID.:**				1376492	1376493	1376494	1376495	1376496	1376497	1376498	1376499	1376500
	Sample Location:				WS07	WS08	WS09	WS10A	WS10A	WS10A	WS11	WS11	WS12
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.10	0.90	0.75	0.30	1.00	1.50	0.90	1.50	0.30
	Bottom Depth (m):				0.20	1.00	0.85	0.40	1.10	1.70	1.00	1.60	0.40
	Date Sampled:				15-Feb-2022	15-Feb-2022	15-Feb-2022	15-Feb-2022	15-Feb-2022	15-Feb-2022	15-Feb-2022	15-Feb-2022	15-Feb-2022
	Asbestos Lab:				COVENTRY			COVENTRY					
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0		< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0		< 1.0
Aromatic TPH >C8-C10	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0		< 1.0
Aromatic TPH >C10-C12	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0		< 1.0
Aromatic TPH >C12-C16	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0		< 1.0
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0		< 1.0
Aromatic TPH >C21-C35	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0		< 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0		< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0		< 5.0	< 5.0		< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	< 10	< 10	< 10		< 10	< 10		< 10
Naphthalene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10		< 0.10	< 0.10		< 0.10
Acenaphthylene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10		< 0.10	< 0.10		< 0.10
Acenaphthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10		< 0.10	< 0.10		< 0.10
Fluorene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10		< 0.10	< 0.10		< 0.10
Phenanthrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.99		< 0.10	< 0.10		< 0.10
Anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.32		< 0.10	< 0.10		< 0.10
Fluoranthene	U	2700	mg/kg	0.10	0.16	< 0.10	< 0.10	2.5		0.28	< 0.10		0.16
Pyrene	U	2700	mg/kg	0.10	0.18	< 0.10	< 0.10	2.7		0.26	< 0.10		0.21
Benzo[a]anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	1.7		< 0.10	< 0.10		< 0.10
Chrysene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	1.8		< 0.10	< 0.10		< 0.10
Benzo[b]fluoranthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	2.4		< 0.10	< 0.10		< 0.10
Benzo[k]fluoranthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	1.3		< 0.10	< 0.10		< 0.10
Benzo[a]pyrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	1.9		< 0.10	< 0.10		< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	1.3		< 0.10	< 0.10		< 0.10
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.47		< 0.10	< 0.10		< 0.10
Benzo[g,h,i]perylene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	1.2		< 0.10	< 0.10		< 0.10
Total Of 16 PAH's	U	2700	mg/kg	2.0	< 2.0	< 2.0	< 2.0	19		< 2.0	< 2.0		< 2.0
Benzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0		< 1.0
Toluene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0		< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0		< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0		< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0		< 1.0
Methyl Tert-Butyl Ether	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0		< 1.0
Total Phenols	U	2920	mg/kg	0.10	0.30	< 0.10	< 0.10	< 0.10		< 0.10	< 0.10		< 0.10

Results - Soil

Project: C3825 Burnt Mill Academy

Client: HSP Consulting Engineers Limited	**Chemtest Job No.:**				22-06457	22-06457
Quotation No.:	**Chemtest Sample ID.:**				1376501	1376502
	Sample Location:				WS12	WS12
	Sample Type:				SOIL	SOIL
	Top Depth (m):				0.60	1.90
	Bottom Depth (m):				0.70	2.00
	Date Sampled:				15-Feb-2022	15-Feb-2022
	Asbestos Lab:				COVENTRY	
Determinand	**Accred.**	**SOP**	**Units**	**LOD**		
ACM Type	U	2192		N/A	-	
Asbestos Identification	U	2192		N/A	No Asbestos Detected	
Moisture	N	2030	%	0.020	11	19
pH	U	2010		4.0	8.2	8.6
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	0.91	
Magnesium (Water Soluble)	N	2120	g/l	0.010		< 0.010
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	0.027	0.050
Total Sulphur	U	2175	%	0.010		0.012
Sulphur (Elemental)	U	2180	mg/kg	1.0	6.2	
Chloride (Water Soluble)	U	2220	g/l	0.010		< 0.010
Nitrate (Water Soluble)	N	2220	g/l	0.010		< 0.010
Cyanide (Free)	U	2300	mg/kg	0.50	< 0.50	
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50	
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50	0.91	
Ammonium (Water Soluble)	U	2220	g/l	0.01		< 0.01
Sulphate (Acid Soluble)	U	2430	%	0.010		< 0.010
Arsenic	U	2450	mg/kg	1.0	20	
Cadmium	U	2450	mg/kg	0.10	0.51	
Chromium	U	2450	mg/kg	1.0	36	
Copper	U	2450	mg/kg	0.50	66	
Mercury	U	2450	mg/kg	0.10	0.44	
Nickel	U	2450	mg/kg	0.50	35	
Lead	U	2450	mg/kg	0.50	300	
Selenium	U	2450	mg/kg	0.20	0.50	
Zinc	U	2450	mg/kg	0.50	200	
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	
Organic Matter	U	2625	%	0.40	4.7	
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	
Aliphatic TPH >C8-C10	U	2680	mg/kg	1.0	< 1.0	
Aliphatic TPH >C10-C12	U	2680	mg/kg	1.0	< 1.0	
Aliphatic TPH >C12-C16	U	2680	mg/kg	1.0	< 1.0	
Aliphatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0	
Aliphatic TPH >C21-C35	U	2680	mg/kg	1.0	< 1.0	
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	

Results - Soil

Project: C3825 Burnt Mill Academy

Client: HSP Consulting Engineers Limited	**Chemtest Job No.:**				22-06457	22-06457
Quotation No.:	**Chemtest Sample ID.:**				1376501	1376502
	Sample Location:				WS12	WS12
	Sample Type:				SOIL	SOIL
	Top Depth (m):				0.60	1.90
	Bottom Depth (m):				0.70	2.00
	Date Sampled:				15-Feb-2022	15-Feb-2022
	Asbestos Lab:				COVENTRY	
Determinand	**Accred.**	**SOP**	**Units**	**LOD**		
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	
Aromatic TPH >C8-C10	U	2680	mg/kg	1.0	< 1.0	
Aromatic TPH >C10-C12	U	2680	mg/kg	1.0	< 1.0	
Aromatic TPH >C12-C16	U	2680	mg/kg	1.0	< 1.0	
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	11	
Aromatic TPH >C21-C35	U	2680	mg/kg	1.0	< 1.0	
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	11	
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	11	
Naphthalene	U	2700	mg/kg	0.10	< 0.10	
Acenaphthylene	U	2700	mg/kg	0.10	< 0.10	
Acenaphthene	U	2700	mg/kg	0.10	< 0.10	
Fluorene	U	2700	mg/kg	0.10	< 0.10	
Phenanthrene	U	2700	mg/kg	0.10	0.47	
Anthracene	U	2700	mg/kg	0.10	0.28	
Fluoranthene	U	2700	mg/kg	0.10	1.2	
Pyrene	U	2700	mg/kg	0.10	1.3	
Benzo[a]anthracene	U	2700	mg/kg	0.10	0.77	
Chrysene	U	2700	mg/kg	0.10	0.86	
Benzo[b]fluoranthene	U	2700	mg/kg	0.10	1.4	
Benzo[k]fluoranthene	U	2700	mg/kg	0.10	0.98	
Benzo[a]pyrene	U	2700	mg/kg	0.10	1.1	
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.10	0.69	
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.10	0.21	
Benzo[g,h,i]perylene	U	2700	mg/kg	0.10	0.67	
Total Of 16 PAH's	U	2700	mg/kg	2.0	9.9	
Benzene	U	2760	µg/kg	1.0	< 1.0	
Toluene	U	2760	µg/kg	1.0	< 1.0	
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	
o-Xylene	U	2760	µg/kg	1.0	< 1.0	
Methyl Tert-Butyl Ether	U	2760	µg/kg	1.0	< 1.0	
Total Phenols	U	2920	mg/kg	0.10	< 0.10	

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2180	Sulphur (Elemental) in Soils by HPLC	Sulphur	Dichloromethane extraction / HPLC with UV detection
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2220	Water soluble Chloride in Soils	Chloride	Aqueous extraction and measuremernt by 'Aquakem 600' Discrete Analyser using ferric nitrate / mercuric thiocyanate.
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2325	Sulphide in Soils	Sulphide	Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N–dimethyl-p-phenylenediamine.
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

Report Information

Key	
U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

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

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied

B - Sample age exceeds stability time (sampling to extraction)

C - Sample not received in appropriate containers

D - Broken Container

E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

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

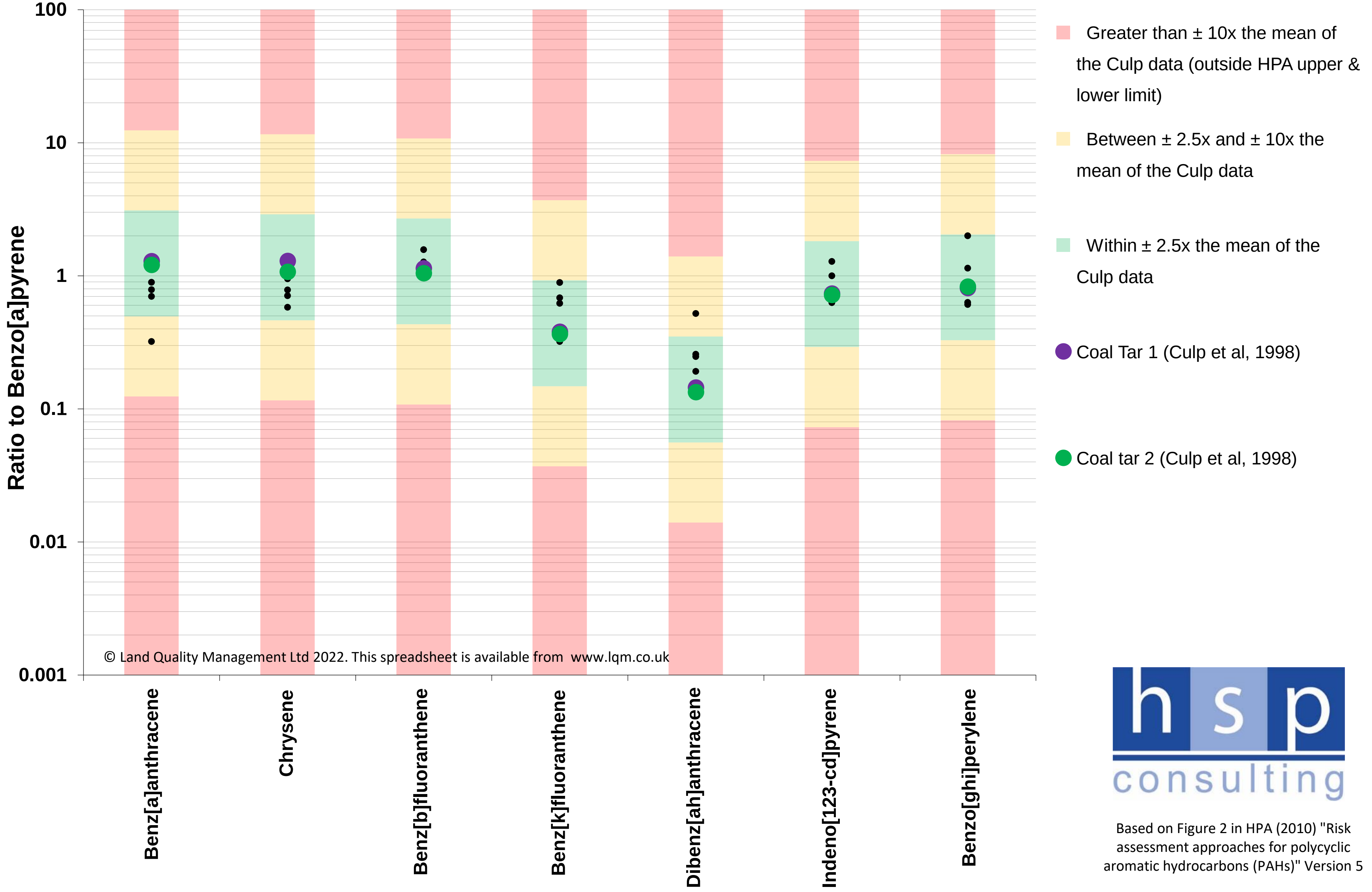
All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com

C:\Users\laura.jones\Desktop\Phase II\Lab Testing\C3825 - Burnt Mill Academy - HSP PAH profiling v1.3



Based on Figure 2 in HPA (2010) "Risk assessment approaches for polycyclic aromatic hydrocarbons (PAHs)" Version 5

Appendix V

Kiwa CMT

Kiwa CMT
Unit 5 Prime Park Way
Prime Enterprise Park
Derby
DE1 3QB

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E uk.cmt.enquiries@kiwa.com

www.kiwa.co.uk/cmt

Client: HSP Consulting Limited
Lawrence House
6 Meadowbank Way
Eastwood
Nottinghamshire
NG16 3SB

Date: 25th March 2022

Lab Ref: 64938

Originator: Laura Jones

Order Ref: C3825

Site: Burnt Mill Academy

Samples:

6No. samples weighing between 2kg and 5kg each were sampled by the client and delivered to Kiwa CMT on 28th February 2022. Sampling certificates were not provided.

Requirements:

Determine the Plasticity Index of 4No. samples in accordance with **BS EN ISO 17892-1:2014**, the Water Content in accordance with **BS EN ISO 17892-12:2018** of 5 No. samples and the Particle Size Distribution in accordance with **BS1377-2:1990** for 6 No. samples.

Results:

The individual results sheets may be viewed on pages 2 to 8 of this report and test results relate solely to the samples as received.

Kiwa CMT

Author: L Anaz
Technical Administrator

Checked and approved by: R Cartlidge
Department Manager

UKAS
TESTING
0529

Particle Size Distribution

Client: HSP Consulting

Site: Burnt Mill Academy

Sample ref: WS07 0.70-1.00m

Sampling cert.: Not given

Lab ref.: 64938

Date Tested: 03-24/03/2022

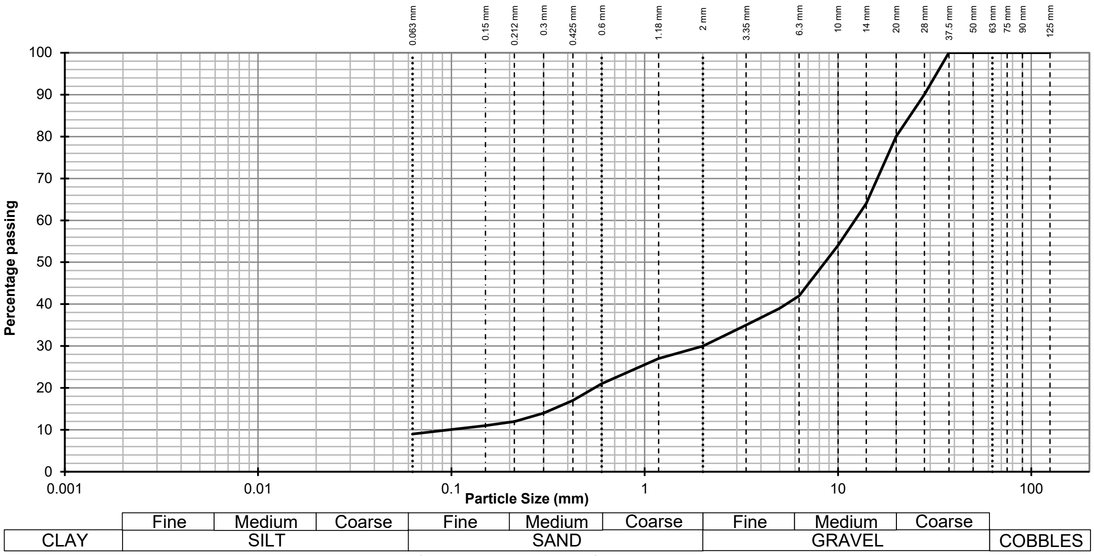
Sample size: 3kg Approx.

Description: Brown clayey very sandy GRAVEL

Sampled by: Client

Source: Site

Sieve Size (mm)	% Passing
125	100
90	100
75	100
63	100
50	100
37.5	100
28	90
20	80
14	64
10	54
6.3	42
5	39
3.35	35
2	30
1.18	27
0.6	21
0.425	17
0.3	14
0.212	12
0.15	11
0.063	9



Soil Fraction	Total Percentage
Cobbles	0
Gravel	70
Sand	21
Silt/Clay	9

Comments: Test carried out in accordance with **BS1377: Part 2: 1990: Clause 9.2**

Uniformity coefficient = 116 (For information only)

Particle Size Distribution

Client: HSP Consulting

Site: Burnt Mill Academy

Sample ref: WS08 1.70-2.00m

Sampling cert.: Not given

Lab ref.: 64938

Date Tested: 03-24/03/2022

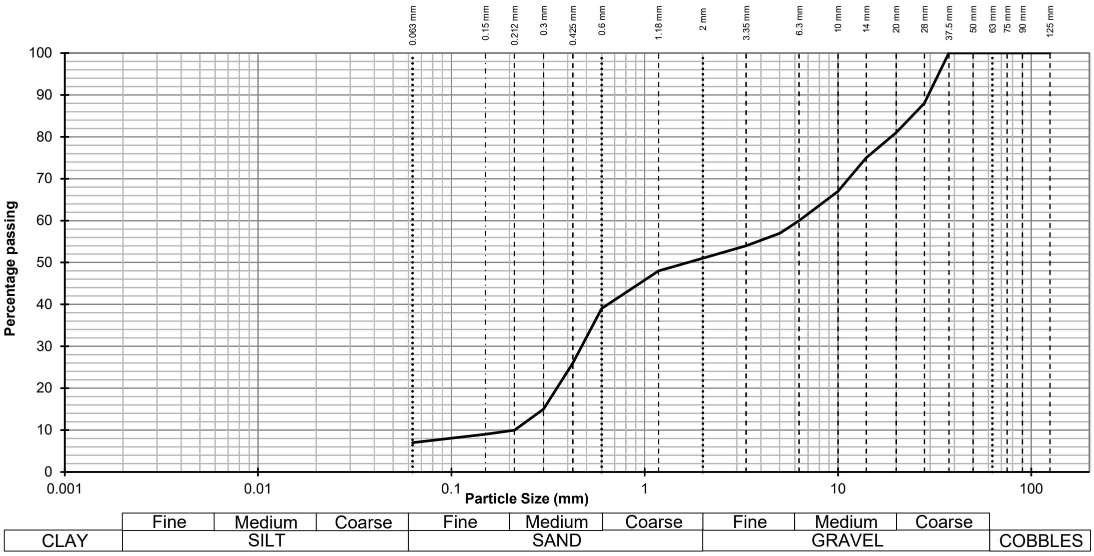
Sample size: 2kg Approx.

Description: Yellowish brown clayey SAND and GRAVEL

Sampled by: Client

Source: Site

Sieve Size (mm)	% Passing
125	100
90	100
75	100
63	100
50	100
37.5	100
28	88
20	81
14	75
10	67
6.3	60
5	57
3.35	54
2	51
1.18	48
0.6	39
0.425	26
0.3	15
0.212	10
0.15	9
0.063	7



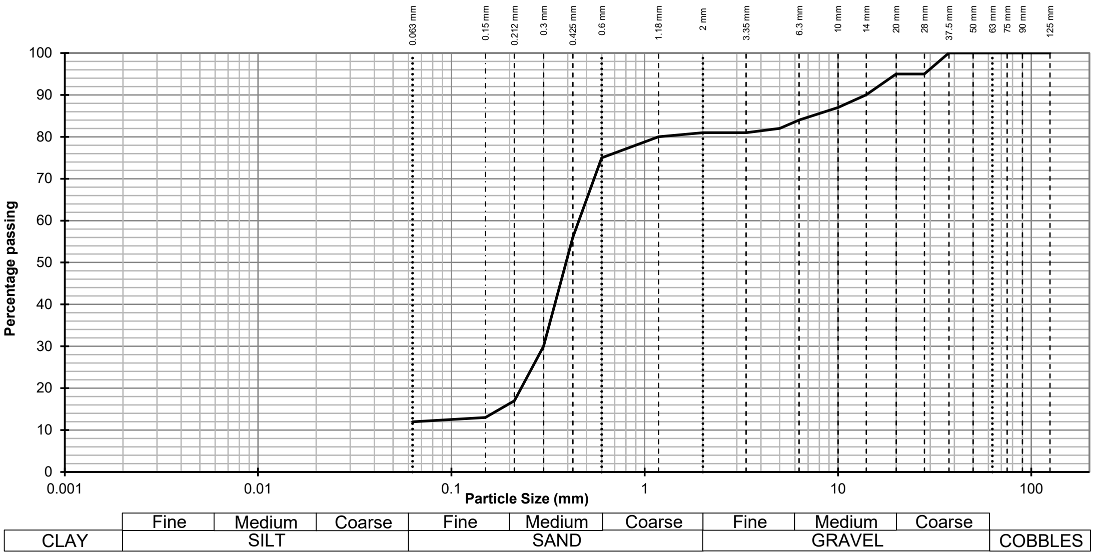
Soil Fraction	Total Percentage
Cobbles	0
Gravel	49
Sand	44
Silt/Clay	7

Comments: Test carried out in accordance with **BS1377: Part 2: 1990: Clause 9.2**
Uniformity coefficient = 30 (For information only)

Particle Size Distribution

Client:	HSP Consulting	**Sample ref:**	WS09 1.00-1.30m	**Date Tested:**	03-24/03/2022	**Sampled by:**	Client
Site:	Burnt Mill Academy	**Sampling cert.:**	Not given	**Sample size:**	1kg Approx.	**Source:**	Site
		Lab ref.:	64938	**Description:**	Brown clayey gravelly SAND		

Sieve Size (mm)	% Passing
125	100
90	100
75	100
63	100
50	100
37.5	100
28	95
20	95
14	90
10	87
6.3	84
5	82
3.35	81
2	81
1.18	80
0.6	75
0.425	56
0.3	30
0.212	17
0.15	13
0.063	12



Soil Fraction	Total Percentage
Cobbles	0
Gravel	19
Sand	69
Silt/Clay	12

Comments: Test carried out in accordance with **BS1377: Part 2: 1990: Clause 9.2**

Uniformity coefficient = N/A (For information only)

Particle Size Distribution

Client: HSP Consulting

Site: Burnt Mill Academy

Sample ref: WS10A 0.70-1.00mm

Sampling cert.: Not given

Lab ref.: 64938

Date Tested: 03-24/03/2022

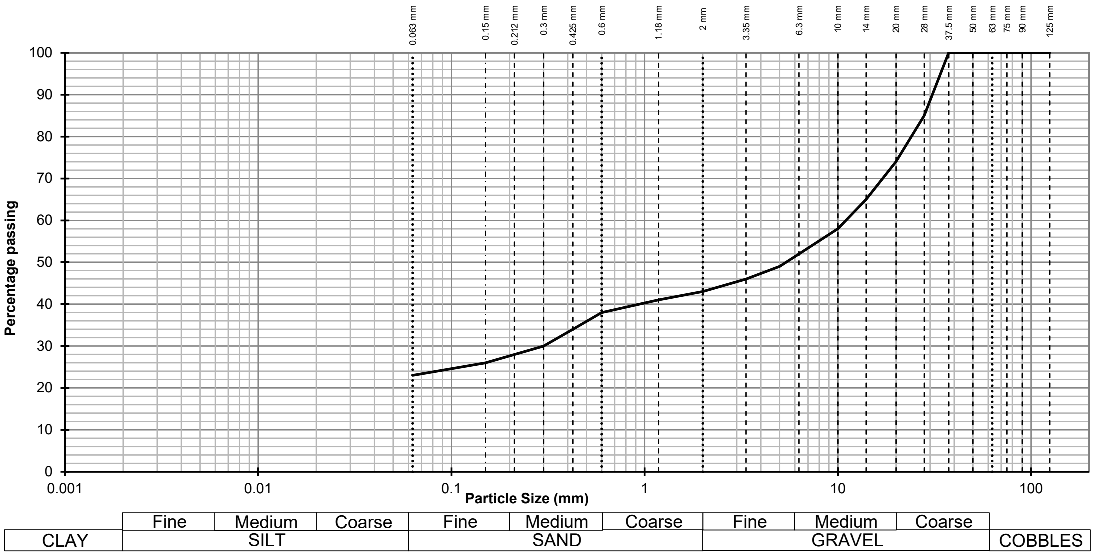
Sample size: 2kg Approx.

Description: Greenish brown sandy very clayey GRAVEL

Sampled by: Client

Source: Site

Sieve Size (mm)	% Passing
125	100
90	100
75	100
63	100
50	100
37.5	100
28	85
20	74
14	65
10	58
6.3	52
5	49
3.35	46
2	43
1.18	41
0.6	38
0.425	34
0.3	30
0.212	28
0.15	26
0.063	23



Soil Fraction	Total Percentage
Cobbles	0
Gravel	57
Sand	20
Silt/Clay	23

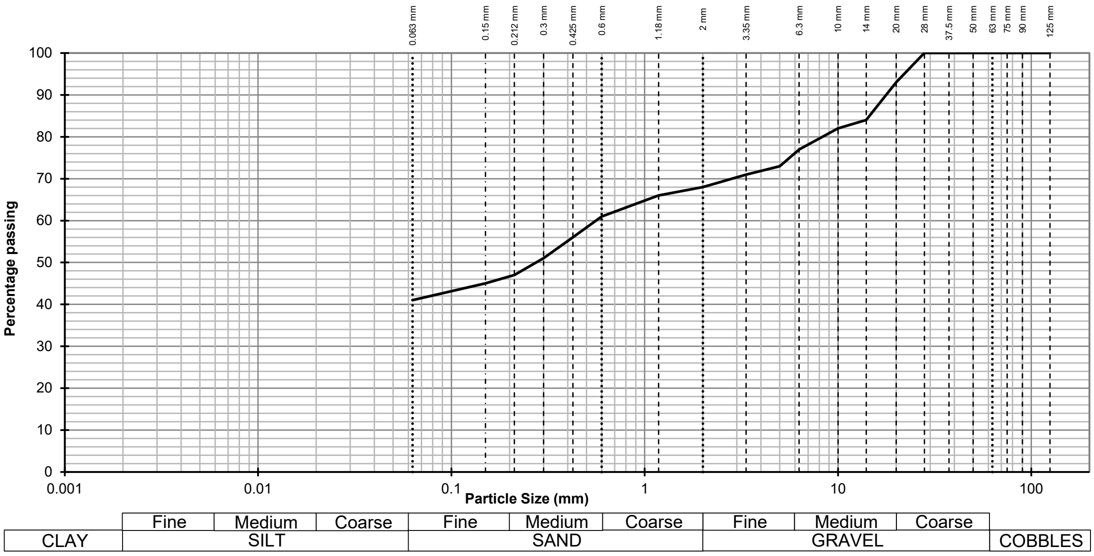
Comments: Test carried out in accordance with **BS1377: Part 2: 1990: Clause 9.2**

Uniformity coefficient = N/A (For information only)

Particle Size Distribution

Client:	HSP Consulting	**Sample ref:**	WS10A 1.70-1.80mm	**Date Tested:**	03-24/03/2022	**Sampled by:**	Client
Site:	Burnt Mill Academy	**Sampling cert.:**	Not given	**Sample size:**	1kg Approx.	**Source:**	Site
		Lab ref.:	64938	**Description:**	Greyish brown slightly sandy gravelly CLAY		

Sieve Size (mm)	% Passing
125	100
90	100
75	100
63	100
50	100
37.5	100
28	100
20	93
14	84
10	82
6.3	77
5	73
3.35	71
2	68
1.18	66
0.6	61
0.425	56
0.3	51
0.212	47
0.15	45
0.063	41



Soil Fraction	Total Percentage
Cobbles	0
Gravel	32
Sand	27
Silt/Clay	41

Comments: Test carried out in accordance with **BS1377: Part 2: 1990: Clause 9.2**
Uniformity coefficient = N/A (For information only)

Particle Size Distribution

Client: HSP Consulting

Site: Burnt Mill Academy

Sample ref: WS11 1.80-2.00m

Sampling cert.: Not given

Lab ref.: 64938

Date Tested: 03-24/03/2022

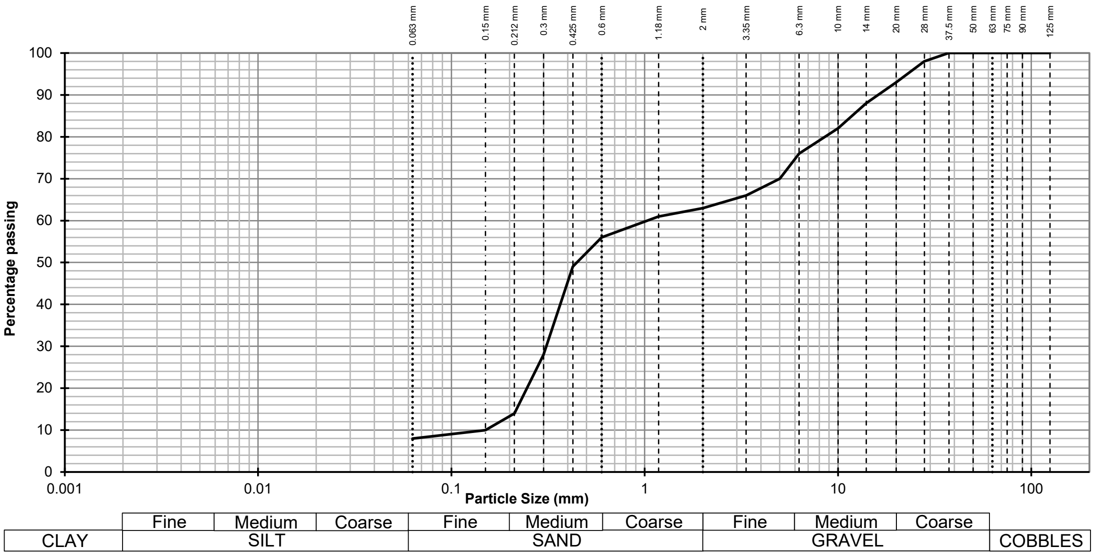
Sample size: 2kg Approx.

Description: Yellowish brown clayey very gravelly SAND

Sampled by: Client

Source: Site

Sieve Size (mm)	% Passing
125	100
90	100
75	100
63	100
50	100
37.5	100
28	98
20	93
14	88
10	82
6.3	76
5	70
3.35	66
2	63
1.18	61
0.6	56
0.425	49
0.3	28
0.212	14
0.15	10
0.063	8



Soil Fraction	Total Percentage
Cobbles	0
Gravel	37
Sand	55
Silt/Clay	8

Comments: Test carried out in accordance with **BS1377: Part 2: 1990: Clause 9.2**

Uniformity coefficient = 7 (For information only)

Certificate of Analysis for Plasticity Index & Water Content

Client: HSP Consulting **Site:** Burnt Mill Academy

Lab Ref: 64938 **Date of Test:** 28/02-08/03/2022

Test Methods: BS EN ISO 17892-12:2018 - Liquid Limit/Plastic Limit/Plasticity Index - Fall Cone Method
BS EN ISO 17892-1:2014 - Water Content

Results:

Sample Ref	Material Description	LL Cone Data			LL (%)	PL (%)	PI (%)	% Retained on 425µm	Modified PI (%)*	Soil Classification	WC (%)
		Cone Pen	Water %	Factor[1]							
WS07 0.70-1.00m	Brown clayey very sandy GRAVEL	15 15.2	31.5 31.5	1.0957	35	16	19	83	3	CL/CI	9.4
WS08 1.70-2.00m	Yellowish brown clayey SAND and GRAVEL					Non plastic		74			11.7
WS09 1.00-1.30m	Brown clayey gravelly SAND	n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r	16.2
WS10A 0.70-1.00m	Greenish brown sandy very clayey GRAVEL	21.5 21.1	28.6 28.7	0.9789	28	12	16	66	5	CL	13.2
WS10A 0.70-1.00m	Greyish brown slightly sandy gravelly CLAY	18 17.6	33.3 33.4	1.0398	35	17	18	44	10	CI/CI	20.7

The samples tested were disturbed and in their natural condition.
LL Test method - Fall Cone / One Point / Cone Spec 80g / 30 degrees
* Modified plasticity index relates to BRE Digest 240 that is not included in the UKAS schedule for this Laboratory.
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
WC = Water Content
n/r - Not required

[1] BS EN 1377-2:1990 table 1

LABORATORY REPORT

4043

Contract Number: PSL21/9407

Report Date: 05 January 2022

Client's Reference: C3825

Client Name:
HSP Consulting
Lawrence House
4 Meadowbank Way
Eastwood
Nottingham
NG16 3SB

For the attention of: Howard Daley

Contract Title: Burnt Mill Academy

Date Received: 30/11/2021
Date Commenced: 30/11/2021
Date Completed: 05/01/2022

Notes: **Opinions and Interpretations are outside the UKAS Accreditation**

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced other than in full, without the prior written approval of the laboratory.

Checked and Approved Signatories:

A Watkins (Director)	R Berriman (Quality Manager)	S Royle (Laboratory Manager)
L Knight (Assistant Laboratory Manager)	S Eyre (Senior Technician)	M Fennell (Senior Technician)

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SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
WS01		B	1.50		Brown slightly gravelly sandy CLAY.
WS02		B	3.00		Brown slightly gravelly sandy CLAY.
WS03		B	0.50		Brown gravelly sandy CLAY.
WS04		B	2.00	3.00	Brown slightly gravelly very clayey SAND.
WS05		B	1.00		Brown slightly gravelly very clayey SAND.
WS06		B	2.00	3.00	Brown slightly clayey SAND & GRAVEL.

UKAS TESTING 4043	PSL Professional Soils Laboratory	Burnt Mill Academy	Contract No: PSL21/9407 Client Ref: C3825

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
WS01		B	1.50		16			47	22	25	98	Intermediate Plasticity CI
WS02		B	3.00		21			48	23	25	97	Intermediate Plasticity CI
WS03		B	0.50		22			41	22	19	89	Intermediate Plasticity CI
WS04		B	2.00	3.00	9.0							
WS05		B	1.00		8.9							
WS06		B	2.00	3.00	7.5							

SYMBOLS : NP : Non Plastic

* : Liquid Limit and Plastic Limit Wet Sieved.

UKAS TESTING 4043

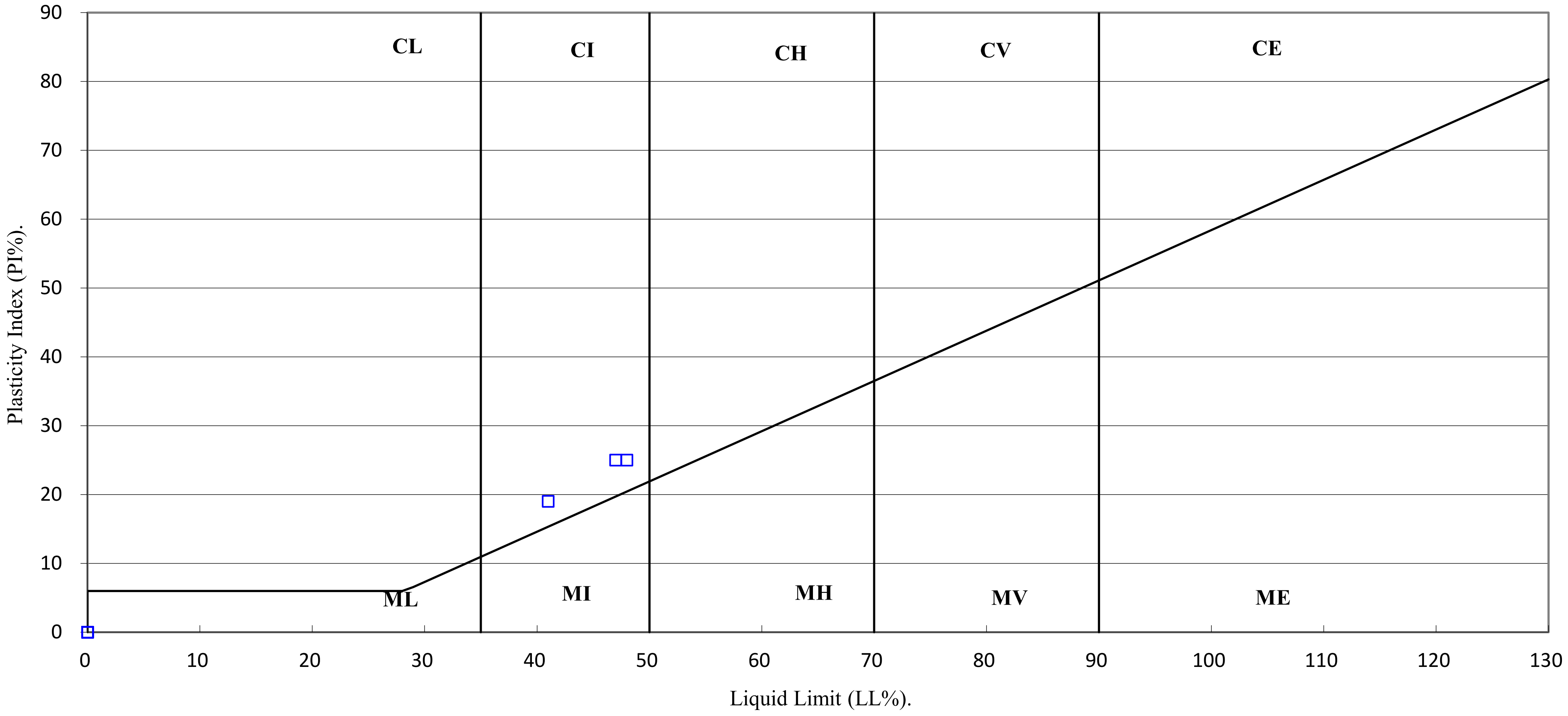
PSL Professional Soils Laboratory

Woodside Quarry

Contract No: PSL21/9407

Client Ref: C3825

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



4043

Professional Soils Laboratory

Woodside Quarry

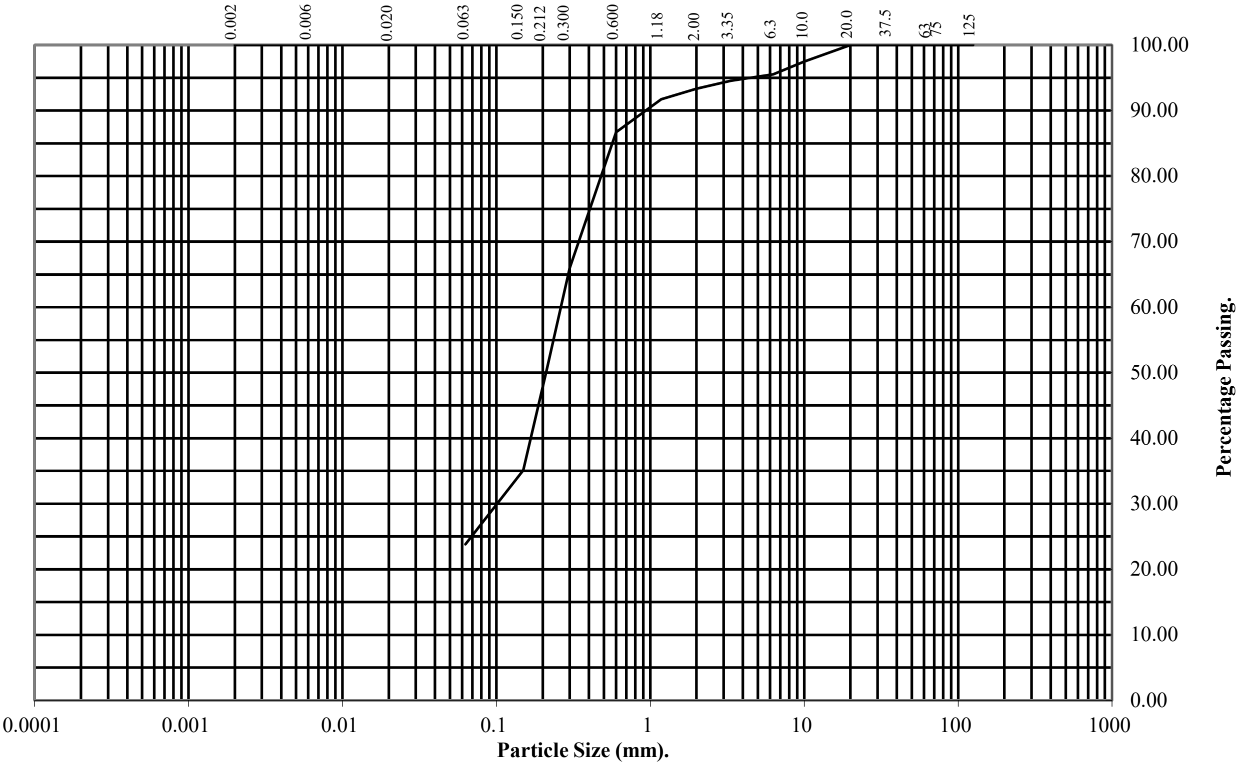
Contract No:
PSL21/9407
Client Ref:
C3825

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**WS04**	**Top Depth (m):**	**2.00**
Sample Number:		**Base Depth(m):**	**3.00**
Sample Type:	**B**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	97
6.3	96
3.35	95
2	93
1.18	92
0.6	87
0.3	66
0.212	50
0.15	35
0.063	24

Soil Fraction	Total Percentage
Cobbles	0
Gravel	7
Sand	69
Silt/Clay	24

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL Professional Soils Laboratory

Burnt Mill Academy

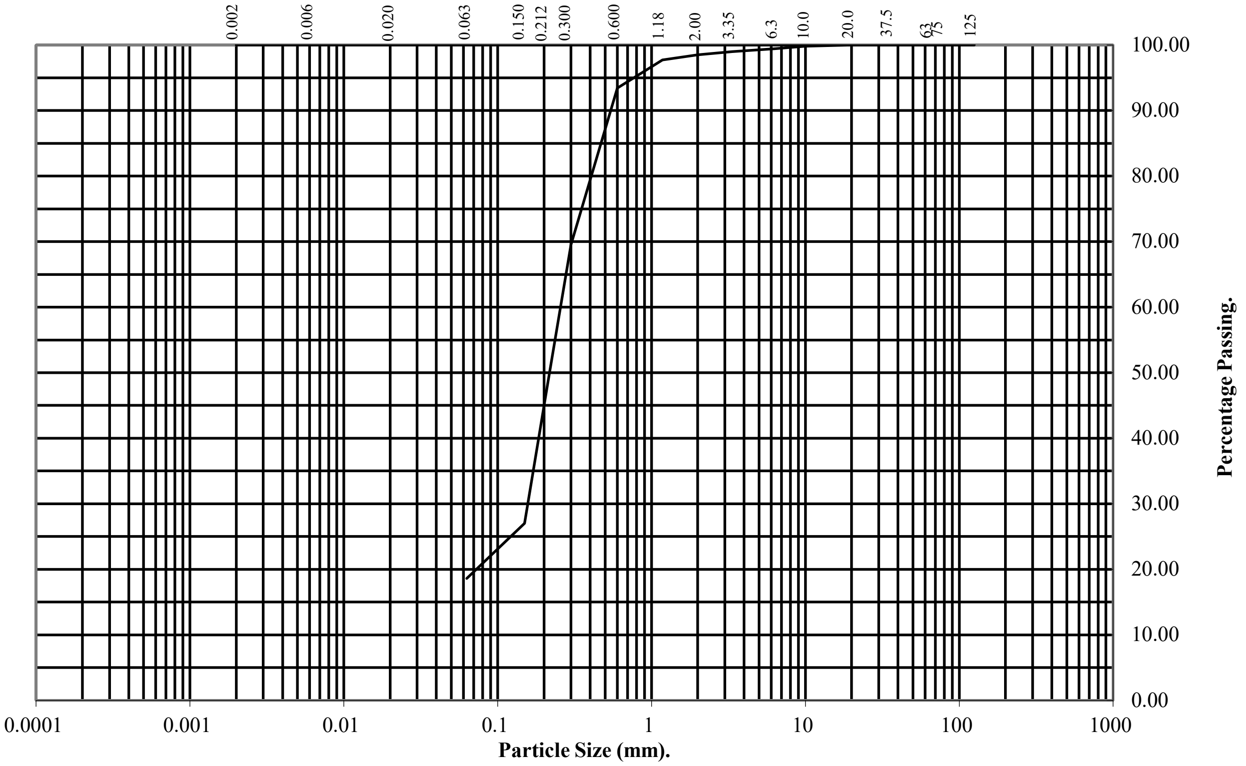
Contract No:
PSL21/9407
Client Ref:
C3825

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**WS05**	**Top Depth (m):**	**1.00**
Sample Number:		**Base Depth(m):**	
Sample Type:	**B**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	99
3.35	99
2	98
1.18	98
0.6	93
0.3	70
0.212	49
0.15	27
0.063	19

Soil Fraction	Total Percentage
Cobbles	0
Gravel	2
Sand	79
Silt/Clay	19

Remarks:
See Summary of Soil Descriptions

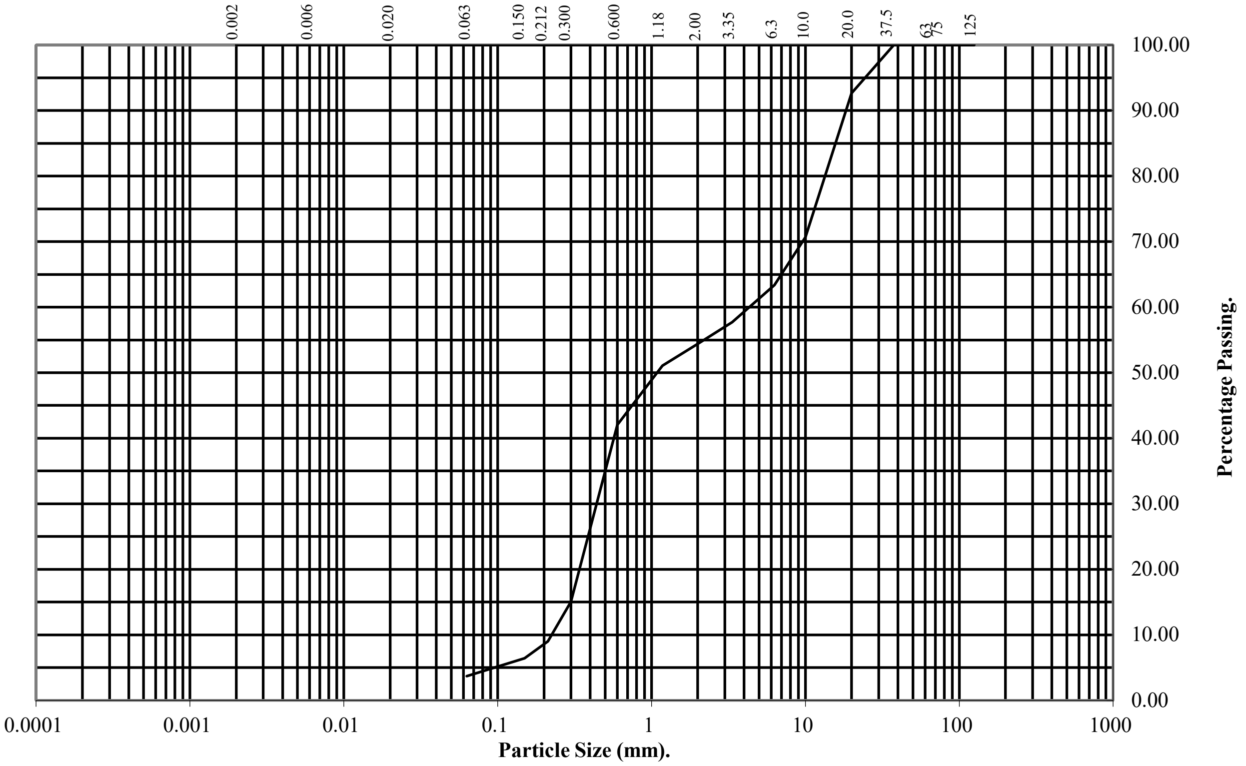
UKAS TESTING 4043	PSL Professional Soils Laboratory	**Burnt Mill Academy**	**Contract No:** **PSL21/9407** **Client Ref:** **C3825**

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**WS06**	**Top Depth (m):**	**2.00**
Sample Number:		**Base Depth(m):**	**3.00**
Sample Type:	**B**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	93
10	71
6.3	63
3.35	58
2	54
1.18	51
0.6	42
0.3	15
0.212	9
0.15	6
0.063	4

Soil Fraction	Total Percentage
Cobbles	0
Gravel	46
Sand	50
Silt/Clay	4

Remarks:

See Summary of Soil Descriptions

UKAS TESTING 4043

PSL Professional Soils Laboratory

Burnt Mill Academy

Contract No:	**PSL21/9407**
Client Ref:	**C3825**

Appendix VI

Gas Testing Summary

Project Number	C3825
Project Name	Burnt Mill Academy
Client	Mace Group

Methane. (%LEL)						
WS01	<0.1	<0.1	<0.1	<0.1		
WS02	>>>>	>>>>	>>>>	>>>		
WS03		<0.1	<0.1	<0.1		
WS04	<0.1	<0.1	<0.1	<0.1		
WS09	<0.1	<0.1	<0.1	<0.1		
WS10A	<0.1	<0.1	32.8	46.7		
WS11	<0.1	<0.1	<0.1	<0.1		

Methane. (%vol)						
WS01	<0.1	<0.1	<0.1	<0.1		
WS02	9.9	10.1	10.6	10.2		
WS03		<0.1	<0.1	<0.1		
WS04	<0.1	<0.1	<0.1	<0.1		
WS09	<0.1	<0.1	<0.1	<0.1		
WS10A	<0.1	<0.1	1.4	2		
WS11	<0.1	<0.1	<0.1	<0.1		

Oxygen. (%vol)						
WS01	16.2	16.7	15.2	14.8		
WS02	0.3	0.5	0.1	1		
WS03		4.3	18	19.6		
WS04	18.1	18.5	18	18.1		
WS09	18.8	18.8	17.2	17.1		
WS10A	16.7	11	5.1	13		
WS11	19	20	20	19.2		

Gas Testing Summary

Project Number	C3825
Project Name	Burnt Mill Academy
Client	Mace Group

Carbon Dioxide. (%vol)						
WS01	3.7	3.5	4.4	4.5		
WS02	5.7	5.6	6	5.5		
WS03		3.7	0.7	0.3		
WS04	2.2	2.2	2.3	2.3		
WS09	1.1	1.6	2.2	2.4		
WS10A	1.8	3.7	5.1	3.6		
WS11	1.2	0.3	0.4	1.6		

Hydrogen Sulphide. (ppm)						
WS01	<1	<1	<1	<1		
WS02	<1	<1	<1	<1		
WS03		<1	<1	<1		
WS04	<1	<1	<1	<1		
WS09	<1	<1	<1	<1		
WS10A	<1	<1	<1	<1		
WS11	<1	<1	<1	<1		

Carbon Monoxide. (ppm)						
WS01	<1	<1	<1	<1		
WS02	<1	<1	<1	<1		
WS03		<1	<1	<1		
WS04	<1	<1	<1	<1		
WS09	<1	<1	<1	<1		
WS10A	<1	<1	<1	<1		
WS11	<1	<1	<1	<1		

Gas Testing Summary

Project Number	C3825
Project Name	Burnt Mill Academy
Client	Mace Group

Gas Flow Rate (l/hr)

WS01	0.1	0.1	0.1	0.1		
WS02	4.9	0.1	0.6	0.1		
WS03		0.1	0.1	0.1		
WS04	0.1	0.1	0.1	0.1		
WS09	0.1	0.1	0.1	0.1		
WS10A	0.1	0.1	0.1	0.1		
WS11	0.1	0.1	0.1	0.1		

Volatile Organic Carbons (ppm)

Atmospheric Pressure Range

	1009	1023	998	980		

Max Methane Concentration (%vol)	10.6
Max Carbon Dioxide Concentration (%vol)	6
Max Carbon Monoxide Concentration (ppm)	0
Max Hydrogen Sulphide Concentration (ppm)	0
Max Flow Rate (l/hr)	4.9
Max Volatile Organic Carbon Concentration (ppm)	0

Methane Gas Screening Value	0.5194
Carbon Dioxide Gas Screening Value	0.294

Carbon Monoxide Gas Screening Value	0
Hydrogen Sulphide Gas Screening Value	0
Maximum Gas Screening Value	0.5194
Characteristic Situation 1	FAIL
Characteristic Situation 2	PASS
Characteristic Situation 3	PASS
Characteristic Situation 4	PASS
Characteristic Situation 5	PASS
Characteristic Situation 6	PASS
Hydrocarbon Vapour Barrier Required?	NO

hsp
consulting

Gas Monitoring Certificate

Project Number C3825
Project Name Burnt Mill Academy
Client Mace Group

WS01

		Detection Limit								
		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
Time	Gas Flow Rate. (l/hr)	Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm)	Depth of Installation. (mbgl)	Depth of Groundwater (mbgl)
00:00	2.7	<0.1	<0.1	19.7	0.1	<1	<1		5.03	4.98
00:15	0.1	<0.1	<0.1	16.7	3.5	<1	<1			
00:30	0.1	<0.1	<0.1	16.3	3.7	<1	<1			
00:45	0.1	<0.1	<0.1	16.2	3.8	<1	<1			
01:00	0.1	<0.1	<0.1	16.2	3.8	<1	<1			
01:15	0.1	<0.1	<0.1	16.2	3.8	<1	<1			
01:30	0.1	<0.1	<0.1	16.2	3.8	<1	<1			
01:45	0.0	<0.1	<0.1	16.2	3.8	<1	<1			
02:00	0.1	<0.1	<0.1	16.2	3.8	<1	<1			
02:15	0.1	<0.1	<0.1	16.2	3.8	<1	<1			
02:30	0.1	<0.1	<0.1	16.1	3.8	<1	<1			
02:45	0.1	<0.1	<0.1	16.1	3.8	<1	<1			
03:00	0.1	<0.1	<0.1	16.2	3.8	<1	<1			
03:15	0.1	<0.1	<0.1	16.1	3.8	<1	<1			
03:30	0.1	<0.1	<0.1	16.2	3.7	<1	<1			
03:45	0.1	<0.1	<0.1	16.2	3.7	<1	<1			
04:00	0.1	<0.1	<0.1	16.2	3.7	<1	<1			
04:15	0.1	<0.1	<0.1	16.2	3.7	<1	<1			
04:30	0.1	<0.1	<0.1	16.2	3.7	<1	<1			
04:45	0.1	<0.1	<0.1	16.2	3.7	<1	<1			
05:00	0.1	<0.1	<0.1	16.2	3.7	<1	<1			
Steady	**0.1**	**<0.1**	**<0.1**	**16.2**	**3.7**	**<1**	**<1**	**#####**	**5.03**	**4.98**
Peak	**2.7**	**0.0**	**0.0**	**19.7**	**3.8**	**0.0**	**0.0**	**0.0**	**5.03**	**4.98**

Date	Notes:			
10.03.2022	Engineer	DRS	Barometric Pressure, mbar	1009
			Pressure Trend	Steady
	Equipment	GFM436	Air Temp (˚C)	14

Gas Monitoring Certificate

Project Number	C3825
Project Name	Burnt Mill Academy
Client	Mace Group

WS02

		Detection Limit								
		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
Time	Gas Flow Rate. (l/hr)	Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm	Depth of Installation. (mbgl)	Depth of Groundwater (mbgl)
00:00	5.3	<0.1	<0.1	12.2	0.2	<1	<1		5.03	4.73
00:15	5.4	>>>>	7.4	3.3	5.2	<1	<1			
00:30	5.3	>>>>	9.1	1.9	5.2	<1	<1			
00:45	5.1	>>>>	9.3	1.6	5.3	<1	<1			
01:00	5.5	>>>>	9.3	1.5	5.4	<1	<1			
01:15	5.1	>>>>	9.4	1.3	5.4	<1	<1			
01:30	4.8	>>>>	9.4	1.2	5.4	<1	<1			
01:45	4.9	>>>>	9.5	1.1	5.4	<1	<1			
02:00	4.9	>>>>	9.5	1.1	5.5	<1	<1			
02:15	5.2	>>>>	9.5	1.0	5.5	<1	<1			
02:30	4.9	>>>>	9.6	0.9	5.5	<1	<1			
02:45	4.9	>>>>	9.6	0.8	5.5	<1	<1			
03:00	4.9	>>>>	9.7	0.8	5.6	<1	<1			
03:15	4.7	>>>>	9.7	0.7	5.6	<1	<1			
03:30	4.8	>>>>	9.8	0.6	5.6	<1	<1			
03:45	4.6	>>>>	9.8	0.5	5.6	<1	<1			
04:00	4.9	>>>>	9.8	0.5	5.6	<1	<1			
04:15	4.5	>>>>	9.8	0.4	5.6	<1	<1			
04:30	4.6	>>>>	9.9	0.3	5.7	<1	<1			
04:45	4.5	>>>>	9.9	0.3	5.7	<1	<1			
05:00	4.9	>>>>	9.9	0.3	5.7	<1	<1			
Steady	**4.9**	**>>>>**	**9.9**	**0.3**	**5.7**	**<1**	**<1**	**#####**	**5.03**	**4.73**
Peak	**5.5**	**0.0**	**9.9**	**12.2**	**5.7**	**0.0**	**0.0**	**0.0**	**5.03**	**4.73**

Date	Notes:			1009
10.03.2022	Engineer	DRS	Barometric Pressure, mbar	
			Pressure Trend	Steady
	Equipment	GFM430	Air Temp (˚C)	14

Gas Monitoring Certificate

Project Number	C3825
Project Name	Burnt Mill Academy
Client	Mace Group

WS03

Time	Gas Flow Rate. (l/hr)	Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppr	Depth of Installation. (mbgl)	Depth of Groundwater (mbgl
Detection Limit		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
00:00		Unable to monitor								
00:15										
00:30										
00:45										
01:00										
01:15										
01:30										
01:45										
02:00										
02:15										
02:30										
02:45										
03:00										
03:15										
03:30										
03:45										
04:00										
04:15										
04:30										
04:45										
05:00										
Steady	**#####**	**ble to m**	**#####**	**#####**	**#####**	**#####**	**#####**	**#####**	**#####**	**#####**
Peak	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.00**	**0.00**

Date	Notes:			
10.03.2022	Engineer	DRS	Barometric Pressure, mbar	1009
			Pressure Trend	Steady
	Equipment	GFM430	Air Temp (˚C)	14

Gas Monitoring Certificate

Project Number C3825
Project Name Burnt Mill Academy
Client Mace Group

WS04

		Detection Limit								
		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
Time	Gas Flow Rate. (l/hr)	Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm	Depth of Installation. (mbgl)	Depth of Groundwater (mbgl
00:00	0.1	<0.1	<0.1	20.2	<0.1	<1	<1		5.05	4.91
00:15	0.1	<0.1	<0.1	18.8	2.1	<1	<1			
00:30	0.1	<0.1	<0.1	18.2	2.2	<1	<1			
00:45	0.1	<0.1	<0.1	18.1	2.3	<1	<1			
01:00	0.1	<0.1	<0.1	18.1	2.3	<1	<1			
01:15	0.1	<0.1	<0.1	18.1	2.3	<1	<1			
01:30	0.1	<0.1	<0.1	18.1	2.3	<1	<1			
01:45	0.1	<0.1	<0.1	18.1	2.3	<1	<1			
02:00	0.1	<0.1	<0.1	18.1	2.3	<1	<1			
02:15	0.1	<0.1	<0.1	18.1	2.3	<1	<1			
02:30	0.1	<0.1	<0.1	18.1	2.3	<1	<1			
02:45	0.1	<0.1	<0.1	18.1	2.2	<1	<1			
03:00	0.1	<0.1	<0.1	18.1	2.2	<1	<1			
03:15	0.1	<0.1	<0.1	18.1	2.2	<1	<1			
03:30	0.1	<0.1	<0.1	18.1	2.2	<1	<1			
03:45	0.1	<0.1	<0.1	18.1	2.2	<1	<1			
04:00	0.1	<0.1	<0.1	18.1	2.2	<1	<1			
04:15	0.1	<0.1	<0.1	18.1	2.2	<1	<1			
04:30	0.1	<0.1	<0.1	18.1	2.2	<1	<1			
04:45	0.1	<0.1	<0.1	18.1	2.2	<1	<1			
05:00	0.1	<0.1	<0.1	18.1	2.2	<1	<1			
Steady	**0.1**	**<0.1**	**<0.1**	**18.1**	**2.2**	**<1**	**<1**	**#####**	**5.05**	**4.91**
Peak	**0.1**	**0.0**	**0.0**	**20.2**	**2.3**	**0.0**	**0.0**	**0.0**	**5.05**	**4.91**

Date	Notes:			
10.03.2022	Engineer	DRS	Barometric Pressure, mbar	1009
			Pressure Trend	Steady
	Equipment	GFM430	Air Temp (˚C)	14

hsp consulting

Gas Monitoring Certificate

Project Number	C3825	**WS09**
Project Name	Burnt Mill Academy	
Client	Mace Group	

Time	Gas Flow Rate. (l/hr)	Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppr	Depth of Installation. (mbgl)	Depth of Groundwater (mbgl
Detection Limit		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
00:00	0.1	<0.1	<0.1	17.8	0.3	<1	<1		2.06	DRY
00:15	0.1	<0.1	<0.1	20.0	0.6	<1	<1			
00:30	0.1	<0.1	<0.1	20.0	0.6	<1	<1			
00:45	0.1	<0.1	<0.1	19.9	0.6	<1	<1			
01:00	0.1	<0.1	<0.1	19.9	0.6	<1	<1			
01:15	0.1	<0.1	<0.1	19.8	0.6	<1	<1			
01:30	0.1	<0.1	<0.1	19.8	0.7	<1	<1			
01:45	0.1	<0.1	<0.1	19.7	0.7	<1	<1			
02:00	0.1	<0.1	<0.1	19.7	0.7	<1	<1			
02:15	0.1	<0.1	<0.1	19.6	0.7	<1	<1			
02:30	0.1	<0.1	<0.1	19.6	0.8	<1	<1			
02:45	0.1	<0.1	<0.1	19.5	0.8	<1	<1			
03:00	0.1	<0.1	<0.1	19.4	0.8	<1	<1			
03:15	0.1	<0.1	<0.1	19.3	0.8	<1	<1			
03:30	0.1	<0.1	<0.1	19.3	0.9	<1	<1			
03:45	0.1	<0.1	<0.1	19.2	0.9	<1	<1			
04:00	0.1	<0.1	<0.1	19.1	0.9	<1	<1			
04:15	0.1	<0.1	<0.1	19.0	0.9	<1	<1			
04:30	0.1	<0.1	<0.1	18.9	1.0	<1	<1			
04:45	0.1	<0.1	<0.1	18.9	1.0	<1	<1			
05:00	0.1	<0.1	<0.1	18.8	1.1	<1	<1			
Steady	**0.1**	**<0.1**	**<0.1**	**18.8**	**1.1**	**<1**	**<1**	**#####**	**2.06**	**DRY**
Peak	**0.1**	**0.0**	**0.0**	**20.0**	**1.1**	**0.0**	**0.0**	**0.0**	**2.06**	**0.00**

Date	Notes:		Barometric Pressure, mbar	1009
10.03.2022	Engineer	DRS	Pressure Trend	Steady
	Equipment	GFM430	Air Temp (˚C)	14

hsp
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Gas Monitoring Certificate

Project Number C3825
Project Name Burnt Mill Academy
Client Mace Group

WS10A

Time	Gas Flow Rate. (l/hr)	Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm)	Depth of Installation. (mbgl)	Depth of Groundwater (mbgl)
Detection Limit		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
00:00	0.1	<0.1	<0.1	20.2	0.1	<1	<1		5.04	3.33
00:15	0.1	<0.1	<0.1	19.2	0.8	<1	<1			
00:30	0.1	<0.1	<0.1	18.8	0.8	<1	<1			
00:45	0.1	<0.1	<0.1	18.8	0.8	<1	<1			
01:00	0.1	<0.1	<0.1	18.7	0.8	<1	<1			
01:15	0.1	<0.1	<0.1	18.6	0.8	<1	<1			
01:30	0.1	<0.1	<0.1	18.6	0.9	<1	<1			
01:45	0.1	<0.1	<0.1	18.5	0.9	<1	<1			
02:00	0.1	<0.1	<0.1	18.3	1.0	<1	<1			
02:15	0.1	<0.1	<0.1	18.2	1.1	<1	<1			
02:30	0.1	<0.1	<0.1	18.1	1.2	<1	<1			
02:45	0.1	<0.1	<0.1	18.1	1.2	<1	<1			
03:00	0.1	<0.1	<0.1	17.9	1.3	<1	<1			
03:15	0.1	<0.1	<0.1	17.8	1.4	<1	<1			
03:30	0.1	<0.1	<0.1	17.7	1.5	<1	<1			
03:45	0.1	<0.1	<0.1	17.6	1.5	<1	<1			
04:00	0.1	<0.1	<0.1	17.4	1.7	<1	<1			
04:15	0.1	<0.1	<0.1	17.1	1.7	<1	<1			
04:30	0.1	<0.1	<0.1	17.0	1.8	<1	<1			
04:45	0.1	<0.1	<0.1	16.8	1.8	<1	<1			
05:00	0.1	<0.1	<0.1	16.7	1.8	<1	<1			
Steady	**0.1**	**<0.1**	**<0.1**	**16.7**	**1.8**	**<1**	**<1**	**#####**	**5.04**	**3.33**
Peak	**0.1**	**0.0**	**0.0**	**20.2**	**1.8**	**0.0**	**0.0**	**0.0**	**5.04**	**3.33**

Date	Notes:			
10.03.2022	Engineer	DRS	Barometric Pressure, mbar	1009
			Pressure Trend	Steady
	Equipment	GFM430	Air Temp (˚C)	14

Gas Monitoring Certificate

hsp consulting

Project Number	C3825
Project Name	Burnt Mill Academy
Client	Mace Group

WS11

Time	Gas Flow Rate. (l/hr)	Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm	Depth of Installation. (mbgl)	Depth of Groundwater (mbgl)
Detection Limit		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
00:00	0.1	<0.1	<0.1	20.0	0.1	<1	<1		4.87	4.81
00:15	0.1	<0.1	<0.1	19.5	1.0	<1	<1			
00:30	0.1	<0.1	<0.1	19.2	1.1	<1	<1			
00:45	0.1	<0.1	<0.1	19.1	1.1	<1	<1			
01:00	0.1	<0.1	<0.1	19.1	1.0	<1	<1			
01:15	0.1	<0.1	<0.1	19.1	1.1	<1	<1			
01:30	0.1	<0.1	<0.1	19.2	1.0	<1	<1			
01:45	0.1	<0.1	<0.1	19.2	1.0	<1	<1			
02:00	0.1	<0.1	<0.1	19.0	1.1	<1	<1			
02:15	0.1	<0.1	<0.1	19.1	1.1	<1	<1			
02:30	0.1	<0.1	<0.1	19.3	0.9	<1	<1			
02:45	0.1	<0.1	<0.1	19.3	0.9	<1	<1			
03:00	0.1	<0.1	<0.1	19.4	0.9	<1	<1			
03:15	0.1	<0.1	<0.1	19.3	0.9	<1	<1			
03:30	0.1	<0.1	<0.1	19.2	1.0	<1	<1			
03:45	0.1	<0.1	<0.1	19.6	0.8	<1	<1			
04:00	0.1	<0.1	<0.1	19.7	0.7	<1	<1			
04:15	0.1	<0.1	<0.1	19.7	0.7	<1	<1			
04:30	0.1	<0.1	<0.1	19.4	0.9	<1	<1			
04:45	0.1	<0.1	<0.1	19.1	1.2	<1	<1			
05:00	0.1	<0.1	<0.1	19.0	1.2	<1	<1			
Steady	**0.1**	**<0.1**	**<0.1**	**19.0**	**1.2**	**<1**	**<1**	**#####**	**4.87**	**4.81**
Peak	**0.1**	**0.0**	**0.0**	**20.0**	**1.2**	**0.0**	**0.0**	**0.0**	**4.87**	**4.81**

Date	Notes:			
10.03.2022	Engineer	DRS	Barometric Pressure, mbar	1009
			Pressure Trend	Steady
	Equipment	GFM430	Air Temp (˚C)	14

hsp consulting

Gas Monitoring Certificate

Project Number C3825
Project Name Burnt Mill Academy
Client Mace Group

WS01

Time	Gas Flow Rate. (l/hr)	Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm)	Depth of Installation. (mbgl)	Depth of Groundwater (mbgl)
Detection Limit		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
00:00	0.1	<0.1	<0.1	19.0	0.2	<1	<1		5.09	4.97
00:15	0.1	<0.1	<0.1	17.6	2.8	<1	<1			
00:30	0.1	<0.1	<0.1	17.2	3.1	<1	<1			
00:45	0.1	<0.1	<0.1	17.0	3.2	<1	<1			
01:00	0.1	<0.1	<0.1	16.9	3.3	<1	<1			
01:15	0.1	<0.1	<0.1	16.8	3.4	<1	<1			
01:30	0.1	<0.1	<0.1	16.8	3.5	<1	<1			
01:45	0.1	<0.1	<0.1	16.7	3.5	<1	<1			
02:00	0.1	<0.1	<0.1	16.7	3.5	<1	<1			
02:15	0.1	<0.1	<0.1	16.7	3.5	<1	<1			
02:30	0.1	<0.1	<0.1	16.7	3.5	<1	<1			
02:45	0.1	<0.1	<0.1	16.7	3.5	<1	<1			
03:00	0.1	<0.1	<0.1	16.7	3.5	<1	<1			
03:15										
03:30										
03:45										
04:00										
04:15										
04:30										
04:45										
05:00										
Steady	**0.1**	**<0.1**	**<0.1**	**16.7**	**3.5**	**<1**	**<1**	**#####**	**5.09**	**4.97**
Peak	**0.1**	**0.0**	**0.0**	**19.0**	**3.5**	**0.0**	**0.0**	**0.0**	**5.09**	**4.97**

Date	Notes:		Barometric Pressure, mbar	1023
23.03.22	Engineer	DRS	Pressure Trend	Falling
	Equipment	GFM436	Air Temp (˚C)	18

hsp consulting

Gas Monitoring Certificate

Project Number	C3825
Project Name	Burnt Mill Academy
Client	Mace Group

WS02

		Detection Limit								
		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
Time	Gas Flow Rate. (l/hr)	Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm	Depth of Installation. (mbgl)	Depth of Groundwater (mbgl)
00:00	0.1	<0.1	<0.1	17.9	0.2	<1	<1		5.06	4.93
00:15	0.1	>>>>	7.2	4.8	4.7	<1	<1			
00:30	0.1	>>>>	8.6	3.3	4.8	<1	<1			
00:45	0.1	>>>>	8.9	3.0	4.9	<1	<1			
01:00	0.1	>>>>	9.0	2.7	5.0	<1	<1			
01:15	0.1	>>>>	9.1	2.5	5.0	<1	<1			
01:30	0.1	>>>>	9.3	2.3	5.1	<1	<1			
01:45	0.1	>>>>	9.3	2.2	5.1	<1	<1			
02:00	0.1	>>>>	9.3	2.0	5.2	<1	<1			
02:15	0.1	>>>>	9.4	1.9	5.2	<1	<1			
02:30	0.1	>>>>	9.5	1.8	5.2	<1	<1			
02:45	0.1	>>>>	9.5	1.6	5.3	<1	<1			
03:00	0.1	>>>>	9.6	1.4	5.3	<1	<1			
03:15	0.1	>>>>	9.7	1.3	5.4	<1	<1			
03:30	0.1	>>>>	9.7	1.2	5.4	<1	<1			
03:45	0.1	>>>>	9.8	1.0	5.4	<1	<1			
04:00	0.1	>>>>	9.8	0.9	5.5	<1	<1			
04:15	0.1	>>>>	9.9	0.8	5.5	<1	<1			
04:30	0.1	>>>>	10.0	0.7	5.5	<1	<1			
04:45	0.1	>>>>	10.0	0.5	5.6	<1	<1			
05:00	0.1	>>>>	10.1	0.5	5.6	<1	<1			
Steady	**0.1**	**>>>>**	**10.1**	**0.5**	**5.6**	**<1**	**<1**	**#####**	**5.06**	**4.93**
Peak	**0.1**	**0.0**	**10.1**	**17.9**	**5.6**	**0.0**	**0.0**	**0.0**	**5.06**	**4.93**

Date	Notes:		Barometric Pressure, mbar	1023
23.03.22	Engineer	DRS		
			Pressure Trend	Falling
	Equipment	GFM430	Air Temp (˚C)	18

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Gas Monitoring Certificate

WS03

Project Number C3825
Project Name Burnt Mill Academy
Client Mace Group

		Detection Limit								
		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
Time	Gas Flow Rate. (l/hr)	Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppr	Depth of Installation. (mbgl)	Depth of Groundwater (mbgl
00:00	0.1	<0.1	<0.1	18.2	0.3	<1	<1		4.00	2.16
00:15	0.1	<0.1	<0.1	5.2	3.5	<1	<1			
00:30	0.1	<0.1	<0.1	3.9	3.8	<1	<1			
00:45	0.1	<0.1	<0.1	4.1	3.8	<1	<1			
01:00	0.1	<0.1	<0.1	4.2	3.7	<1	<1			
01:15	0.1	<0.1	<0.1	4.2	3.7	<1	<1			
01:30	0.1	<0.1	<0.1	4.3	3.7	<1	<1			
01:45	0.1	<0.1	<0.1	4.3	3.7	<1	<1			
02:00	0.1	<0.1	<0.1	4.3	3.7	<1	<1			
02:15	0.1	<0.1	<0.1	4.3	3.7	<1	<1			
02:30	0.1	<0.1	<0.1	4.3	3.7	<1	<1			
02:45	0.1	<0.1	<0.1	4.3	3.7	<1	<1			
03:00	0.1	<0.1	<0.1	4.3	3.7	<1	<1			
03:15										
03:30										
03:45										
04:00										
04:15										
04:30										
04:45										
05:00										
Steady	**0.1**	**<0.1**	**<0.1**	**4.3**	**3.7**	**<1**	**<1**	**#####**	**4.00**	**2.16**
Peak	**0.1**	**0.0**	**0.0**	**18.2**	**3.8**	**0.0**	**0.0**	**0.0**	**4.00**	**2.16**

Date	Notes:		Barometric Pressure, mbar	1023
23.03.22	Engineer	DRS	Pressure Trend	Falling
	Equipment	GFM430	Air Temp (˚C)	18

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consulting

Gas Monitoring Certificate

Project Number C3825
Project Name Burnt Mill Academy
Client Mace Group

WS04

		Detection Limit								
		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
Time	Gas Flow Rate. (l/hr)	Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm	Depth of Installation. (mbgl)	Depth of Groundwater (mbgl
00:00	0.1	<0.1	<0.1	19	0.2	<1	<1		5.01	4.91
00:15	0.1	<0.1	<0.1	19.0	2.1	<1	<1			
00:30	0.1	<0.1	<0.1	18.6	2.1	<1	<1			
00:45	0.1	<0.1	<0.1	18.6	2.1	<1	<1			
01:00	0.1	<0.1	<0.1	18.5	2.2	<1	<1			
01:15	0.1	<0.1	<0.1	18.5	2.2	<1	<1			
01:30	0.1	<0.1	<0.1	18.5	2.2	<1	<1			
01:45	0.1	<0.1	<0.1	18.5	2.2	<1	<1			
02:00	0.1	<0.1	<0.1	18.5	2.2	<1	<1			
02:15	0.1	<0.1	<0.1	18.5	2.2	<1	<1			
02:30	0.1	<0.1	<0.1	18.5	2.2	<1	<1			
02:45	0.1	<0.1	<0.1	18.5	2.2	<1	<1			
03:00	0.1	<0.1	<0.1	18.5	2.2	<1	<1			
03:15										
03:30										
03:45										
04:00										
04:15										
04:30										
04:45										
05:00										
Steady	**0.1**	**<0.1**	**<0.1**	**18.5**	**2.2**	**<1**	**<1**	**#####**	**5.01**	**4.91**
Peak	**0.1**	**0.0**	**0.0**	**19.0**	**2.2**	**0.0**	**0.0**	**0.0**	**5.01**	**4.91**

Date	Notes:		Barometric Pressure, mbar	1023
23.03.22	Engineer	DRS	Pressure Trend	Falling
	Equipment	GFM430	Air Temp (˚C)	18

Gas Monitoring Certificate

Project Number C3825
Project Name Burnt Mill Academy
Client Mace Group

WS09

		Detection Limit								
		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
Time	Gas Flow Rate. (l/hr)	Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppr	Depth of Installation. (mbgl)	Depth of Groundwater (mbgl
00:00	0.1	<0.1	<0.1	19.5	0.1	<1	<1		2.05	DRY
00:15	0.1	<0.1	<0.1	19.5	1.3	<1	<1			
00:30	0.1	<0.1	<0.1	19.3	1.4	<1	<1			
00:45	0.1	<0.1	<0.1	19.2	1.4	<1	<1			
01:00	0.1	<0.1	<0.1	19.2	1.4	<1	<1			
01:15	0.1	<0.1	<0.1	19.2	1.4	<1	<1			
01:30	0.1	<0.1	<0.1	19.2	1.4	<1	<1			
01:45	0.1	<0.1	<0.1	19.2	1.4	<1	<1			
02:00	0.1	<0.1	<0.1	19.1	1.4	<1	<1			
02:15	0.1	<0.1	<0.1	19.1	1.5	<1	<1			
02:30	0.1	<0.1	<0.1	19.1	1.5	<1	<1			
02:45	0.1	<0.1	<0.1	19.1	1.5	<1	<1			
03:00	0.1	<0.1	<0.1	19.1	1.5	<1	<1			
03:15	0.1	<0.1	<0.1	19.1	1.5	<1	<1			
03:30	0.1	<0.1	<0.1	19.0	1.5	<1	<1			
03:45	0.1	<0.1	<0.1	19.0	1.5	<1	<1			
04:00	0.1	<0.1	<0.1	19.0	1.5	<1	<1			
04:15	0.1	<0.1	<0.1	18.9	1.5	<1	<1			
04:30	0.1	<0.1	<0.1	18.9	1.6	<1	<1			
04:45	0.1	<0.1	<0.1	18.8	1.6	<1	<1			
05:00	0.1	<0.1	<0.1	18.8	1.6	<1	<1			
Steady	**0.1**	**<0.1**	**<0.1**	**18.8**	**1.6**	**<1**	**<1**	**#####**	**2.05**	**DRY**
Peak	**0.1**	**0.0**	**0.0**	**19.5**	**1.6**	**0.0**	**0.0**	**0.0**	**2.05**	**0.00**

Date	Notes:			
23.03.22	Engineer	DRS	Barometric Pressure, mbar	1023
			Pressure Trend	Falling
	Equipment	GFM430	Air Temp (˚C)	18

hsp consulting

Gas Monitoring Certificate

Project Number C3825
Project Name Burnt Mill Academy
Client Mace Group

WS10A

Time	Gas Flow Rate. (l/hr)	Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm)	Depth of Installation. (mbgl)	Depth of Groundwater (mbgl)
Detection Limit		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
00:00	0.1	<0.1	<0.1	20.2	<0.1	<1	<1		5.05	3.50
00:15	0.1	<0.1	<0.1	12.9	3.0	<1	<1			
00:30	0.1	<0.1	<0.1	11.3	3.7	<1	<1			
00:45	0.1	<0.1	<0.1	11.1	3.8	<1	<1			
01:00	0.1	<0.1	<0.1	11.0	3.8	<1	<1			
01:15	0.1	<0.1	<0.1	11.0	3.8	<1	<1			
01:30	0.1	<0.1	<0.1	11.0	3.8	<1	<1			
01:45	0.1	<0.1	<0.1	11.0	3.8	<1	<1			
02:00	0.1	<0.1	<0.1	11.0	3.7	<1	<1			
02:15	0.1	<0.1	<0.1	11.0	3.7	<1	<1			
02:30	0.1	<0.1	<0.1	11.0	3.7	<1	<1			
02:45	0.1	<0.1	<0.1	11.0	3.7	<1	<1			
03:00	0.1	<0.1	<0.1	11.0	3.7	<1	<1			
03:15	0.1	<0.1	<0.1	11.0	3.7	<1	<1			
03:30	0.1	<0.1	<0.1	11.0	3.7	<1	<1			
03:45										
04:00										
04:15										
04:30										
04:45										
05:00										
Steady	**0.1**	**<0.1**	**<0.1**	**11.0**	**3.7**	**<1**	**<1**	**#####**	**5.05**	**3.50**
Peak	**0.1**	**0.0**	**0.0**	**20.2**	**3.8**	**0.0**	**0.0**	**0.0**	**5.05**	**3.50**

Date	Notes:			
23.03.22	Engineer	DRS	Barometric Pressure, mbar	1023
			Pressure Trend	Falling
	Equipment	GFM430	Air Temp (˚C)	18

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Gas Monitoring Certificate

Project Number C3825
Project Name Burnt Mill Academy
Client Mace Group

WS11

		Detection Limit								
		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
Time	Gas Flow Rate. (l/hr)	Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm	Depth of Installation. (mbgl)	Depth of Groundwater (mbgl)
00:00	0.1	<0.1	<0.1	20.0	<0.1	<1	<1		4.87	4.77
00:15	0.1	<0.1	<0.1	20.6	<0.1	<1	<1			
00:30	0.1	<0.1	<0.1	20.4	<0.1	<1	<1			
00:45	0.1	<0.1	<0.1	20.3	0.1	<1	<1			
01:00	0.1	<0.1	<0.1	20.2	0.2	<1	<1			
01:15	0.1	<0.1	<0.1	20.2	0.2	<1	<1			
01:30	0.1	<0.1	<0.1	20.1	0.2	<1	<1			
01:45	0.1	<0.1	<0.1	20.1	0.3	<1	<1			
02:00	0.1	<0.1	<0.1	20.0	0.3	<1	<1			
02:15	0.1	<0.1	<0.1	20.0	0.3	<1	<1			
02:30	0.1	<0.1	<0.1	20.0	0.3	<1	<1			
02:45	0.1	<0.1	<0.1	20.0	0.3	<1	<1			
03:00	0.1	<0.1	<0.1	20.0	0.3	<1	<1			
03:15	0.1	<0.1	<0.1	20.0	0.3	<1	<1			
03:30										
03:45										
04:00										
04:15										
04:30										
04:45										
05:00										
Steady	**0.1**	**<0.1**	**<0.1**	**20.0**	**0.3**	**<1**	**<1**	**#####**	**4.87**	**4.77**
Peak	**0.1**	**0.0**	**0.0**	**20.6**	**0.3**	**0.0**	**0.0**	**0.0**	**4.87**	**4.77**

Date	Notes:			1023
23.03.22	Engineer	DRS	Barometric Pressure, mbar	
			Pressure Trend	Falling
	Equipment	GFM430	Air Temp (˚C)	18

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Gas Monitoring Certificate

Project Number	C3825	WS01
Project Name	Burnt Mill Academy	
Client	Mace Group	

		Detection Limit								
		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
Time	Gas Flow Rate. (l/hr)	Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm)	Depth of Installation. (mbgl)	Depth of Groundwater (mbgl)
00:00	0.1	<0.1	<0.1	19.2	<0.1	<1	<1		5.04	4.98
00:15	0.1	<0.1	<0.1	16.3	3.8	<1	<1			
00:30	0.1	<0.1	<0.1	15.5	4.3	<1	<1			
00:45	0.1	<0.1	<0.1	15.3	4.4	<1	<1			
01:00	0.1	<0.1	<0.1	15.3	4.4	<1	<1			
01:15	0.1	<0.1	<0.1	15.3	4.4	<1	<1			
01:30	0.1	<0.1	<0.1	15.3	4.4	<1	<1			
01:45	0.1	<0.1	<0.1	15.2	4.4	<1	<1			
02:00	0.1	<0.1	<0.1	15.2	4.4	<1	<1			
02:15	0.1	<0.1	<0.1	15.2	4.4	<1	<1			
02:30	0.1	<0.1	<0.1	15.2	4.4	<1	<1			
02:45	0.1	<0.1	<0.1	15.2	4.4	<1	<1			
03:00	0.1	<0.1	<0.1	15.2	4.4	<1	<1			
03:15										
03:30										
03:45										
04:00										
04:15										
04:30										
04:45										
05:00										
Steady	**0.1**	**<0.1**	**<0.1**	**15.2**	**4.4**	**<1**	**<1**	**#####**	**5.04**	**4.98**
Peak	**0.1**	**0.0**	**0.0**	**19.2**	**4.4**	**0.0**	**0.0**	**0.0**	**5.04**	**4.98**

Date	Notes:			
30.03.2022	Engineer	DRS	Barometric Pressure, mbar	998
			Pressure Trend	Steady
	Equipment	GFM436	Air Temp (˚C)	9

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Gas Monitoring Certificate

Project Number C3825
Project Name Burnt Mill Academy
Client Mace Group

WS02

		Detection Limit								
		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
Time	Gas Flow Rate. (l/hr)	Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm	Depth of Installation. (mbgl)	Depth of Groundwater (mbgl)
00:00	1.0	<0.1	<0.1	14.6	0.1	<1	<1		5.01	4.94
00:15	1.1	>>>>	9.6	2.0	5.8	<1	<1			
00:30	1.1	>>>>	10.3	0.1	5.9	<1	<1			
00:45	1.0	>>>>	10.5	0.1	6.0	<1	<1			
01:00	1.5	>>>>	10.5	0.1	6.0	<1	<1			
01:15	0.9	>>>>	10.5	0.1	6.0	<1	<1			
01:30	0.7	>>>>	10.5	0.1	6.0	<1	<1			
01:45	0.8	>>>>	10.5	0.1	6.0	<1	<1			
02:00	0.9	>>>>	10.5	0.1	6.0	<1	<1			
02:15	1.1	>>>>	10.5	0.1	6.0	<1	<1			
02:30	0.9	>>>>	10.5	0.1	6.0	<1	<1			
02:45	0.9	>>>>	10.5	0.1	6.0	<1	<1			
03:00	0.7	>>>>	10.5	0.1	6.0	<1	<1			
03:15	0.8	>>>>	10.5	0.1	6.0	<1	<1			
03:30	0.6	>>>>	10.6	0.1	6.0	<1	<1			
03:45	0.6	>>>>	10.5	0.1	6.0	<1	<1			
04:00	0.6	>>>>	10.6	0.1	6.0	<1	<1			
04:15	0.6	>>>>	10.5	0.1	6.0	<1	<1			
04:30	0.7	>>>>	10.6	0.1	6.0	<1	<1			
04:45	0.6	>>>>	10.6	0.1	6.0	<1	<1			
05:00	0.6	>>>>	10.6	0.1	6.0	<1	<1			
Steady	**0.6**	**>>>>**	**10.6**	**0.1**	**6.0**	**<1**	**<1**	**#####**	**5.01**	**4.94**
Peak	**1.5**	**0.0**	**10.6**	**14.6**	**6.0**	**0.0**	**0.0**	**0.0**	**5.01**	**4.94**

Date	Notes:		Barometric Pressure, mbar	998
30.03.2022	Engineer	DRS		
			Pressure Trend	Steady
	Equipment	GFM430	Air Temp (˚C)	9

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Gas Monitoring Certificate

Project Number	C3825
Project Name	Burnt Mill Academy
Client	Mace Group

WS03

		Detection Limit								
		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
Time	Gas Flow Rate. (l/hr)	Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppr	Depth of Installation. (mbgl)	Depth of Groundwater (mbgl
00:00	0.1	<0.1	<0.1	17.8	0.2	<1	<1		4.02	2.33
00:15	0.1	<0.1	<0.1	8.8	3.2	<1	<1			
00:30	0.1	<0.1	<0.1	8.4	3.0	<1	<1			
00:45	0.1	<0.1	<0.1	10.1	2.4	<1	<1			
01:00	0.1	<0.1	<0.1	11.5	2.2	<1	<1			
01:15	0.1	<0.1	<0.1	12.7	1.9	<1	<1			
01:30	0.1	<0.1	<0.1	13.8	1.6	<1	<1			
01:45	0.1	<0.1	<0.1	14.5	1.5	<1	<1			
02:00	0.1	<0.1	<0.1	15.1	1.3	<1	<1			
02:15	0.1	<0.1	<0.1	15.7	1.1	<1	<1			
02:30	0.1	<0.1	<0.1	16.2	1.0	<1	<1			
02:45	0.1	<0.1	<0.1	16.6	0.9	<1	<1			
03:00	0.1	<0.1	<0.1	16.9	0.8	<1	<1			
03:15	0.1	<0.1	<0.1	17.1	0.8	<1	<1			
03:30	0.1	<0.1	<0.1	17.3	0.8	<1	<1			
03:45	0.1	<0.1	<0.1	17.5	0.7	<1	<1			
04:00	0.1	<0.1	<0.1	17.8	0.7	<1	<1			
04:15	0.1	<0.1	<0.1	17.8	0.7	<1	<1			
04:30	0.1	<0.1	<0.1	17.9	0.7	<1	<1			
04:45	0.1	<0.1	<0.1	17.9	0.7	<1	<1			
05:00	0.1	<0.1	<0.1	18.0	0.7	<1	<1			
Steady	**0.1**	**<0.1**	**<0.1**	**18.0**	**0.7**	**<1**	**<1**	**#####**	**4.02**	**2.33**
Peak	**0.1**	**0.0**	**0.0**	**18.0**	**3.2**	**0.0**	**0.0**	**0.0**	**4.02**	**2.33**

Date	Notes:		Barometric Pressure, mbar	998
30.03.2022	Engineer	DRS		
			Pressure Trend	Steady
	Equipment	GFM430	Air Temp (˚C)	9

Gas Monitoring Certificate

Project Number C3825
Project Name Burnt Mill Academy
Client Mace Group

WS04

		Detection Limit								
		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
Time	Gas Flow Rate. (l/hr)	Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm	Depth of Installation. (mbgl)	Depth of Groundwater (mbgl
00:00	0.1	<0.1	<0.1	19.7	0.1	<1	<1		5.01	4.94
00:15	0.1	<0.1	<0.1	18.6	2.2	<1	<1			
00:30	0.1	<0.1	<0.1	18.1	2.3	<1	<1			
00:45	0.1	<0.1	<0.1	18.0	2.3	<1	<1			
01:00	0.1	<0.1	<0.1	18.0	2.3	<1	<1			
01:15	0.1	<0.1	<0.1	18.0	2.3	<1	<1			
01:30	0.1	<0.1	<0.1	18.0	2.3	<1	<1			
01:45	0.1	<0.1	<0.1	18.0	2.3	<1	<1			
02:00	0.1	<0.1	<0.1	18.0	2.3	<1	<1			
02:15	0.1	<0.1	<0.1	18.0	2.3	<1	<1			
02:30	0.1	<0.1	<0.1	18.0	2.3	<1	<1			
02:45	0.1	<0.1	<0.1	18.0	2.3	<1	<1			
03:00	0.1	<0.1	<0.1	18.0	2.3	<1	<1			
03:15										
03:30										
03:45										
04:00										
04:15										
04:30										
04:45										
05:00										
Steady	**0.1**	**<0.1**	**<0.1**	**18.0**	**2.3**	**<1**	**<1**	**#####**	**5.01**	**4.94**
Peak	**0.1**	**0.0**	**0.0**	**19.7**	**2.3**	**0.0**	**0.0**	**0.0**	**5.01**	**4.94**

Date	Notes:			
30.03.2022	Engineer	DRS	Barometric Pressure, mbar	998
			Pressure Trend	Steady
	Equipment	GFM430	Air Temp (˚C)	9

Gas Monitoring Certificate

Project Number	C3825	WS09
Project Name	Burnt Mill Academy	
Client	Mace Group	

		Detection Limit								
		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
Time	Gas Flow Rate. (l/hr)	Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppr	Depth of Installation. (mbgl)	Depth of Groundwater (mbgl
00:00	0.1	<0.1	<0.1	19.4	0.2	<1	<1		2.07	DRY
00:15	0.1	<0.1	<0.1	17.8	2.1	<1	<1			
00:30	0.1	<0.1	<0.1	17.4	2.2	<1	<1			
00:45	0.1	<0.1	<0.1	17.3	2.2	<1	<1			
01:00	0.1	<0.1	<0.1	17.3	2.2	<1	<1			
01:15	0.1	<0.1	<0.1	17.2	2.2	<1	<1			
01:30	0.1	<0.1	<0.1	17.2	2.2	<1	<1			
01:45	0.1	<0.1	<0.1	17.2	2.2	<1	<1			
02:00	0.1	<0.1	<0.1	17.2	2.2	<1	<1			
02:15	0.1	<0.1	<0.1	17.2	2.2	<1	<1			
02:30	0.1	<0.1	<0.1	17.2	2.2	<1	<1			
02:45	0.1	<0.1	<0.1	17.2	2.2	<1	<1			
03:00	0.1	<0.1	<0.1	17.2	2.2	<1	<1			
03:15										
03:30										
03:45										
04:00										
04:15										
04:30										
04:45										
05:00										
Steady	**0.1**	**<0.1**	**<0.1**	**17.2**	**2.2**	**<1**	**<1**	**#####**	**2.07**	**DRY**
Peak	**0.1**	**0.0**	**0.0**	**19.4**	**2.2**	**0.0**	**0.0**	**0.0**	**2.07**	**0.00**

Date	Notes:			
30.03.2022	Engineer	DRS	Barometric Pressure, mbar	998
			Pressure Trend	Steady
	Equipment	GFM430	Air Temp (˚C)	9

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Gas Monitoring Certificate

Project Number C3825
Project Name Burnt Mill Academy
Client Mace Group

WS10A

		Detection Limit								
		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
Time	Gas Flow Rate. (l/hr)	Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm)	Depth of Installation. (mbgl)	Depth of Groundwater (mbgl)
00:00	0.1	<0.1	<0.1	20.0	<0.1	<1	<1		5.00	3.66
00:15	0.1	23.5	1.0	10.9	4.2	<1	<1			
00:30	0.1	34.3	1.5	8.1	5.2	<1	<1			
00:45	0.1	42.1	1.9	5.2	6.0	<1	<1			
01:00	0.1	44.9	1.9	4.4	6.3	<1	<1			
01:15	0.1	47.3	2.0	3.8	6.5	<1	<1			
01:30	0.1	47.0	2.0	3.7	6.5	<1	<1			
01:45	0.1	47.3	2.0	3.6	6.5	<1	<1			
02:00	0.1	47.0	2.0	3.6	6.5	<1	<1			
02:15	0.1	45.9	2.0	3.6	6.5	<1	<1			
02:30	0.1	47.0	2.0	3.6	6.5	<1	<1			
02:45	0.1	47.0	2.0	3.6	6.5	<1	<1			
03:00	0.1	46.8	2.0	3.4	6.6	<1	<1			
03:15	0.1	46.3	2.0	3.5	6.6	<1	<1			
03:30	0.1	45.4	1.9	3.7	6.5	<1	<1			
03:45	0.1	44.4	1.8	4.0	6.3	<1	<1			
04:00	0.1	41.8	1.8	4.2	6.1	<1	<1			
04:15	0.1	39.0	1.6	4.5	5.9	<1	<1			
04:30	0.1	36.4	1.5	4.7	5.4	<1	<1			
04:45	0.1	35.0	1.5	5.0	5.2	<1	<1			
05:00	0.1	32.8	1.4	5.1	5.1	<1	<1			
Steady	**0.1**	**32.8**	**1.4**	**5.1**	**5.1**	**<1**	**<1**	**#####**	**5.00**	**3.66**
Peak	**0.1**	**47.3**	**2.0**	**20.0**	**6.6**	**0.0**	**0.0**	**0.0**	**5.00**	**3.66**

Date	Notes:			
30.03.2022	Engineer	DRS	Barometric Pressure, mbar	998
			Pressure Trend	Steady
	Equipment	GFM430	Air Temp (˚C)	9

hsp consulting

Gas Monitoring Certificate

Project Number C3825
Project Name Burnt Mill Academy
Client Mace Group

WS11

Time	Gas Flow Rate. (l/hr)	Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm	Depth of Installation. (mbgl)	Depth of Groundwater (mbgl)
Detection Limit		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
00:00	0.1	<0.1	<0.1	19.9	<0.1	<1	<1		4.85	4.77
00:15	0.1	<0.1	<0.1	20.3	0.1	<1	<1			
00:30	0.1	<0.1	<0.1	20.2	0.1	<1	<1			
00:45	0.1	<0.1	<0.1	20.2	0.1	<1	<1			
01:00	0.1	<0.1	<0.1	20.2	0.1	<1	<1			
01:15	0.1	<0.1	<0.1	20.1	0.1	<1	<1			
01:30	0.1	<0.1	<0.1	20.1	0.1	<1	<1			
01:45	0.1	<0.1	<0.1	20.1	0.1	<1	<1			
02:00	0.1	<0.1	<0.1	20.1	0.1	<1	<1			
02:15	0.1	<0.1	<0.1	20.1	0.2	<1	<1			
02:30	0.1	<0.1	<0.1	20.1	0.2	<1	<1			
02:45	0.1	<0.1	<0.1	20.1	0.2	<1	<1			
03:00	0.1	<0.1	<0.1	20.1	0.2	<1	<1			
03:15	0.1	<0.1	<0.1	20.1	0.2	<1	<1			
03:30	0.1	<0.1	<0.1	20.1	0.2	<1	<1			
03:45	0.1	<0.1	<0.1	20.1	0.2	<1	<1			
04:00	0.1	<0.1	<0.1	20.1	0.3	<1	<1			
04:15	0.1	<0.1	<0.1	20.0	0.3	<1	<1			
04:30	0.1	<0.1	<0.1	20.0	0.3	<1	<1			
04:45	0.1	<0.1	<0.1	20.0	0.4	<1	<1			
05:00	0.1	<0.1	<0.1	20.0	0.4	<1	<1			
Steady	**0.1**	**<0.1**	**<0.1**	**20.0**	**0.4**	**<1**	**<1**	**#####**	**4.85**	**4.77**
Peak	**0.1**	**0.0**	**0.0**	**20.3**	**0.4**	**0.0**	**0.0**	**0.0**	**4.85**	**4.77**

Date	Notes:			
30.03.2022	Engineer	DRS	Barometric Pressure, mbar	998
			Pressure Trend	Steady
	Equipment	GFM430	Air Temp (˚C)	9

hsp consulting

Gas Monitoring Certificate

Project Number C3825
Project Name Burnt Mill Academy
Client Mace Group

WS01

		Detection Limit								
		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
Time	Gas Flow Rate. (l/hr)	Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm)	Depth of Installation. (mbgl)	Depth of Groundwater (mbgl)
00:00	0.1	<0.1	<0.1	19.6	0.1	<1	<1		5.11	5.00
00:15	0.1	<0.1	<0.1	17.7	2.4	<1	<1			
00:30	0.1	<0.1	<0.1	16.5	3.5	<1	<1			
00:45	0.1	<0.1	<0.1	14.7	4.1	<1	<1			
01:00	0.1	<0.1	<0.1	15.2	4.3	<1	<1			
01:15	0.1	<0.1	<0.1	15.0	4.4	<1	<1			
01:30	0.1	<0.1	<0.1	15.0	4.5	<1	<1			
01:45	0.1	<0.1	<0.1	14.9	4.5	<1	<1			
02:00	0.1	<0.1	<0.1	14.9	4.5	<1	<1			
02:15	0.1	<0.1	<0.1	14.8	4.5	<1	<1			
02:30	0.1	<0.1	<0.1	14.8	4.5	<1	<1			
02:45	0.1	<0.1	<0.1	14.8	4.5	<1	<1			
03:00	0.1	<0.1	<0.1	14.8	4.5	<1	<1			
03:15	0.1	<0.1	<0.1	14.8	4.5	<1	<1			
03:30		<0.1	<0.1	14.8	4.5	<1	<1			
03:45										
04:00										
04:15										
04:30										
04:45										
05:00										
Steady	**0.1**	**<0.1**	**<0.1**	**14.8**	**4.5**	**<1**	**<1**	**#####**	**5.11**	**5.00**
Peak	**0.1**	**0.0**	**0.0**	**19.6**	**4.5**	**0.0**	**0.0**	**0.0**	**5.11**	**5.00**

Date	Notes:			
07.04.22	Engineer	DRS	Barometric Pressure, mbar	980
			Pressure Trend	Rising
	Equipment	GFM436	Air Temp (˚C)	11

Gas Monitoring Certificate

Project Number C3825
Project Name Burnt Mill Academy
Client Mace Group

WS02

		Detection Limit								
		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
Time	Gas Flow Rate. (l/hr)	Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm	Depth of Installation. (mbgl)	Depth of Groundwater (mbgl)
00:00	0.1	<0.1	<0.1	19.8	0.1	<1	<1			
00:15	0.1	>>>	6.8	6.8	4.6	<1	<1			
00:30	0.1	>>>	8.1	4.6	4.7	<1	<1			
00:45	0.1	>>>	8.8	3.9	4.8	<1	<1			
01:00	0.1	>>>	9.0	3.6	4.9	<1	<1			
01:15	0.1	>>>	9.1	3.3	4.9	<1	<1			
01:30	0.1	>>>	9.3	2.9	5.0	<1	<1			
01:45	0.1	>>>	9.4	2.7	5.0	<1	<1			
02:00	0.1	>>>	9.5	2.6	5.1	<1	<1			
02:15	0.1	>>>	9.5	2.4	5.1	<1	<1			
02:30	0.1	>>>	9.6	2.3	5.2	<1	<1			
02:45	0.1	>>>	9.7	2.2	5.2	<1	<1			
03:00	0.1	>>>	9.7	2.0	5.3	<1	<1			
03:15	0.1	>>>	9.8	1.9	5.3	<1	<1			
03:30	0.1	>>>	9.8	1.7	5.3	<1	<1			
03:45	0.1	>>>	9.9	1.6	5.4	<1	<1			
04:00	0.1	>>>	9.9	1.5	5.4	<1	<1			
04:15	0.1	>>>	10.0	1.3	5.4	<1	<1			
04:30	0.1	>>>	10.1	1.2	5.5	<1	<1			
04:45	0.1	>>>	10.1	1.1	5.5	<1	<1			
05:00	0.1	>>>	10.2	1.0	5.5	<1	<1			
Steady	**0.1**	**>>>**	**10.2**	**1.0**	**5.5**	**<1**	**<1**	**#####**	**#####**	**#####**
Peak	**0.1**	**0.0**	**10.2**	**19.8**	**5.5**	**0.0**	**0.0**	**0.0**	**0.00**	**0.00**

Date	Notes:		Barometric Pressure, mbar	980
07.04.22	Engineer	DRS		
			Pressure Trend	Rising
	Equipment	GFM430	Air Temp (˚C)	11

hsp consulting

Gas Monitoring Certificate

Project Number	C3825
Project Name	Burnt Mill Academy
Client	Mace Group

WS03

		Detection Limit								
		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
Time	Gas Flow Rate. (l/hr)	Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppr	Depth of Installation. (mbgl)	Depth of Groundwater (mbgl
00:00	0.1	<0.1	<0.1	19.8	0.2	<1	<1		4.10	2.47
00:15	0.1	<0.1	<0.1	18.3	0.7	<1	<1			
00:30	0.1	<0.1	<0.1	17.6	0.8	<1	<1			
00:45	0.1	<0.1	<0.1	17.6	0.8	<1	<1			
01:00	0.1	<0.1	<0.1	18.0	0.7	<1	<1			
01:15	0.1	<0.1	<0.1	18.0	0.6	<1	<1			
01:30	0.1	<0.1	<0.1	18.3	0.6	<1	<1			
01:45	0.1	<0.1	<0.1	18.6	0.5	<1	<1			
02:00	0.1	<0.1	<0.1	18.9	0.5	<1	<1			
02:15	0.1	<0.1	<0.1	19.0	0.5	<1	<1			
02:30	0.1	<0.1	<0.1	19.1	0.4	<1	<1			
02:45	0.1	<0.1	<0.1	19.2	0.4	<1	<1			
03:00	0.1	<0.1	<0.1	19.3	0.4	<1	<1			
03:15	0.1	<0.1	<0.1	19.4	0.4	<1	<1			
03:30	0.1	<0.1	<0.1	19.4	0.4	<1	<1			
03:45	0.1	<0.1	<0.1	19.4	0.4	<1	<1			
04:00	0.1	<0.1	<0.1	19.4	0.4	<1	<1			
04:15	0.1	<0.1	<0.1	19.5	0.4	<1	<1			
04:30	0.1	<0.1	<0.1	19.5	0.4	<1	<1			
04:45	0.1	<0.1	<0.1	19.5	0.3	<1	<1			
05:00	0.1	<0.1	<0.1	19.6	0.3	<1	<1			
Steady	**0.1**	**<0.1**	**<0.1**	**19.6**	**0.3**	**<1**	**<1**	**#####**	**4.10**	**2.47**
Peak	**0.1**	**0.0**	**0.0**	**19.8**	**0.8**	**0.0**	**0.0**	**0.0**	**4.10**	**2.47**

Date	Notes:		Barometric Pressure, mbar	980
07.04.22	Engineer	DRS	Pressure Trend	Rising
	Equipment	GFM430	Air Temp (˚C)	11

hsp consulting

Gas Monitoring Certificate

Project Number C3825
Project Name Burnt Mill Academy
Client Mace Group

WS04

		Detection Limit								
		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
Time	Gas Flow Rate. (l/hr)	Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (pp	Depth of Installation. (mbgl)	Depth of Groundwater (mbgl
00:00	0.1	<0.1	<0.1	19.6	0.2	<1	<1		5.10	4.95
00:15	0.1	<0.1	<0.1	18.7	2.2	<1	<1			
00:30	0.1	<0.1	<0.1	18.2	2.2	<1	<1			
00:45	0.1	<0.1	<0.1	18.1	2.3	<1	<1			
01:00	0.1	<0.1	<0.1	18.0	2.3	<1	<1			
01:15	0.1	<0.1	<0.1	18.1	2.3	<1	<1			
01:30	1.9	<0.1	<0.1	18.1	2.3	<1	<1			
01:45	2.5	<0.1	<0.1	18.1	2.3	<1	<1			
02:00	0.1	<0.1	<0.1	18.1	2.3	<1	<1			
02:15	0.1	<0.1	<0.1	18.1	2.3	<1	<1			
02:30	0.1	<0.1	<0.1	18.1	2.3	<1	<1			
02:45	2.5	<0.1	<0.1	18.1	2.3	<1	<1			
03:00	0.1	<0.1	<0.1	18.1	2.3	<1	<1			
03:15										
03:30										
03:45										
04:00										
04:15										
04:30										
04:45										
05:00										
Steady	**0.1**	**<0.1**	**<0.1**	**18.1**	**2.3**	**<1**	**<1**	**#####**	**5.10**	**4.95**
Peak	**2.5**	**0.0**	**0.0**	**19.6**	**2.3**	**0.0**	**0.0**	**0.0**	**5.10**	**4.95**

Date	Notes:		Barometric Pressure, mbar	980
07.04.22	Engineer	DRS	Pressure Trend	Rising
	Equipment	GFM430	Air Temp (˚C)	11

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Gas Monitoring Certificate

Project Number	C3825
Project Name	Burnt Mill Academy
Client	Mace Group

WS09

Time	Gas Flow Rate. (l/hr)	Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm	Depth of Installation. (mbgl)	Depth of Groundwater (mbgl
		Detection Limit								
		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
00:00	0.1	<0.1	<0.1	19.7	<0.1	<1	<1		2.10	DRY
00:15	0.1	<0.1	<0.1	17.9	2.2	<1	<1			
00:30	0.1	<0.1	<0.1	17.3	2.4	<1	<1			
00:45	0.1	<0.1	<0.1	17.2	2.4	<1	<1			
01:00	0.1	<0.1	<0.1	17.1	2.4	<1	<1			
01:15	0.1	<0.1	<0.1	17.1	2.4	<1	<1			
01:30	0.1	<0.1	<0.1	17.1	2.4	<1	<1			
01:45	0.1	<0.1	<0.1	17.1	2.4	<1	<1			
02:00	0.1	<0.1	<0.1	17.1	2.4	<1	<1			
02:15	0.1	<0.1	<0.1	17.1	2.4	<1	<1			
02:30	2.4	<0.1	<0.1	17.1	2.4	<1	<1			
02:45	0.1	<0.1	<0.1	17.1	2.4	<1	<1			
03:00	0.1	<0.1	<0.1	17.1	2.4	<1	<1			
03:15										
03:30										
03:45										
04:00										
04:15										
04:30										
04:45										
05:00										
Steady	**0.1**	**<0.1**	**<0.1**	**17.1**	**2.4**	**<1**	**<1**	**#####**	**2.10**	**DRY**
Peak	**2.4**	**0.0**	**0.0**	**19.7**	**2.4**	**0.0**	**0.0**	**0.0**	**2.10**	**0.00**

Date	Notes:		Barometric Pressure, mbar	980
07.04.22	Engineer	DRS	Pressure Trend	Rising
	Equipment	GFM430	Air Temp (˚C)	11

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Gas Monitoring Certificate

Project Number C3825
Project Name Burnt Mill Academy
Client Mace Group

WS10A

		Detection Limit								
		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
Time	Gas Flow Rate. (l/hr)	Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm)	Depth of Installation. (mbgl)	Depth of Groundwater (mbgl)
00:00	0.3	<0.1	<0.1	16.0	0.3	<1	<1		5.08	3.54
00:15	0.1	65.7	3.0	7.2	6.4	<1	<1			
00:30	0.3	81.8	3.5	6.4	6.5	<1	<1			
00:45	0.1	83.0	3.6	6.3	6.5	<1	<1			
01:00	3.7	84.1	3.6	6.4	6.5	<1	<1			
01:15	3.9	83.7	3.6	6.4	6.5	<1	<1			
01:30	0.1	83.3	3.6	6.5	6.4	<1	<1			
01:45	0.1	82.5	3.6	6.6	6.4	<1	<1			
02:00	0.5	81.8	3.6	6.8	6.3	<1	<1			
02:15	3.3	77.0	3.5	7.0	6.2	<1	<1			
02:30	1.5	79.2	3.4	7.2	6.1	<1	<1			
02:45	0.3	78.5	3.4	7.3	6.1	<1	<1			
03:00	0.1	77.0	3.3	7.5	6.0	<1	<1			
03:15	0.7	75.1	3.2	8.0	5.6	<1	<1			
03:30	0.1	70.6	3.0	7.8	5.0	<1	<1			
03:45	0.1	64.3	2.7	9.9	4.6	<1	<1			
04:00	1.6	57.8	2.5	10.7	4.4	<1	<1			
04:15	0.1	55.4	2.4	11.2	4.1	<1	<1			
04:30	0.1	52.5	2.2	11.8	3.9	<1	<1			
04:45	0.1	49.6	2.2	12.4	3.7	<1	<1			
05:00	0.1	46.7	2.0	13.0	3.6	<1	<1			
Steady	**0.1**	**46.7**	**2.0**	**13.0**	**3.6**	**<1**	**<1**	**#####**	**5.08**	**3.54**
Peak	**3.9**	**84.1**	**3.6**	**16.0**	**6.5**	**0.0**	**0.0**	**0.0**	**5.08**	**3.54**

Date	Notes:			
07.04.22	Engineer	DRS	Barometric Pressure, mbar	980
			Pressure Trend	Rising
	Equipment	GFM430	Air Temp (˚C)	11

Gas Monitoring Certificate

Project Number	C3825	WS11
Project Name	Burnt Mill Academy	
Client	Mace Group	

		Detection Limit								
		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
Time	Gas Flow Rate. (l/hr)	Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm	Depth of Installation. (mbgl)	Depth of Groundwater (mbgl)
00:00	0.1	<0.1	<0.1	17.7	0.2	<1	<1		4.95	DAMP
00:15	0.3	<0.1	<0.1	20.3	0.2	<1	<1			
00:30	2.2	<0.1	<0.1	20.4	0.2	<1	<1			
00:45	2.3	<0.1	<0.1	20.3	0.3	<1	<1			
01:00	0.1	<0.1	<0.1	20.4	0.3	<1	<1			
01:15	0.1	<0.1	<0.1	20.3	0.4	<1	<1			
01:30	0.1	<0.1	<0.1	20.3	0.4	<1	<1			
01:45	0.1	<0.1	<0.1	20.2	0.5	<1	<1			
02:00	1.0	<0.1	<0.1	20.1	0.5	<1	<1			
02:15	0.1	<0.1	<0.1	20.1	0.6	<1	<1			
02:30	0.1	<0.1	<0.1	19.9	0.7	<1	<1			
02:45	0.1	<0.1	<0.1	20.0	0.7	<1	<1			
03:00	0.1	<0.1	<0.1	19.9	0.8	<1	<1			
03:15	0.1	<0.1	<0.1	19.8	0.9	<1	<1			
03:30	0.1	<0.1	<0.1	19.8	0.9	<1	<1			
03:45	0.1	<0.1	<0.1	19.7	0.9	<1	<1			
04:00	0.6	<0.1	<0.1	19.7	1	<1	<1			
04:15	0.1	<0.1	<0.1	19.6	1.2	<1	<1			
04:30	0.1	<0.1	<0.1	19.4	1.4	<1	<1			
04:45	2.4	<0.1	<0.1	19.4	1.5	<1	<1			
05:00	0.1	<0.1	<0.1	19.2	1.6	<1	<1			
Steady	**0.1**	**<0.1**	**<0.1**	**19.2**	**1.6**	**<1**	**<1**	**#####**	**4.95**	**DAMP**
Peak	**2.4**	**0.0**	**0.0**	**20.4**	**1.6**	**0.0**	**0.0**	**0.0**	**4.95**	**0.00**

Date	Notes:			
07.04.22	Engineer	DRS	Barometric Pressure, mbar	980
			Pressure Trend	Rising
	Equipment	GFM430	Air Temp (˚C)	11

Appendix VII

Waste Classification Report

HazWasteOnline™ classifies waste as either **hazardous** or **non-hazardous** based on its chemical composition, related legislation and the rules and data defined in the current UK or EU technical guidance (Appendix C) (note that HP 9 Infectious is not assessed). It is the responsibility of the classifier named below to:

a) understand the origin of the waste
b) select the correct List of Waste code(s)
c) confirm that the list of determinands, results and sampling plan are fit for purpose
d) select and justify the chosen metal species (Appendix B)
e) correctly apply moisture correction and other available corrections
f) add the meta data for their user-defined substances (Appendix A)
g) check that the classification engine is suitable with respect to the national destination of the waste (Appendix C)

To aid the reviewer, the laboratory results, assumptions and justifications managed by the classifier are highlighted in pale yellow.

QVN39-BXFPT-6GM6L

Job name

C3825 - Burnt Mill Academy

Description/Comments

Brownfield Site
Eurofins Chemtest Report: 21-42360

Project

C3825 - Burnt Mill Academy

Site

Burnt Mill Academy

Classified by

Name:
Laura Jones
Date:
14 Mar 2022 07:11 GMT
Telephone:

Company:
HSP Consulting Engineers Limited

HazWasteOnline™ provides a two day, hazardous waste classification course that covers the use of the software and both basic and advanced waste classification techniques. Certification has to be renewed every 3 years.

HazWasteOnline™ Certification: **CERTIFIED**

Course	**Date**
Hazardous Waste Classification	12 Feb 2020

Next 3 year Refresher due by Feb 2023

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	WS01-26/11/2021-0.70	0.70	Non Hazardous		2
2	WS01-26/11/2021-1.00	1.00	Non Hazardous		4
3	WS02-26/11/2021-0.05	0.05	Non Hazardous		6
4	WS02-26/11/2021-1.00	1.00	Non Hazardous		8
5	WS03-26/11/2021-0.25	0.25	Non Hazardous		10
6	WS03-26/11/2021-2.20	2.20	Non Hazardous		12
7	WS04-26/11/2021-0.80	0.80	Non Hazardous		14
8	WS05-26/11/2021-0.15	0.15	Non Hazardous		16
9	WS05-26/11/2021-0.80	0.80	Non Hazardous		18
10	WS06-26/11/2021-0.40	0.40	Non Hazardous		20

Related documents

#	Name	Description
1	HWOL_21-42360-20211207 191351.hwol	.hwol file used to create the Job
2	Example waste stream template for contaminated soils	waste stream template used to create this Job

Report

Created by: Laura Jones

Created date: 14 Mar 2022 07:11 GMT

Appendices	Page
Appendix A: Classifier defined and non GB MCL determinands	22
Appendix B: Rationale for selection of metal species	23
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Classification of sample: WS01-26/11/2021-0.70

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
WS01-26/11/2021-0.70	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:		
0.70 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Moisture content:		
21% (wet weight correction)		

Hazard properties

None identified

Determinands

Moisture content: 21% Wet Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
1		arsenic { arsenic trioxide }				14	mg/kg	1.32	14.603	mg/kg	0.00146 %	✓	
		033-003-00-0	215-481-4	1327-53-3									
2		boron { diboron trioxide; boric oxide }				1.5	mg/kg	3.22	3.816	mg/kg	0.000382 %	✓	
		005-008-00-8	215-125-8	1303-86-2									
3		cadmium { cadmium oxide }				0.41	mg/kg	1.142	0.37	mg/kg	0.000037 %	✓	
		048-002-00-0	215-146-2	1306-19-0									
4		chromium in chromium(III) compounds { ● chromium(III) oxide (worst case) }				30	mg/kg	1.462	34.639	mg/kg	0.00346 %	✓	
			215-160-9	1308-38-9									
5		chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		<LOD
		024-001-00-0	215-607-8	1333-82-0									
6		copper { dicopper oxide; copper (I) oxide }				85	mg/kg	1.126	75.603	mg/kg	0.00756 %	✓	
		029-002-00-X	215-270-7	1317-39-1									
7		lead { lead chromate }			1	36	mg/kg	1.56	44.361	mg/kg	0.00284 %	✓	
		082-004-00-2	231-846-0	7758-97-6									
8		mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
		080-010-00-X	231-299-8	7487-94-7									
9		nickel { nickel chromate }				27	mg/kg	2.976	63.484	mg/kg	0.00635 %	✓	
		028-035-00-7	238-766-5	14721-18-7									
10		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				0.21	mg/kg	1.405	0.233	mg/kg	0.0000233 %	✓	
		034-002-00-8											
11		zinc { zinc chromate }				69	mg/kg	2.774	151.219	mg/kg	0.0151 %	✓	
		024-007-00-3	236-878-9	13530-65-9									
12	●	TPH (C6 to C40) petroleum group				<10	mg/kg		<10	mg/kg	<0.001 %		<LOD
				TPH									
13		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		603-181-00-X	216-653-1	1634-04-4									
14		benzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
15		toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-021-00-3	203-625-9	108-88-3									

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
16	●	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		**<LOD**
17		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		**<LOD**
18	⚛	cyanides { ● salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		**<LOD**
19	●	pH			PH		8.3	pH		8.3	pH	8.3 pH		
20		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
21	●	acenaphthylene		205-917-1	208-96-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
22	●	acenaphthene		201-469-6	83-32-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
23	●	fluorene		201-695-5	86-73-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
24	●	phenanthrene		201-581-5	85-01-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
25	●	anthracene		204-371-1	120-12-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
26	●	fluoranthene		205-912-4	206-44-0		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
27	●	pyrene		204-927-3	129-00-0		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
28		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
29		chrysene	601-048-00-0	205-923-4	218-01-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
30		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
31		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
32		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
33	●	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
34		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
35	●	benzo[ghi]perylene		205-883-8	191-24-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
36	●	monohydric phenols			P1186		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
											Total:	0.0386 %		

Key

🟨	User supplied data
⬜	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
⚛	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS01-26/11/2021-1.00

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
WS01-26/11/2021-1.00	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:		
1.00 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Moisture content:		
8.3% (wet weight correction)		

Hazard properties

None identified

Determinands

Moisture content: 8.3% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		13	mg/kg	1.32	15.74	mg/kg	0.00157 %	✓	
2		boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		<0.4	mg/kg	3.22	<1.288	mg/kg	<0.000129 %		<LOD
3		cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		<0.1	mg/kg	1.142	<0.114	mg/kg	<0.0000114 %		<LOD
4		chromium in chromium(III) compounds { ● chromium(III) oxide (worst case) }		215-160-9	1308-38-9		29	mg/kg	1.462	38.867	mg/kg	0.00389 %	✓	
5		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		<LOD
6		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		58	mg/kg	1.126	59.881	mg/kg	0.00599 %	✓	
7		lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	15	mg/kg	1.56	21.455	mg/kg	0.00138 %	✓	
8		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
9		nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		24	mg/kg	2.976	65.502	mg/kg	0.00655 %	✓	
10		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.2	mg/kg	1.405	<0.281	mg/kg	<0.0000281 %		<LOD
11		zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		42	mg/kg	2.774	106.843	mg/kg	0.0107 %	✓	
12	●	TPH (C6 to C40) petroleum group			TPH		<10	mg/kg		<10	mg/kg	<0.001 %		<LOD
13		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
14		benzene	601-020-00-8	200-753-7	71-43-2		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
15		toluene	601-021-00-3	203-625-9	108-88-3		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
16	●	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		**<LOD**
17		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		**<LOD**
18	⚛	cyanides { ● salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				3.2 mg/kg	1.884	5.528 mg/kg	0.000553 %	✓	
19	●	pH			PH		8.6 pH		8.6 pH	8.6 pH		
20		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
21	●	acenaphthylene		205-917-1	208-96-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
22	●	acenaphthene		201-469-6	83-32-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
23	●	fluorene		201-695-5	86-73-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
24	●	phenanthrene		201-581-5	85-01-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
25	●	anthracene		204-371-1	120-12-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
26	●	fluoranthene		205-912-4	206-44-0		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
27	●	pyrene		204-927-3	129-00-0		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
28		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
29		chrysene	601-048-00-0	205-923-4	218-01-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
30		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
31		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
32		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
33	●	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
34		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
35	●	benzo[ghi]perylene		205-883-8	191-24-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
36	●	monohydric phenols			P1186		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
									Total:	0.0321 %		

Key

🟨	User supplied data
▨	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
⚛	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS02-26/11/2021-0.05

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:		LoW Code:	
WS02-26/11/2021-0.05		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:			
0.05 m		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Moisture content:			
9% (wet weight correction)			

Hazard properties

None identified

Determinands

Moisture content: 9% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		14	mg/kg	1.32	16.821	mg/kg	0.00168 %	✓	
2		boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		<0.4	mg/kg	3.22	<1.288	mg/kg	<0.000129 %		<LOD
3		cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.19	mg/kg	1.142	0.198	mg/kg	0.0000198 %	✓	
4		chromium in chromium(III) compounds { ● chromium(III) oxide (worst case) }		215-160-9	1308-38-9		19	mg/kg	1.462	25.27	mg/kg	0.00253 %	✓	
5		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		<LOD
6		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		21	mg/kg	1.126	21.516	mg/kg	0.00215 %	✓	
7		lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	42	mg/kg	1.56	59.616	mg/kg	0.00382 %	✓	
8		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.13	mg/kg	1.353	0.16	mg/kg	0.000016 %	✓	
9		nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		21	mg/kg	2.976	56.876	mg/kg	0.00569 %	✓	
10		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.2	mg/kg	1.405	<0.281	mg/kg	<0.0000281 %		<LOD
11		zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		58	mg/kg	2.774	146.419	mg/kg	0.0146 %	✓	
12	●	TPH (C6 to C40) petroleum group			TPH		<10	mg/kg		<10	mg/kg	<0.001 %		<LOD
13		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
14		benzene	601-020-00-8	200-753-7	71-43-2		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
15		toluene	601-021-00-3	203-625-9	108-88-3		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
16	●	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		**<LOD**
17		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		**<LOD**
18	⚛	cyanides { ● salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %		**<LOD**
19	●	pH			PH		8.2 pH		8.2 pH	8.2 pH		
20		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
21	●	acenaphthylene		205-917-1	208-96-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
22	●	acenaphthene		201-469-6	83-32-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
23	●	fluorene		201-695-5	86-73-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
24	●	phenanthrene		201-581-5	85-01-8		0.49 mg/kg		0.446 mg/kg	0.0000446 %	✓	
25	●	anthracene		204-371-1	120-12-7		0.12 mg/kg		0.109 mg/kg	0.0000109 %	✓	
26	●	fluoranthene		205-912-4	206-44-0		0.9 mg/kg		0.819 mg/kg	0.0000819 %	✓	
27	●	pyrene		204-927-3	129-00-0		0.97 mg/kg		0.883 mg/kg	0.0000883 %	✓	
28		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.48 mg/kg		0.437 mg/kg	0.0000437 %	✓	
29		chrysene	601-048-00-0	205-923-4	218-01-9		0.68 mg/kg		0.619 mg/kg	0.0000619 %	✓	
30		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.59 mg/kg		0.537 mg/kg	0.0000537 %	✓	
31		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.48 mg/kg		0.437 mg/kg	0.0000437 %	✓	
32		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.48 mg/kg		0.437 mg/kg	0.0000437 %	✓	
33	●	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
34		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
35	●	benzo[ghi]perylene		205-883-8	191-24-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
36	●	monohydric phenols			P1186		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
									Total:	0.0324 %		

Key

🟨	User supplied data
▨	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
⚛	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS02-26/11/2021-1.00

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:		LoW Code:	
WS02-26/11/2021-1.00		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:			
1.00 m		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Moisture content:			
17% (wet weight correction)			

Hazard properties

None identified

Determinands

Moisture content: 17% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		11	mg/kg	1.32	12.055	mg/kg	0.00121 %	✓	
2		boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		<0.4	mg/kg	3.22	<1.288	mg/kg	<0.000129 %		**<LOD**
3		cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.12	mg/kg	1.142	0.114	mg/kg	0.0000114 %	✓	
4		chromium in chromium(III) compounds { ● chromium(III) oxide (worst case) }		215-160-9	1308-38-9		13	mg/kg	1.462	15.77	mg/kg	0.00158 %	✓	
5		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		**<LOD**
6		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		8.2	mg/kg	1.126	7.663	mg/kg	0.000766 %	✓	
7		lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	7.4	mg/kg	1.56	9.58	mg/kg	0.000614 %	✓	
8		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		**<LOD**
9		nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		15	mg/kg	2.976	37.054	mg/kg	0.00371 %	✓	
10		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.2	mg/kg	1.405	<0.281	mg/kg	<0.0000281 %		**<LOD**
11		zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		33	mg/kg	2.774	75.984	mg/kg	0.0076 %	✓	
12	●	TPH (C6 to C40) petroleum group			TPH		<10	mg/kg		<10	mg/kg	<0.001 %		**<LOD**
13		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		**<LOD**
14		benzene	601-020-00-8	200-753-7	71-43-2		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		**<LOD**
15		toluene	601-021-00-3	203-625-9	108-88-3		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		**<LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16	●	ethylbenzene											
		601-023-00-4	202-849-4	100-41-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		**<LOD**
17		xylene											
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		**<LOD**
18	⚛	cyanides { ● salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }											
		006-007-00-5				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		**<LOD**
19	●	pH											
				PH		8.4	pH		8.4	pH	8.4 pH		
20		naphthalene											
		601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
21	●	acenaphthylene											
			205-917-1	208-96-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
22	●	acenaphthene											
			201-469-6	83-32-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
23	●	fluorene											
			201-695-5	86-73-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
24	●	phenanthrene											
			201-581-5	85-01-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
25	●	anthracene											
			204-371-1	120-12-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
26	●	fluoranthene											
			205-912-4	206-44-0		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
27	●	pyrene											
			204-927-3	129-00-0		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
28		benzo[a]anthracene											
		601-033-00-9	200-280-6	56-55-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
29		chrysene											
		601-048-00-0	205-923-4	218-01-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
30		benzo[b]fluoranthene											
		601-034-00-4	205-911-9	205-99-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
31		benzo[k]fluoranthene											
		601-036-00-5	205-916-6	207-08-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
32		benzo[a]pyrene; benzo[def]chrysene											
		601-032-00-3	200-028-5	50-32-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
33	●	indeno[123-cd]pyrene											
			205-893-2	193-39-5		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
34		dibenz[a,h]anthracene											
		601-041-00-2	200-181-8	53-70-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
35	●	benzo[ghi]perylene											
			205-883-8	191-24-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
36	●	monohydric phenols											
				P1186		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
										Total:	0.017 %		

Key

🟨	User supplied data
⬜	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
⚛	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS03-26/11/2021-0.25

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
WS03-26/11/2021-0.25
Sample Depth:
0.25 m
Moisture content:
21%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 21% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				11	mg/kg	1.32	11.474	mg/kg	0.00115 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	boron { diboron trioxide; boric oxide }				<0.4	mg/kg	3.22	<1.288	mg/kg	<0.000129 %		<LOD
	005-008-00-8	215-125-8	1303-86-2									
3	cadmium { cadmium oxide }				<0.1	mg/kg	1.142	<0.114	mg/kg	<0.0000114 %		<LOD
	048-002-00-0	215-146-2	1306-19-0									
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				54	mg/kg	1.462	62.35	mg/kg	0.00623 %	✓	
		215-160-9	1308-38-9									
5	chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		<LOD
	024-001-00-0	215-607-8	1333-82-0									
6	copper { dicopper oxide; copper (I) oxide }				22	mg/kg	1.126	19.568	mg/kg	0.00196 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
7	lead { lead chromate }			1	16	mg/kg	1.56	19.716	mg/kg	0.00126 %	✓	
	082-004-00-2	231-846-0	7758-97-6									
8	mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
9	nickel { nickel chromate }				48	mg/kg	2.976	112.86	mg/kg	0.0113 %	✓	
	028-035-00-7	238-766-5	14721-18-7									
10	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<0.2	mg/kg	1.405	<0.281	mg/kg	<0.0000281 %		<LOD
	034-002-00-8											
11	zinc { zinc chromate }				55	mg/kg	2.774	120.537	mg/kg	0.0121 %	✓	
	024-007-00-3	236-878-9	13530-65-9									
12	TPH (C6 to C40) petroleum group				<10	mg/kg		<10	mg/kg	<0.001 %		<LOD
			TPH									
13	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
14	benzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2									
15	toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3									

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	**User entered data**		Conv. Factor	Compound conc.		**Classification value**	MC Applied	Conc. Not Used
16	●	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		**<LOD**
17		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		**<LOD**
18	⚛	cyanides { ● salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		**<LOD**
19	●	pH			PH		8.2	pH		8.2	pH	8.2 pH		
20		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
21	●	acenaphthylene		205-917-1	208-96-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
22	●	acenaphthene		201-469-6	83-32-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
23	●	fluorene		201-695-5	86-73-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
24	●	phenanthrene		201-581-5	85-01-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
25	●	anthracene		204-371-1	120-12-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
26	●	fluoranthene		205-912-4	206-44-0		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
27	●	pyrene		204-927-3	129-00-0		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
28		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
29		chrysene	601-048-00-0	205-923-4	218-01-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
30		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
31		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
32		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
33	●	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
34		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
35	●	benzo[ghi]perylene		205-883-8	191-24-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
36	●	monohydric phenols			P1186		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
											Total:	0.0355 %		

Key

🟨	User supplied data
⬜	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
⚛	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS03-26/11/2021-2.20

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:		LoW Code:	
WS03-26/11/2021-2.20		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:			
2.20 m		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Moisture content:			
21% (wet weight correction)			

Hazard properties

None identified

Determinands

Moisture content: 21% Wet Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	**User entered data**		Conv. Factor	Compound conc.		**Classification value**	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
1		arsenic { arsenic trioxide } 033-003-00-0	215-481-4	1327-53-3		7.3	mg/kg	1.32	7.614	mg/kg	0.000761 %	✓	
2		boron { diboron trioxide; boric oxide } 005-008-00-8	215-125-8	1303-86-2		0.78	mg/kg	3.22	1.984	mg/kg	0.000198 %	✓	
3		cadmium { cadmium oxide } 048-002-00-0	215-146-2	1306-19-0		0.18	mg/kg	1.142	0.162	mg/kg	0.0000162 %	✓	
4		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }	215-160-9	1308-38-9		19	mg/kg	1.462	21.938	mg/kg	0.00219 %	✓	
5		chromium in chromium(VI) compounds { chromium(VI) oxide } 024-001-00-0	215-607-8	1333-82-0		<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		<LOD
6		copper { dicopper oxide; copper (I) oxide } 029-002-00-X	215-270-7	1317-39-1		12	mg/kg	1.126	10.673	mg/kg	0.00107 %	✓	
7		lead { lead chromate } 082-004-00-2	231-846-0	7758-97-6	1	330	mg/kg	1.56	406.644	mg/kg	0.0261 %	✓	
8		mercury { mercury dichloride } 080-010-00-X	231-299-8	7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
9		nickel { nickel chromate } 028-035-00-7	238-766-5	14721-18-7		19	mg/kg	2.976	44.674	mg/kg	0.00447 %	✓	
10		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } 034-002-00-8				<0.2	mg/kg	1.405	<0.281	mg/kg	<0.0000281 %		<LOD
11		zinc { zinc chromate } 024-007-00-3	236-878-9	13530-65-9		43	mg/kg	2.774	94.238	mg/kg	0.00942 %	✓	
12		TPH (C6 to C40) petroleum group		TPH		<10	mg/kg		<10	mg/kg	<0.001 %		<LOD
13		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane 603-181-00-X	216-653-1	1634-04-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
14		benzene 601-020-00-8	200-753-7	71-43-2		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
15		toluene 601-021-00-3	203-625-9	108-88-3		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16	●	ethylbenzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
17		xylene				<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<LOD
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
18	⚛	cyanides { ● salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<LOD
		006-007-00-5											
19	●	pH				8.1	pH		8.1	pH	8.1 pH		
				PH									
20		naphthalene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
21	●	acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-917-1	208-96-8									
22	●	acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-469-6	83-32-9									
23	●	fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-695-5	86-73-7									
24	●	phenanthrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-581-5	85-01-8									
25	●	anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-371-1	120-12-7									
26	●	fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-912-4	206-44-0									
27	●	pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-927-3	129-00-0									
28		benzo[a]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
29		chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
30		benzo[b]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
31		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
32		benzo[a]pyrene; benzo[def]chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
33	●	indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-893-2	193-39-5									
34		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
35	●	benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-883-8	191-24-2									
36	●	monohydric phenols				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
				P1186									
										Total:	0.0456 %		

Key

🟨	User supplied data
⬜	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
⚛	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS04-26/11/2021-0.80

✓ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:		LoW Code:	
WS04-26/11/2021-0.80		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:			
0.80 m		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Moisture content:			
3.9% (wet weight correction)			

Hazard properties

None identified

Determinands

Moisture content: 3.9% Wet Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	**User entered data**		Conv. Factor	Compound conc.		**Classification value**	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
1		arsenic { arsenic trioxide }				50	mg/kg	1.32	63.442	mg/kg	0.00634 %	✓	
		033-003-00-0	215-481-4	1327-53-3									
2		boron { diboron trioxide; boric oxide }				0.8	mg/kg	3.22	2.475	mg/kg	0.000248 %	✓	
		005-008-00-8	215-125-8	1303-86-2									
3		cadmium { cadmium oxide }				0.19	mg/kg	1.142	0.209	mg/kg	0.0000209 %	✓	
		048-002-00-0	215-146-2	1306-19-0									
4		chromium in chromium(III) compounds { ● chromium(III) oxide (worst case) }				21	mg/kg	1.462	29.496	mg/kg	0.00295 %	✓	
			215-160-9	1308-38-9									
5		chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		<LOD
		024-001-00-0	215-607-8	1333-82-0									
6		copper { dicopper oxide; copper (I) oxide }				55	mg/kg	1.126	59.509	mg/kg	0.00595 %	✓	
		029-002-00-X	215-270-7	1317-39-1									
7		lead { lead chromate }			1	12	mg/kg	1.56	17.988	mg/kg	0.00115 %	✓	
		082-004-00-2	231-846-0	7758-97-6									
8		mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
		080-010-00-X	231-299-8	7487-94-7									
9		nickel { nickel chromate }				31	mg/kg	2.976	88.666	mg/kg	0.00887 %	✓	
		028-035-00-7	238-766-5	14721-18-7									
10		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				0.2	mg/kg	1.405	0.27	mg/kg	0.000027 %	✓	
		034-002-00-8											
11		zinc { zinc chromate }				82	mg/kg	2.774	218.608	mg/kg	0.0219 %	✓	
		024-007-00-3	236-878-9	13530-65-9									
12	●	TPH (C6 to C40) petroleum group				<10	mg/kg		<10	mg/kg	<0.001 %		<LOD
				TPH									
13		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		603-181-00-X	216-653-1	1634-04-4									
14		benzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
15		toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-021-00-3	203-625-9	108-88-3									

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16	●	ethylbenzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		**<LOD**
		601-023-00-4	202-849-4	100-41-4									
17		xylene				<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		**<LOD**
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
18	⚛	cyanides { ● salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		**<LOD**
		006-007-00-5											
19	●	pH				8.5	pH		8.5	pH	8.5 pH		
				PH									
20		naphthalene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		601-052-00-2	202-049-5	91-20-3									
21	●	acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			205-917-1	208-96-8									
22	●	acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			201-469-6	83-32-9									
23	●	fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			201-695-5	86-73-7									
24	●	phenanthrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			201-581-5	85-01-8									
25	●	anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			204-371-1	120-12-7									
26	●	fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			205-912-4	206-44-0									
27	●	pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			204-927-3	129-00-0									
28		benzo[a]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		601-033-00-9	200-280-6	56-55-3									
29		chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		601-048-00-0	205-923-4	218-01-9									
30		benzo[b]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		601-034-00-4	205-911-9	205-99-2									
31		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		601-036-00-5	205-916-6	207-08-9									
32		benzo[a]pyrene; benzo[def]chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		601-032-00-3	200-028-5	50-32-8									
33	●	indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			205-893-2	193-39-5									
34		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		601-041-00-2	200-181-8	53-70-3									
35	●	benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			205-883-8	191-24-2									
36	●	monohydric phenols				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
				P1186									
										Total:	0.0488 %		

Key

🟨	User supplied data
▨	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
⚛	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS05-26/11/2021-0.15

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:		LoW Code:	
WS05-26/11/2021-0.15		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.15 m			
Moisture content:			
10% (wet weight correction)			

Hazard properties

None identified

Determinands

Moisture content: 10% Wet Weight Moisture Correction applied (MC)

#		Determinand				CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
			EU CLP index number	EC Number	CAS Number									
1		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		14	mg/kg	1.32	16.636	mg/kg	0.00166 %	✓	
2		boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		1.4	mg/kg	3.22	4.057	mg/kg	0.000406 %	✓	
3		cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		<0.1	mg/kg	1.142	<0.114	mg/kg	<0.0000114 %		<LOD
4		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		26	mg/kg	1.462	34.2	mg/kg	0.00342 %	✓	
5		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		<LOD
6		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		25	mg/kg	1.126	25.332	mg/kg	0.00253 %	✓	
7		lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	30	mg/kg	1.56	42.115	mg/kg	0.0027 %	✓	
8		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.1	mg/kg	1.353	0.122	mg/kg	0.0000122 %	✓	
9		nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		22	mg/kg	2.976	58.93	mg/kg	0.00589 %	✓	
10		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.2	mg/kg	1.405	<0.281	mg/kg	<0.0000281 %		<LOD
11		zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		57	mg/kg	2.774	142.314	mg/kg	0.0142 %	✓	
12		TPH (C6 to C40) petroleum group			TPH		<10	mg/kg		<10	mg/kg	<0.001 %		<LOD
13		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
14		benzene	601-020-00-8	200-753-7	71-43-2		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
15		toluene	601-021-00-3	203-625-9	108-88-3		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16	●	ethylbenzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		**<LOD**
		601-023-00-4	202-849-4	100-41-4									
17		xylene				<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		**<LOD**
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
18	⚛	cyanides { ● salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				35	mg/kg	1.884	59.346	mg/kg	0.00593 %	✓	
		006-007-00-5											
19	●	pH				9.2	pH		9.2	pH	9.2 pH		
				PH									
20		naphthalene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		601-052-00-2	202-049-5	91-20-3									
21	●	acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			205-917-1	208-96-8									
22	●	acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			201-469-6	83-32-9									
23	●	fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			201-695-5	86-73-7									
24	●	phenanthrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			201-581-5	85-01-8									
25	●	anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			204-371-1	120-12-7									
26	●	fluoranthene				1.6	mg/kg		1.44	mg/kg	0.000144 %	✓	
			205-912-4	206-44-0									
27	●	pyrene				1.8	mg/kg		1.62	mg/kg	0.000162 %	✓	
			204-927-3	129-00-0									
28		benzo[a]anthracene				1.1	mg/kg		0.99	mg/kg	0.000099 %	✓	
		601-033-00-9	200-280-6	56-55-3									
29		chrysene				0.99	mg/kg		0.891	mg/kg	0.0000891 %	✓	
		601-048-00-0	205-923-4	218-01-9									
30		benzo[b]fluoranthene				2.2	mg/kg		1.98	mg/kg	0.000198 %	✓	
		601-034-00-4	205-911-9	205-99-2									
31		benzo[k]fluoranthene				0.87	mg/kg		0.783	mg/kg	0.0000783 %	✓	
		601-036-00-5	205-916-6	207-08-9									
32		benzo[a]pyrene; benzo[def]chrysene				1.4	mg/kg		1.26	mg/kg	0.000126 %	✓	
		601-032-00-3	200-028-5	50-32-8									
33	●	indeno[123-cd]pyrene				1.4	mg/kg		1.26	mg/kg	0.000126 %	✓	
			205-893-2	193-39-5									
34		dibenz[a,h]anthracene				0.36	mg/kg		0.324	mg/kg	0.0000324 %	✓	
		601-041-00-2	200-181-8	53-70-3									
35	●	benzo[ghi]perylene				1.6	mg/kg		1.44	mg/kg	0.000144 %	✓	
			205-883-8	191-24-2									
36	●	monohydric phenols				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
				P1186									
										Total:	0.0392 %		

Key

🟨	User supplied data
▨	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
⚛	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS05-26/11/2021-0.80

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:		LoW Code:	
WS05-26/11/2021-0.80		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:			
0.80 m		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Moisture content:			
5.7% (wet weight correction)			

Hazard properties

None identified

Determinands

Moisture content: 5.7% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				12	mg/kg	1.32	14.941	mg/kg	0.00149 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	boron { diboron trioxide; boric oxide }				0.6	mg/kg	3.22	1.822	mg/kg	0.000182 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
3	cadmium { cadmium oxide }				0.21	mg/kg	1.142	0.226	mg/kg	0.0000226 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
4	chromium in chromium(III) compounds { ● chromium(III) oxide (worst case) }				12	mg/kg	1.462	16.539	mg/kg	0.00165 %	✓	
		215-160-9	1308-38-9									
5	chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		<LOD
	024-001-00-0	215-607-8	1333-82-0									
6	copper { dicopper oxide; copper (I) oxide }				12	mg/kg	1.126	12.741	mg/kg	0.00127 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
7	lead { lead chromate }			1	7.2	mg/kg	1.56	10.591	mg/kg	0.000679 %	✓	
	082-004-00-2	231-846-0	7758-97-6									
8	mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
9	nickel { nickel chromate }				22	mg/kg	2.976	61.746	mg/kg	0.00617 %	✓	
	028-035-00-7	238-766-5	14721-18-7									
10	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<0.2	mg/kg	1.405	<0.281	mg/kg	<0.0000281 %		<LOD
	034-002-00-8											
11	zinc { zinc chromate }				55	mg/kg	2.774	143.881	mg/kg	0.0144 %	✓	
	024-007-00-3	236-878-9	13530-65-9									
12	● TPH (C6 to C40) petroleum group				<10	mg/kg		<10	mg/kg	<0.001 %		<LOD
			TPH									
13	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
14	benzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2									
15	toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3									

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
16	●	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		**<LOD**
17		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		**<LOD**
18	⚗	cyanides { ● salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				7.3 mg/kg	1.884	12.969 mg/kg	0.0013 %	✓	
19	●	pH			PH		8.2 pH		8.2 pH	8.2 pH		
20		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
21	●	acenaphthylene		205-917-1	208-96-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
22	●	acenaphthene		201-469-6	83-32-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
23	●	fluorene		201-695-5	86-73-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
24	●	phenanthrene		201-581-5	85-01-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
25	●	anthracene		204-371-1	120-12-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
26	●	fluoranthene		205-912-4	206-44-0		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
27	●	pyrene		204-927-3	129-00-0		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
28		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
29		chrysene	601-048-00-0	205-923-4	218-01-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
30		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
31		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
32		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
33	●	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
34		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
35	●	benzo[ghi]perylene		205-883-8	191-24-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
36	●	monohydric phenols			P1186		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
									Total:	0.0285 %		

Key

🟨	User supplied data
▒	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
⚗	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS06-26/11/2021-0.40

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:		LoW Code:	
WS06-26/11/2021-0.40		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:			
0.40 m		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Moisture content:			
11% (wet weight correction)			

Hazard properties

None identified

Determinands

Moisture content: 11% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	**User entered data**		Conv. Factor	Compound conc.		**Classification value**	MC Applied	Conc. Not Used
1		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		13	mg/kg	1.32	15.276	mg/kg	0.00153 %	✓	
2		boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		<0.4	mg/kg	3.22	<1.288	mg/kg	<0.000129 %		<LOD
3		cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.54	mg/kg	1.142	0.549	mg/kg	0.0000549 %	✓	
4		chromium in chromium(III) compounds { ● chromium(III) oxide (worst case) }		215-160-9	1308-38-9		26	mg/kg	1.462	33.82	mg/kg	0.00338 %	✓	
5		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		<LOD
6		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		18	mg/kg	1.126	18.037	mg/kg	0.0018 %	✓	
7		lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	38	mg/kg	1.56	52.753	mg/kg	0.00338 %	✓	
8		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.32	mg/kg	1.353	0.385	mg/kg	0.0000385 %	✓	
9		nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		24	mg/kg	2.976	63.573	mg/kg	0.00636 %	✓	
10		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.2	mg/kg	1.405	<0.281	mg/kg	<0.0000281 %		<LOD
11		zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		71	mg/kg	2.774	175.298	mg/kg	0.0175 %	✓	
12	●	TPH (C6 to C40) petroleum group			TPH		<10	mg/kg		<10	mg/kg	<0.001 %		<LOD
13		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
14		benzene	601-020-00-8	200-753-7	71-43-2		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
15		toluene	601-021-00-3	203-625-9	108-88-3		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD

#		Determinand				CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
			EU CLP index number	EC Number	CAS Number									
16	●	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
17		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<LOD
18	⚛	cyanides { ● salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				1	mg/kg	1.884	1.677	mg/kg	0.000168 %	✓	
19	●	pH			PH		8.2	pH		8.2	pH	8.2 pH		
20		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
21	●	acenaphthylene		205-917-1	208-96-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
22	●	acenaphthene		201-469-6	83-32-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
23	●	fluorene		201-695-5	86-73-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
24	●	phenanthrene		201-581-5	85-01-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
25	●	anthracene		204-371-1	120-12-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
26	●	fluoranthene		205-912-4	206-44-0		0.14	mg/kg		0.125	mg/kg	0.0000125 %	✓	
27	●	pyrene		204-927-3	129-00-0		0.22	mg/kg		0.196	mg/kg	0.0000196 %	✓	
28		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.64	mg/kg		0.57	mg/kg	0.000057 %	✓	
29		chrysene	601-048-00-0	205-923-4	218-01-9		0.72	mg/kg		0.641	mg/kg	0.0000641 %	✓	
30		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
31		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
32		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
33	●	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
34		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
35	●	benzo[ghi]perylene		205-883-8	191-24-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
36	●	monohydric phenols			P1186		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
											Total:	0.0358 %		

Key

🟨	User supplied data
▨	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
⚛	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Appendix A: Classifier defined and non GB MCL determinands

chromium(III) oxide (worst case) (EC Number: 215-160-9, CAS Number: 1308-38-9)

Description/Comments: Data from C&L Inventory Database
Data source: https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4; H332 , Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Resp. Sens. 1; H334 , Skin Sens. 1; H317 , Repr. 1B; H360FD , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

TPH (C6 to C40) petroleum group (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: Flam. Liq. 3; H226 , Asp. Tox. 1; H304 , STOT RE 2; H373 , Muta. 1B; H340 , Carc. 1B; H350 , Repr. 2; H361d , Aquatic Chronic 2; H411

ethylbenzene (EC Number: 202-849-4, CAS Number: 100-41-4)

GB MCL index number: 601-023-00-4
Description/Comments:
Additional Hazard Statement(s): Carc. 2; H351
Reason for additional Hazards Statement(s):
20 Nov 2021 - Carc. 2; H351 hazard statement sourced from: IARC Group 2B (77) 2000

salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex

GB MCL index number: 006-007-00-5
Description/Comments: Conversion factor based on a worst case compound: sodium cyanide
Additional Hazard Statement(s): EUH032 >= 0.2 %
Reason for additional Hazards Statement(s):
20 Nov 2021 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

pH (CAS Number: PH)

Description/Comments: Appendix C4
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: None.

acenaphthylene (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4; H302 , Acute Tox. 1; H330 , Acute Tox. 1; H310 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315

acenaphthene (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Aquatic Chronic 2; H411

fluorene (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

phenanthrene (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Carc. 2; H351 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Skin Irrit. 2; H315

anthracene (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

fluoranthene (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21 Aug 2015
Hazard Statements: Acute Tox. 4; H302 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

pyrene (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21 Aug 2015
Hazard Statements: Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

indeno[123-cd]pyrene (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Carc. 2; H351

benzo[ghi]perylene (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 23 Jul 2015
Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

monohydric phenols (CAS Number: P1186)

Description/Comments: Combined hazards statements from harmonised entries in CLP for phenol, cresols and xylenols (604-001-00-2, 604-004-00-9, 604-006-00-X)
Data source: CLP combined data
Data source date: 26 Mar 2019
Hazard Statements: Muta. 2; H341 , Acute Tox. 3; H331 , Acute Tox. 3; H311 , Acute Tox. 3; H301 , STOT RE 2; H373 , Skin Corr. 1B; H314 , Skin Corr. 1B; H314 >= 3 % , Skin Irrit. 2; H315 1 £ conc. < 3 % , Eye Irrit. 2; H319 1 £ conc. < 3 % , Aquatic Chronic 2; H411

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

Reasonable case CLP species based on hazard statements/molecular weight and most common (stable) oxide of arsenic. Industrial sources include: smelting; main precursor to other arsenic compounds (edit as required)

boron {diboron trioxide; boric oxide}

Reasonable case CLP species based on hazard statements/ molecular weight, physical form and low solubility. Industrial sources include: fluxing agent for glass/enamels; additive for fibre optics, borosilicate glass (edit as required)

cadmium {cadmium oxide}

Reasonable case CLP species based on hazard statements/molecular weight, very low solubility in water. Industrial sources include: electroplating baths, electrodes for storage batteries, catalysts, ceramic glazes, phosphors, pigments and nematocides. (edit as required) Worst case compounds in CLP: cadmium sulphate, chloride, fluoride & iodide not expected as either very soluble and/or compound's industrial usage not related to site history (edit as required)

chromium in chromium(III) compounds {chromium(III) oxide (worst case)}

Reasonable case species based on hazard statements/molecular weight. Industrial sources include: tanning, pigment in paint, inks and glass (edit as required)

chromium in chromium(VI) compounds {chromium(VI) oxide}

Worst case CLP species based on hazard statements/molecular weight. Industrial sources include: production stainless steel, electroplating, wood preservation, anti-corrosion agents or coatings, pigments (edit as required)

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Industrial sources include: oxidised copper metal, brake pads, pigments, antifouling paints, fungicide. (edit as required) Worse case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected. (edit as required)

lead {lead chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

nickel {nickel chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

selenium {selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case. Pigment cadmium sulphoselenide not likely to be present in this soil. No evidence for the other CLP entries: sodium selenite, nickel II selenite and nickel selenide, to be present in this soil. (edit as required)

zinc {zinc chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

cyanides {salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case as complex cyanides and those specified elsewhere in the annex are not likely to be present in this soil: [Note conversion factor based on a worst case compound: sodium cyanide] (edit as required)

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.2.GB - Oct 2021
HazWasteOnline Classification Engine Version: 2022.25.4995.9469 (25 Jan 2022)
HazWasteOnline Database: 2022.25.4995.9469 (25 Jan 2022)

This classification utilises the following guidance and legislation:
WM3 v1.2.GB - Waste Classification - 1st Edition v1.2.GB - Oct 2021
CLP Regulation - Regulation 1272/2008/EC of 16 December 2008
1st ATP - Regulation 790/2009/EC of 10 August 2009
2nd ATP - Regulation 286/2011/EC of 10 March 2011
3rd ATP - Regulation 618/2012/EU of 10 July 2012
4th ATP - Regulation 487/2013/EU of 8 May 2013
Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013
5th ATP - Regulation 944/2013/EU of 2 October 2013
6th ATP - Regulation 605/2014/EU of 5 June 2014
WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014
Revised List of Waste 2014 - Decision 2014/955/EU of 18 December 2014
7th ATP - Regulation 2015/1221/EU of 24 July 2015
8th ATP - Regulation (EU) 2016/918 of 19 May 2016
9th ATP - Regulation (EU) 2016/1179 of 19 July 2016
10th ATP - Regulation (EU) 2017/776 of 4 May 2017
HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017
13th ATP - Regulation (EU) 2018/1480 of 4 October 2018
14th ATP - Regulation (EU) 2020/217 of 4 October 2019
15th ATP - Regulation (EU) 2020/1182 of 19 May 2020
The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1567 of 16th December 2020
The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1540 of 16th December 2020
GB MCL List - version 1.1 of 09 June 2021

hsp consulting

HazWasteOnline™

Waste Classification Report

HazWasteOnline™ classifies waste as either **hazardous** or **non-hazardous** based on its chemical composition, related legislation and the rules and data defined in the current UK or EU technical guidance (Appendix C) (note that HP 9 Infectious is not assessed). It is the responsibility of the classifier named below to:

a) understand the origin of the waste
b) select the correct List of Waste code(s)
c) confirm that the list of determinands, results and sampling plan are fit for purpose
d) select and justify the chosen metal species (Appendix B)
e) correctly apply moisture correction and other available corrections
f) add the meta data for their user-defined substances (Appendix A)
g) check that the classification engine is suitable with respect to the national destination of the waste (Appendix C)

To aid the reviewer, the laboratory results, assumptions and justifications managed by the classifier are highlighted in pale yellow.

ZOAG2-6OMOY-CTHYW

Job name

C3825 Burnt Mill Academy

Description/Comments

Brownfield Site
Eurofins Chemtest Report: 22-06457

Project

C3825 Burnt Mill Academy

Site

Burnt Mill Academy

Classified by

Name:
Laura Jones
Date:
14 Mar 2022 07:15 GMT
Telephone:

Company:
HSP Consulting Engineers Limited

HazWasteOnline™ provides a two day, hazardous waste classification course that covers the use of the software and both basic and advanced waste classification techniques. Certification has to be renewed every 3 years.

HazWasteOnline™ Certification: **CERTIFIED**

Course	**Date**
Hazardous Waste Classification	12 Feb 2020

Next 3 year Refresher due by Feb 2023

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	WS07-15/02/2022-0.10	0.10-0.20	Non Hazardous		2
2	WS08-15/02/2022-0.90	0.90-1.00	Non Hazardous		4
3	WS09-15/02/2022-0.75	0.75-0.85	Non Hazardous		6
4	WS10A-15/02/2022-0.30	0.30-0.40	Non Hazardous		8
5	WS10A-15/02/2022-1.50	1.50-1.70	Non Hazardous		10
6	WS11-15/02/2022-0.90	0.90-1.00	Non Hazardous		12
7	WS12-15/02/2022-0.30	0.30-0.40	Non Hazardous		14
8	WS12-15/02/2022-0.60	0.60-0.70	Non Hazardous		16

Related documents

#	Name	Description
1	HWOL_22-06457-20220228 173623.hwol	.hwol file used to create the Job
2	Example waste stream template for contaminated soils	waste stream template used to create this Job

Report

Created by: Laura Jones

Created date: 14 Mar 2022 07:15 GMT

Appendices	Page
Appendix A: Classifier defined and non GB MCL determinands	19
Appendix B: Rationale for selection of metal species	20
Appendix C: Version	21

Classification of sample: WS07-15/02/2022-0.10

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
WS07-15/02/2022-0.10	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:		
0.10-0.20 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Moisture content:		
29% (wet weight correction)		

Hazard properties

None identified

Determinands

Moisture content: 29% Wet Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	**User entered data**		Conv. Factor	Compound conc.		**Classification value**	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
1		arsenic { arsenic trioxide }				10	mg/kg	1.32	9.374	mg/kg	0.000937 %	✓	
		033-003-00-0	215-481-4	1327-53-3									
2		boron { diboron trioxide; boric oxide }				0.69	mg/kg	3.22	1.577	mg/kg	0.000158 %	✓	
		005-008-00-8	215-125-8	1303-86-2									
3		cadmium { cadmium oxide }				0.34	mg/kg	1.142	0.276	mg/kg	0.0000276 %	✓	
		048-002-00-0	215-146-2	1306-19-0									
4		chromium in chromium(III) compounds { ● chromium(III) oxide (worst case) }				20	mg/kg	1.462	20.754	mg/kg	0.00208 %	✓	
			215-160-9	1308-38-9									
5		chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		<LOD
		024-001-00-0	215-607-8	1333-82-0									
6		copper { dicopper oxide; copper (I) oxide }				19	mg/kg	1.126	15.188	mg/kg	0.00152 %	✓	
		029-002-00-X	215-270-7	1317-39-1									
7		lead { lead chromate }			1	29	mg/kg	1.56	32.117	mg/kg	0.00206 %	✓	
		082-004-00-2	231-846-0	7758-97-6									
8		mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
		080-010-00-X	231-299-8	7487-94-7									
9		nickel { nickel chromate }				20	mg/kg	2.976	42.263	mg/kg	0.00423 %	✓	
		028-035-00-7	238-766-5	14721-18-7									
10		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				0.32	mg/kg	1.405	0.319	mg/kg	0.0000319 %	✓	
		034-002-00-8											
11		zinc { zinc chromate }				71	mg/kg	2.774	139.845	mg/kg	0.014 %	✓	
		024-007-00-3	236-878-9	13530-65-9									
12	●	TPH (C6 to C40) petroleum group				<10	mg/kg		<10	mg/kg	<0.001 %		<LOD
				TPH									
13		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		603-181-00-X	216-653-1	1634-04-4									
14		benzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
15		toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-021-00-3	203-625-9	108-88-3									

#		Determinand				CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
			EU CLP index number	EC Number	CAS Number									
16	●	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		**<LOD**
17		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		**<LOD**
18	⚛	cyanides { ● salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		**<LOD**
19	●	pH			PH		7.5	pH		7.5	pH	7.5 pH		
20		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
21	●	acenaphthylene		205-917-1	208-96-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
22	●	acenaphthene		201-469-6	83-32-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
23	●	fluorene		201-695-5	86-73-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
24	●	phenanthrene		201-581-5	85-01-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
25	●	anthracene		204-371-1	120-12-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
26	●	fluoranthene		205-912-4	206-44-0		0.16	mg/kg		0.114	mg/kg	0.0000114 %	✓	
27	●	pyrene		204-927-3	129-00-0		0.18	mg/kg		0.128	mg/kg	0.0000128 %	✓	
28		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
29		chrysene	601-048-00-0	205-923-4	218-01-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
30		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
31		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
32		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
33	●	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
34		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
35	●	benzo[ghi]perylene		205-883-8	191-24-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
36	●	monohydric phenols			P1186		0.3	mg/kg		0.213	mg/kg	0.0000213 %	✓	
											Total:	0.0264 %		

Key

🟨	User supplied data
⬜	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
⚛	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS08-15/02/2022-0.90

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:		LoW Code:	
WS08-15/02/2022-0.90		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:			
0.90-1.00 m		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Moisture content:			
12% (wet weight correction)			

Hazard properties

None identified

Determinands

Moisture content: 12% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				24	mg/kg	1.32	27.885	mg/kg	0.00279 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	boron { diboron trioxide; boric oxide }				0.59	mg/kg	3.22	1.672	mg/kg	0.000167 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
3	cadmium { cadmium oxide }				0.17	mg/kg	1.142	0.171	mg/kg	0.0000171 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
4	chromium in chromium(III) compounds { ● chromium(III) oxide (worst case) }				30	mg/kg	1.462	38.585	mg/kg	0.00386 %	✓	
		215-160-9	1308-38-9									
5	chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		<LOD
	024-001-00-0	215-607-8	1333-82-0									
6	copper { dicopper oxide; copper (I) oxide }				22	mg/kg	1.126	21.797	mg/kg	0.00218 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
7	lead { lead chromate }			1	34	mg/kg	1.56	46.67	mg/kg	0.00299 %	✓	
	082-004-00-2	231-846-0	7758-97-6									
8	mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
9	nickel { nickel chromate }				34	mg/kg	2.976	89.05	mg/kg	0.0089 %	✓	
	028-035-00-7	238-766-5	14721-18-7									
10	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<0.2	mg/kg	1.405	<0.281	mg/kg	<0.0000281 %		<LOD
	034-002-00-8											
11	zinc { zinc chromate }				79	mg/kg	2.774	192.859	mg/kg	0.0193 %	✓	
	024-007-00-3	236-878-9	13530-65-9									
12	● TPH (C6 to C40) petroleum group				<10	mg/kg		<10	mg/kg	<0.001 %		<LOD
			TPH									
13	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
14	benzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2									
15	toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3									

#		Determinand				CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
			EU CLP index number	EC Number	CAS Number									
16	●	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
17		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<LOD
18	⚛	cyanides { ● salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<LOD
19	●	pH			PH		8.5	pH		8.5	pH	8.5 pH		
20		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
21	●	acenaphthylene		205-917-1	208-96-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
22	●	acenaphthene		201-469-6	83-32-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
23	●	fluorene		201-695-5	86-73-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
24	●	phenanthrene		201-581-5	85-01-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
25	●	anthracene		204-371-1	120-12-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
26	●	fluoranthene		205-912-4	206-44-0		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
27	●	pyrene		204-927-3	129-00-0		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
28		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
29		chrysene	601-048-00-0	205-923-4	218-01-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
30		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
31		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
32		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
33	●	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
34		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
35	●	benzo[ghi]perylene		205-883-8	191-24-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
36	●	monohydric phenols			P1186		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
											Total:	0.0416 %		

Key

🟨	User supplied data
▨	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
⚛	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS09-15/02/2022-0.75

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:		LoW Code:	
WS09-15/02/2022-0.75		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:			
0.75-0.85 m		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Moisture content:			
7% (wet weight correction)			

Hazard properties

None identified

Determinands

Moisture content: 7% Wet Weight Moisture Correction applied (MC)

#		Determinand				CLP Note	**User entered data**		Conv. Factor	Compound conc.		**Classification value**	MC Applied	Conc. Not Used
			EU CLP index number	EC Number	CAS Number									
1		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		8.5	mg/kg	1.32	10.437	mg/kg	0.00104 %	✓	
2		boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		<0.4	mg/kg	3.22	<1.288	mg/kg	<0.000129 %		<LOD
3		cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		<0.1	mg/kg	1.142	<0.114	mg/kg	<0.0000114 %		<LOD
4		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		30	mg/kg	1.462	40.777	mg/kg	0.00408 %	✓	
5		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		<LOD
6		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		17	mg/kg	1.126	17.8	mg/kg	0.00178 %	✓	
7		lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	12	mg/kg	1.56	17.408	mg/kg	0.00112 %	✓	
8		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
9		nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		31	mg/kg	2.976	85.806	mg/kg	0.00858 %	✓	
10		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.2	mg/kg	1.405	<0.281	mg/kg	<0.0000281 %		<LOD
11		zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		62	mg/kg	2.774	159.957	mg/kg	0.016 %	✓	
12		TPH (C6 to C40) petroleum group			TPH		<10	mg/kg		<10	mg/kg	<0.001 %		<LOD
13		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
14		benzene	601-020-00-8	200-753-7	71-43-2		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
15		toluene	601-021-00-3	203-625-9	108-88-3		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16	●	ethylbenzene 601-023-00-4	202-849-4	100-41-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		**<LOD**
17		xylene 601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		**<LOD**
18	⚛	cyanides { ● salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } 006-007-00-5				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		**<LOD**
19	●	pH		PH		8.5	pH		8.5	pH	8.5 pH		
20		naphthalene 601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
21	●	acenaphthylene	205-917-1	208-96-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
22	●	acenaphthene	201-469-6	83-32-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
23	●	fluorene	201-695-5	86-73-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
24	●	phenanthrene	201-581-5	85-01-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
25	●	anthracene	204-371-1	120-12-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
26	●	fluoranthene	205-912-4	206-44-0		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
27	●	pyrene	204-927-3	129-00-0		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
28		benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
29		chrysene 601-048-00-0	205-923-4	218-01-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
30		benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
31		benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
32		benzo[a]pyrene; benzo[def]chrysene 601-032-00-3	200-028-5	50-32-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
33	●	indeno[123-cd]pyrene	205-893-2	193-39-5		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
34		dibenz[a,h]anthracene 601-041-00-2	200-181-8	53-70-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
35	●	benzo[ghi]perylene	205-883-8	191-24-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
36	●	monohydric phenols		P1186		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
										Total:	0.0341 %		

Key

🟨	User supplied data
▨	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
⚛	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS10A-15/02/2022-0.30

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
WS10A-15/02/2022-0.30	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:		
0.30-0.40 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Moisture content:		
18% (wet weight correction)		

Hazard properties

None identified

Determinands

Moisture content: 18% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	**User entered data**	Conv. Factor	Compound conc.	**Classification value**	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				25 mg/kg	1.32	27.067 mg/kg	0.00271 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	boron { diboron trioxide; boric oxide }				1.3 mg/kg	3.22	3.432 mg/kg	0.000343 %	✓	
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.45 mg/kg	1.142	0.422 mg/kg	0.0000422 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { ● chromium(III) oxide (worst case) }				41 mg/kg	1.462	49.138 mg/kg	0.00491 %	✓	
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.5 mg/kg	1.923	<0.962 mg/kg	<0.0000962 %		<LOD
	024-001-00-0	215-607-8	1333-82-0							
6	copper { dicopper oxide; copper (I) oxide }				47 mg/kg	1.126	43.392 mg/kg	0.00434 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead chromate }			1	170 mg/kg	1.56	217.438 mg/kg	0.0139 %	✓	
	082-004-00-2	231-846-0	7758-97-6							
8	mercury { mercury dichloride }				0.31 mg/kg	1.353	0.344 mg/kg	0.0000344 %	✓	
	080-010-00-X	231-299-8	7487-94-7							
9	nickel { nickel chromate }				34 mg/kg	2.976	82.978 mg/kg	0.0083 %	✓	
	028-035-00-7	238-766-5	14721-18-7							
10	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				0.3 mg/kg	1.405	0.346 mg/kg	0.0000346 %	✓	
	034-002-00-8									
11	zinc { zinc chromate }				160 mg/kg	2.774	363.968 mg/kg	0.0364 %	✓	
	024-007-00-3	236-878-9	13530-65-9							
12	● TPH (C6 to C40) petroleum group				<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
			TPH							
13	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
14	benzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
15	toluene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16	●	ethylbenzene											
		601-023-00-4	202-849-4	100-41-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		**<LOD**
17		xylene											
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		**<LOD**
18	⚛	cyanides { ● salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }											
		006-007-00-5				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		**<LOD**
19	●	pH											
				PH		8.2	pH		8.2	pH	8.2 pH		
20		naphthalene											
		601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
21	●	acenaphthylene											
			205-917-1	208-96-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
22	●	acenaphthene											
			201-469-6	83-32-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
23	●	fluorene											
			201-695-5	86-73-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
24	●	phenanthrene											
			201-581-5	85-01-8		0.99	mg/kg		0.812	mg/kg	0.0000812 %	✓	
25	●	anthracene											
			204-371-1	120-12-7		0.32	mg/kg		0.262	mg/kg	0.0000262 %	✓	
26	●	fluoranthene											
			205-912-4	206-44-0		2.5	mg/kg		2.05	mg/kg	0.000205 %	✓	
27	●	pyrene											
			204-927-3	129-00-0		2.7	mg/kg		2.214	mg/kg	0.000221 %	✓	
28		benzo[a]anthracene											
		601-033-00-9	200-280-6	56-55-3		1.7	mg/kg		1.394	mg/kg	0.000139 %	✓	
29		chrysene											
		601-048-00-0	205-923-4	218-01-9		1.8	mg/kg		1.476	mg/kg	0.000148 %	✓	
30		benzo[b]fluoranthene											
		601-034-00-4	205-911-9	205-99-2		2.4	mg/kg		1.968	mg/kg	0.000197 %	✓	
31		benzo[k]fluoranthene											
		601-036-00-5	205-916-6	207-08-9		1.3	mg/kg		1.066	mg/kg	0.000107 %	✓	
32		benzo[a]pyrene; benzo[def]chrysene											
		601-032-00-3	200-028-5	50-32-8		1.9	mg/kg		1.558	mg/kg	0.000156 %	✓	
33	●	indeno[123-cd]pyrene											
			205-893-2	193-39-5		1.3	mg/kg		1.066	mg/kg	0.000107 %	✓	
34		dibenz[a,h]anthracene											
		601-041-00-2	200-181-8	53-70-3		0.47	mg/kg		0.385	mg/kg	0.0000385 %	✓	
35	●	benzo[ghi]perylene											
			205-883-8	191-24-2		1.2	mg/kg		0.984	mg/kg	0.0000984 %	✓	
36	●	monohydric phenols											
				P1186		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
										Total:	0.0738 %		

Key

🟨	User supplied data
▨	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
⚛	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS10A-15/02/2022-1.50

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:		LoW Code:	
WS10A-15/02/2022-1.50		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:			
1.50-1.70 m		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Moisture content:			
16% (wet weight correction)			

Hazard properties

None identified

Determinands

Moisture content: 16% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	**User entered data**		Conv. Factor	Compound conc.		**Classification value**	MC Applied	Conc. Not Used
1		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		16	mg/kg	1.32	17.745	mg/kg	0.00177 %	✓	
2		boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		1.3	mg/kg	3.22	3.516	mg/kg	0.000352 %	✓	
3		cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.35	mg/kg	1.142	0.336	mg/kg	0.0000336 %	✓	
4		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		25	mg/kg	1.462	30.693	mg/kg	0.00307 %	✓	
5		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		<LOD
6		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		23	mg/kg	1.126	21.752	mg/kg	0.00218 %	✓	
7		lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	36	mg/kg	1.56	47.169	mg/kg	0.00302 %	✓	
8		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.22	mg/kg	1.353	0.25	mg/kg	0.000025 %	✓	
9		nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		26	mg/kg	2.976	65.002	mg/kg	0.0065 %	✓	
10		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				0.36	mg/kg	1.405	0.425	mg/kg	0.0000425 %	✓	
11		zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		75	mg/kg	2.774	174.771	mg/kg	0.0175 %	✓	
12		TPH (C6 to C40) petroleum group			TPH		<10	mg/kg		<10	mg/kg	<0.001 %		<LOD
13		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
14		benzene	601-020-00-8	200-753-7	71-43-2		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
15		toluene	601-021-00-3	203-625-9	108-88-3		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
16	●	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		**<LOD**
17		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		**<LOD**
18	⚛	cyanides { ● salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %		**<LOD**
19	●	pH			PH		7.8 pH		7.8 pH	7.8 pH		
20		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
21	●	acenaphthylene		205-917-1	208-96-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
22	●	acenaphthene		201-469-6	83-32-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
23	●	fluorene		201-695-5	86-73-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
24	●	phenanthrene		201-581-5	85-01-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
25	●	anthracene		204-371-1	120-12-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
26	●	fluoranthene		205-912-4	206-44-0		0.28 mg/kg		0.235 mg/kg	0.0000235 %	✓	
27	●	pyrene		204-927-3	129-00-0		0.26 mg/kg		0.218 mg/kg	0.0000218 %	✓	
28		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
29		chrysene	601-048-00-0	205-923-4	218-01-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
30		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
31		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
32		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
33	●	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
34		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
35	●	benzo[ghi]perylene		205-883-8	191-24-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
36	●	monohydric phenols			P1186		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
									Total:	0.0359 %		

Key

🟨	User supplied data
▨	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
⚛	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS11-15/02/2022-0.90

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:		LoW Code:	
WS11-15/02/2022-0.90		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:			
0.90-1.00 m		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Moisture content:			
10% (wet weight correction)			

Hazard properties

None identified

Determinands

Moisture content: 10% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				14	mg/kg	1.32	16.636	mg/kg	0.00166 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	boron { diboron trioxide; boric oxide }				<0.4	mg/kg	3.22	<1.288	mg/kg	<0.000129 %		<LOD
	005-008-00-8	215-125-8	1303-86-2									
3	cadmium { cadmium oxide }				<0.1	mg/kg	1.142	<0.114	mg/kg	<0.0000114 %		<LOD
	048-002-00-0	215-146-2	1306-19-0									
4	chromium in chromium(III) compounds { ● chromium(III) oxide (worst case) }				31	mg/kg	1.462	40.777	mg/kg	0.00408 %	✓	
		215-160-9	1308-38-9									
5	chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		<LOD
	024-001-00-0	215-607-8	1333-82-0									
6	copper { dicopper oxide; copper (I) oxide }				15	mg/kg	1.126	15.199	mg/kg	0.00152 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
7	lead { lead chromate }			1	10	mg/kg	1.56	14.038	mg/kg	0.0009 %	✓	
	082-004-00-2	231-846-0	7758-97-6									
8	mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
9	nickel { nickel chromate }				25	mg/kg	2.976	66.966	mg/kg	0.0067 %	✓	
	028-035-00-7	238-766-5	14721-18-7									
10	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<0.2	mg/kg	1.405	<0.281	mg/kg	<0.0000281 %		<LOD
	034-002-00-8											
11	zinc { zinc chromate }				62	mg/kg	2.774	154.797	mg/kg	0.0155 %	✓	
	024-007-00-3	236-878-9	13530-65-9									
12	● TPH (C6 to C40) petroleum group				<10	mg/kg		<10	mg/kg	<0.001 %		<LOD
			TPH									
13	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
14	benzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2									
15	toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3									

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
16	●	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		**<LOD**
17		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		**<LOD**
18	⚛	cyanides { ● salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %		**<LOD**
19	●	pH			PH		8.5 pH		8.5 pH	8.5 pH		
20		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
21	●	acenaphthylene		205-917-1	208-96-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
22	●	acenaphthene		201-469-6	83-32-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
23	●	fluorene		201-695-5	86-73-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
24	●	phenanthrene		201-581-5	85-01-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
25	●	anthracene		204-371-1	120-12-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
26	●	fluoranthene		205-912-4	206-44-0		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
27	●	pyrene		204-927-3	129-00-0		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
28		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
29		chrysene	601-048-00-0	205-923-4	218-01-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
30		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
31		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
32		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
33	●	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
34		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
35	●	benzo[ghi]perylene		205-883-8	191-24-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
36	●	monohydric phenols			P1186		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
									Total:	0.0319 %		

Key

🟨	User supplied data
▨	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
⚛	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS12-15/02/2022-0.30

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
WS12-15/02/2022-0.30
Sample Depth:
0.30-0.40 m
Moisture content:
13%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 13% Wet Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
1		arsenic { arsenic trioxide }				11	mg/kg	1.32	12.636	mg/kg	0.00126 %	✓	
		033-003-00-0	215-481-4	1327-53-3									
2		boron { diboron trioxide; boric oxide }				0.49	mg/kg	3.22	1.373	mg/kg	0.000137 %	✓	
		005-008-00-8	215-125-8	1303-86-2									
3		cadmium { cadmium oxide }				<0.1	mg/kg	1.142	<0.114	mg/kg	<0.0000114 %		<LOD
		048-002-00-0	215-146-2	1306-19-0									
4		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				18	mg/kg	1.462	22.888	mg/kg	0.00229 %	✓	
			215-160-9	1308-38-9									
5		chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		<LOD
		024-001-00-0	215-607-8	1333-82-0									
6		copper { dicopper oxide; copper (I) oxide }				20	mg/kg	1.126	19.59	mg/kg	0.00196 %	✓	
		029-002-00-X	215-270-7	1317-39-1									
7		lead { lead chromate }			1	11	mg/kg	1.56	14.927	mg/kg	0.000957 %	✓	
		082-004-00-2	231-846-0	7758-97-6									
8		mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
		080-010-00-X	231-299-8	7487-94-7									
9		nickel { nickel chromate }				20	mg/kg	2.976	51.787	mg/kg	0.00518 %	✓	
		028-035-00-7	238-766-5	14721-18-7									
10		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<0.2	mg/kg	1.405	<0.281	mg/kg	<0.0000281 %		<LOD
		034-002-00-8											
11		zinc { zinc chromate }				29	mg/kg	2.774	69.992	mg/kg	0.007 %	✓	
		024-007-00-3	236-878-9	13530-65-9									
12		TPH (C6 to C40) petroleum group				<10	mg/kg		<10	mg/kg	<0.001 %		<LOD
				TPH									
13		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		603-181-00-X	216-653-1	1634-04-4									
14		benzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
15		toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-021-00-3	203-625-9	108-88-3									

#		Determinand				CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
			EU CLP index number	EC Number	CAS Number									
16	●	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		**<LOD**
17		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		**<LOD**
18	⚗	cyanides { ● salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		**<LOD**
19	●	pH			PH		8.4	pH		8.4	pH	8.4 pH		
20		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
21	●	acenaphthylene		205-917-1	208-96-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
22	●	acenaphthene		201-469-6	83-32-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
23	●	fluorene		201-695-5	86-73-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
24	●	phenanthrene		201-581-5	85-01-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
25	●	anthracene		204-371-1	120-12-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
26	●	fluoranthene		205-912-4	206-44-0		0.16	mg/kg		0.139	mg/kg	0.0000139 %	✓	
27	●	pyrene		204-927-3	129-00-0		0.21	mg/kg		0.183	mg/kg	0.0000183 %	✓	
28		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
29		chrysene	601-048-00-0	205-923-4	218-01-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
30		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
31		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
32		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
33	●	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
34		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
35	●	benzo[ghi]perylene		205-883-8	191-24-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
36	●	monohydric phenols			P1186		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
											Total:	0.0202 %		

Key

🟨	User supplied data
▨	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
⚗	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS12-15/02/2022-0.60

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
WS12-15/02/2022-0.60	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:		
0.60-0.70 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Moisture content:		
11% (wet weight correction)		

Hazard properties

None identified

Determinands

Moisture content: 11% Wet Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	**User entered data**		Conv. Factor	Compound conc.		**Classification value**	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
1		arsenic { arsenic trioxide }				20	mg/kg	1.32	23.502	mg/kg	0.00235 %	✓	
		033-003-00-0	215-481-4	1327-53-3									
2		boron { diboron trioxide; boric oxide }				0.91	mg/kg	3.22	2.608	mg/kg	0.000261 %	✓	
		005-008-00-8	215-125-8	1303-86-2									
3		cadmium { cadmium oxide }				0.51	mg/kg	1.142	0.519	mg/kg	0.0000519 %	✓	
		048-002-00-0	215-146-2	1306-19-0									
4		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				36	mg/kg	1.462	46.828	mg/kg	0.00468 %	✓	
			215-160-9	1308-38-9									
5		chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		<LOD
		024-001-00-0	215-607-8	1333-82-0									
6		copper { dicopper oxide; copper (I) oxide }				66	mg/kg	1.126	66.135	mg/kg	0.00661 %	✓	
		029-002-00-X	215-270-7	1317-39-1									
7		lead { lead chromate }			1	300	mg/kg	1.56	416.471	mg/kg	0.0267 %	✓	
		082-004-00-2	231-846-0	7758-97-6									
8		mercury { mercury dichloride }				0.44	mg/kg	1.353	0.53	mg/kg	0.000053 %	✓	
		080-010-00-X	231-299-8	7487-94-7									
9		nickel { nickel chromate }				35	mg/kg	2.976	92.711	mg/kg	0.00927 %	✓	
		028-035-00-7	238-766-5	14721-18-7									
10		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				0.5	mg/kg	1.405	0.625	mg/kg	0.0000625 %	✓	
		034-002-00-8											
11		zinc { zinc chromate }				200	mg/kg	2.774	493.798	mg/kg	0.0494 %	✓	
		024-007-00-3	236-878-9	13530-65-9									
12		TPH (C6 to C40) petroleum group				11	mg/kg		9.79	mg/kg	0.000979 %	✓	
				TPH									
13		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		603-181-00-X	216-653-1	1634-04-4									
14		benzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
15		toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-021-00-3	203-625-9	108-88-3									

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16	●	ethylbenzene 601-023-00-4	202-849-4	100-41-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
17		xylene 601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<LOD
18	⚛	cyanides { ● salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } 006-007-00-5				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<LOD
19	●	pH		PH		8.2	pH		8.2	pH	8.2 pH		
20		naphthalene 601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
21	●	acenaphthylene	205-917-1	208-96-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
22	●	acenaphthene	201-469-6	83-32-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
23	●	fluorene	201-695-5	86-73-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
24	●	phenanthrene	201-581-5	85-01-8		0.47	mg/kg		0.418	mg/kg	0.0000418 %	✓	
25	●	anthracene	204-371-1	120-12-7		0.28	mg/kg		0.249	mg/kg	0.0000249 %	✓	
26	●	fluoranthene	205-912-4	206-44-0		1.2	mg/kg		1.068	mg/kg	0.000107 %	✓	
27	●	pyrene	204-927-3	129-00-0		1.3	mg/kg		1.157	mg/kg	0.000116 %	✓	
28		benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		0.77	mg/kg		0.685	mg/kg	0.0000685 %	✓	
29		chrysene 601-048-00-0	205-923-4	218-01-9		0.86	mg/kg		0.765	mg/kg	0.0000765 %	✓	
30		benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		1.4	mg/kg		1.246	mg/kg	0.000125 %	✓	
31		benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		0.98	mg/kg		0.872	mg/kg	0.0000872 %	✓	
32		benzo[a]pyrene; benzo[def]chrysene 601-032-00-3	200-028-5	50-32-8		1.1	mg/kg		0.979	mg/kg	0.0000979 %	✓	
33	●	indeno[123-cd]pyrene	205-893-2	193-39-5		0.69	mg/kg		0.614	mg/kg	0.0000614 %	✓	
34		dibenz[a,h]anthracene 601-041-00-2	200-181-8	53-70-3		0.21	mg/kg		0.187	mg/kg	0.0000187 %	✓	
35	●	benzo[ghi]perylene	205-883-8	191-24-2		0.67	mg/kg		0.596	mg/kg	0.0000596 %	✓	
36	●	monohydric phenols		P1186		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
										Total:	0.102 %		

Key

🟨	User supplied data
▨	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
⚛	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because No evidence of free product.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00097%)

Appendix A: Classifier defined and non GB MCL determinands

chromium(III) oxide (worst case) (EC Number: 215-160-9, CAS Number: 1308-38-9)

Description/Comments: Data from C&L Inventory Database
Data source: https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4; H332 , Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Resp. Sens. 1; H334 , Skin Sens. 1; H317 , Repr. 1B; H360FD , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

TPH (C6 to C40) petroleum group (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: Flam. Liq. 3; H226 , Asp. Tox. 1; H304 , STOT RE 2; H373 , Muta. 1B; H340 , Carc. 1B; H350 , Repr. 2; H361d , Aquatic Chronic 2; H411

ethylbenzene (EC Number: 202-849-4, CAS Number: 100-41-4)

GB MCL index number: 601-023-00-4
Description/Comments:
Additional Hazard Statement(s): Carc. 2; H351
Reason for additional Hazards Statement(s):
20 Nov 2021 - Carc. 2; H351 hazard statement sourced from: IARC Group 2B (77) 2000

salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex

GB MCL index number: 006-007-00-5
Description/Comments: Conversion factor based on a worst case compound: sodium cyanide
Additional Hazard Statement(s): EUH032 >= 0.2 %
Reason for additional Hazards Statement(s):
20 Nov 2021 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

pH (CAS Number: PH)

Description/Comments: Appendix C4
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: None.

acenaphthylene (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4; H302 , Acute Tox. 1; H330 , Acute Tox. 1; H310 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315

acenaphthene (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Aquatic Chronic 2; H411

fluorene (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

phenanthrene (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Carc. 2; H351 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Skin Irrit. 2; H315

anthracene (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

- **fluoranthene** (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21 Aug 2015
Hazard Statements: Acute Tox. 4; H302 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

- **pyrene** (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21 Aug 2015
Hazard Statements: Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

- **indeno[123-cd]pyrene** (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Carc. 2; H351

- **benzo[ghi]perylene** (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 23 Jul 2015
Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

- **monohydric phenols** (CAS Number: P1186)

Description/Comments: Combined hazards statements from harmonised entries in CLP for phenol, cresols and xylenols (604-001-00-2, 604-004-00-9, 604-006-00-X)
Data source: CLP combined data
Data source date: 26 Mar 2019
Hazard Statements: Muta. 2; H341 , Acute Tox. 3; H331 , Acute Tox. 3; H311 , Acute Tox. 3; H301 , STOT RE 2; H373 , Skin Corr. 1B; H314 , Skin Corr. 1B; H314 >= 3 % , Skin Irrit. 2; H315 1 £ conc. < 3 % , Eye Irrit. 2; H319 1 £ conc. < 3 % , Aquatic Chronic 2; H411

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

Reasonable case CLP species based on hazard statements/molecular weight and most common (stable) oxide of arsenic. Industrial sources include: smelting; main precursor to other arsenic compounds (edit as required)

boron {diboron trioxide; boric oxide}

Reasonable case CLP species based on hazard statements/ molecular weight, physical form and low solubility. Industrial sources include: fluxing agent for glass/enamels; additive for fibre optics, borosilicate glass (edit as required)

cadmium {cadmium oxide}

Reasonable case CLP species based on hazard statements/molecular weight, very low solubility in water. Industrial sources include: electroplating baths, electrodes for storage batteries, catalysts, ceramic glazes, phosphors, pigments and nematocides. (edit as required) Worst case compounds in CLP: cadmium sulphate, chloride, fluoride & iodide not expected as either very soluble and/or compound's industrial usage not related to site history (edit as required)

chromium in chromium(III) compounds {chromium(III) oxide (worst case)}

Reasonable case species based on hazard statements/molecular weight. Industrial sources include: tanning, pigment in paint, inks and glass (edit as required)

chromium in chromium(VI) compounds {chromium(VI) oxide}

Worst case CLP species based on hazard statements/molecular weight. Industrial sources include: production stainless steel, electroplating, wood preservation, anti-corrosion agents or coatings, pigments (edit as required)

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Industrial sources include: oxidised copper metal, brake pads, pigments, antifouling paints, fungicide. (edit as required) Worse case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected. (edit as required)

lead {lead chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

nickel {nickel chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

selenium {selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case. Pigment cadmium sulphoselenide not likely to be present in this soil. No evidence for the other CLP entries: sodium selenite, nickel II selenite and nickel selenide, to be present in this soil. (edit as required)

zinc {zinc chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

cyanides {salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case as complex cyanides and those specified elsewhere in the annex are not likely to be present in this soil: [Note conversion factor based on a worst case compound: sodium cyanide] (edit as required)

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.2.GB - Oct 2021
HazWasteOnline Classification Engine Version: 2022.25.4995.9469 (25 Jan 2022)
HazWasteOnline Database: 2022.25.4995.9469 (25 Jan 2022)

This classification utilises the following guidance and legislation:
WM3 v1.2.GB - Waste Classification - 1st Edition v1.2.GB - Oct 2021
CLP Regulation - Regulation 1272/2008/EC of 16 December 2008
1st ATP - Regulation 790/2009/EC of 10 August 2009
2nd ATP - Regulation 286/2011/EC of 10 March 2011
3rd ATP - Regulation 618/2012/EU of 10 July 2012
4th ATP - Regulation 487/2013/EU of 8 May 2013
Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013
5th ATP - Regulation 944/2013/EU of 2 October 2013
6th ATP - Regulation 605/2014/EU of 5 June 2014
WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014
Revised List of Waste 2014 - Decision 2014/955/EU of 18 December 2014
7th ATP - Regulation 2015/1221/EU of 24 July 2015
8th ATP - Regulation (EU) 2016/918 of 19 May 2016
9th ATP - Regulation (EU) 2016/1179 of 19 July 2016
10th ATP - Regulation (EU) 2017/776 of 4 May 2017
HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017
13th ATP - Regulation (EU) 2018/1480 of 4 October 2018
14th ATP - Regulation (EU) 2020/217 of 4 October 2019
15th ATP - Regulation (EU) 2020/1182 of 19 May 2020
The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1567 of 16th December 2020
The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1540 of 16th December 2020
GB MCL List - version 1.1 of 09 June 2021

Appendix VIII

CLEA Software Version 1.071

Report generated	30-Mar-22
Report title	Burnt Mill Academy
Created by	Johanne Bridgman at HSP Consulting Engineers Ltd

RESULTS

		Assessment Criterion (mg kg^{-1})			Ratio of ADE to HCV			Saturation Limit (mg kg^{-1})	50% rule?		Top Two applied?	Apply Top 2 Approach to Produce Group					
		oral	inhalation	combined	oral	inhalation	combined		Oral	Inhal		Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
1	Arsenic (C4SL child)	6.69E+01	1.69E+03	NR	1.00	0.04	NR	NR	No	No	Yes	Yes	No	No	No	No	Yes
2	Lead (C4SL child)	5.29E+02	NR	NR	1.00	NR	NR	NR	No	No	Yes	Yes	No	Yes	No	No	No
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	Assessment Criterion (mg kg^{-1})			Ratio of ADE to HCV			Saturation Limit (mg kg^{-1})	50% rule?		Top Two applied?	Apply Top 2 Approach to Produce Group					
	oral	inhalation	combined	oral	inhalation	combined		Oral	Inhal		Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
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		Soil Distribution				Media Concentrations													
		Sorbed	Dissolved	Vapour	Total	Soil	Soil gas	Indoor Dust	Outdoor dust at 0.8m	Outdoor dust at 1.6m	Indoor Vapour	Outdoor vapour at 0.8m	Outdoor vapour at 1.6m	Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
		%	%	%	%	mg kg^{-1}	mg m^{-3}	mg kg^{-1}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW
1	Arsenic (C4SL child)	99.9	0.1	0.0	100.0	6.69E+01	NR	3.34E+01	2.85E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	NA	NA	NA	NA
2	Lead (C4SL child)	100.0	0.0	0.0	100.0	5.29E+02	NR	2.65E+02	2.25E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	NA	NA	NA	NA
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Environment Agency

	Soil Distribution				Media Concentrations													
	Sorbed	Dissolved	Vapour	Total	Soil	Soil gas	Indoor Dust	Outdoor dust at 0.8m	Outdoor dust at 1.6m	Indoor Vapour	Outdoor vapour at 0.8m	Outdoor vapour at 1.6m	Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
	%	%	%	%	mg kg^{-1}	mg m^{-3}	mg kg^{-1}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW
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		Average Daily Exposure (mg kg^{-1} bw day^{-1})							Distribution by Pathway (%)							
		Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour	Background (oral)	Background (inhalation)	Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour (indoor)	Inhalation of vapour (outdoor)	Background (oral)	Background (inhalation)
1	Arsenic (C4SL child)	2.94E-04	0.00E+00	5.61E-06	3.45E-07	0.00E+00	0.00E+00	0.00E+00	98.13	0.00	1.87	0.00	0.00	0.00	0.00	0.00
2	Lead (C4SL child)	1.40E-03	0.00E+00	0.00E+00	1.75E-06	0.00E+00	0.00E+00	0.00E+00	99.88	0.00	0.00	0.12	0.00	0.00	0.00	0.00
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	Average Daily Exposure (mg kg^{-1} bw day^{-1})							Distribution by Pathway (%)							
	Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour	Background (oral)	Background (inhalation)	Direct soil ingestion	Consumption of homegrown produce	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour (indoor)	Inhalation of vapour (outdoor)	Background (oral)	Background (inhalation)
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Environment Agency

		Oral Health Criteria Value (µg kg^{-1} BW day^{-1})		Inhalation Health Criteria Value (µg kg^{-1} BW day^{-1})		Oral Mean Daily Intake (µg day^{-1})	Inhalation Mean Daily Intake (µg day^{-1})	Air-water partition coefficient (K_{aw}) (cm^3 cm^{-3})	Coefficient of Diffusion in Air (m^2 s^{-1})	Coefficient of Diffusion in Water (m^2 s^{-1})	log K_{oc} (cm^3 g^{-1})	log K_{ow} (dimensionless)	Dermal Absorption Fraction (dimensionless)	Soil-to-dust transport factor (g g^{-1} DW)	Sub-surface soil to indoor air correction factor (dimensionless)	Relative bioavailability via soil ingestion (unitless)	Relative bioavailability via dust inhalation (unitless)
1	Arsenic (C4SL child)	ID	0.3	ID	0.0087	NR	NR	NR	NR	NR	NR	NR	0.03	0.5	1	1	1
2	Lead (C4SL child)	ID	1.4	NR	0	NR	NR	NR	NR	NR	NR	NR	0	0.5	1	0.6	0.64
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	Oral Health Criteria Value (µg kg^{-1} BW day^{-1})	Inhalation Health Criteria Value (µg kg^{-1} BW day^{-1})	Oral Mean Daily Intake (µg day^{-1})	Inhalation Mean Daily Intake (µg day^{-1})	Air-water partition coefficient (K_{aw}) (cm^3 cm^{-3})	Coefficient of Diffusion in Air (m^2 s^{-1})	Coefficient of Diffusion in Water (m^2 s^{-1})	log K_{oc} (cm^3 g^{-1})	log K_{ow} (dimensionless)	Dermal Absorption Fraction (dimensionless)	Soil-to-dust transport factor (g g^{-1} DW)	Sub-surface soil to indoor air correction factor (dimensionless)	Relative bioavailability via soil ingestion (unitless)	Relative bioavailability via dust inhalation (unitless)
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		Soil-to-water partition coefficient ($cm^3 g^{-1}$)	Vapour pressure (Pa)	Water solubility ($mg L^{-1}$)	Soil-to-plant concentration factor for green vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for root vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for tuber vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for herbaceous fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for shrub fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for tree fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)
1	Arsenic (C4SL child)	5.00E+02	NR	1.25E+06	0.00043 fw	0.0004 fw	0.00023 fw	0.00033 fw	0.0002 fw	0.0011 fw
2	Lead (C4SL child)	1.00E+03	NR	2.96E+05	0.00419 fw	0.00402 fw	0.00731 fw	0.00074 fw	0.00020 fw	0.00022 fw
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Environment Agency

	Soil-to-water partition coefficient ($cm^3 g^{-1}$)	Vapour pressure (Pa)	Water solubility (mg L^{-1})	Soil-to-plant concentration factor for green vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for root vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for tuber vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for herbaceous fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for shrub fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for tree fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)
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CLEA Software Version 1.071

Report generated	30/03/2022
Report title	Burnt Mill Academy
Created by	Johanne Bridgman at HSP Consulting Engineers Ltd

BASIC SETTINGS

Land Use	Residential without produce (C4SL)
Building	Office (post 1970)
Receptor	Female (res C4SL)
Soil	Sandy loam

Start age class 1

End age class 6

Exposure Duration 6 years

Exposure Pathways

Direct soil and dust ingestion	☑	Dermal contact with indoor dust	☑	Inhalation of indoor dust	☑
Consumption of homegrown produce	☒	Dermal contact with soil	☑	Inhalation of soil dust	☑
Soil attached to homegrown produce	☒			Inhalation of indoor vapour	☑
				Inhalation of outdoor vapour	☑

Land Use Residential without produce (C4SL)

Receptor Female (res C4SL)

	Exposure Frequencies (days yr^{-1})						Occupation Periods (hr day^{-1})		Soil to skin adherence factors (mg cm^{2})						Max exposed skin factor		
Age Class	Direct soil ingestion	Consumption of homegrown produce	Dermal contact with indoor dust	Dermal contact with soil	Inhalation of dust and vapour, indoor	Inhalation of dust and vapour, outdoor	Indoors	Outdoors	Indoor	Outdoor	Direct soil ingestion rate (g day^{-1})	Body weight (kg)	Body height (m)	Inhalation rate (m^{3} day^{-1})	Indoor (m^{2} m^{-2})	Outdoor (m^{2} m^{-2})	Total skin area (m^{2})
1	180	0	180	**180**	**180**	**180**	**7.0**	**2.0**	0.06	0.10	0.10	5.60	0.7	5.4	0.32	0.26	3.43E-01
2	**180**	0	**180**	**180**	**180**	**180**	**7.0**	**2.0**	0.06	0.10	0.10	9.80	0.8	8.0	0.33	0.26	4.84E-01
3	**180**	0	**180**	**180**	**180**	**180**	**7.0**	**2.0**	0.06	0.10	0.10	12.70	0.9	8.9	0.32	0.25	5.82E-01
4	**180**	0	**180**	**180**	**180**	**180**	**7.0**	**2.0**	0.06	0.10	0.10	15.10	0.9	10.1	0.35	0.28	6.36E-01
5	**180**	0	**180**	**180**	**180**	**180**	**7.0**	**2.0**	0.06	0.10	0.10	16.90	1.0	10.1	0.35	0.28	7.04E-01
6	**180**	0	**180**	**180**	**180**	**180**	**7.0**	**2.0**	0.06	0.10	0.10	19.70	1.1	10.1	0.33	0.26	7.94E-01
7	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	22.10	1.2	12.0	0.22	0.15	8.73E-01
8	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	25.30	1.2	12.0	0.22	0.15	9.36E-01
9	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	27.50	1.3	12.0	0.22	0.15	1.01E+00
10	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	31.40	1.3	12.0	0.22	0.15	1.08E+00
11	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	35.70	1.4	12.0	0.22	0.14	1.19E+00
12	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	41.30	1.4	15.2	0.22	0.14	1.29E+00
13	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	47.20	1.5	15.2	0.22	0.14	1.42E+00
14	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	51.20	1.6	15.2	0.22	0.14	1.52E+00
15	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	56.70	1.6	15.2	0.21	0.14	1.60E+00
16	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	59.00	1.6	15.2	0.21	0.14	1.63E+00
17	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	70.00	1.6	15.7	0.33	0.27	1.78E+00
18	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	70.90	1.6	13.6	0.33	0.27	1.80E+00

Consumption Rates

Age Class	Consumption rates (g FW kg^{-1} bodyweight day^{-1}) by Produce Group											
	MEAN RATES						90TH PERCENTILE RATES					
	Green veg	Root veg	Tuber veg	Herb. Fruit	Shrub fruit	Tree fruit	Green veg	Root veg	Tuber veg	Herb. Fruit	Shrub fruit	Tree fruit
1	3.47E+00	5.22E+00	9.22E+00	8.90E-01	1.07E+00	1.87E+00	7.12E+00	1.07E+01	1.60E+01	1.83E+00	2.23E+00	3.82E+00
2	3.34E+00	1.61E+00	3.14E+00	1.93E+00	2.60E-01	5.84E+00	5.87E+00	2.83E+00	6.60E+00	3.39E+00	4.60E-01	1.03E+01
3	3.34E+00	1.61E+00	3.14E+00	1.93E+00	2.60E-01	5.84E+00	5.87E+00	2.83E+00	6.60E+00	3.39E+00	4.60E-01	1.03E+01
4	3.34E+00	1.61E+00	3.14E+00	1.93E+00	2.60E-01	5.84E+00	5.87E+00	2.83E+00	6.60E+00	3.39E+00	4.60E-01	1.03E+01
5	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
6	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
7	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
8	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
9	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
10	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
11	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
12	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
13	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
14	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
15	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
16	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
17	1.26E+00	6.00E-01	1.18E+00	6.90E-01	9.00E-02	1.27E+00	2.36E+00	1.12E+00	2.35E+00	1.29E+00	1.80E-01	2.38E+00
18	1.35E+00	6.40E-01	1.25E+00	7.40E-01	1.00E-01	1.36E+00	2.34E+00	1.12E+00	2.36E+00	1.28E+00	1.80E-01	2.37E+00

Top 2 applied? Yes

Where top 2 method is applied, two produce categories use 90th percentile rates, while the remainder use the mean. Produce categories vary on a chemical-by-chemical basis. Where top 2 method is not used, all produce categories for all chemicals assume 90th percentile rates.

Building Office (post 1970)

Building footprint (m^2)	6.10E+02
Living space air exchange rate (hr^{-1})	1.00E+00
Living space height (above ground, m)	1.28E+01
Living space height (below ground, m)	0.00E+00
Pressure difference (soil to enclosed space, Pa)	5.10E+00
Foundation thickness (m)	1.50E-01
Floor crack area (cm^2)	1.98E+03
Dust loading factor (µg m^{-3})	1.00E+02

Soil Sandy loam

Porosity, Total (cm^3 cm^{-3})	5.30E-01
Porosity, Air-Filled (cm^3 cm^{-3})	2.00E-01
Porosity, Water-Filled (cm^3 cm^{-3})	3.30E-01
Residual soil water content (cm^3 cm^{-3})	1.20E-01
Saturated hydraulic conductivity (cm s^{-1})	3.56E-03
van Genuchten shape parameter *m* (dimensionless)	3.20E-01
Bulk density (g cm^{-3})	1.21E+00
Threshold value of wind speed at 10m (m s^{-1})	7.20E+00
Empirical function (F_x) for dust model (dimensionless)	1.22E+00
Ambient soil temperature (K)	2.83E+02

Soil pH	8.00E+00
Soil Organic Matter content (%)	2.50E+00
Fraction of organic carbon (g g^{-1})	1.45E-02

Effective total fluid saturation (unitless)	5.12E-01
Intrinsic soil permeability (cm^2)	4.75E-08
Relative soil air permeability (unitless)	6.42E-01
Effective air permeability (cm^2)	3.05E-08

Environment Agency

Soil - Vapour Model

Depth to top of source (no building) (cm)	0
Depth to top of source (beneath building) (cm)	65
Default soil gas ingress rate?	Yes
Soil gas ingress rate (cm^3 s^{-1})	1.50E+02
Building ventilation rate (cm^3 s^{-1})	2.17E+06
Averaging time surface emissions (yr)	6
Finite vapour source model?	No
Thickness of contaminated layer (cm)	200

Air Dispersion Model

Mean annual windspeed at 10m (m s^{-1})		5.00
Air dispersion factor at height of 0.8m *		2400.00
Air dispersion factor at height of 1.6m *		0.00
Fraction of site cover (m^2 m^{-2})		0.75

* Air dispersion factor in g m^{-2} s^{-1} per kg m^{-3}

Soil - Plant Model

	Dry weight conversion factor	Homegrown fraction Average	Homegrown fraction High	Soil loading factor	Preparation correction factor
	g DW g^{-1} FW	dimensionless		g g^{-1} DW	dimensionless
Green vegetables	0.096	0.05	0.33	1.00E-03	2.00E-01
Root vegetables	0.103	0.06	0.40	1.00E-03	1.00E+00
Tuber vegetables	0.210	0.02	0.13	1.00E-03	1.00E+00
Herbaceous fruit	0.058	0.06	0.40	1.00E-03	6.00E-01
Shrub fruit	0.166	0.09	0.60	1.00E-03	6.00E-01
Tree fruit	0.157	0.04	0.27	1.00E-03	6.00E-01

Gardener type None

Appendix D ESP Cable Percussion Borehole Records (inc. Supplementary)

Earth Science Partnership

Consulting Engineers | Geologists | Environmental Scientists

BH101

Start date:	20/02/2023	**Driller:**	Endeavour Drilling
End date:	21/02/2023	**Logged by:**	ESP - MRS
Backfill date:	24/02/2023	**Date logged:**	21/02/2023

Project Name: Burnt Mill Academy
Site Location: Harlow
Client: Bowmer and Kirkland
Project No: 8511

Drilling method
Light Cable Percussion Borehole
Equipment
Dando 2000 Drilling Rig

Ground Level:	63.90 mOD
Easting:	545394 m
Northing:	210813 m

Depth	Sample Type	Sample Class	Test Details Type	Test Details Result	TCR (%)	Water Depth	Casing Depth	Water Strikes/ Standing
0.30 - 0.60	B							
1.00	D							
1.20 - 1.65	UT							
1.70	D							
2.00	D		SPT	5 (1,1/1,1,1,2)			1.90	
2.00 - 2.45	D							
3.00	D							
3.00 - 3.45	UT							
3.50 - 4.00	B							
4.00	B		SPT-C	10 (1,1/1,3,3,3)		3.5	3.90	
4.00 - 4.50	D							
5.00	B		SPT	21 (2,3/4,5,5,7)		4.2	4.90	
5.00 - 5.50	D							
6.00	D		SPT	21 (3,5/4,5,6,6)		4	5.90	▽
6.00 - 6.45	D							
7.00	D							
7.50 - 7.95	D		SPT	23 (2,3/4,6,6,7)		6.1	5.90	
8.00	D							
9.00	D		SPT	35 (3,5/7,8,10,10)		6	5.90	
9.00 - 9.45	D							

Strata Details Description	Depth (Thickness)	mOD
Tarmacadam surfacing	(0.10) 0.10	63.80
Dark brown slightly silty very sandy fine to coarse GRAVEL with low to medium cobble content. Gravel is angular to subangular brick, tarmacadam, concrete and flint (MADE GROUND)	(0.20) 0.30	63.60
Dark yellowish brown silty fine to coarse SAND and GRAVEL. Gravel is angular to rounded flint. (POSSIBLE MADE GROUND)	(0.50) 0.80	63.10
Very dark grey sandy very gravelly very clayey SILT. Gravel is fine to coarse angular to rounded flint and chalk. With a slight organic odour. (POSSIBLE RELICT TOPSOIL)	(0.10) 0.90	63.00
Firm to stiff grey mottled orange brown gravelly silty CLAY. Gravel is fine to coarse subangular to rounded chalk and flint. (LOWESTOFT FORMATION)	(2.30) 3.20	60.70
Medium dense brown very sandy silty fine to coarse GRAVEL. Gravel is angular to rounded flint. (GLACIOFLUVIAL DEPOSITS)	(1.30) 4.50	59.40
Medium dense to dense light brown very silty fine to medium SAND. With rare fine to medium angular to subrounded flint gravel. (GLACIOFLUVIAL DEPOSITS)		

Progress & Standing Water Levels

Date	Time	Hole Depth	Casing Depth	Water Depth
21-02-2023	07:45	10.50	6.00	10.4
24-02-2023	08:00	18.80	16.50	11.3

Water Strikes

Date	Time	Strike Depth	Casing Depth	Elapsed Minutes	Depth to Water	Depth Sealed
21/02/2023	12:00	24.00	16.50	5.00	6.00	

Chiselling

Depth Top	Depth Base	Duration

Hole Diameter

Hole Depth	Hole Diameter
10.00	250
25.00	200

Casing Diameter

Casing Diameter	Casing Depth
250	6.00
200	16.50

General Remarks

1. Location scanned with CAT and genny prior to breaking ground.
2. Hand excavated pit undertaken to clear for services.
3. Water added to borehole to aid with drilling which likely was measured during progression, groundwater strikes are likely to have been obscured.
4. Borehole completed at 25 m depth and collapsed back to 18.8 m depth by 24th February.
5. Potential groundwater strike during SPT at 24 m depth, water in borehole rose to 6m depth during SPT test.
6. Gas and groundwater monitoring well installed to 25 m depth on completion with response zone between 4.8 and 18.8 m.

Earth Science Partnership
Consulting Engineers | Geologists | Environmental Scientists

BH101

Start date:	20/02/2023	**Driller:**	Endeavour Drilling
End date:	21/02/2023	**Logged by:**	ESP - MRS
Backfill date:	24/02/2023	**Date logged:**	21/02/2023

Project Name: Burnt Mill Academy
Site Location: Harlow
Client: Bowmer and Kirkland
Project No: 8511

Drilling method
Light Cable Percussion Borehole
Equipment
Dando 2000 Drilling Rig

Ground Level:	63.90 mOD
Easting:	545394 m
Northing:	210813 m

Depth	Sample		Test Details		TCR (%)	Water Depth	Casing Depth	Strata Details		Water	Depth		Backfill/ Install-ations
	Type	Class	Type	Result				Description	Legend	Strikes/ Standing	Depth (Thickness)	mOD	
10.00	D							Medium dense to dense light brown very silty fine to medium SAND. With rare fine to medium angular to subrounded flint gravel. (GLACIOFLUVIAL DEPOSITS)		▶			
11.00	D									▶	11		
12.00	D		SPT	34 (3,5/6,9,9,10)		8.4	11.90				12		
12.00 - 12.45	D												
13.00	D							Clayey from 13.5 m depth. Clay content increasing with depth with thin bands of very silty clay below 13.5 m depth			13		
13.50 - 13.95	D		SPT	17 (2,2/3,4,5,5)		8	13.40						
14.00	D										14		
											(20.50)		
15.00	D		SPT	17 (2,2/4,4,4,5)		9.2	14.90				15		
15.00 - 15.45	D												
16.00 - 16.50	B										16		
			SPT	25 (10,11/8,5,5,7)			16.40						
17.00	D										17		
18.00	D		SPT	24 (3,3/5,6,6,7)		12.2	16.40				18		
18.00 - 18.45	D												
19.00	D										19		
19.50 - 19.95	D		SPT	19 (3,3/4,4,5,6)		13.5	16.40						

Progress & Standing Water Levels

Date	Time	Hole Depth	Casing Depth	Water Depth
21-02-2023	07:45	10.50	6.00	10.4
24-02-2023	08:00	18.80	16.50	11.3

Water Strikes

Date	Time	Strike Depth	Casing Depth	Elapsed Minutes	Depth to Water	Depth Sealed
21/02/2023	12:00	24.00	16.50	5.00	6.00	

Chiselling

Depth Top	Depth Base	Duration

Hole Diameter

Hole Depth	Hole Diameter
10.00	250
25.00	200

Casing Diameter

Casing Diameter	Casing Depth
250	6.00
200	16.50

General Remarks

1. Location scanned with CAT and genny prior to breaking ground.
2. Hand excavated pit undertaken to clear for services.
3. Water added to borehole to aid with drilling which likely was measured during progression, groundwater strikes are likely to have been obscured.
4. Borehole completed at 25 m depth and collapsed back to 18.8 m depth by 24th February.
5. Potential groundwater strike during SPT at 24 m depth, water in borehole rose to 6m depth during SPT test.
6. Gas and groundwater monitoring well installed to 25 m depth on completion with response zone between 4.8 and 18.8 m.

Earth Science Partnership
Consulting Engineers | Geologists | Environmental Scientists

Project Name: Burnt Mill Academy
Site Location: Harlow
Client: Bowmer and Kirkland
Project No: 8511

Drilling method
Light Cable Percussion Borehole
Equipment
Dando 2000 Drilling Rig

BH101

Start date: 20/02/2023
End date: 21/02/2023
Backfill date: 24/02/2023

Driller: Endeavour Drilling
Logged by: ESP - MRS
Date logged: 21/02/2023

Ground Level: 63.90 mOD
Easting: 545394 m
Northing: 210813 m

Depth	Sample		Test Details		TCR (%)	Water Depth	Casing Depth	Strata Details		Water	Depth		Backfill/ Install- ations
	Type	Class	Type	Result				Description	Legend	Strikes/ Standing	Depth (Thickness)	mOD	
20.00	D							Medium dense to dense light brown very silty fine to medium SAND. With rare fine to medium angular to subrounded flint gravel. (GLACIOFLUVIAL DEPOSITS)	▨				▨
21.00	D		SPT	30 (2,3/4,6,8,12)		17	16.40						
21.00 - 21.45	D												
22.00	D												
22.50 - 22.95	D		SPT	17 (3,3/3,4,5,5)		16.3	16.40						
23.00	D												
24.00	D		SPT	13 (2,2/3,3,3,4)		18.6	16.40			→			
24.00 - 24.45	D												
25.00	D							End of Borehole at 25.000m			25.00	38.90	

Progress & Standing Water Levels

Date	Time	Hole Depth	Casing Depth	Water Depth
21-02-2023	07:45	10.50	6.00	10.4
24-02-2023	08:00	18.80	16.50	11.3

Water Strikes

Date	Time	Strike Depth	Casing Depth	Elapsed Minutes	Depth to Water	Depth Sealed
21/02/2023	12:00	24.00	16.50	5.00	6.00	

Chiselling

Depth Top	Depth Base	Duration

Hole Diameter

Hole Depth	Hole Diameter
10.00	250
25.00	200

Casing Diameter

Casing Diameter	Casing Depth
250	6.00
200	16.50

General Remarks

1. Location scanned with CAT and genny prior to breaking ground.
2. Hand excavated pit undertaken to clear for services.
3. Water added to borehole to aid with drilling which likely was measured during progression, groundwater strikes are likely to have been obscured.
4. Borehole completed at 25 m depth and collapsed back to 18.8 m depth by 24th February.
5. Potential groundwater strike during SPT at 24 m depth, water in borehole rose to 6m depth during SPT test.
6. Gas and groundwater monitoring well installed to 25 m depth on completion with response zone between 4.8 and 18.8 m.

Earth Science Partnership
Consulting Engineers | Geologists | Environmental Scientists

Project Name: Burnt Mill Academy
Site Location: Harlow
Client: Bowmer and Kirkland
Project No: 8511

Drilling method Light Cable Percussion Borehole
Equipment Dando 2000 Drilling Rig

BH102

Start date: 15/02/2023
End date: 16/02/2023
Backfill date: 17/02/2023
Driller: Endeavour Drilling
Logged by: ESP - MRS
Date logged: 16/02/2023
Ground Level: 64.80 mOD
Easting: 545429 m
Northing: 210769 m

Depth	Sample		Test Details		TCR (%)	Water Depth	Casing Depth	Strata Details		Water	Depth		Backfill/ Installations
	Type	Class	Type	Result				Description	Legend	Strikes/ Standing	Depth (Thickness)	mOD	
								Topsoil - Drillers Description only			(0.10) 0.10	64.70	
								Loose dark orange brown slightly silty very sandy fine to coarse GRAVEL. Gravel is fine to medium angular to subrounded flint. (POSSIBLE MADE GROUND)					
1.00	D												
1.20 - 1.70	B		SPT-C	6 (1,1/1,1,2,2)			0.00				(2.20)		
2.00	B		SPT-C	9 (1,2/2,2,2,3)		1.4	1.90						
2.00 - 2.50	D												
								Loose to medium dense orange brown slightly gravelly slightly silty medium to coarse SAND. Gravel is fine to medium flint and chalk. (LOWESTOFT FORMATION)			2.30	62.50	
3.00	D		SPT	10 (1,3/3,3,2,2)		2.5	2.90						
3.00 - 3.45	D												
4.00	D		SPT	16 (1,1/3,4,4,5)		3	3.90						
4.00 - 4.45	D										(4.00)		
5.00	D		SPT	21 (1,2/3,6,6,6)		4.1	4.50						
5.00 - 5.45	D												
6.00	D		SPT	5 (1,1/0,1,2,2)		5	4.50	No gravel past 6.0 m depth					
6.00 - 6.45	D												
								Medium dense light brown very silty fine to coarse SAND. (GLACIOFLUVIAL DEPOSITS)			6.30	58.50	
7.00	D							With a band of soft brown silty clay at 7.0 m depth					
7.50 - 7.95	D		SPT	20 (1,3/5,5,5,5)		6.3	4.50						
8.00	D												
9.00	D		SPT	15 (2,3/3,3,4,5)		6.8	4.50						
9.00 - 9.45	D												

Progress & Standing Water Levels

Date	Time	Hole Depth	Casing Depth	Water Depth

Water Strikes

Date	Time	Strike Depth	Casing Depth	Elapsed Minutes	Depth to Water	Depth Sealed

Chiselling

Depth Top	Depth Base	Duration

Hole Diameter

Hole Depth	Hole Diameter
13.50	200
16.90	150

Casing Diameter

Casing Diameter	Casing Depth
200	4.50
150	16.90

General Remarks

1. Location scanned with CAT and genny prior to breaking ground.
2. Hand excavated pit undertaken to clear for services.
3. Sands blew up casing from 13.5 to 11.0 m depth.
4. No obvious groundwater encountered. Water added to borehole to aid with drilling, potential groundwater strikes are likely to have been obscured.
5. Borehole refused at 16.9 m depth in dense gravels.
6. Gas and groundwater monitoring well installed to 14.5 m depth on completion with response zone between 1 and 14.5 m depth.

Earth Science Partnership
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BH102

Start date: 15/02/2023	**Driller:** Endeavour Drilling	**Project Name:** Burnt Mill Academy	**Drilling method** Light Cable Percussion Borehole
End date: 16/02/2023	**Logged by:** ESP - MRS	**Site Location:** Harlow	**Equipment** Dando 2000 Drilling Rig
Backfill date: 17/02/2023	**Date logged:** 16/02/2023	**Client:** Bowmer and Kirkland	**Ground Level:** 64.80 mOD
		Project No: 8511	**Easting:** 545429 m
			Northing: 210769 m

Depth	Sample		Test Details		TCR (%)	Water Depth	Casing Depth	Strata Details		Water	Depth		Backfill/ Install- ations
	Type	Class	Type	Result				Description	Legend	Strikes/ Standing	Depth (Thickness)	mOD	
10.00	D							Medium dense light brown very silty fine to coarse SAND. (GLACIOFLUVIAL DEPOSITS)			(7.50)		
10.50 - 10.95	D		SPT	14 (1,3/5,3,3,3)		7	4.50						
11.00	D												
12.00	D		SPT	17 (1,3/4,4,4,5)		9.2	4.50						
12.00 - 12.45	D												
13.00	D												
13.50 - 13.95	D		SPT	22 (3,3/4,4,6,8)		8.8	4.50						
								Recovered as light brown slightly sandy coarse GRAVEL. Gravel is angular to rounded flint. (GLACIOFLUVIAL DEPOSITS)			13.80	51.00	
14.00	D										(0.70)		
								Stiff to very stiff reddish brown mottled orange brown sandy gravelly silty CLAY. Gravel is fine to coarse angular to subrounded flint and chalk. (GLACIOFLUVIAL DEPOSITS) Locally water softened Blue grey in colour past 15.5 m depth			14.50	50.30	
15.00	D		SPT	42 (3,5/5,9,13,15)			14.90						
15.00 - 15.45	D										(2.10)		
16.00	D												
								SANDS and GRAVELS - Drillers Description only. (GLACIOFLUVIAL DEPOSITS)			16.60 (0.30)	48.20	
								End of Borehole at 16.900m			16.90	47.90	

Progress & Standing Water Levels

Date	Time	Hole Depth	Casing Depth	Water Depth

Water Strikes

Date	Time	Strike Depth	Casing Depth	Elapsed Minutes	Depth to Water	Depth Sealed

Chiselling

Depth Top	Depth Base	Duration

Hole Diameter

Hole Depth	Hole Diameter
13.50	200
16.90	150

Casing Diameter

Casing Diameter	Casing Depth
200	4.50
150	16.90

General Remarks

1. Location scanned with CAT and genny prior to breaking ground.
2. Hand excavated pit undertaken to clear for services.
3. Sands blew up casing from 13.5 to 11.0 m depth.
4. No obvious groundwater encountered. Water added to borehole to aid with drilling, potential groundwater strikes are likely to have been obscured.
5. Borehole refused at 16.9 m depth in dense gravels.
6. Gas and groundwater monitoring well installed to 14.5 m depth on completion with response zone between 1 and 14.5 m depth.

Earth Science Partnership
Consulting Engineers | Geologists | Environmental Scientists

Project Name:	Burnt Mill Academy	**Drilling method**	Light Cable Percussion Borehole
Site Location:	Harlow	**Equipment**	Dando 2000 Drilling Rig
Client:	Bowmer and Kirkland	**Ground Level:**	62.00 mOD
Project No:	8511	**Easting:**	545506 m
		Northing:	210808 m

BH103

Start date:	13/02/2023	**Driller:**	Endeavour Drilling
End date:	15/02/2023	**Logged by:**	ESP - MRS
Backfill date:	15/02/2023	**Date logged:**	15/02/2023

Depth	Sample Type	Sample Class	Test Details Type	Test Details Result	TCR (%)	Water Depth	Casing Depth
1.00	D						
1.20 - 1.65	UT						
1.70	D						
2.00	D		SPT	9 (1,1/2,2,2,3)			1.90
2.00 - 2.45	D						
3.00	D						
3.00 - 3.45	UT						
3.50	D						
3.70 - 4.00	B						
4.00	D		SPT	9 (1,1/1,1,2,5)			3.90
4.00 - 4.45	D						
5.00	B		SPT-C	21 (2,5/5,5,5,6)		3.6	4.90
5.00 - 5.45	D						
6.00	D		SPT	22 (3,4/6,4,6,6)		3.2	5.90
6.00 - 6.45	D						
7.00	D						
7.50 - 7.95	D		SPT	23 (3,4/5,6,6,6)		3.4	7.40
8.00	D						
9.00	D		SPT	22 (3,4/5,5,6,6)		4	8.90
9.00 - 9.45	D						

Strata Details Description	Legend	Water Strikes/ Standing	Depth (Thickness)	mOD	Backfill/ Install- ations
Tarmacadam surfacing			(0.20) 0.20	61.80	
MAGE GROUND - Drillers Description only			(0.25) 0.45	61.55	
Soft to firm brown slightly sandy very gravelly very silty CLAY. Gravel is fine to coarse angular to rounded flint. (LOWESTOFT FORMATION)			(1.35) 1.80	60.20	
Firm light brown sandy very silty CLAY. (LOWESTOFT FORMATION)			(1.90) 3.70	58.30	
Loose light brown clayey very gravelly fine to coarse SAND. Gravel is fine to coarse subangular to rounded flint and chalk. (LOWESTOFT FORAMTION)			(0.50) 4.20	57.80	
Medium dense to dense light brown slightly gravelly silty fine to coarse SAND. Gravel is fine to coarse subangular to rounded flint. With intermittent layers of firm silty clay. (GLACIOFLUVIAL DEPOSITS) With a layer of slightly silty very gravelly sand between 5 to 6 m					

Progress & Standing Water Levels

Date	Time	Hole Depth	Casing Depth	Water Depth

Water Strikes

Date	Time	Strike Depth	Casing Depth	Elapsed Minutes	Depth to Water	Depth Sealed

Chiselling

Depth Top	Depth Base	Duration
16.50	17.00	01:00

Hole Diameter

Hole Depth	Hole Diameter
16.50	200
25.00	150

Casing Diameter

Casing Diameter	Casing Depth
200	10.40
150	17.90

General Remarks

1. Location scanned with CAT and genny prior to breaking ground.
2. Hand excavated pit undertaken to clear for services.
3. No obvious groundwater encountered. Water added to borehole to aid with drilling, groundwater strikes are likely to have been obscured.
4. Borehole completed at 25 m depth.
5. Backfilled with bentonite on completion and tarmacadam surfacing reinstated.

Earth Science Partnership
Consulting Engineers | Geologists | Environmental Scientists

BH103

Start date:	13/02/2023	**Driller:**	Endeavour Drilling
End date:	15/02/2023	**Logged by:**	ESP - MRS
Backfill date:	15/02/2023	**Date logged:**	15/02/2023

Project Name: Burnt Mill Academy
Site Location: Harlow
Client: Bowmer and Kirkland
Project No: 8511

Drilling method Light Cable Percussion Borehole
Equipment Dando 2000 Drilling Rig

Ground Level:	62.00 mOD
Easting:	545506 m
Northing:	210808 m

Depth	Sample		Test Details		TCR	Water	Casing	Strata Details		Water	Depth		Backfill/ Install-ations
	Type	Class	Type	Result	(%)	Depth	Depth	Description	Legend	Strikes/ Standing	Depth (Thickness)	mOD	
10.00	D							Medium dense to dense light brown slightly gravelly silty fine to coarse SAND. Gravel is fine to coarse subangular to rounded flint. With intermittent layers of firm silty clay. (GLACIOFLUVIAL DEPOSITS)					
10.50 - 10.95	D		SPT	23 (3,4/4,5,7,7)		5.2	10.40				(12.30)		
11.00	D										11		
12.00	D		SPT	24 (3,5/5,5,6,8)		5	10.40				12		
12.00 - 12.45	D												
13.00	D										13		
13.50 - 13.95	D		SPT	24 (3,4/5,5,6,8)			10.40						
14.00	D										14		
15.00	D		SPT	46 (5,5/7,12,13,14)		9	10.40				15		
15.00 - 15.45	D												
16.00	D										16		
16.50 - 17.00	B							Light brown slightly silty sandy fine to coarse GRAVEL. Gravel is angular to rounded flint. (GLACIOFLUVIAL DEPOSITS) With a layer of sandy gravelly silty clay between 17.0 to 17.6 m			16.50	45.50	
17.00	B										17		
17.00 - 17.50	D										(1.50)		
18.00	D		SPT	27 (2,3/4,6,8,9)			17.90	Stiff to very stiff dark grey silty CLAY. Also containing some fine to coarse sand-sized selenite crystals. (LONDON CLAY FORMATION)			18.00	44.00	
18.00 - 18.45	D												
19.00	D										19		
19.50 - 19.95	UT												

Progress & Standing Water Levels

Date	Time	Hole Depth	Casing Depth	Water Depth

Water Strikes

Date	Time	Strike Depth	Casing Depth	Elapsed Minutes	Depth to Water	Depth Sealed

Chiselling

Depth Top	Depth Base	Duration
16.50	17.00	01:00

Hole Diameter

Hole Depth	Hole Diameter
16.50	200
25.00	150

Casing Diameter

Casing Diameter	Casing Depth
200	10.40
150	17.90

General Remarks

1. Location scanned with CAT and genny prior to breaking ground.
2. Hand excavated pit undertaken to clear for services.
3. No obvious groundwater encountered. Water added to borehole to aid with drilling, groundwater strikes are likely to have been obscured.
4. Borehole completed at 25 m depth.
5. Backfilled with bentonite on completion and tarmacadam surfacing reinstated.

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BH103

Start date:	13/02/2023	**Driller:**	Endeavour Drilling
End date:	15/02/2023	**Logged by:**	ESP - MRS
Backfill date:	15/02/2023	**Date logged:**	15/02/2023

Project Name: Burnt Mill Academy
Site Location: Harlow
Client: Bowmer and Kirkland
Project No: 8511

Drilling method
Light Cable Percussion Borehole
Equipment
Dando 2000 Drilling Rig

Ground Level:	62.00 mOD
Easting:	545506 m
Northing:	210808 m

Depth	Sample Type	Sample Class	Test Details Type	Test Details Result	TCR (%)	Water Depth	Casing Depth	Strata Details Description	Legend	Water Strikes/ Standing	Depth (Thickness)	mOD	Backfill/ Install-ations
20.00	D							Stiff to very stiff dark grey silty CLAY. Also containing some fine to coarse sand-sized selenite crystals. (LONDON CLAY FORMATION)					
21.00	D		SPT	30 (3,3/6,6,8,10)			17.90				21		
21.00 - 21.45	D												
											(7.00)		
22.00	D										22		
22.50 - 22.95	D		SPT	33 (3,5/6,8,8,11)			17.90						
23.00	D										23		
24.00	D										24		
24.00 - 24.45	UT												
24.50	D												
25.00	D							End of Borehole at 25.000m			25.00	37.00	
											26		
											27		
											28		
											29		

Progress & Standing Water Levels

Date	Time	Hole Depth	Casing Depth	Water Depth

Water Strikes

Date	Time	Strike Depth	Casing Depth	Elapsed Minutes	Depth to Water	Depth Sealed

Chiselling

Depth Top	Depth Base	Duration
16.50	17.00	01:00

Hole Diameter

Hole Depth	Hole Diameter
16.50	200
25.00	150

Casing Diameter

Casing Diameter	Casing Depth
200	10.40
150	17.90

General Remarks

1. Location scanned with CAT and genny prior to breaking ground.
2. Hand excavated pit undertaken to clear for services.
3. No obvious groundwater encountered. Water added to borehole to aid with drilling, groundwater strikes are likely to have been obscured.
4. Borehole completed at 25 m depth.
5. Backfilled with bentonite on completion and tarmacadam surfacing reinstated.

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BH104

Project Name: Burnt Mill Academy
Site Location: Harlow
Client: Bowmer and Kirkland
Project No: 8511

Drilling method Light Cable Percussion Borehole
Equipment Dando 2000 Drilling Rig

Start date: 24/02/2023
End date: 28/02/2023
Backfill date: 01/03/2023

Driller: Endeavour Drilling
Logged by: ESP - MRS
Date logged: 28/02/2023

Ground Level: 64.30 mOD
Easting: 545404 m
Northing: 210749 m

Depth	Sample Type	Sample Class	Test Details Type	Test Details Result	TCR (%)	Water Depth	Casing Depth
0.30	ES						
0.50 - 0.70	B						
1.00	D						
1.20 - 1.65	B		SPT-C	23 (2,5/0,6,7,10)			
2.00	B		SPT-C	22 (2,7/7,5,5,5)		1	1.90
2.00 - 2.45	D						
3.00	B		SPT-C	6 (1,1/1,1,1,3)		1.2	2.90
3.00 - 3.45	D						
4.00	D		SPT	8 (1,1/2,2,2,2)		2.2	3.90
4.00 - 4.45	D						
5.00	B		SPT-C	7 (1,1/1,1,2,3)		3.6	4.90
5.00 - 5.45	D						
6.00	D		SPT	9 (1,2/2,2,2,3)		4.3	5.90
6.00 - 6.45	D						
7.00	D						
7.50 - 7.95	D		SPT	18 (2,3/3,5,5,5)		5	6.00
8.00	D						
9.00	D		SPT	12 (1,1/3,3,3,3)		6.8	6.00
9.00 - 9.45	D						

Strata Details Description	Depth (Thickness)	mOD
Tarmacadam surfacing	(0.12) 0.12	64.18
Greyish brown sandy fine to coarse GRAVEL and COBBLES. Gravels and cobbles are angular to subangular brick and concrete. (MADE GROUND)	(0.13) 0.25	64.05
Orange brown slightly silty fine to coarse SAND and GRAVEL. Gravel is angular to rounded flint. (POSSIBLE MADE GROUND)	(0.20) 0.45	63.85
Medium dense dark brown slightly silty sandy fine to coarse GRAVEL. Gravel is angular to rounded flint. With pockets of clay. (GLACIOFLUVIAL DEPOSITS) Possibly becoming loose at base of layer	(2.65) 3.10	61.20
Loose dark orange brown gravelly silty fine to coarse SAND. Gravel is fine to medium angular to subangular flint. (GLACIOFLUVIAL DEPOSITS)	(1.40) 4.50	59.80
Loose orange brown gravelly silty fine to coarse SAND. Gravel is angular to rounded flint. (GLACIOFLUVIAL DEPOSITS)	(1.10) 5.60	58.70
Loose becoming medium dense light brown silty fine to medium, occasionally coarse, SAND. With rare fine to medium subangular to rounded flint gravel and occasional bands of soft light brown very silty clay. (GLACIOFLUVIAL DEPOSITS)	(5.40)	

Progress & Standing Water Levels

Date	Time	Hole Depth	Casing Depth	Water Depth
28-02-2023	09:00	10.00	10.00	7.6

Water Strikes

Date	Time	Strike Depth	Casing Depth	Elapsed Minutes	Depth to Water	Depth Sealed
28/02/2023	12:00	16.10	11.50	20.00	14.95	

Chiselling

Depth Top	Depth Base	Duration

Hole Diameter

Hole Depth	Hole Diameter
10.00	250
16.00	200
25.00	150

Casing Diameter

Casing Diameter	Casing Depth
250	6.00
200	12.00
150	19.50

General Remarks

1. Location scanned with CAT and genny prior to breaking ground.
2. Hand excavated pit undertaken to clear for services.
3. Water added to borehole to aid with drilling.
4. Groundwater strike at 16.1 m depth rising to 14.95 m after 20 minutes.
5. Borehole completed at 25.0 m depth.
6. Backfilled with bentonite on completion and tarmacadam surfacing reinstated.

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BH104

Start date:	24/02/2023	**Driller:**	Endeavour Drilling
End date:	28/02/2023	**Logged by:**	ESP - MRS
Backfill date:	01/03/2023	**Date logged:**	28/02/2023

Project Name: Burnt Mill Academy
Site Location: Harlow
Client: Bowmer and Kirkland
Project No: 8511

Drilling method
Light Cable Percussion Borehole
Equipment
Dando 2000 Drilling Rig

Ground Level:	64.30 mOD
Easting:	545404 m
Northing:	210749 m

Depth	Sample Type	Sample Class	Test Details Type	Test Details Result	TCR (%)	Water Depth	Casing Depth
10.00	D						
10.50 - 10.95	D		SPT	28 (5,7/8,6,6,8)		7.3	10.40
11.00	D						
12.00	D						
12.00 - 12.45	D						
13.00	D						
13.50 - 13.95	D		SPT	30 (3,4/6,6,8,10)			11.90
14.00	D						
15.00	D						
15.00 - 15.45	UT						
15.50	D						
16.00	D						
16.50 - 16.95	B		SPT-C	38 (1,2/4,8,10,16)		15.2	16.40
17.00	D						
18.00	B		SPT-C	32 (2,2/5,8,9,10)		16.4	17.90
18.00 - 18.45	D						
19.00	D						
19.50 - 19.95	D		SPT	32 (4,4/5,7,9,11)			19.40

Strata Details Description	Water Strikes/ Standing	Depth (Thickness)	mOD
Loose becoming medium dense light brown silty fine to medium, occasionally coarse, SAND. With rare fine to medium subangular to rounded flint gravel and occasional bands of soft light brown very silty clay. (GLACIOFLUVIAL DEPOSITS) With a basal gravel band between 10.9 to 11.0 m		11.00	53.30
Stiff light brown slightly gravelly slightly silty CLAY. Gravel is fine subangular to subrounded flint. With pockets of yellow brown sand. (GLACIOFLUVIAL DEPOSITS)		(0.40) 11.40	52.90
Stiff to very stiff dark grey mottled orange brown silty gravelly CLAY. Gravel is fine to medium subangular to rounded chalk and flint. (GLACIOFLUVIAL DEPOSITS) With a layer of gravelly silty sand between 12 to 12.5 m	▽	(4.60) 16.00	48.30
Soft to firm orange brown very sandy very gravelly silty CLAY. Gravel is fine to coarse angular to rounded flint. (GLACIOFLUVIAL DEPOSITS)	→	(0.20) 16.20	48.10
Dense light brown slightly silty sandy fine to coarse GRAVEL. Gravel is angular to rounded flint. (GLACIOFLUVIAL DEPOSITS)		(3.20) 19.40	44.90
Stiff dark brownish grey silty CLAY. With rare fine sand-sized selenite crystals. (LONDON CLAY FORMATION)			

Progress & Standing Water Levels

Date	Time	Hole Depth	Casing Depth	Water Depth
28-02-2023	09:00	10.00	10.00	7.6

Water Strikes

Date	Time	Strike Depth	Casing Depth	Elapsed Minutes	Depth to Water	Depth Sealed
28/02/2023	12:00	16.10	11.50	20.00	14.95	

Chiselling

Depth Top	Depth Base	Duration

Hole Diameter

Hole Depth	Hole Diameter
10.00	250
16.00	200
25.00	150

Casing Diameter

Casing Diameter	Casing Depth
250	6.00
200	12.00
150	19.50

General Remarks

1. Location scanned with CAT and genny prior to breaking ground.
2. Hand excavated pit undertaken to clear for services.
3. Water added to borehole to aid with drilling.
4. Groundwater strike at 16.1 m depth rising to 14.95 m after 20 minutes.
5. Borehole completed at 25.0 m depth.
6. Backfilled with bentonite on completion and tarmacadam surfacing reinstated.

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Project Name: Burnt Mill Academy
Site Location: Harlow
Client: Bowmer and Kirkland
Project No: 8511

Drilling method
Light Cable Percussion Borehole
Equipment
Dando 2000 Drilling Rig

BH104

Start date: 24/02/2023
End date: 28/02/2023
Backfill date: 01/03/2023

Driller: Endeavour Drilling
Logged by: ESP - MRS
Date logged: 28/02/2023

Ground Level: 64.30 mOD
Easting: 545404 m
Northing: 210749 m

Depth	Sample		Test Details		TCR (%)	Water Depth	Casing Depth	Strata Details		Water	Depth		Backfill/ Install-ations
	Type	Class	Type	Result				Description	Legend	Strikes/ Standing	Depth (Thickness)	mOD	
20.00	D							Stiff dark brownish grey silty CLAY. With rare fine sand-sized selenite crystals. (LONDON CLAY FORMATION) Brown in colour between 19.4 to 19.8 m					
21.00	D												
21.00 - 21.45	UT												
21.50	D												
22.00	D										(5.60)		
22.50 - 22.95	D		SPT	37 (5,6/8,8,10,11)			19.50						
23.00	D												
24.00	D												
24.00 - 24.45	UT												
24.50	D												
25.00	D							End of Borehole at 25.000m			25.00	39.30	

Depth scale: 21, 22, 23, 24, 25, 26, 27, 28, 29

Progress & Standing Water Levels

Date	Time	Hole Depth	Casing Depth	Water Depth
28-02-2023	09:00	10.00	10.00	7.6

Water Strikes

Date	Time	Strike Depth	Casing Depth	Elapsed Minutes	Depth to Water	Depth Sealed
28/02/2023	12:00	16.10	11.50	20.00	14.95	

Chiselling

Depth Top	Depth Base	Duration

Hole Diameter

Hole Depth	Hole Diameter
10.00	250
16.00	200
25.00	150

Casing Diameter

Casing Diameter	Casing Depth
250	6.00
200	12.00
150	19.50

General Remarks

1. Location scanned with CAT and genny prior to breaking ground.
2. Hand excavated pit undertaken to clear for services.
3. Water added to borehole to aid with drilling.
4. Groundwater strike at 16.1 m depth rising to 14.95 m after 20 minutes.
5. Borehole completed at 25.0 m depth.
6. Backfilled with bentonite on completion and tarmacadam surfacing reinstated.

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Project Name: Burnt Mill Academy
Site Location: Harlow
Client: Bowmer and Kirkland
Project No: 8511

Drilling method
Light Cable Percussion Borehole
Equipment
Dando 2000 Drilling Rig

BH105

Start date: 01/03/2023
End date: 03/03/2023
Backfill date: 03/03/2023

Driller: Endeavour Drilling
Logged by: ESP - MRS
Date logged: 03/03/2023

Ground Level: 65.30 mOD
Easting: 545456 m
Northing: 210725 m

Depth	Sample Type	Sample Class	Test Type	Test Result	TCR (%)	Water Depth	Casing Depth
0.30	ES						
0.60 - 1.00	B						
1.00	D						
1.20 - 1.65	B		SPT-C	50 (7,9/50 for 285mm)			
2.00	B		SPT-C	34 (3,5/7,10,7,10)		1.2	1.90
2.00 - 2.45	D						
3.00	B		SPT-C	18 (2,3/5,5,3,5)		2	2.90
3.00 - 3.45	D						
4.00	D		SPT-C	4 (1,1/1,1,1,1)		2.5	3.90
4.00 - 4.45	D						
5.00	B		SPT-C	4 (1,1/1,1,1,1)		3.65	4.90
5.00 - 5.45	D						
6.00	D		SPT	6 (1,1/1,1,2,2)		4.7	5.90
6.00 - 6.45	D						
7.00	D						
7.50 - 7.95	D		SPT	4 (1,0/1,1,0,2)		5	6.00
8.00	D						
9.00	D		SPT	8 (1,3/2,2,2,2)		6.3	6.00
9.00 - 9.45	D						

Strata Description	Legend	Water Strikes/Standing	Depth (Thickness)	mOD
Light brown gravelly silty fine to coarse SAND. Gravel is angular to rounded flint. (TOPSOIL)	▨		(0.20) 0.20	65.10
Light brown very sandy very silty slightly clayey fine to coarse GRAVEL. Gravel is fine to coarse angular to rounded flint. (POSSIBLE MADE GROUND)	▨		(0.35) 0.55	64.75
Soft light brown slightly sandy gravelly very silty CLAY. Gravel is fine to coarse angular to subrounded flint. (POSSIBLE MADE GROUND)	▨		(0.65) 1.20	64.10
Dense to very dense, becoming medium dense at 2m, light brown slightly silty sandy fine to coarse GRAVEL. Gravel is angular to rounded flint. (GLACIOFLUVIAL DEPOSITS) Very loose to loose from 4m	▨		(3.90) 5.10	60.20
Loose, locally very loose, light brown gravelly silty fine to coarse SAND. Gravel is fine to coarse subangular to subrounded flint. (GLACIOFLUVIAL DEPOSITS)	▨		(5.20)	

Progress & Standing Water Levels

Date	Time	Hole Depth	Casing Depth	Water Depth
03-03-2023	06:30	20.50	20.50	16.5

Water Strikes

Date	Time	Strike Depth	Casing Depth	Elapsed Minutes	Depth to Water	Depth Sealed
02/03/2023	12:00	19.80	19.80	0.00	19.80	

Chiselling

Depth Top	Depth Base	Duration
19.80	20.50	01:00
20.50	21.00	01:00

Hole Diameter

Hole Depth	Hole Diameter
10.00	250
16.50	200
21.00	150

Casing Diameter

Casing Diameter	Casing Depth
250	6.00
200	10.50
150	21.00

General Remarks

1. Location scanned with CAT and genny prior to breaking ground.
2. Hand excavated pit undertaken to clear for services.
3. Water added to borehole to aid with drilling.
4. Groundwater strike at 19.8 m depth.
5. Borehole refused at 21 m depth in very dense 'claystone'.
6. Dual gas and groundwater monitoring wells installed on completion with response zones between 16 and 21 m (deep) and 1 to 5 m depth (shallow).

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Start date:	01/03/2023	**Driller:**	Endeavour Drilling
End date:	03/03/2023	**Logged by:**	ESP - MRS
Backfill date:	03/03/2023	**Date logged:**	03/03/2023

Project Name: Burnt Mill Academy
Site Location: Harlow
Client: Bowmer and Kirkland
Project No: 8511

Drilling method
Light Cable Percussion Borehole
Equipment
Dando 2000 Drilling Rig

Ground Level:	65.30 mOD
Easting:	545456 m
Northing:	210725 m

BH105

Depth	Sample		Test Details		TCR (%)	Water Depth	Casing Depth	Strata Details		Water	Depth		Backfill/ Install-ations
	Type	Class	Type	Result				Description	Legend	Strikes/ Standing	Depth (Thickness)	mOD	
10.00	D							Loose, locally very loose, light brown gravelly silty fine to coarse SAND. Gravel is fine to coarse subangular to subrounded flint. (GLACIOFLUVIAL DEPOSITS)					
											10.30	55.00	
10.50 - 10.95	D		SPT	18 (2,3/3,4,5,6)		9.2	10.40						
11.00	D							Stiff dark grey gravelly silty CLAY. Gravel is fine to coarse subangular to subrounded chalk and flint. (GLACIOFLUVIAL DEPOSITS) Light brown in colour above 10.8 m			11		
12.00	D										12		
12.00 - 12.45	UT												
12.50	D												
13.00	D										13		
											(6.00)		
13.50 - 13.95	D		SPT	30 (3,3/6,6,8,10)			10.50						
14.00	D										14		
15.00	D										15		
15.00 - 15.45	UT							With a layer of gravelly silty sand between 15 to 15.5 m					
15.50	D												
16.00	B										16		
16.00 - 16.50	D										16.30	49.00	
			SPT-C	24 (5,6/6,6,6,6)		12	16.40	Medium dense to dense light brown very sandy slightly silty fine to coarse GRAVEL. Gravel is angular to rounded flint. (GLACIOFLUVIAL DEPOSITS)		▶			
17.00	D										17		
18.00	B		SPT-C	30 (2,3/6,8,8,8)		14.1	17.90	Sand and gravel past 18.0 m depth			(3.40)		
18.00 - 18.45	D												
19.00	B										19		
19.00 - 19.45	D												
			SPT-C	33 (2,5/7,7,9,10)		15.5	19.40						
19.70	D							Stiff to very stiff brownish grey silty		▽	19.70	45.60	

Progress & Standing Water Levels

Date	Time	Hole Depth	Casing Depth	Water Depth
03-03-2023	06:30	20.50	20.50	16.5

Water Strikes

Date	Time	Strike Depth	Casing Depth	Elapsed Minutes	Depth to Water	Depth Sealed
02/03/2023	12:00	19.80	19.80	0.00	19.80	

Chiselling

Depth Top	Depth Base	Duration
19.80	20.50	01:00
20.50	21.00	01:00

Hole Diameter

Hole Depth	Hole Diameter
10.00	250
16.50	200
21.00	150

Casing Diameter

Casing Diameter	Casing Depth
250	6.00
200	10.50
150	21.00

General Remarks

1. Location scanned with CAT and genny prior to breaking ground.
2. Hand excavated pit undertaken to clear for services.
3. Water added to borehole to aid with drilling.
4. Groundwater strike at 19.8 m depth.
5. Borehole refused at 21 m depth in very dense 'claystone'.
6. Dual gas and groundwater monitoring wells installed on completion with response zones between 16 and 21 m (deep) and 1 to 5 m depth (shallow).

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BH105

Project Name: Burnt Mill Academy
Site Location: Harlow
Client: Bowmer and Kirkland
Project No: 8511

Drilling method
Light Cable Percussion Borehole

Equipment
Dando 2000 Drilling Rig

Start date: 01/03/2023
End date: 03/03/2023
Backfill date: 03/03/2023

Driller: Endeavour Drilling
Logged by: ESP - MRS
Date logged: 03/03/2023

Ground Level: 65.30 mOD
Easting: 545456 m
Northing: 210725 m

Depth	Sample		Test Details		TCR (%)	Water Depth	Casing Depth	Strata Details		Water	Depth		Backfill/ Install-ations
	Type	Class	Type	Result				Description	Legend	Strikes/ Standing	Depth (Thickness)	mOD	
								Stiff to very stiff brownish grey silty CLAY. With claystone fragments. (LONDON CLAY FORMATION) layer of very dense claystone between 19.8 to 21.0 m			(1.30)		
21.00	UT		SPT-C	50 (25 for 80mm/50 for 5mm)		16.5	20.90				21.00	44.30	
								End of Borehole at 21.000m					

Progress & Standing Water Levels

Date	Time	Hole Depth	Casing Depth	Water Depth
03-03-2023	06:30	20.50	20.50	16.5

Water Strikes

Date	Time	Strike Depth	Casing Depth	Elapsed Minutes	Depth to Water	Depth Sealed
02/03/2023	12:00	19.80	19.80	0.00	19.80	

Chiselling

Depth Top	Depth Base	Duration
19.80	20.50	01:00
20.50	21.00	01:00

Hole Diameter

Hole Depth	Hole Diameter
10.00	250
16.50	200
21.00	150

Casing Diameter

Casing Diameter	Casing Depth
250	6.00
200	10.50
150	21.00

General Remarks

1. Location scanned with CAT and genny prior to breaking ground.
2. Hand excavated pit undertaken to clear for services.
3. Water added to borehole to aid with drilling.
4. Groundwater strike at 19.8 m depth.
5. Borehole refused at 21 m depth in very dense 'claystone'.
6. Dual gas and groundwater monitoring wells installed on completion with response zones between 16 and 21 m (deep) and 1 to 5 m depth (shallow).

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BH201

Project Name:	Burnt Mill Academy	**Drilling method**	Light Cable Percussion
Site Location:	Harlow	**Equipment**	Dando 2000
Client:	Bowmer and Kirkland	**Ground Level:**	61.40 mOD
Project No:	8511.02	**Easting:**	545385 m
		Northing:	210856 m

Start date:	05/06/2023	**Driller:**	Endeavour Drilling
End date:	06/06/2023	**Logged by:**	ESP-MRS
Backfill date:	06/06/2023	**Date logged:**	06/06/2023

Depth	Sample Type	Sample Class	Test Type	Test Result	TCR (%)	Water Depth	Casing Depth
0.50	B						
1.00	B		SPT	4 (1,1/1,1,1,1)			0.00
2.00	D		SPT	2 (1,1/0,0,1,1)			1.50
3.00	D		SPT	15 (1,1/4,4,5,2)			3.00
3.50 - 3.95	U						
4.00	D		SPT	4 (1,1/1,1,1,1)			3.00
5.00 5.00 - 5.50	B D		SPT-C	10 (3,3/3,2,2,3)		3	3.00
6.00	D		SPT	14 (1,2/2,3,4,5)			3.00
7.00	D		SPT	19 (1,2/3,5,5,6)			6.00
8.00	D						
9.00	D		SPT	23 (3,3/4,6,6,7)			6.00

Strata Details: Description	Water Strikes/ Standing	Depth (Thickness)	mOD
Greyish brown gravelly slightly silty fine to coarse SAND. Gravel is fine to coarse angular to subrounded flint and chalk. Also containing rare fragments of plastic, brick and concrete. (MADE GROUND - TOPSOIL)		(0.15) 0.15	61.25
Firm to stiff greyish brown slightly sandy gravelly silty CLAY. Gravel is fine to coarse angular to rounded flint and chalk with rare brick and tarmac. (MADE GROUND - POSSIBLE REWORKED LOWESTOFT FORMATION)		(0.50) 0.65	60.75
Very soft to firm dark yellow brown gravelly very sandy CLAY with low cobble content. Gravel is fine to coarse angular to rounded flint, chalk, brick and rare tarmac. (MADE GROUND) Occasionally sand dominant		(2.75) 3.40	58.00
Soft dark greeny grey mottled black gravelly silty CLAY. Gravel is fine to coarse angular to subrounded flint. Also containing rare brick and decaying plant matter. With a slight organic odour. (MADE GROUND - POSSIBLE RELICT TOPSOIL)		(0.60) 4.00	57.40
Soft to firm greeny grey gravelly silty CLAY. Gravel is fine to coarse angular to rounded chalk and rare brick. With rare black organic pockets. (MADE GROUND - POSSIBLE REWORKED LOWESTOFT FORMATION)		(0.50) 4.50	56.90
Loose to medium dense dark grey sandy fine to coarse GRAVEL. Gravel is angular to rounded flint. (POSSIBLE LOWESTOFT FORMATION) Water level on SPT from added water during drilling process, no groundwater encountered		(1.00) 5.50	55.90
Firm to stiff blue grey mottled yellow brown gravelly silty CLAY. Gravel is fine to coarse angular to subrounded chalk and flint. (LOWESTOFT FORMATION)		(6.50)	

Progress & Standing Water Levels

Date	Time	Hole Depth	Casing Depth	Water Depth

Water Strikes

Date	Time	Strike Depth	Casing Depth	Elapsed Minutes	Depth to Water	Depth Sealed

Chiselling

Depth Top	Depth Base	Duration

Hole Diameter

Hole Depth	Hole Diameter
13.00	200
15.00	150

Casing Diameter

Casing Diameter	Casing Depth
200	6.00
150	15.00

General Remarks

1. Coordinates and ground level obtained using GEODE GPS (+/- 0.5 m).
2. Scanned with CAT and genny prior to breaking ground.
3. Hand excavated pit undertaken to 1.2 m depth to clear for services.
4. No groundwater encountered. Water added during drilling.
5. Borehole completed at 15m depth.
6. Backfilled to 5.5 m depth with bentonite and monitoring well installed with response zone between 5.5 and 1.0 m depth with bentonite seal between ground level and 1.0 m.

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BH201

Start date:	05/06/2023	**Driller:**	Endeavour Drilling
End date:	06/06/2023	**Logged by:**	ESP-MRS
Backfill date:	06/06/2023	**Date logged:**	06/06/2023

Project Name: Burnt Mill Academy
Site Location: Harlow
Client: Bowmer and Kirkland
Project No: 8511.02

Drilling method
Light Cable Percussion

Equipment
Dando 2000

Ground Level:	61.40 mOD
Easting:	545385 m
Northing:	210856 m

Depth	Sample		Test Details		TCR (%)	Water Depth	Casing Depth	Strata Details		Water	Depth		Backfill/ Install-ations
	Type	Class	Type	Result				Description	Legend	Strikes/ Standing	Depth (Thickness)	mOD	
10.00	D							Firm to stiff blue grey mottled yellow brown gravelly silty CLAY. Gravel is fine to coarse angular to subrounded chalk and flint. (LOWESTOFT FORMATION)					
			SPT	18 (1,3/3,4,5,6)			6.00						
11.00	D							With pockets of orange brown sand from 11 m depth			11		
12.00	D		SPT	7 (3,2/2,2,1,2)			6.00				12.00	49.40	
								Loose to medium dense orange brown sandy fine to coarse GRAVEL. Gravel is angular to rounded flint. (GLACIOFLUVIAL DEPOSITS)					
13.00	D							Very sandy past 13.5 m depth			13		
13.50 - 14.00	B		SPT-C	16 (1,1/2,3,4,7)			13.50				(3.00)		
14.00	D										14		
15.00	D		SPT-C	14 (1,2/3,4,3,4)			15.00				15.00	46.40	
								End of Borehole at 15.000m					
											16		
											17		
											18		
											19		

Progress & Standing Water Levels

Date	Time	Hole Depth	Casing Depth	Water Depth

Water Strikes

Date	Time	Strike Depth	Casing Depth	Elapsed Minutes	Depth to Water	Depth Sealed

Chiselling

Depth Top	Depth Base	Duration

Hole Diameter

Hole Depth	Hole Diameter
13.00	200
15.00	150

Casing Diameter

Casing Diameter	Casing Depth
200	6.00
150	15.00

General Remarks

1. Coordinates and ground level obtained using GEODE GPS (+/- 0.5 m).
2. Scanned with CAT and genny prior to breaking ground.
3. Hand excavated pit undertaken to 1.2 m depth to clear for services.
4. No groundwater encountered. Water added during drilling.
5. Borehole completed at 15m depth.
6. Backfilled to 5.5 m depth with bentonite and monitoring well installed with response zone between 5.5 and 1.0 m depth with bentonite seal between ground level and 1.0 m.

Appendix E ESP Trial Pit Records

Earth Science Partnership
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TP101

Excavation method/plant: JCB-3CX

Shoring/support: None

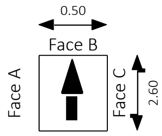
Project Name: Burnt Mill Academy
Site Location: Harlow
Client: Bowmer and Kirkland
Project No: 8511

Excavation date: 14/02/2023
Backfill date: 17/02/2023
Logged by: AB - ESP

Survey details:

Ground Level: 61.5 mOD
Easting: 545399 mOD
Northing: 210836 mOD
Bearing:

Plan details:



Face Stability:

Stable

Groundwater observations:

None Observed

Depth	Sample		Test Details		Strata Details			
m	Type	Class	Type	Result	Description	Depth (thickness)	mOD	Legend
					Firm, dark brown, sandy SILT. Sand is fine to coarse. (MADE GROUND - TOPSOIL).	(0.30) 0.30	61.20	▩
0.35 0.40 1.40	ES D B				Yellowish brown, sandy silty clayey GRAVEL. Sand is fine to coarse, gravel is fine to coarse rounded to subrounded consisting of flint and chalk fragments. Rare brick and rebar present. (MADE GROUND - REWORKED NATURAL DEPOSITS).	(1.30) 1.60	59.90	▨
1.70 2.00	D B				Stiff, grey, gravelly slightly sandy CLAY. Sand is fine to coarse, gravel is fine to coarse rounded to subrounded consisting of mudstone and flint. In-tact buried petrified tree at base of pit between 2.0-2.2m. (PROBABLE LOWESTOFT FORMATION).	(0.50) 2.10	59.40	▧
					End of Trialpit at 2.100m			

Weather and environmental conditions:

1. Cold, Raining

Other comments:

1. Coordinates obtained using handheld GPS on site, ground levels inferred from topographic survey.
2. Service plans inspected and Trail Pit position scanned with CAT and Genny prior to breaking ground.
3. Trial Pit terminated at 2.1m to undertake soakaway testing.
4. Trial Pit securely heras fenced off for duration of testing.
5. Trial Pit backfilled with arisings upon completion.

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Excavation method/plant: JCB-3CX

Shoring/support: None

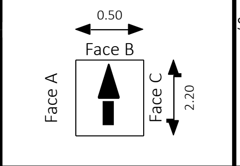
TP102

Project Name: Burnt Mill Academy
Site Location: Harlow
Client: Bowmer and Kirkland
Project No: 8511

Excavation date: 14/02/2023
Backfill date: 17/02/2023
Logged by: AB - ESP

Survey details:
Ground Level: 61.8 mOD
Easting: 545466 mOD
Northing: 210848 mOD
Bearing:

Plan details:



Face Stability:
Stable

Groundwater observations:
None Observed

Depth m	Sample Type	Sample Class	Test Type	Test Result	Strata Description	Depth (thickness)	mOD	Legend
0.30	ES				Firm, dark brown, sandy SILT. Sand is fine to coarse. (TOPSOIL).	(0.45) 0.45	61.35	▨
0.50 0.60	D ES				Firm to stiff, brown mottled white, very gravelly slightly sandy CLAY. Sand is fine to coarse, gravel is fine to coarse rounded to subrounded consisting of mudstone and chalk. (PROBABLE LOWESTOFT FORMATION).	(0.45) 0.90	60.90	▨
1.00 1.80	D B				Firm to stiff, brown mottled white, slightly gravelly slightly sandy CLAY. Sand is fine to coarse, gravel is fine to coarse rounded to subrounded consisting of mudstone and chalk. (PROBABLE LOWESTOFT FORMATION).	(1.10) 2.00	59.80	▨
					End of Trialpit at 2.000m			

Weather and environmental conditions:
1. Cold, Raining

Other comments:
1. Coordinates obtained using handheld GPS on site, ground levels inferred from topographic survey.
2. Service plans inspected and Trail Pit position scanned with CAT and Genny prior to breaking ground.
3. Trial Pit terminated at 2.0m to undertake soakaway testing.
4. Trial Pit securely heras fenced off for duration of testing.
5. Trial Pit backfilled with arisings upon completion.

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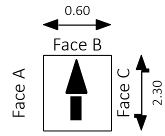
TP103

Excavation method/plant: JCB-3CX
Shoring/support: None

Project Name: Burnt Mill Academy
Site Location: Harlow
Client: Bowmer and Kirkland
Project No: 8511

Excavation date: 14/02/2023
Backfill date: 14/02/2023
Logged by: AB - ESP

Survey details:
Ground Level: 62.5 mOD
Easting: 545556 mOD
Northing: 210805 mOD
Bearing:

Plan details:


Face Stability:
Substantial Sidewall Collapse between 0.8 - 1.6m

Groundwater observations:
None Observed

Depth	Sample		Test Details		Strata Details			
m	Type	Class	Type	Result	Description	Depth (thickness)	mOD	Legend
					Firm, dark brown, sandy SILT. Sand is fine to coarse. (MADE GROUND - TOPSOIL).	(0.20) 0.20	62.30	▩
0.30	ES				Yellowish brown, very gravelly silty clayey SAND. Sand is fine to coarse, gravel is fine to coarse rounded to subrounded consisting of flint and chalk fragments. Rare brick and concrete present. (MADE GROUND - REWORKED NATURAL DEPOSITS).	(0.30) 0.50	62.00	▩
0.60	ES				Yellowish brown, very gravelly silty SAND. Sand is fine to coarse, gravel is fine to coarse rounded to subrounded consisting of flint and chalk fragments. (PROBABLE GLACIO-FLUVIAL DEPOSITS).	(0.50) 1.00	61.50	░
1.20	D				Yellowish brown, silty very sandy GRAVEL. Sand is fine to coarse, gravel is fine to coarse rounded to subrounded consisting of flint and mudstone. (PROBABLE GLACIO-FLUVIAL DEPOSITS).	(0.60) 1.60	60.90	░
1.60	B				End of Trialpit at 1.600m			

Weather and environmental conditions:
1. Cold, Raining

Other comments:
1. Coordinates obtained using handheld GPS on site, ground levels inferred from topographic survey.
2. Service plans inspected and Trail Pit position scanned with CAT and Genny prior to breaking ground.
3. Trial Pit terminated at 1.6m due to substantial sidewall collapse and to undertake soakaway testing.
4. Trial Pit securely heras fenced off for duration of testing.
5. Trial Pit backfilled with arisings upon completion.

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Excavation method/plant: JCB-3CX

Shoring/support: None

TP104

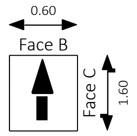
Project Name: Burnt Mill Academy
Site Location: Harlow
Client: Bowmer and Kirkland
Project No: 8511

Excavation date: 14/02/2023
Backfill date: 17/02/2023
Logged by: AB - ESP

Survey details:

Ground Level: 62.3 mOD
Easting: 545543 mOD
Northing: 210845 mOD
Bearing:

Plan details:



Face Stability:

Minor Sidewall Collapse between 1.0 - 1.5m

Groundwater observations:

None Observed

Depth	Sample		Test Details		Strata Details			
m	Type	Class	Type	Result	Description	Depth (thickness)	mOD	Legend
					Firm, dark brown, sandy SILT. Sand is fine to coarse. (TOPSOIL).	(*0.10*) 0.10	62.20	▨
0.30	ES				Light brown, very gravelly slightly silty SAND with low cobble content. Sand is fine to coarse, gravel is fine to coarse rounded to subrounded consisting of flint. flint cobbles are rounded to subrounded measuring up to 75mm. (PROBABLE GLACIO-FLUVIAL DEPOSITS).	(*1.40*)		▨
						1.0		
1.10	D							
1.40	B					1.50	60.80	
					End of Trialpit at 1.500m			
						2.0		
						3.0		
						4.0		

Weather and environmental conditions:

1. Cold, Dry

Other comments:

1. Coordinates obtained using handheld GPS on site, ground levels inferred from topographic survey.
2. Service plans inspected and Trail Pit position scanned with CAT and Genny prior to breaking ground.
3. Trial Pit terminated at 1.5m to undertake soakaway testing.
4. Trial Pit securely heras fenced off for duration of testing.
5. Trial Pit backfilled with arisings upon completion.

Appendix F ESP Hand Pit Records

Earth Science Partnership
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Excavation method/plant: Shovel, Split Shovel

Shoring/support: None

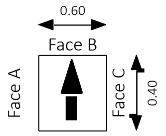
HP01

Project Name: Burnt Mill Academy
Site Location: Harlow
Client: Bowmer and Kirkland
Project No: 8511

Excavation date: 15/02/2023
Backfill date: 15/02/2023
Logged by: AB - ESP

Survey details:
Ground Level: 62.2 mOD
Easting: 545494 mOD
Northing: 210884 mOD
Bearing:

Plan details:



Face Stability:
Stable

Groundwater observations:
None Observed

Depth	Sample		Test Details		Strata Details			
m	Type	Class	Type	Result	Description	Depth (thickness)	mOD	Legend
0.10	ES				Soft to firm, dark brown speckled white, slightly sandy clayey SILT. Sand is fine to coarse. Rare brick fragments. Abundant rootlets. Grass overlain. (MADE GROUND - TOPSOIL).	(0.10) 0.10	62.10	▨
0.20	ES				Dark brown mottled white, sandy silty clayey GRAVEL with low cobble content. Sand is fine to coarse, gravel is fine to coarse angular to subrounded consisting of flint, brick fragments and concrete. Concrete cobbles are angular measuring up to 75mm. (MADE GROUND - PROBABLE DEMOLITION RUBBLE).	(0.15) 0.25	61.95	▨

End of Trialpit at 0.250m

1.0

Weather and environmental conditions:

1. Cold, Dry

Other comments:

1. Coordinates and ground level obtained using handheld GPS on site.
2. Service plans inspected and Trail Pit position scanned with CAT and Genny prior to breaking ground.
3. Trial Pit terminated at 0.25m as sufficient sampling depth had been achieved.
4. ACMs not identified visually in pit.
5. Trial Pit backfilled with arisings upon completion.

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HP02

Excavation method/plant: Shovel, Split Shovel

Shoring/support: None

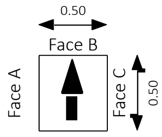
Project Name: Burnt Mill Academy
Site Location: Harlow
Client: Bowmer and Kirkland
Project No: 8511

Excavation date: 15/02/2023
Backfill date: 15/02/2023
Logged by: AB - ESP

Survey details:

Ground Level: 62.4 mOD
Easting: 545576 mOD
Northing: 210927 mOD
Bearing:

Plan details:



Face Stability:

Stable

Groundwater observations:

None Observed

Depth	Sample		Test Details		Strata Details			
m	Type	Class	Type	Result	Description	Depth (thickness)	mOD	Legend
					Soft to firm, dark brown speckled white, slightly sandy clayey SILT. Sand is fine to coarse. Brick fragments and porcelain. Abundant rootlets. Grass overlain. (MADE GROUND - TOPSOIL).	(0.60)		▨
0.50	ES							
					GEOTEXTILE MEMBRANE	0.60	61.80	▨
0.70	ES				Stiff, dark brown, gravelly sandy silty CLAY with low cobble content. Sand is fine to coarse, gravel is fine to coarse angular to subrounded consisting of flint, brick fragments and concrete. Concrete cobbles are angular measuring up to 80mm. Porcelain fragments present. (MADE GROUND - POSSIBLE REWORKED LOWESTOFT FORMATION).	0.60 (0.00) (0.60) 1.0	61.80	▨
					End of Trialpit at 1.200m	1.20	61.20	

Weather and environmental conditions:

1. Cold, Dry

Other comments:

1. Coordinates and ground level obtained using handheld GPS on site.
2. Service plans inspected and Trail Pit position scanned with CAT and Genny prior to breaking ground.
3. Trial Pit terminated at 1.2m as sufficient sampling depth had been achieved.
4. ACMs not identified visually in pit.
5. Trial Pit backfilled with arisings upon completion.

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Excavation method/plant: Shovel, Split Shovel
Shoring/support: None

HP03

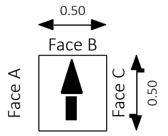
Project Name: Burnt Mill Academy
Site Location: Harlow
Client: Bowmer and Kirkland
Project No: 8511

Excavation date: 15/02/2023
Backfill date: 15/02/2023
Logged by: AB - ESP

Survey details:

Ground Level: 62.4 mOD
Easting: 545486 mOD
Northing: 210900 mOD
Bearing:

Plan details:



Face Stability:

Stable

Groundwater observations:

None Observed

Depth	Sample		Test Details		Strata Details			
m	Type	Class	Type	Result	Description	Depth (thickness)	mOD	Legend
					Soft to firm, dark brown speckled white, slightly sandy clayey SILT. Sand is fine to coarse. Brick fragments, concrete and porcelain. Abundant rootlets. Grass overlain. (MADE GROUND - TOPSOIL).	(*0.40*)		▨
0.35	ES							
					GEOTEXTILE MEMBRANE	0.40	62.00	
0.45	ES				Stiff, dark brown, gravelly sandy silty CLAY. Sand is fine to coarse, gravel is fine to coarse angular to subrounded consisting of flint, brick fragments and concrete. Porcelain fragments present. (MADE GROUND - POSSIBLE REWORKED LOWESTOFT FORMATION).	0.40 (*0.00*) (*0.40*)	62.00	▨
0.70	ES							
					End of Trialpit at 0.800m	0.80	61.60	
						1.0		

Weather and environmental conditions:

1. Cold, Dry

Other comments:

1. Coordinates and ground level obtained using handheld GPS on site.
2. Service plans inspected and Trail Pit position scanned with CAT and Genny prior to breaking ground.
3. Trial Pit terminated at 0.8m as sufficient sampling depth had been achieved.
4. ACMs not identified visually in pit.
5. Trial Pit backfilled with arisings upon completion.

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Excavation method/plant: Shovel, Split Shovel

Shoring/support: None

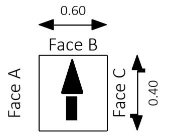
HP04

Project Name: Burnt Mill Academy
Site Location: Harlow
Client: Bowmer and Kirkland
Project No: 8511

Excavation date: 15/02/2023
Backfill date: 15/02/2023
Logged by: AB - ESP

Survey details:
Ground Level: 62.0 mOD
Easting: 545496 mOD
Northing: 210880 mOD
Bearing:

Plan details:



Face Stability:
Stable

Groundwater observations:
None Observed

Depth	Sample		Test Details		Strata Details			
m	Type	Class	Type	Result	Description	Depth (thickness)	mOD	Legend
0.10	ES				Soft to firm, dark brown speckled white, slightly sandy gravelly clayey SILT. Sand is fine to coarse, Gravel is fine to coarse rounded to subangular consisting of flint. Abundant rootlets. Grass overlain. (MADE GROUND - REWORKED TOPSOIL).	(*0.20*) 0.20	61.80	▨
0.30	ES				Soft to firm, dark brown, gravelly sandy silty CLAY. Sand is fine to coarse, gravel is fine to coarse angular to subrounded consisting of flint, brick fragments and concrete. Porcelain fragments present. (MADE GROUND - POSSIBLE REWORKED LOWESTOFT FORMATION)	(*0.10*) 0.30	61.70	▨
0.35	ES				Black, gravelly SAND with low cobble content. Sand is fine to coarse, gravel is fine to coarse angular to subrounded consisting of flint, brick fragments and concrete. Brick and concrete cobbles are angular to subangular measuring up to 65mm. Porcelain fragments present. (MADE GROUND - POSSIBLE BUILDING RUBBLE).	(*0.10*) 0.40	61.60	▨
0.60	ES				Light brown, gravelly silty SAND with low cobble content. Sand is fine to coarse, gravel is fine to coarse angular to subrounded consisting of flint, brick fragments and concrete. Rare brick cobbles are angular measuring up to 70mm. Plastic bottle present. (MADE GROUND - PROBABLE REWORKED NATURAL DEPOSITS).	(*0.20*) 0.60	61.40	▨
					End of Trialpit at 0.600m			
						1.0		

Weather and environmental conditions:
1. Cold, Dry

Other comments:
1. Coordinates and ground level obtained using handheld GPS on site.
2. Service plans inspected and Trail Pit position scanned with CAT and Genny prior to breaking ground.
3. Trial Pit terminated at 0.6m as sufficient sampling depth had been achieved.
4. ACMs not identified visually in pit.
5. Trial Pit backfilled with arisings upon completion.

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Excavation method/plant: Shovel, Split Shovel

Shoring/support: None

HP05

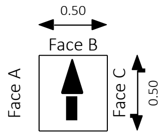
Project Name: Burnt Mill Academy
Site Location: Harlow
Client: Bowmer and Kirkland
Project No: 8511

Excavation date: 15/02/2023
Backfill date: 15/02/2023
Logged by: AB - ESP

Survey details:

Ground Level: 62.0 mOD
Easting: 545501 mOD
Northing: 210871 mOD
Bearing:

Plan details:



Face Stability:

Stable

Groundwater observations:

None Observed

Depth	Sample		Test Details		Strata Details			
m	Type	Class	Type	Result	Description	Depth (thickness)	mOD	Legend
0.05	ES				Firm to stiff, dark brown speckled white, slightly sandy gravelly clayey SILT. Sand is fine to coarse, Gravel is fine to coarse rounded to subangular consisting of flint. Brick fragments, concrete and porcelain. Abundant rootlets. Grass overlain. (MADE GROUND - REWORKED TOPSOIL).			▨
						(*0.40*)		
0.30	ES							
						0.40	61.60	
					End of Trialpit at 0.400m			
						1.0		

Weather and environmental conditions:

1. Cold, Dry

Other comments:

1. Coordinates and ground level obtained using handheld GPS on site.
2. Service plans inspected and Trail Pit position scanned with CAT and Genny prior to breaking ground.
3. Trial Pit terminated at 0.4m as sufficient sampling depth had been achieved.
4. ACMs not identified visually in pit.
5. Trial Pit backfilled with arisings upon completion.

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Excavation method/plant: Hand tools

Shoring/support: Unsupported

HP06

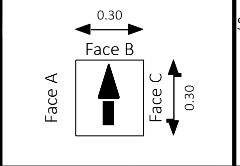
Project Name: Burnt Mill Academy
Site Location: Harlow
Client: Bowmer and Kirkland
Project No: 8511

Excavation date: 28/02/2023
Backfill date: 28/02/2023
Logged by: ESP - MRS

Survey details:

Ground Level: 61.4 mOD
Easting: 545481 mOD
Northing: 210906 mOD
Bearing:

Plan details:



Face Stability:

Stable

Groundwater observations:

No groundwater encountered

Depth	Sample		Test Details		Strata Details			
m	Type	Class	Type	Result	Description	Depth (thickness)	mOD	Legend
0.10	ES				Light brown silty gravelly fine to medium SAND. Gravel is fine to coarse angular to subrounded flint, brick and tarmac. Also containing rare glass. (TOPSOIL)	(0.25) 0.25	61.15	▨
0.45	ES				Dark brown slightly silty slightly gravelly fine to coarse SAND. Gravel is fine to coarse angular to subrounded flint and brick (MADE GROUND)	(0.35) 0.60	60.80	▨
0.65	ES				Brown silty slightly clayey very sandy fine to coarse GRAVEL. Gravel is angular to rounded flint with rare tarmac. Also containing rare plastic. (MADE GROUND)	(0.20) 0.80	60.60	▨
					End of Trialpit at 0.800m			
						1.0		

Weather and environmental conditions:

1.

Other comments:

1. Location scanned with CAT and genny prior to breaking ground.
2. Excavated to 0.8 m depth, no membrane encountered.
3. Backfilled with arisings on completion.

Earth Science Partnership
Consulting Engineers | Geologists | Environmental Scientists

Excavation method/plant: Hand tools

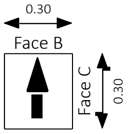
Shoring/support: Unsupported

HP07

Project Name: Burnt Mill Academy
Site Location: Harlow
Client: Bowmer and Kirkland
Project No: 8511

Excavation date: 28/02/2023
Backfill date: 28/02/2023
Logged by: ESP - MRS

Plan details:



Face Stability:
Stable

Groundwater observations:
No groundwater encountered

Survey details:
Ground Level: 62.2 mOD
Easting: 545482 mOD
Northing: 210918 mOD
Bearing:

Depth	Sample		Test Details		Strata Details			
m	Type	Class	Type	Result	Description	Depth (thickness)	mOD	Legend
0.10	ES				Brown gravelly silty fine to medium SAND. Gravell is fine to coarse angular to rounded flint and rare brick. (TOPSOIL)	(0.25)		▨
						0.25	61.95	
					Dark brown sandy silty slightly clayey fine to coarse GRAVEL. Gravel is angular to rounded flint, brick and slag. Also containing rare metal fragment. (MADE GROUND)			▨
0.50	ES							
						(0.75)		
					End of Trialpit at 1.000m	1.00	61.20	

Weather and environmental conditions:
1.

Other comments:
1. Location scanned with CAT and genny prior to breaking ground.
2. Excavated to 1.0 m depth, no membrane encountered.
3. Backfilled with arisings on completion.

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Excavation method/plant: Hand tools

Shoring/support: Unsupported

HP08

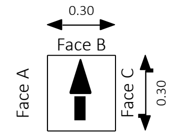
Project Name: Burnt Mill Academy
Site Location: Harlow
Client: Bowmer and Kirkland
Project No: 8511

Excavation date: 28/02/2023
Backfill date: 28/02/2023
Logged by: ESP - MRS

Survey details:

Ground Level: 62.3 mOD
Easting: 545474 mOD
Northing: 210926 mOD
Bearing:

Plan details:



Face Stability:

Stable

Groundwater observations:

No groundwater encountered

Depth	Sample		Test Details		Strata Details			
m	Type	Class	Type	Result	Description	Depth (thickness)	mOD	Legend
0.10	ES				Brown silty fine to medium SAND and GRAVEL. Gravel is fine to coarse angular to subrounded flint, brick and tarmac. Also containing rare wood. (TOPSOIL) Geotextile membrane present in base of pit	(*0.38*) 0.38	61.92	▨
					End of Trialpit at 0.380m	1.0		

Weather and environmental conditions:

1.

Other comments:

1. Location scanned with CAT and genny prior to breaking ground.
2. Excavated to 0.38 m depth where membrane is present.
3. Backfilled with arisings on completion.

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HP09

Excavation method/plant: Hand tools

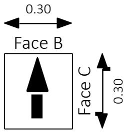
Shoring/support: Unsupported

Project Name: Burnt Mill Academy
Site Location: Harlow
Client: Bowmer and Kirkland
Project No: 8511

Excavation date: 01/03/2023
Backfill date: 01/03/2023
Logged by: ESP - MRS

Survey details:
Ground Level: 62.5 mOD
Easting: 545478 mOD
Northing: 210938 mOD
Bearing:

Plan details:



Face Stability:
Stable

Groundwater observations:
No groundwater encountered

Depth	Sample		Test Details		Strata Details			
m	Type	Class	Type	Result	Description	Depth (thickness)	mOD	Legend
					Brown slightly silty gravelly fine to medium SAND. Gravel is fine to coarse angular to subrounded flint and rare brick. (TOPSOIL)			▨
0.30	ES					(0.58)		
					Geotextile membrane present in base of pit			
						0.58	61.92	
					End of Trialpit at 0.580m			
						1.0		

Weather and environmental conditions:
1.

Other comments:
1. Location scanned with CAT and genny prior to breaking ground.
2. Excavated to 0.58 m depth where membrane is present.
3. Backfilled with arisings on completion.

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Excavation method/plant: Hand tools

Shoring/support: Unsupported

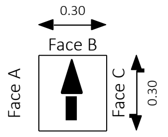
HP10

Project Name: Burnt Mill Academy
Site Location: Harlow
Client: Bowmer and Kirkland
Project No: 8511

Excavation date: 01/03/2023
Backfill date: 01/03/2023
Logged by: ESP - MRS

Survey details:
Ground Level: 62.6 mOD
Easting: 545476 mOD
Northing: 210948 mOD
Bearing:

Plan details:



Face Stability:
Stable

Groundwater observations:
No groundwater encountered

Depth	Sample		Test Details		Strata Details			
m	Type	Class	Type	Result	Description	Depth (thickness)	mOD	Legend
0.10	ES				Dark brown slightly silty fine to coarse SAND and GRAVEL. Gravel is angular to subrounded flint, brick and tile. (TOPSOIL) Geotextile membrane present in base of pit	(*0.25*) 0.25	62.35	▨
					End of Trialpit at 0.250m			
						1.0		

Weather and environmental conditions:
1.

Other comments:
1. Location scanned with CAT and genny prior to breaking ground.
2. Excavated to 0.25 m depth where membrane is present.
3. Backfilled with arisings on completion.

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Excavation method/plant: Hand tools

Shoring/support: Unsupported

HP11

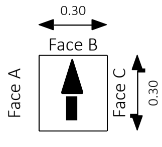
Project Name: Burnt Mill Academy
Site Location: Harlow
Client: Bowmer and Kirkland
Project No: 8511

Excavation date: 01/03/2023
Backfill date: 01/03/2023
Logged by: ESP - MRS

Survey details:

Ground Level: 62.8 mOD
Easting: 545467 mOD
Northing: 210953 mOD
Bearing:

Plan details:



Face Stability:

Stable

Groundwater observations:

No groundwater encountered

Depth	Sample		Test Details		Strata Details			
m	Type	Class	Type	Result	Description	Depth (thickness)	mOD	Legend
0.10	ES				Dark brown slightly gravelly very silty fine to medium SAND. Gravel is fine to medium angular to subrounded flint. (TOPSOIL)	(0.20)		▨
						0.20	62.60	
					Firm to stiff brown very gravelly slightly sandy silty CLAY. Gravel is fine to coarse angular to rounded flint, chalk, brick and concrete. (MADE GROUND)			▨
0.40	ES							
						(0.60)		
					End of Trialpit at 0.800m	0.80	62.00	
						1.0		

Weather and environmental conditions:

1.

Other comments:

1. Location scanned with CAT and genny prior to breaking ground.
2. Excavated to 0.8 m depth, no membrane encountered.
3. Backfilled with arisings on completion.

Appendix G ESP Windowless Sample Drillhole Records (inc. Supplementary)

Earth Science Partnership
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WS103

Project Name: Burnt Mill Academy
Site Location: Harlow
Client: Bowmer and Kirkland
Project No: 8511

Drilling method Windowless Sample
Equipment Terrier 3000

Start date: 15/02/2023
End date: 15/02/2023
Backfill date: 15/02/2023
Driller: Endeavour Drilling
Logged by: AB - ESP
Date logged: 15/02/2023

Ground Level: 64.20 mOD
Easting: 545557 m
Northing: 210811 m

Depth	Sample Type	Sample Class	Test Type	Test Result	TCR (%)	Water Depth	Casing Depth
0.20	ES						
0.80	B						
1.10	B						
1.20 - 2.00	B		SPT	11 (3,2/3,3,2,3)			
			SPT	26 (5,7/7,7,8,4)			
3.00 - 4.00	B		SPT	28 (2,7/6,8,7,7)			

Strata Description	Legend	Water Strikes/Standing	Depth (Thickness)	mOD
Firm, dark brown, sandy SILT. Sand is fine to coarse. (MADE GROUND - TOPSOIL).	▩		(0.15) 0.15	64.05
Loose, yellowish brown, very sandy silty clayey GRAVEL. Sand is fine to coarse, gravel is fine to coarse rounded to subrounded consisting of flint and chalk fragments. Rare brick and concrete present. (MADE GROUND).	▩		(0.25) 0.40	63.80
Loose, orangey brown, very gravelly silty SAND. Sand is fine to coarse, gravel is fine to coarse rounded to subrounded consisting of flint and chalk fragments. (GLACIOFLUVIAL DEPOSITS).	⁘		(0.50) 0.90	63.30
Loose, yellowish brown, slightly gravelly silty SAND. Sand is fine to coarse, gravel is fine to coarse rounded to subrounded consisting of flint. (GLACIOFLUVIAL DEPOSITS).	⁘		(0.30) 1.20	63.00
Medium dense orange brown slightly silty very sandy fine to coarse GRAVEL. Gravel is angular to rounded flint. (GLACIOFLUVIAL DEPOSITS)	⁘		(2.80) 4.00	60.20

End of Borehole at 4.000m

Progress & Standing Water Levels

Date	Time	Hole Depth	Casing Depth	Water Depth

Water Strikes

Date	Time	Strike Depth	Casing Depth	Elapsed Minutes	Depth to Water	Depth Sealed

Chiselling

Depth Top	Depth Base	Duration

Hole Diameter

Hole Depth	Hole Diameter
2.00	101
3.00	87
4.00	77

Casing Diameter

Casing Diameter	Casing Depth
150	21.00

General Remarks

1. Coordinates obtained using handheld GPS on site, ground levels inferred from topographic survey.
2. Service plans inspected and Windowless Sample position scanned with CAT and Genny prior to breaking ground.
3. Windowless Sample terminated at 4.0m.
4. No groundwater encountered.
5. Collapsed back to 3 m depth on completion.
6. 50mm Groundwater monitoring well installed with response zone between 1 - 3m .

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Project Name: Burnt Mill Academy
Site Location: Harlow
Client: Bowmer and Kirkland
Project No: 8511

Drilling method Windowless Sample
Equipment Terrier 3000

WS104

Start date: 15/02/2023
End date: 15/02/2023
Backfill date: 15/02/2023

Driller: Endeavour Drilling
Logged by: AB - ESP
Date logged: 15/02/2023

Ground Level: 62.50 mOD
Easting: 545542 m
Northing: 210841 m

Depth	Sample Type	Sample Class	Test Type	Test Result	TCR (%)	Water Depth	Casing Depth
0.30	ES						
0.80	B						
1.20 - 2.00	B		SPT	7 (1,1/2,2,2,1)			
			SPT	8 (1,1/2,2,2,2)			
2.50	D						
			SPT	3 (0,0/1,0,1,1)			

Description	Legend	Water Strikes/ Standing	Depth (Thickness)	mOD
Firm, dark brown, sandy SILT. Sand is fine to coarse. (MADE GROUND).	▨		(0.10) 0.10	62.40
Loose, light brown, very gravelly slightly silty SAND with low cobble content. Sand is fine to coarse, gravel is fine to coarse subangular to subrounded consisting of flint, brick and concrete. Flint cobbles are rounded to subrounded measuring up to 70mm. (MADE GROUND).	▨		(0.30) 0.40	62.10
Loose, orangey brown, gravelly silty SAND with low cobble content. Sand is fine to medium, gravel is fine to coarse rounded to subrounded consisting of flint. Flint cobbles are rounded to subrounded measuring up to 80mm. (GLACIOFLUVIAL DEPOSITS). Gravel content is rare past 1.2 m depth Becoming very loose at 3m depth	░		(2.60) 3.00	59.50
End of Borehole at 3.000m				

Progress & Standing Water Levels

Date	Time	Hole Depth	Casing Depth	Water Depth

Water Strikes

Date	Time	Strike Depth	Casing Depth	Elapsed Minutes	Depth to Water	Depth Sealed

Chiselling

Depth Top	Depth Base	Duration

Hole Diameter

Hole Depth	Hole Diameter
2.00	101
3.00	87

Casing Diameter

Casing Diameter	Casing Depth
150	21.00

General Remarks

1. Coordinates obtained using handheld GPS on site, ground levels inferred from topographic survey.
2. Service plans inspected and Windowless Sample position scanned with CAT and Genny prior to breaking ground.
3. Windowless Sample terminated at 3.0m.
4. No groundwater encountered.
5. 50mm Groundwater monitoring well installed with response zone between 1 - 3m .

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WS105

Start date: 15/02/2023	**Driller:** Endeavour Drilling	**Project Name:** Burnt Mill Academy	**Drilling method** Windowless Sample
End date: 15/02/2023	**Logged by:** AB - ESP	**Site Location:** Harlow	**Equipment** Terrier 3000
Backfill date: 15/02/2023	**Date logged:** 15/02/2023	**Client:** Bowmer and Kirkland	**Ground Level:** 61.50 mOD
		Project No: 8511	**Easting:** 545421 m
			Northing: 210843 m

Depth	Sample Type	Sample Class	Test Type	Test Result	TCR (%)	Water Depth	Casing Depth	Strata Description	Legend	Water Strikes/ Standing	Depth (Thickness)	mOD	Backfill/ Install-ations
								Firm, dark brown, sandy SILT. Sand is fine to coarse. (MADE GROUND).			(0.10) 0.10	61.40	
0.30	ES							Soft to firm, dark brown mottled white, gravelly sandy CLAY. Sand is fine to coarse, gravel is fine to coarse angular to subrounded consisting of flint, brick and concrete. (MADE GROUND).			(0.30) 0.40	61.10	
1.00	B							Soft to firm, dark brown mottled white gravelly sandy CLAY. Sand is fine to coarse, gravel is fine to coarse rounded to subrounded consisting of flint. (MADE GROUND).			(0.80) 1.20	60.30	
 1.30	 D		SPT	2 (1,1/1,0,1,0)				Very soft to soft dark greeny brown mottled red brown and orange brown sandy gravelly silty CLAY. Gravel is angular to rounded chalk and flint with rare brick and coal. (MADE GROUND) Containing occasional very dark pockets with a slight odour between 1.5 to 1.8 m depth - Possible relict topsoil			(0.60) 1.80	59.70	
1.90 2.60 3.70	D D D		 SPT SPT SPT	 12 (1,2/2,3,3,4) 14 (4,2/1,3,5,5) 27 (2,3/6,6,7,8)				Firm to stiff greeny grey very gravelly silty CLAY. Gravel is fine to coarse subangular to rounded chalk with a little flint. (LOWESTOFT FORMATION) Light grey mottled yellow brown past 2.0 m depth			(3.20)		

Depth scale: 1, 2, 3, 4

Progress & Standing Water Levels

Date	Time	Hole Depth	Casing Depth	Water Depth

Water Strikes

Date	Time	Strike Depth	Casing Depth	Elapsed Minutes	Depth to Water	Depth Sealed

Chiselling

Depth Top	Depth Base	Duration

Hole Diameter

Hole Depth	Hole Diameter
2.00	101
3.00	87
4.00	77
5.00	77

Casing Diameter

Casing Diameter	Casing Depth
150	21.00

General Remarks

1. Coordinates obtained using handheld GPS on site, ground levels inferred from topographic survey.
2. Service plans inspected and Windowless Sample position scanned with CAT and Genny prior to breaking ground.
3. Windowless Sample terminated at 5.0m.
4. No groundwater encountered.
5. Collapsed back to 4 m depth on completion.
6. 50mm Groundwater monitoring well installed with response zone between 1 - 4m.

Earth Science Partnership
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Project Name: Burnt Mill Academy
Site Location: Harlow
Client: Bowmer and Kirkland
Project No: 8511

Drilling method
Windowless Sample

Equipment
Terrier 3000

WS105

Start date: 15/02/2023
End date: 15/02/2023
Backfill date: 15/02/2023

Driller: Endeavour Drilling
Logged by: AB - ESP
Date logged: 15/02/2023

Ground Level: 61.50 mOD
Easting: 545421 m
Northing: 210843 m

Depth	Sample		Test Details		TCR (%)	Water Depth	Casing Depth	Strata Details		Water	Depth		Backfill/ Install-ations
	Type	Class	Type	Result				Description	Legend	Strikes/ Standing	Depth (Thickness)	mOD	
								End of Borehole at 5.000m			5.00	56.50	
											6		
											7		
											8		
											9		

Progress & Standing Water Levels

Date	Time	Hole Depth	Casing Depth	Water Depth

Water Strikes

Date	Time	Strike Depth	Casing Depth	Elapsed Minutes	Depth to Water	Depth Sealed

Chiselling

Depth Top	Depth Base	Duration

Hole Diameter

Hole Depth	Hole Diameter
2.00	101
3.00	87
4.00	77
5.00	77

Casing Diameter

Casing Diameter	Casing Depth
150	21.00

General Remarks

1. Coordinates obtained using handheld GPS on site, ground levels inferred from topographic survey.
2. Service plans inspected and Windowless Sample position scanned with CAT and Genny prior to breaking ground.
3. Windowless Sample terminated at 5.0m.
4. No groundwater encountered.
5. Collapsed back to 4 m depth on completion.
6. 50mm Groundwater monitoring well installed with response zone between 1 - 4m.

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WS106

Start date:	16/02/2023	**Driller:**	Endeavour Drilling
End date:	16/02/2023	**Logged by:**	AB - ESP
Backfill date:	16/02/2023	**Date logged:**	16/02/2023

Project Name: Burnt Mill Academy
Site Location: Harlow
Client: Bowmer and Kirkland
Project No: 8511

Drilling method Windowless Sample
Equipment Terrier 3000

Ground Level: 61.40 mOD
Easting: 545382 m
Northing: 210858 m

Depth	Sample Type	Sample Class	Test Type	Test Result	TCR (%)	Water Depth	Casing Depth
0.20	ES						
0.50	ES						
0.60	D						
1.20	B		SPT	14 (1,2/4,4,4,2)			
1.30	D						
1.70	D						
2.00 - 2.50	B		SPT	2 (1,0/1,0,1,0)			
			SPT	1 (0,0/0,1,0,0)			
3.30	D						
3.50	D						
			SPT	2 (1,1/1,0,1,0)			
4.70	D						

Strata Details Description	Legend	Water Strikes/ Standing	Depth (Thickness)	mOD
Firm, dark brown, sandy SILT. Sand is fine to coarse. (MADE GROUND).			(0.15) 0.15	61.25
Soft to firm, dark brown mottled white, gravelly sandy CLAY with low cobble content. Sand is fine to coarse, gravel is fine to coarse angular to subrounded consisting of flint, brick and concrete. Concrete cobbles are angular to subangular measuring up to 65mm. (MADE GROUND).			(0.25) 0.40	61.00
Soft to firm, dark brown, very gravelly sandy CLAY. Sand is fine to coarse, gravel is fine to coarse rounded to subrounded consisting of flint. (POSSIBLE MADE GROUND).			(0.50) 0.90	60.50
Loose, orangey brown, gravelly silty SAND with low cobble content. Sand is fine to medium, gravel is fine to coarse rounded to subrounded consisting of flint. flint cobbles are rounded measuring up to 70mm. (POSSIBLE MADE GROUND).			(0.30) 1.20	60.20
Firm dark brownish grey mottled orange brown gravelly very sandy very silty CLAY. Gravel is fine to coarse angular to rounded flint. (POSSIBLE MADE GROUND)			(0.20) 1.40	60.00
Very loose light orange brown silty fine to coarse SAND and GRAVEL. Gravel is angular to rounded flint. With layers of soft very silty clay. (POSSIBLE MADE GROUND)			(1.50) 2.90	58.50
Very soft to firm dark greeny grey gravelly very sandy very silty CLAY. Gravel is fine to coarse angular to rounded flint. (POSSIBLE MADE GROUND) Very dark grey to black in colour containing plant matter with a slight organic odour between 3.4 to 3.6 m		→	(2.10)	

Progress & Standing Water Levels

Date	Time	Hole Depth	Casing Depth	Water Depth

Water Strikes

Date	Time	Strike Depth	Casing Depth	Elapsed Minutes	Depth to Water	Depth Sealed
16/02/2023	12:00	5.00	0.00	5.00	0.00	

Chiselling

Depth Top	Depth Base	Duration

Hole Diameter

Hole Depth	Hole Diameter
2.00	101
3.00	87
4.00	77
5.00	67

Casing Diameter

Casing Diameter	Casing Depth
150	21.00

General Remarks

1. Coordinates obtained using handheld GPS on site, ground levels inferred from topographic survey.
2. Service plans inspected and Windowless Sample position scanned with CAT and Genny prior to breaking ground.
3. Water strike encountered at 5.0m depth with fragments of brick, inferred as possible service and borehole terminated with no SPT at 5m depth.
4. 50mm Groundwater monitoring well installed with response zone between 1 - 5m.

Earth Science Partnership
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Project Name: Burnt Mill Academy
Site Location: Harlow
Client: Bowmer and Kirkland
Project No: 8511

Drilling method Windowless Sample
Equipment Terrier 3000

WS106

Start date: 16/02/2023
End date: 16/02/2023
Backfill date: 16/02/2023

Driller: Endeavour Drilling
Logged by: AB - ESP
Date logged: 16/02/2023

Ground Level: 61.40 mOD
Easting: 545382 m
Northing: 210858 m

Depth	Sample		Test Details		TCR	Water	Casing	Strata Details		Water	Depth		Backfill/ Install-ations
	Type	Class	Type	Result	(%)	Depth	Depth	Description	Legend	Strikes/ Standing	Depth (Thickness)	mOD	
								End of Borehole at 5.000m			5.00	56.40	
											6		
											7		
											8		
											9		

Progress & Standing Water Levels

Date	Time	Hole Depth	Casing Depth	Water Depth

Water Strikes

Date	Time	Strike Depth	Casing Depth	Elapsed Minutes	Depth to Water	Depth Sealed
16/02/2023	12:00	5.00	0.00	5.00	0.00	

Chiselling

Depth Top	Depth Base	Duration

Hole Diameter

Hole Depth	Hole Diameter
2.00	101
3.00	87
4.00	77
5.00	67

Casing Diameter

Casing Diameter	Casing Depth
150	21.00

General Remarks

1. Coordinates obtained using handheld GPS on site, ground levels inferred from topographic survey.
2. Service plans inspected and Windowless Sample position scanned with CAT and Genny prior to breaking ground.
3. Water strike encountered at 5.0m depth with fragments of brick, inferred as possible service and borehole terminated with no SPT at 5m depth.
4. 50mm Groundwater monitoring well installed with response zone between 1 - 5m.

Earth Science Partnership
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Start date: 16/02/2023	**Driller:** Endeavour Drilling	**Project Name:** Burnt Mill Academy	**Drilling method** Windowless Sample
End date: 16/02/2023	**Logged by:** AB - ESP	**Site Location:** Harlow	**Equipment** Terrier 3000
Backfill date: 16/02/2023	**Date logged:** 16/02/2023	**Client:** Bowmer and Kirkland	**Ground Level:** 61.80 mOD
		Project No: 8511	**Easting:** 545436 m
			Northing: 210868 m

WS107

Depth	Sample Type	Sample Class	Test Type	Test Result	TCR (%)	Water Depth	Casing Depth
0.30	ES						
0.60	ES						
1.00	D						
1.20	ES		SPT	8 (1,2/2,2,2,2)			
1.30	D						
1.90	D						
			SPT	2 (0,0/0,0,1,1)			
2.40	D						
			SPT	6 (1,1/1,1,2,2)			
3.30	D						
3.90	D						
			SPT	17 (1,3/3,4,4,6)			
4.50	D						

Strata Description	Legend	Water Strikes/ Standing	Depth (Thickness)	mOD	Backfill/ Installations
Firm, dark brown, sandy SILT. Sand is fine to coarse. (MADE GROUND).	▨		(0.10) 0.10	61.70	▨
Loose to medium dense, black, very sandy GRAVEL with low cobble content. Sand is fine to coarse, gravel is fine to coarse rounded to subangular consisting of flint, brick and concrete. (MADE GROUND).	▨		(0.30) 0.40	61.40	▨
Soft to firm, dark brown, very gravelly sandy CLAY with low cobble content. Sand is fine to coarse, gravel is fine to coarse angular to subrounded consisting of flint, brick and concrete. Concrete cobbles are angular to subangular measuring up to 80mm. (MADE GROUND).	▨		(1.40) 1.80	60.00	▨
Stiff dark greyish brown gravelly very sandy silty CLAY. Gravel is fine to coarse angular to rounded flint with rare brick and chalk. (MADE GROUND)	▨		(0.20) 2.00	59.80	▨
Very soft to firm greeny grey slightly sandy silty CLAY. Gravel is fine to coarse angular to rounded flint and rare brick. With a slight organic odour. (MADE GROUND - Possible relict topsoil)	▨		(0.60) 2.60	59.20	▨
Soft to firm light brown sandy gravelly silty CLAY. Gravel is fine to medium subangular to subrounded chalk and flint. (LOWESTOFT FORMATION) With a layer of firm blue grey slightly gravelly silty clay between 3.5 to 4.0 m	∴		(2.40)		▨

Progress & Standing Water Levels

Date	Time	Hole Depth	Casing Depth	Water Depth

Water Strikes

Date	Time	Strike Depth	Casing Depth	Elapsed Minutes	Depth to Water	Depth Sealed

Chiselling

Depth Top	Depth Base	Duration

Hole Diameter

Hole Depth	Hole Diameter
2.00	101
3.00	101
4.00	87
5.00	77

Casing Diameter

Casing Diameter	Casing Depth
150	21.00

General Remarks

1. Coordinates obtained using handheld GPS on site, ground levels inferred from topographic survey.
2. Service plans inspected and Windowless Sample position scanned with CAT and Genny prior to breaking ground.
3. Windowless Sample terminated at 5.0m.
4. No groundwater encountered.
5. Backfilled with arisings on completion.

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WS107

Project Name:	Burnt Mill Academy	**Drilling method**	Windowless Sample
Site Location:	Harlow	**Equipment**	Terrier 3000
Client:	Bowmer and Kirkland	**Ground Level:**	61.80 mOD
Project No:	8511	**Easting:**	545436 m
		Northing:	210868 m

Start date:	16/02/2023	**Driler:**	Endeavour Drilling
End date:	16/02/2023	**Logged by:**	AB - ESP
Backfill date:	16/02/2023	**Date logged:**	16/02/2023

Depth	Sample		Test Details		TCR (%)	Water Depth	Casing Depth	Strata Details		Water	Depth		Backfill/ Install-ations
	Type	Class	Type	Result				Description	Legend	Strikes/ Standing	Depth (Thickness)	mOD	
			SPT	22 (2,3/4,6,5,7)				End of Borehole at 5.000m			5.00	56.80	

Progress & Standing Water Levels

Date	Time	Hole Depth	Casing Depth	Water Depth

Water Strikes

Date	Time	Strike Depth	Casing Depth	Elapsed Minutes	Depth to Water	Depth Sealed

Chiselling

Depth Top	Depth Base	Duration

Hole Diameter

Hole Depth	Hole Diameter
2.00	101
3.00	101
4.00	87
5.00	77

Casing Diameter

Casing Diameter	Casing Depth
150	21.00

General Remarks

1. Coordinates obtained using handheld GPS on site, ground levels inferred from topographic survey.
2. Service plans inspected and Windowless Sample position scanned with CAT and Genny prior to breaking ground.
3. Windowless Sample terminated at 5.0m.
4. No groundwater encountered.
5. Backfilled with arisings on completion.

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Start date:	16/02/2023	**Driller:**	Endeavour Drilling
End date:	16/02/2023	**Logged by:**	AB - ESP
Backfill date:	16/02/2023	**Date logged:**	16/02/2023

Project Name: Burnt Mill Academy
Site Location: Harlow
Client: Bowmer and Kirkland
Project No: 8511

Drilling method Windowless Sample
Equipment Terrier 3000

Ground Level:	62.30 mOD
Easting:	545491 m
Northing:	210811 m

WS108

Depth	Sample		Test Details		TCR (%)	Water Depth	Casing Depth
	Type	Class	Type	Result			
0.30	ES						
0.60	ES						
0.80	D						
1.10	B						
1.20 - 2.00	B		SPT	5 (1,1/1,1,1,2)			
			SPT	7 (1,2/1,2,2,2)			
2.50	D						
			SPT	18 (1,0/3,4,5,6)			
3.10	D						
4.00 - 5.00	B		SPT	18 (4,4/5,4,4,5)			

Strata Details		Water	Depth		Backfill/ Install-ations
Description	Legend	Strikes/ Standing	Depth (Thickness)	mOD	
TARMACADAM COVER (MADE GROUND).			(0.05) 0.05	62.25	
Medium dense, greyish black, sandy GRAVEL with low cobble content. Sand is fine to coarse, gravel is fine to coarse angular to subangular consisting of brick and concrete. (MADE GROUND).			(0.35) 0.40	61.90	
Loose, orangey brown, silty fine to medium SAND (GLACIOFLUVIAL DEPOSITS)			1 (2.50) 2 2.90	59.40	
Soft light brown slightly sandy very silty CLAY. (GLACIOFLUVIAL DEPOSITS)			3 (0.40) 3.30	59.00	
Probable medium-dense, light brown slightly silty fine to coarse SAND and GRAVEL. Gravel is angular to rounded flint. (GLACIOFLUVIAL DEPOSITS)			(0.70) 4.00	58.30	
Medium dense light brown gravelly silty fine to coarse SAND. Gravel is fine to coarse angular to rounded flint with rare chalk. (GLACIOFLUVIAL DEPOSITS)			(1.00)		

Progress & Standing Water Levels

Date	Time	Hole Depth	Casing Depth	Water Depth

Water Strikes

Date	Time	Strike Depth	Casing Depth	Elapsed Minutes	Depth to Water	Depth Sealed

Chiselling

Depth Top	Depth Base	Duration

Hole Diameter

Hole Depth	Hole Diameter
2.00	101
3.00	87
4.00	77
5.00	77

Casing Diameter

Casing Diameter	Casing Depth
150	21.00

General Remarks

1. Coordinates obtained using handheld GPS on site, ground levels inferred from topographic survey.
2. Service plans inspected and Windowless Sample position scanned with CAT and Genny prior to breaking ground.
3. Windowless Sample terminated at 5.0m.
4. No groundwater encountered.
5. Backfilled with arisings on completion.

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Start date: 16/02/2023	**Driller:** Endeavour Drilling	**Project Name:** Burnt Mill Academy	**Drilling method** Windowless Sample
End date: 16/02/2023	**Logged by:** AB - ESP	**Site Location:** Harlow	**Equipment** Terrier 3000
Backfill date: 16/02/2023	**Date logged:** 16/02/2023	**Client:** Bowmer and Kirkland	**Ground Level:** 62.30 mOD
		Project No: 8511	**Easting:** 545491 m
			Northing: 210811 m

WS108

Depth	Sample		Test Details		TCR (%)	Water Depth	Casing Depth	Strata Details		Water	Depth		Backfill/ Install-ations
	Type	Class	Type	Result				Description	Legend	Strikes/ Standing	Depth (Thickness)	mOD	
			SPT	18 (2,2/3,4,5,6)				End of Borehole at 5.000m			5.00	57.30	
											6		
											7		
											8		
											9		

Progress & Standing Water Levels

Date	Time	Hole Depth	Casing Depth	Water Depth

Water Strikes

Date	Time	Strike Depth	Casing Depth	Elapsed Minutes	Depth to Water	Depth Sealed

Chiselling

Depth Top	Depth Base	Duration

Hole Diameter

Hole Depth	Hole Diameter
2.00	101
3.00	87
4.00	77
5.00	77

Casing Diameter

Casing Diameter	Casing Depth
150	21.00

General Remarks

1. Coordinates obtained using handheld GPS on site, ground levels inferred from topographic survey.
2. Service plans inspected and Windowless Sample position scanned with CAT and Genny prior to breaking ground.
3. Windowless Sample terminated at 5.0m.
4. No groundwater encountered.
5. Backfilled with arisings on completion.

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Project Name: Burnt Mill Academy
Site Location: Harlow
Client: Bowmer and Kirkland
Project No: 8511.02

Drilling method
Windowless sampled borehole

Equipment
Tracked terrier rig

WS201

Start date: 12/06/2023
End date: 12/06/2023
Backfill date: 12/06/2023

Driller: SWGT
Logged by: ESP-MRS
Date logged: 12/06/2023

Ground Level: 61.40 mOD
Easting: 545385 m
Northing: 210840 m

Depth	Sample Type	Sample Class	Test Type	Test Result	TCR (%)	Water Depth	Casing Depth
0.10	ES						
0.30	ES						
0.40	B						
0.70	ES						
0.80	B						
			SPT-C	9 (1,2/3,2,2,2)			
1.30	ES						
					80		
1.70 - 2.00	B						
			SPT-C	5 (1,1/1,1,1,2)			
2.30	D						
					90		
2.80	D						
			SPT-C	6 (1,3/2,2,1,1)			
3.50	ES				80		
			SPT-C	11 (2,3/3,3,2,3)			
4.50	D				90		

Strata Description	Water Strikes/ Standing	Depth (Thickness)	mOD
Light greyish brown silty very gravelly SAND. Gravel is fine to coarse angular to rounded flint and sandstone. Also containing rare plastic. (MADE GROUND - TOPSOIL)		(0.15) 0.15	61.25
Light brown silty fine to coarse SAND and GRAVEL. Gravel is angular to rounded flint with rare chalk, brick and mudstone. Also containing rare fragments of metal reinforcement wire. (MADE GROUND)		(0.35) 0.50	60.90
Firm to stiff dark orange brown very gravelly slightly sandy slightly silty CLAY with low cobble content. Gravel is fine to coarse angular to rounded flint and chalk with rare brick. (MADE GROUND - POSSIBLE REWORKED LOWESTOFT FORMATION)		(0.60) 1.10	60.30
Loose dark yellow brown slightly silty fine to coarse SAND and GRAVEL. Gravel is fine to coarse angular to rounded flint and rare brick. Also containing pockets of soft brown clay. (MADE GROUND)		(1.00) 2.10	59.30
Soft grey mottled orange brown gravelly sandy very silty CLAY. Gravel is fine to coarse angular to rounded flint, chalk and brick. With pockets of orange brown sand. (MADE GROUND)		(1.30) 3.40	58.00
Soft very dark grey mottled black very gravelly silty CLAY with slight organic odour. Gravel is fine to coarse angular to subrounded flint. With rare decaying plant matter. (MADE GROUND - POSSIBLE RELICT TOPSOIL)		(0.50) 3.90	57.50
Firm to stiff greeny grey mottled orange brown gravelly silty CLAY. Gravel is fine to coarse angular to subrounded chalk and flint. (LOWESTOFT FORMATION)		(1.10)	

Progress & Standing Water Levels

Date	Time	Hole Depth	Casing Depth	Water Depth

Water Strikes

Date	Time	Strike Depth	Casing Depth	Elapsed Minutes	Depth to Water	Depth Sealed

Chiselling

Depth Top	Depth Base	Duration

Hole Diameter

Hole Depth	Hole Diameter

Casing Diameter

Casing Diameter	Casing Depth

General Remarks

1. Coordinates and ground level obtained using GEODE GPS (+/- 0.5 m).
2. Scanned with CAT and genny prior to breaking ground.
3. Hand excavated pit undertaken to 1.2 m to clear for services.
4. No groundwater encountered.
5. Borehole completed at 5m depth.
6. Monitoring well installed on completion with response zone between 1.0 and 5.0 m depth with bentonite seal between ground level and 1.0 m.

WS201

Project Name: Burnt Mill Academy
Site Location: Harlow
Client: Bowmer and Kirkland
Project No: 8511.02

Drilling method
Windowless sampled borehole

Equipment
Tracked terrier rig

Start date: 12/06/2023
End date: 12/06/2023
Backfill date: 12/06/2023

Driller: SWGT
Logged by: ESP-MRS
Date logged: 12/06/2023

Ground Level: 61.40 mOD
Easting: 545385 m
Northing: 210840 m

Depth	Sample		Test Details		TCR (%)	Water Depth	Casing Depth	Strata Details		Water	Depth		Backfill/ Install-ations
	Type	Class	Type	Result				Description	Legend	Strikes/ Standing	Depth (Thickness)	mOD	
5.00	D		SPT-C	31 (4,6/6,7,9,9)				End of Borehole at 5.000m			5.00	56.40	
											6		
											7		
											8		
											9		

Progress & Standing Water Levels

Date	Time	Hole Depth	Casing Depth	Water Depth

Water Strikes

Date	Time	Strike Depth	Casing Depth	Elapsed Minutes	Depth to Water	Depth Sealed

Chiselling

Depth Top	Depth Base	Duration

Hole Diameter

Hole Depth	Hole Diameter

Casing Diameter

Casing Diameter	Casing Depth

General Remarks

1. Coordinates and ground level obtained using GEODE GPS (+/- 0.5 m).
2. Scanned with CAT and genny prior to breaking ground.
3. Hand excavated pit undertaken to 1.2 m to clear for services.
4. No groundwater encountered.
5. Borehole completed at 5m depth.
6. Monitoring well installed on completion with response zone between 1.0 and 5.0 m depth with bentonite seal between ground level and 1.0 m.

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WS202

Project Name:	Burnt Mill Academy
Site Location:	Harlow
Client:	Bowmer and Kirkland
Project No:	8511.02
Drilling method	Windowless sampled borehole
Equipment	Tracked terrier rig
Ground Level:	61.40 mOD
Easting:	545409 m
Northing:	210864 m
Start date:	13/06/2023
End date:	13/06/2023
Backfill date:	13/06/2023
Driller:	SWGT
Logged by:	ESP-MRS
Date logged:	13/06/2023

Depth	Sample Type	Sample Class	Test Type	Test Result	TCR (%)	Water Depth	Casing Depth
0.05	ES						
0.30	ES						
0.40	B						
0.60	ES						
0.80	B						
1.00	ES						
			SPT-C	4 (0,0/0,0,1,3)			
1.60	D				80		
1.90	D						
			SPT-C	7 (0,1/3,2,1,1)			
2.40	D						
					90		
2.80	D						
			SPT-C	3 (1,0/1,0,1,1)			
3.50	D				70		
3.80	D						
			SPT-C	5 (1,2/1,1,1,2)			
					50		
4.90	D						

Strata Details Description	Legend	Water Strikes/ Standing	Depth (Thickness)	mOD
Light greyish brown slightly gravelly silty fine to medium SAND. Gravel is fine to medium angular to subrounded chalk and flint. (MADE GROUND - TOPSOIL)	▨		(0.10) 0.10	61.30
Very stiff light greyish brown gravelly CLAY. Gravel is fine to coarse angular to rounded chalk and flint. (MADE GROUND - POSSIBLE REWORKED LOWESTOFT FORMATION - DESICCATED)	▨		(0.35) 0.45	60.95
Dark orange brown very sandy very clayey fine to coarse GRAVEL with low cobble content. Gravel is angular to rounded flint with rare chalk. With pockets of orange brown clay. (MADE GROUND)	▨		(0.40) 0.85	60.55
Soft dark brown very gravelly sandy silty CLAY. Gravel is fine to coarse angular to rounded flint. (MADE GROUND)	▨		(0.55) 1.40	60.00
Soft to firm greeny grey mottled dark brown sandy gravelly silty CLAY. Gravel is fine to coarse angular to rounded flint, chalk and rare brick. (MADE GROUND) With dark grey staining and decaying organic matter at 1.6 m	▨		(1.20) 2.60	58.80
Soft dark greeny grey mottled black sandy slightly gravelly CLAY with slight organic odour. Gravel is fine to coarse angular to rounded chalk and flint. (MADE GROUND) With decaying plant matter and rare brick fragment below 3.6 m depth - Possible relict topsoil No recovery between 4.0 - 4.5 m depth	▨	▶ (3.5) → (4.5)	(2.00) 4.60	56.80
Firm to stiff greeny grey mottled yellow brown gravelly silty CLAY. Gravel is fine to coarse subangular to rounded chalk. (LOWESTOFT	▨		(0.40)	

Depth scale: 1, 2, 3, 4

Progress & Standing Water Levels

Date	Time	Hole Depth	Casing Depth	Water Depth
13-06-2023	12:00	5.00		3.5

Water Strikes

Date	Time	Strike Depth	Casing Depth	Elapsed Minutes	Depth to Water	Depth Sealed
13/06/2023	12:00	4.50		0.00	0.00	

Chiselling

Depth Top	Depth Base	Duration

Hole Diameter

Hole Depth	Hole Diameter

Casing Diameter

Casing Diameter	Casing Depth

General Remarks

1. Coordinates and ground level obtained using GEODE GPS (+/- 0.5 m).
2. Scanned with CAT and genny prior to breaking ground.
3. Hand excavated pit undertaken to 1.2 m to clear for services.
4. Groundwater struck between 4-5 m and standing at 3.5 m on completion.
5. Borehole completed at 5m depth.
6. Monitoring well installed on completion with response zone between 0.6 and 4.6 m depth with bentonite seal between ground level and 0.6 m.

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Start date:	13/06/2023	**Driller:**	SWGT
End date:	13/06/2023	**Logged by:**	ESP-MRS
Backfill date:	13/06/2023	**Date logged:**	13/06/2023

Project Name:
Burnt Mill Academy
Site Location:
Harlow
Client:
Bowmer and Kirkland
Project No:
8511.02

Drilling method
Windowless sampled borehole

Equipment
Tracked terrier rig

Ground Level:	61.40 mOD
Easting:	545409 m
Northing:	210864 m

WS202

Depth	Sample		Test Details		TCR (%)	Water Depth	Casing Depth	Strata Details		Water	Depth		Backfill/ Install-ations
	Type	Class	Type	Result				Description	Legend	Strikes/ Standing	Depth (Thickness)	mOD	
			SPT-C	19 (2,3/3,4,5,7)				Firm to stiff greeny grey mottled yellow brown gravelly silty CLAY. Gravel is fine to coarse subangular to rounded chalk. (LOWESTOFT FORMATION) End of Borehole at 5.000m			5.00	56.40	
											6		
											7		
											8		
											9		

Progress & Standing Water Levels					Water Strikes							Chiselling			Hole Diameter		Casing Diameter	
Date	Time	Hole Depth	Casing Depth	Water Depth	Date	Time	Strike Depth	Casing Depth	Elapsed Minutes	Depth to Water	Depth Sealed	Depth Top	Depth Base	Duration	Hole Depth	Hole Diameter	Casing Diameter	Casing Depth
13-06-2023	12:00	5.00		3.5	13/06/2023	12:00	4.50		0.00	0.00								

General Remarks

1. Coordinates and ground level obtained using GEODE GPS (+/- 0.5 m).
2. Scanned with CAT and genny prior to breaking ground.
3. Hand excavated pit undertaken to 1.2 m to clear for services.
4. Groundwater struck between 4-5 m and standing at 3.5 m on completion.
5. Borehole completed at 5m depth.
6. Monitoring well installed on completion with response zone between 0.6 and 4.6 m depth with bentonite seal between ground level and 0.6 m.

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WS203

Start date:	12/06/2023	**Driller:**	SWGT
End date:	12/06/2023	**Logged by:**	ESP-MRS
Backfill date:	12/06/2023	**Date logged:**	12/06/2023

Project Name: Burnt Mill Academy
Site Location: Harlow
Client: Bowmer and Kirkland
Project No: 8511.02

Drilling method
Windowless sampled borehole

Equipment
Tracked terrier rig

Ground Level:	61.40 mOD
Easting:	545397 m
Northing:	210852 m

Sample			Test Details					Strata Details		Water	Depth		
Depth	Type	Class	Type	Result	TCR (%)	Water Depth	Casing Depth	Description	Legend	Strikes/ Standing	Depth (Thickness)	mOD	Backfill/ Install-ations
0.05	ES							Greyish brown silty gravelly fine to medium SAND. Gravel is angular to rounded chalk and flint. (MADE GROUND - TOPSOIL)	▨		(0.10) 0.10	61.30	▨
0.20	ES												
0.50	B							Very stiff very gravelly sandy CLAY. Gravel is fine to coarse angular to rounded flint and chalk with rare brick. (MADE GROUND - POSSIBLE REWORKED LOWESTOFT FORMATION) Desiccated between 0.1 to 0.5 m depth Stiff below 0.5 m depth	▨		(0.60)		
0.80	ES										0.70	60.70	
1.20 - 1.50	B		SPT-C	3 (1,1/1,1,0,1)				Very loose orange brown silty very gravelly fine to coarse SAND. Gravel is angular to rounded chalk and flint. Also containing pockets of soft brown clay. (MADE GROUND)	▨		(0.90)		
					80			Firm to stiff greeny grey mottled black gravelly silty CLAY. Gravel is fine to coarse angular to subrounded chalk and flint with rare brick and tarmac. Also containing rare decaying plant matter and glass. (MADE GROUND) Poor recovery between 2-3 m depth	▨		1.60	59.80	
1.70	D												
			SPT-C	23 (1,2/1,2,2,18)									
										▶			
2.50	D				30								
2.90	D												
			SPT-C	4 (1,1/1,1,1,1)				With soft very dark grey slightly organic layer between 2.8 and 3.4 m depth			(2.90)		
3.50	D				50					→			
			SPT-C	10 (3,3/2,3,2,3)				Change over depth unknown between 4 - 5 m depth due to poor recovery, 4.5m approximate only					
					25			Firm to stiff greeny grey gravelly silty CLAY. Gravel is fine to coarse angular to subrounded chalk and flint. (LOWESTOFT FORMATION)	▨		4.50	56.90	
4.80	D										(0.50)		

Progress & Standing Water Levels					Water Strikes							Chiselling			Hole Diameter		Casing Diameter	
Date	Time	Hole Depth	Casing Depth	Water Depth	Date	Time	Strike Depth	Casing Depth	Elapsed Minutes	Depth to Water	Depth Sealed	Depth Top	Depth Base	Duration	Hole Depth	Hole Diameter	Casing Diameter	Casing Depth
12-06-2023	12:00	5.00		2.4	12/06/2023	12:00	3.50		0.00	0.00								

General Remarks

1. Coordinates and ground level obtained using GEODE GPS (+/- 0.5 m).
2. Scanned with CAT and genny prior to breaking ground.
3. Hand excavated pit undertaken to 1.2 m to clear for services.
4. Groundwater struck between 3-4 m and standing at 2.4 m on completion.
5. Borehole completed at 5m depth.
6. Backfilled with arisings on completion.

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Start date: 12/06/2023
End date: 12/06/2023
Backfill date: 12/06/2023

Driller: SWGT
Logged by: ESP-MRS
Date logged: 12/06/2023

Project Name: Burnt Mill Academy
Site Location: Harlow
Client: Bowmer and Kirkland
Project No: 8511.02

Drilling method Windowless sampled borehole
Equipment Tracked terrier rig
Ground Level: 61.40 mOD
Easting: 545397 m
Northing: 210852 m

WS203

Depth	Sample		Test Details		TCR (%)	Water Depth	Casing Depth	Strata Details		Water	Depth		Backfill/ Install-ations
	Type	Class	Type	Result				Description	Legend	Strikes/ Standing	Depth (Thickness)	mOD	
			SPT-C	21 (3,3/4,4,6,7)				End of Borehole at 5.000m			5.00	56.40	

Progress & Standing Water Levels

Date	Time	Hole Depth	Casing Depth	Water Depth
12-06-2023	12:00	5.00		2.4

Water Strikes

Date	Time	Strike Depth	Casing Depth	Elapsed Minutes	Depth to Water	Depth Sealed
12/06/2023	12:00	3.50		0.00	0.00	

Chiselling

Depth Top	Depth Base	Duration

Hole Diameter

Hole Depth	Hole Diameter

Casing Diameter

Casing Diameter	Casing Depth

General Remarks

1. Coordinates and ground level obtained using GEODE GPS (+/- 0.5 m).
2. Scanned with CAT and genny prior to breaking ground.
3. Hand excavated pit undertaken to 1.2 m to clear for services.
4. Groundwater struck between 3-4 m and standing at 2.4 m on completion.
5. Borehole completed at 5m depth.
6. Backfilled with arisings on completion.

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Project Name: Burnt Mill Academy	**Drilling method** Windowless sampled borehole		
Site Location: Harlow	**Equipment** Tracked terrier rig		
Client: Bowmer and Kirkland	**Ground Level:** 61.80 mOD		
Project No: 8511.02	**Easting:** 545438 m		
	Northing: 210858 m		

WS204

Start date: 13/06/2023
End date: 13/06/2023
Backfill date: 13/06/2023
Driler: SWGT
Logged by: ESP-MRS
Date logged: 13/06/2023

Depth	Sample		Test Details		TCR (%)	Water Depth	Casing Depth	Strata Details		Water	Depth		Backfill/ Install-ations
	Type	Class	Type	Result				Description	Legend	Strikes/ Standing	Depth (Thickness)	mOD	
0.05	ES							Light brown slightly gravelly silty fine to medium SAND. Gravel is fine to coarse angular to subrounded chalk and flint. Also containing tin can and plastic wrapper. (MADE GROUND - TOPSOIL)	▨		(0.15)		
								Dark greyish brown sandy medium to coarse angular to subangular flint GRAVEL. (MADE GROUND)	▨		0.15	61.65	
0.30	ES										(0.30)		
								Dark grey silty fine to coarse SAND and GRAVEL. Gravel is angular to rounded brick, flint and concrete. Also containing pockets of soft grey clay. (MADE GROUND)	▨		0.45	61.35	
0.60	ES										(0.25)		
								Yellow brown silty very gravelly fine to coarse SAND. Gravel is fine to coarse angular to rounded flint. (MADE GROUND)	▨		0.70	61.10	
0.80	ES												
0.90	B										(0.60)		
			SPT-C	6 (1,2/1,1,2,2)									
								Soft to firm greeny grey mottled black and light brown gravelly silty CLAY. Gravel is fine to coarse chalk, brick and concrete. With rare decaying plant matter. (MADE GROUND)	▨		1.30	60.50	
1.50	D												
					100								
1.80	D										(0.90)		
			SPT-C	14 (3,3/3,4,3,4)							2		
2.10	D												
								Firm to stiff light grey mottled orange brown gravelly silty CLAY. Gravel is fine to coarse angular to subrounded chalk. (LOWESTOFT FORMATION)	▨		2.20	59.60	
2.40	D												
					100						(0.80)		
2.80	D												
			SPT-C	27 (5,5/6,6,7,8)				End of Borehole at 3.000m			3.00	58.80	
											4		

Progress & Standing Water Levels					Water Strikes							Chiselling			Hole Diameter		Casing Diameter	
Date	Time	Hole Depth	Casing Depth	Water Depth	Date	Time	Strike Depth	Casing Depth	Elapsed Minutes	Depth to Water	Depth Sealed	Depth Top	Depth Base	Duration	Hole Depth	Hole Diameter	Casing Diameter	Casing Depth

General Remarks

1. Coordinates and ground level obtained using GEODE GPS (+/- 0.5 m).
2. Scanned with CAT and genny prior to breaking ground.
3. Hand excavated pit undertaken to 1.2 m to clear for services.
4. No groundwater encountered.
5. Borehole completed at 3m depth.
6. Monitoring well installed on completion with response zone between 1.0 and 3.0 m depth with bentonite seal between ground level and 1.0 m.

Earth Science Partnership
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Project Name: Burnt Mill Academy
Site Location: Harlow
Client: Bowmer and Kirkland
Project No: 8511.02

Drilling method Windowless sampled borehole
Equipment Tracked terrier rig

WS205

Start date: 12/06/2023
End date: 12/06/2023
Backfill date: 12/06/2023
Driller: SWGT
Logged by: ESP-MRS
Date logged: 12/06/2023
Ground Level: 61.40 mOD
Easting: 545411 m
Northing: 210849 m

Depth	Sample		Test Details		TCR (%)	Water Depth	Casing Depth	Strata Details		Water	Depth		Backfill/ Install-ations
	Type	Class	Type	Result				Description	Legend	Strikes/ Standing	Depth (Thickness)	mOD	
0.02	ES							Greyish brown silty gravelly fine to medium SAND. Gravel is angular to rounded chalk and flint. (MADE GROUND - TOPSOIL)			(0.05) 0.05	61.35	
0.30	ES												
0.40	B							Very stiff light brownish grey slightly sandy very gravelly CLAY. Gravel is fine to coarse angular to rounded chalk and flint. (MADE GROUND - POSSIBLE REWORKED LOWESTOFT - DESICCATED)			(0.45) 0.50	60.90	
0.70	ES												
0.90	B							Orange brown silty fine to coarse SAND and GRAVEL. Gravel is fine to coarse angular to rounded chalk and flint. Also containing pockets of soft orange brown clay. (MADE GROUND)			(0.80) 1.30	60.10	
			SPT-C	11 (2,2/3,3,2,3)									
1.50	D				90			Firm to stiff greeny grey mottled black gravelly silty CLAY. Gravel is fine to coarse angular to subrounded chalk and flint with rare brick. (MADE GROUND)					
1.90	D												
			SPT-C	9 (1,1/3,2,2,2)							(1.40)		
2.50	D				90			Very soft to soft with a little decaying plant matter between 2.4 and 2.7 m depth - possible relict topsoil			2.70	58.70	
2.90	D							Stiff blue grey mottled orange brown gravelly silty CLAY. Gravel is fine to coarse angular to rounded chalk and rare flint. (LOWESTOFT FORMATION)					
			SPT-C	16 (2,2/4,3,4,5)									
3.30	D				100						(1.30)		
3.70	D												
			SPT-C	22 (4,5/5,5,6,6)				End of Borehole at 4.000m			4.00	57.40	

Progress & Standing Water Levels					Water Strikes							Chiselling			Hole Diameter		Casing Diameter	
Date	Time	Hole Depth	Casing Depth	Water Depth	Date	Time	Strike Depth	Casing Depth	Elapsed Minutes	Depth to Water	Depth Sealed	Depth Top	Depth Base	Duration	Hole Depth	Hole Diameter	Casing Diameter	Casing Depth

General Remarks

1. Coordinates and ground level obtained using GEODE GPS (+/- 0.5 m).
2. Scanned with CAT and genny prior to breaking ground.
3. Hand excavated pit undertaken to 1.2 m to clear for services.
4. No groundwater encountered.
5. Borehole completed at 4m depth.
6. Backfilled with arisings on completion.

Earth Science Partnership
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WS206

Project Name: Burnt Mill Academy
Site Location: Harlow
Client: Bowmer and Kirkland
Project No: 8511.02

Drilling method
Windowless sampled borehole

Equipment
Tracked terrier rig

Start date: 14/06/2023
End date: 14/06/2023
Backfill date: 14/06/2023

Driller: SWGT
Logged by: ESP-MRS
Date logged: 14/06/2023

Ground Level: 62.00 mOD
Easting: 545438 m
Northing: 210903 m

Depth	Sample Type	Sample Class	Test Type	Test Result	TCR (%)	Water Depth	Casing Depth
0.10	ES						
0.20	ES						
0.40	ES						
0.60	ES						
0.80	B						
			SPT-C	7 (2,1/2,2,1,2)			
1.40	D						
					90		
1.90	D						
			SPT-C	2 (1,0/0,1,0,1)			
2.40	D						
					100		
2.70	D						
2.90	D						
			SPT-C	4 (1,0/1,1,1,1)			
3.50	D				80		
3.90	D						
			SPT-C	5 (1,1/1,1,1,2)			
4.50	D				70		
4.90	D						

Strata Details Description	Legend	Water Strikes/Standing	Depth (Thickness)	mOD	Backfill/Installations
TARMACADAM SURFACING			(0.14) 0.14	61.86	
Dark greeny grey slightly sandy medium to coarse GRAVEL. Gravel is angular to rounded flint (MADE GROUND - SUBBASE)			(0.31) 0.45	61.55	
Soft brown sandy very gravelly silty CLAY. Gravel is medium to coarse angular to rounded flint. (MADE GROUND) Soft past 0.6 m depth			(0.25) 0.70	61.30	
Firm brownish grey gravelly sandy silty CLAY. Gravel is fine to coarse angular to rounded flint, chalk and rare brick and mudstone. (MADE GROUND - POSSIBLE REWORKED LOWESTOFT) With some decaying wood fragments at 0.7 m depth			(0.80) 1.50	60.50	
Soft to firm dark greeny grey slightly gravelly silty CLAY with a slight organic odour. Gravel is fine to coarse angular to rounded flint and rare brick. With occasional rootlets. (MADE GROUND)			(1.10) 2.60	59.40	
Soft to firm light grey mottled yellow brown gravelly silty CLAY. Gravel is fine to coarse angular to rounded chalk and rare flint. (POSSIBLE REWORKED LOWESTOFT) With a band of orange brown silty fine to coarse sand between 2.8 and 3.5 m depth Soft below 3.5 m depth With a layer of dark brown fine to coarse sand			(2.40)		

Progress & Standing Water Levels

Date	Time	Hole Depth	Casing Depth	Water Depth

Water Strikes

Date	Time	Strike Depth	Casing Depth	Elapsed Minutes	Depth to Water	Depth Sealed

Chiselling

Depth Top	Depth Base	Duration

Hole Diameter

Hole Depth	Hole Diameter

Casing Diameter

Casing Diameter	Casing Depth

General Remarks

1. Coordinates and ground level obtained using GEODE GPS (+/- 0.5 m).
2. Scanned with CAT and genny prior to breaking ground.
3. Hand excavated pit undertaken to 1.2 m to clear for services.
4. No groundwater encountered.
5. Borehole completed at 5m depth.
6. Backfilled with arisings on completion.

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Project Name: Burnt Mill Academy
Site Location: Harlow
Client: Bowmer and Kirkland
Project No: 8511.02

Drilling method
Windowless sampled borehole

Equipment
Tracked terrier rig

WS206

Start date: 14/06/2023
End date: 14/06/2023
Backfill date: 14/06/2023

Driller: SWGT
Logged by: ESP-MRS
Date logged: 14/06/2023

Ground Level: 62.00 mOD
Easting: 545438 m
Northing: 210903 m

Depth	Sample		Test Details		TCR (%)	Water Depth	Casing Depth	Strata Details		Water	Depth		Backfill/ Install-ations
	Type	Class	Type	Result				Description	Legend	Strikes/ Standing	Depth (Thickness)	mOD	
			SPT-C	6 (1,2/1,1,2,2)				Soft to firm light grey mottled yellow brown gravelly silty CLAY. Gravel is fine to coarse angular to rounded chalk and rare flint. (POSSIBLE REWORKED LOWESTOFT) With a layer of dark brown fine to coarse sand between 4.8 to 5.0 m depth			5.00	57.00	
								End of Borehole at 5.000m					
											6		
											7		
											8		
											9		

Progress & Standing Water Levels

Date	Time	Hole Depth	Casing Depth	Water Depth

Water Strikes

Date	Time	Strike Depth	Casing Depth	Elapsed Minutes	Depth to Water	Depth Sealed

Chiselling

Depth Top	Depth Base	Duration

Hole Diameter

Hole Depth	Hole Diameter

Casing Diameter

Casing Diameter	Casing Depth

General Remarks

1. Coordinates and ground level obtained using GEODE GPS (+/- 0.5 m).
2. Scanned with CAT and genny prior to breaking ground.
3. Hand excavated pit undertaken to 1.2 m to clear for services.
4. No groundwater encountered.
5. Borehole completed at 5m depth.
6. Backfilled with arisings on completion.

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WS207

Project Name:	Burnt Mill Academy
Site Location:	Harlow
Client:	Bowmer and Kirkland
Project No:	8511.02
Drilling method	Windowless sampled borehole
Equipment	Tracked terrier rig
Ground Level:	62.00 mOD
Easting:	545470 m
Northing:	210897 m
Start date:	13/06/2023
End date:	13/06/2023
Backfill date:	13/06/2023
Driller:	SWGT
Logged by:	ESP-MRS
Date logged:	13/06/2023

Depth	Sample		Test Details		TCR (%)	Water Depth	Casing Depth
	Type	Class	Type	Result			
0.10	ES						
0.20	ES						
0.40	ES						
0.50	ES						
0.70	ES						
0.80	B						
			SPT-C	6 (2,1/1,1,2,2)			
1.50	D				90		
1.90	D						
			SPT-C	9 (1,1/2,2,2,3)			
2.20	D						
2.60	D				100		
3.00	D		SPT-C	5 (1,1/1,1,1,2)			

Strata Details		Water	Depth		Backfill/ Installations
Description	Legend	Strikes/ Standing	Depth (Thickness)	mOD	
TARMACADAM SURFACING	▨		(0.13) 0.13	61.87	▨
Dark greeny grey slightly sandy medium to coarse GRAVEL. Gravel is angular to rounded flint (MADE GROUND - SUBBASE)	▨		(0.17) 0.30	61.70	▨
Dark brown very clayey very silty sandy fine to coarse GRAVEL. Gravel is angular to rounded flint. (MADE GROUND)	▨		(0.15) 0.45	61.55	▨
Firm orange brown gravelly silty CLAY. Gravel is fine to coarse angular to rounded chalk, flint and rare brick. (MADE GROUND - POSSIBLE REWORKED LOWESTOFT)	▨		(0.10) 0.55	61.45	▨
Loose dark brown very gravelly very clayey fine to coarse SAND. Gravel is fine to coarse angular to rounded flint, brick, chalk. Also containing pockets of clay. (MADE GROUND) With fragments of wood at base of stratum	▨		(1.15) 1.70	60.30	▨
Firm dark greeny grey slightly gravelly silty CLAY. Gravel is medium subangular to subrounded flint. (MADE GROUND) Gravel includes fragments of chalk and brick below 2.0 m depth	▨		(0.60) 2.30	59.70	▨
Soft to stiff light grey mottled yellow brown gravelly silty CLAY. Gravel is fine to coarse angular to subrounded chalk. (POSSIBLE LOWESTOFT FORMATION) With a layer of orange brown fine to coarse sand between 2.9 to 3.0 m depth	▨		(0.70) 3.00	59.00	▨
End of Borehole at 3.000m					

Progress & Standing Water Levels				
Date	Time	Hole Depth	Casing Depth	Water Depth

Water Strikes						
Date	Time	Strike Depth	Casing Depth	Elapsed Minutes	Depth to Water	Depth Sealed

Chiselling		
Depth Top	Depth Base	Duration

Hole Diameter	
Hole Depth	Hole Diameter

Casing Diameter	
Casing Diameter	Casing Depth

General Remarks

1. Coordinates and ground level obtained using GEODE GPS (+/- 0.5 m).
2. Scanned with CAT and genny prior to breaking ground.
3. Hand excavated pit undertaken to 1.2 m to clear for services.
4. No groundwater encountered.
5. Borehole completed at 3m depth.
6. Backfilled with arisings on completion.

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WS208

Project Name:	Burnt Mill Academy	**Drilling method**	Windowless sampled borehole
Site Location:	Harlow	**Equipment**	Tracked terrier rig
Client:	Bowmer and Kirkland	**Ground Level:**	61.80 mOD
Project No:	8511.02	**Easting:**	545459 m
		Northing:	210868 m

Start date:	12/06/2023	**Driller:**	SWGT
End date:	12/06/2023	**Logged by:**	ESP-MRS
Backfill date:	12/06/2023	**Date logged:**	12/06/2023

Depth	Sample Type	Sample Class	Test Details Type	Test Details Result	TCR (%)	Water Depth	Casing Depth
0.10	ES						
0.20	ES						
0.40	ES						
0.60	B						
			SPT-C	3 (1,0/1,0,1,1)			
1.50	D				90		
1.90	D						
			SPT-C	9 (1,2/3,2,2,2)			
2.30	D				70		
2.80	D						
			SPT-C	15 (2,2/3,4,5,3)			
3.20	D				90		
3.70	D						
			SPT-C	9 (2,2/2,2,2,3)			

Strata Details Description	Legend	Water Strikes/ Standing	Depth (Thickness)	mOD	Backfill/ Install-ations
TARMACADAM SURFACING	▨		(0.13) 0.13	61.67	▨
Very dark grey slightly clayey sandy medium to coarse GRAVEL. Gravel is subangular to rounded flint. (MADE GROUND - SUBBASE)	▨		(0.17) 0.30	61.50	▨
Firm orange brown gravelly silty CLAY. Gravel is fine to coarse angular to rounded chalk, flint and rare brick. (MADE GROUND - POSSIBLE REWORKED LOWESTOFT)	▨		(0.80) 1.10	60.70	▨
Soft to firm dark greeny grey mottled dark grey sandy gravelly silty CLAY. Gravel is fine to coarse angular to rounded flint, brick and rare chalk. (MADE GROUND)	▨		(1.10) 2.20	59.60	▨
Loose dark greeny grey very clayey silty slightly gravelly fine to coarse SAND. Gravel is fine to medium subangular to rounded flint. (MADE GROUND)	▨		(0.20) 2.40	59.40	▨
Firm to stiff greeny grey mottled yellow brown silty CLAY. (LOWESTOFT FORMATION) With a little medium to coarse flint gravel between 2.9 - 3.3 m	▨		(1.60) 4.00	57.80	▨

End of Borehole at 4.000m

Progress & Standing Water Levels

Date	Time	Hole Depth	Casing Depth	Water Depth

Water Strikes

Date	Time	Strike Depth	Casing Depth	Elapsed Minutes	Depth to Water	Depth Sealed

Chiselling

Depth Top	Depth Base	Duration

Hole Diameter

Hole Depth	Hole Diameter

Casing Diameter

Casing Diameter	Casing Depth

General Remarks

1. Coordinates and ground level obtained using GEODE GPS (+/- 0.5 m).
2. Scanned with CAT and genny prior to breaking ground.
3. Hand excavated pit undertaken to 1.2 m to clear for services.
4. No groundwater encountered.
5. Borehole completed at 4m depth.
6. Backfilled with arisings on completion.

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Start date: 13/09/2023	**Driller:** SWGT	**Project Name:** Burnt Mill Academy	**Drilling method** Windowless sampled borehole
End date: 13/06/2023	**Logged by:** ESP-MRS	**Site Location:** Harlow	**Equipment** Tracked terrier rig
Backfill date: 13/03/2023	**Date logged:** 13/06/2022	**Client:** Bowmer and Kirkland	**Ground Level:** 61.50 mOD
		Project No: 8511.02	**Easting:** 545422 m
			Northing: 210862 m

WS209

Depth	Sample		Test Details		TCR (%)	Water Depth	Casing Depth	Strata Details		Water	Depth		Backfill/ Install-ations
	Type	Class	Type	Result				Description	Legend	Strikes/ Standing	Depth (Thickness)	mOD	
0.05	ES							Greyish brown silty slightly gravelly fine to medium SAND. Gravel is fine to coarse angular to subrounded flint and rare chalk. (MADE GROUND - TOPSOIL)	▨		(0.10) 0.10	61.40	▨
0.20	ES										(0.35)		
0.40	B							Very stiff greyish brown gravelly CLAY. Gravel is fine to coarse angular to rounded flint, chalk and rare brick. (MADE GROUND - POSSIBLE REWORKED LOWESTOFT FORMATION - DESICCATED)	▨		0.45	61.05	
0.60	ES												
0.80	B										(0.65)		
								Dark orange brown silty clayey fine to coarse SAND and GRAVEL. Gravel is fine to coarse angular to rounded flint and chalk with rare brick. (MADE GROUND) Clay content increasing with depth	▨		1 1.10	60.40	
			SPT-C	11 (1,2/2,2,4,3)							(0.30)		
1.30	D												
											1.40	60.10	
1.60	D				90			Firm light grey mottled orange brown and dark grey gravelly silty CLAY. Gravel is fine to coarse angular to rounded chalk, brick and rare flint. (MADE GROUND - POSSIBLE REWORKED LOWESTOFT FORMATION	▨		(0.90)		
			SPT-C	5 (1,0/1,1,1,2)							2		
								Soft to firm dark brown mottled black sandy silty gravelly CLAY. Gravel is fine to coarse angular to rounded flint and brick. Also containing pockets of decaying plant matter with a slight organic odour and lenses of fine to medium sand. (MADE GROUND)	▨		2.30	59.20	
					80								
2.60	D							Soft dark greeny brown sandy slightly gravelly silty CLAY. Gravel is fine to coarse angular to subrounded chalk, brick and flint. (MADE GROUND)	▨				
											(1.10)		
2.90	D												
			SPT-C	9 (1,2/2,2,2,3)							3		
3.30	D												
											3.40	58.10	
					80			Firm to stiff light grey mottled yellow brown gravelly silty CLAY. Gravel is fine to coarse angular to subrounded chalk. (LOWESTOFT FORMATION)	▨				
3.70	D												
			SPT-C	25 (4,6/5,6,6,8)				Poor recovery between 4 - 5m depth. Water strike encountered and fragments of gravels recovered, possible change over to sand and gravel layer.		▶	4		
4.20	D										(1.60)		
					20					→			

Progress & Standing Water Levels				
Date	Time	Hole Depth	Casing Depth	Water Depth
13-06-2023	12:00	5.00		4

Water Strikes						
Date	Time	Strike Depth	Casing Depth	Elapsed Minutes	Depth to Water	Depth Sealed
13/06/2023	12:00	4.50		0.00	0.00	

Chiselling		
Depth Top	Depth Base	Duration

Hole Diameter	
Hole Depth	Hole Diameter

Casing Diameter	
Casing Diameter	Casing Depth

General Remarks

1. Coordinates and ground level obtained using GEODE GPS (+/- 0.5 m).
2. Scanned with CAT and genny prior to breaking ground.
3. Hand excavated pit undertaken to 1.2 m to clear for services.
4. Groundwater struck between 4 - 5 m and standing at 4.0 m on completion.
5. Borehole completed at 5m depth.
6. Backfilled with arisings on completion.

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Project Name: Burnt Mill Academy
Site Location: Harlow
Client: Bowmer and Kirkland
Project No: 8511.02

Drilling method Windowless sampled borehole
Equipment Tracked terrier rig

WS209

Start date: 13/09/2023
End date: 13/06/2023
Backfill date: 13/03/2023

Driller: SWGT
Logged by: ESP-MRS
Date logged: 13/06/2022

Ground Level: 61.50 mOD
Easting: 545422 m
Northing: 210862 m

Depth	Sample		Test Details		TCR (%)	Water Depth	Casing Depth	Strata Details		Water	Depth		Backfill/ Install- ations
	Type	Class	Type	Result				Description	Legend	Strikes/ Standing	Depth (Thickness)	mOD	
			SPT-C	27 (4,4/5,6,7,9)				End of Borehole at 5.000m			5.00	56.50	
											6		
											7		
											8		
											9		

Progress & Standing Water Levels

Date	Time	Hole Depth	Casing Depth	Water Depth
13-06-2023	12:00	5.00		4

Water Strikes

Date	Time	Strike Depth	Casing Depth	Elapsed Minutes	Depth to Water	Depth Sealed
13/06/2023	12:00	4.50		0.00	0.00	

Chiselling

Depth Top	Depth Base	Duration

Hole Diameter

Hole Depth	Hole Diameter

Casing Diameter

Casing Diameter	Casing Depth

General Remarks

1. Coordinates and ground level obtained using GEODE GPS (+/- 0.5 m).
2. Scanned with CAT and genny prior to breaking ground.
3. Hand excavated pit undertaken to 1.2 m to clear for services.
4. Groundwater struck between 4 - 5 m and standing at 4.0 m on completion.
5. Borehole completed at 5m depth.
6. Backfilled with arisings on completion.

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WS210

Start date: 12/06/2023	**Driller:** SWGT	**Project Name:** Burnt Mill Academy	**Drilling method** Windowless sampled borehole
End date: 12/06/2023	**Logged by:** ESP-MRS	**Site Location:** Harlow	**Equipment** Tracked terrier rig
Backfill date: 12/06/2023	**Date logged:** 12/06/2023	**Client:** Bowmer and Kirkland	**Ground Level:** 61.40 mOD
		Project No: 8511.02	**Easting:** 545382 m
			Northing: 210849 m

Depth	Sample Type	Sample Class	Test Details Type	Test Details Result	TCR (%)	Water Depth	Casing Depth
0.10	ES						
0.30	ES						
0.40	B						
0.60	ES						
0.90	B						
			SPT-C	11 (1,1/1,1,5,4)			
1.30	ES				70		
1.80	ES						
			SPT-C	3 (1,0/1,0,1,1)			
2.50	D				80		
2.90	D						
			SPT-C	0 (1,0/0,0,0,0)			
3.70	D				20		
			SPT-C	6 (1,1/1,1,1,3)			
4.20	D						
			SPT-C	14 (7,5/4,3,3,4)	40		

Strata Details Description	Legend	Water Strikes/Standing	Depth (Thickness)	mOD	Backfill/Installations
Greyish brown very gravelly silty fine to medium SAND. Gravel is fine to coarse angular to subrounded flint. (MADE GROUND - TOPSOIL)			(0.15) 0.15	61.25	
Light brown very sandy slightly silty fine to coarse GRAVEL. Gravel is angular to rounded flint and rare chalk, brick and concrete. Also containing rare glass and metal. (MADE GROUND)			(0.30) 0.45	60.95	
Firm orange brown very gravelly silty CLAY. Gravel is fine to coarse angular to rounded chalk, flint and brick. (MADE GROUND - POSSIBLE REWORKED LOWESTOFT)			(1.05) 1.50	59.90	
Very loose orange brown slightly silty fine to coarse SAND and GRAVEL. Gravel is fine to coarse angular to rounded flint and rare chalk. Also containing pockets of soft orange brown clay. (MADE GROUND) With a band of very gravelly clay between 2.2 - 2.6 m depth Water strike between 3 to 4 m, leading to poor recovery between 3 - 4.5 m depth - possible relict topsoil layer in this zone			(2.40) 3.90	57.50	
Recovered as soft greeny grey gravelly silty CLAY. Gravel is fine to coarse angular to subrounded chalk and flint. (Possible MADE GROUND) Dark organic pockets at 4.0 m depth			(0.60) 4.50	56.90	
End of Borehole at 4.500m					

Progress & Standing Water Levels

Date	Time	Hole Depth	Casing Depth	Water Depth
12-06-2023	12:00	4.50		4.4

Water Strikes

Date	Time	Strike Depth	Casing Depth	Elapsed Minutes	Depth to Water	Depth Sealed
12/06/2023	12:00	4.20		0.00	0.00	

Chiselling

Depth Top	Depth Base	Duration

Hole Diameter

Hole Depth	Hole Diameter

Casing Diameter

Casing Diameter	Casing Depth

General Remarks

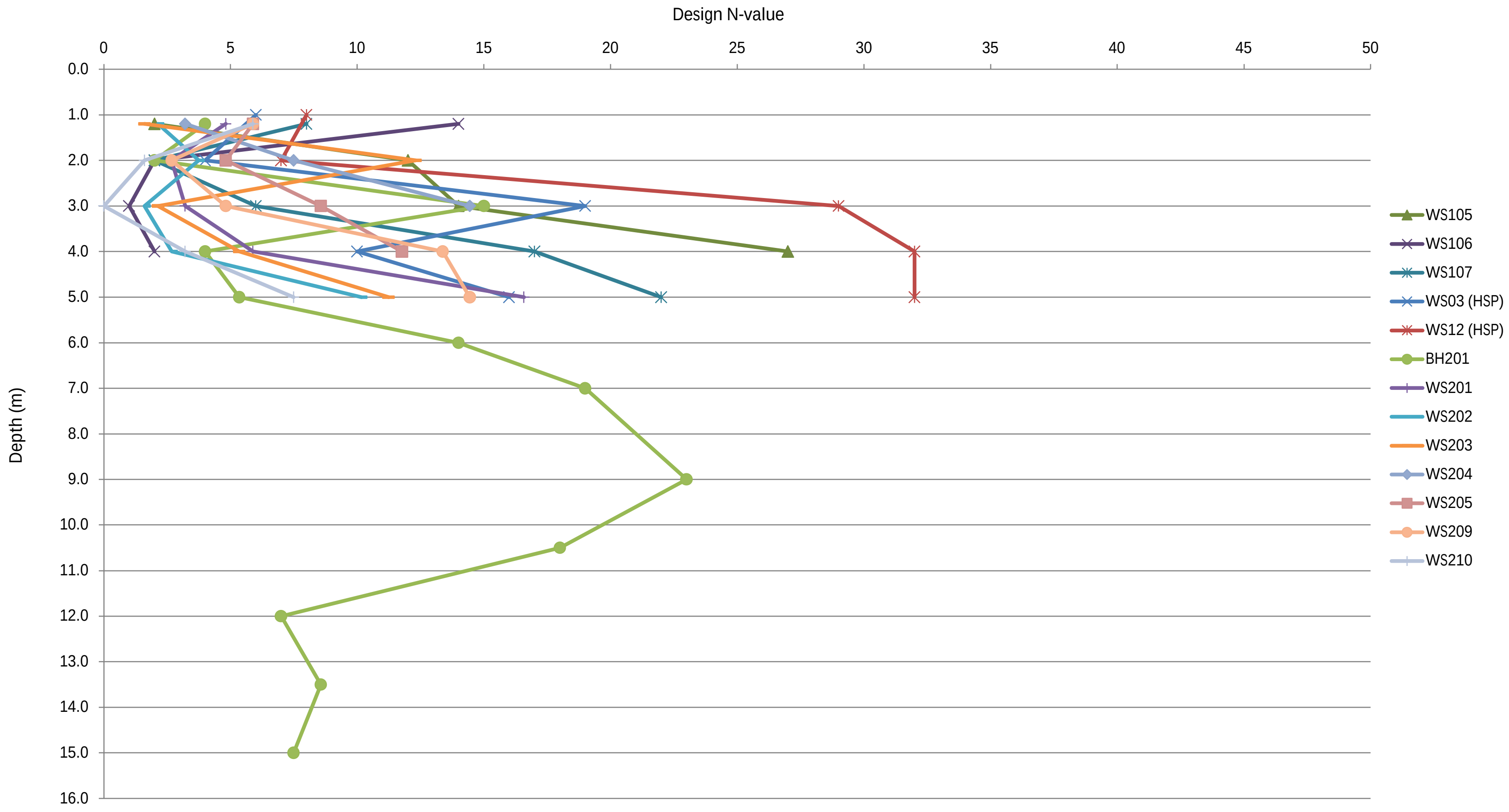
1. Coordinates and ground level obtained using GEODE GPS (+/- 0.5 m).
2. Scanned with CAT and genny prior to breaking ground.
3. Hand excavated pit undertaken to 1.2 m to clear for services.
4. Groundwater strike between 4 - 4.5 m depth and standing at 4.4 m depth on competion.
5. Borehole refused at 4.5 m depth on possible cobble.
6. Backfilled with arisings on completion.

Appendix H SPT vs Depth Plots for Various Areas of Development (ESP and HSP)

BURNT MILL ACADEMY, HARLOW
AREA OF DEMOUNTABLE TEMPORARY CLASSROOM

esp
ENGINEERS
GEOLOGISTS
SCIENTISTS

ESP RESULTS OF STANDARD PENETRATION TESTING (SPT)

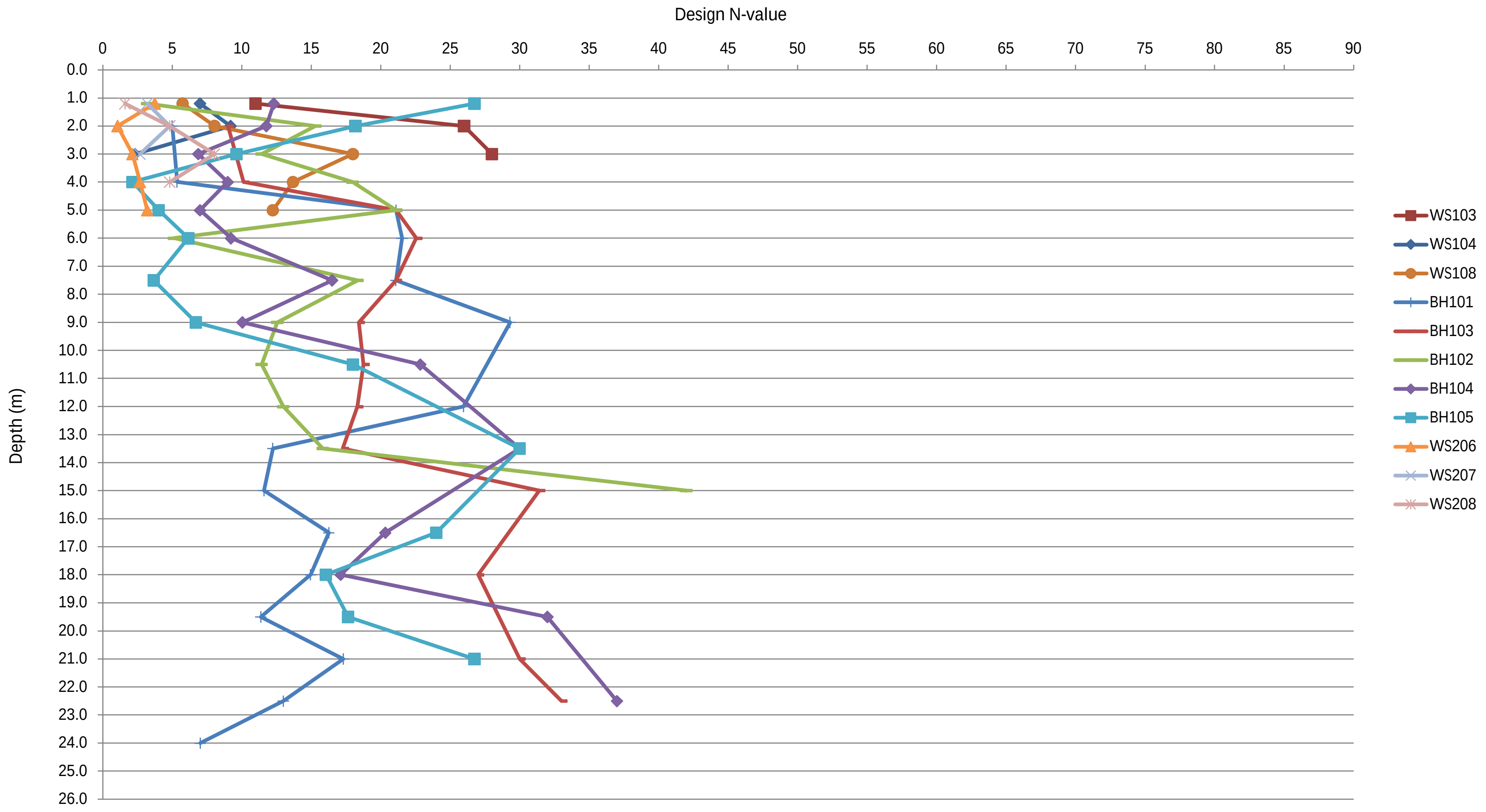


Design values corrected for use of solid cone and sandy soils where applicable **(ESP Results Only)**

esp
ENGINEERS
GEOLOGISTS
SCIENTISTS

BURNT MILL ACADEMY, HARLOW
AREA OF PROPOSED SCHOOL, SPORTS CENTRE AND MUGA

ESP RESULTS OF STANDARD PENETRATION TESTING (SPT)

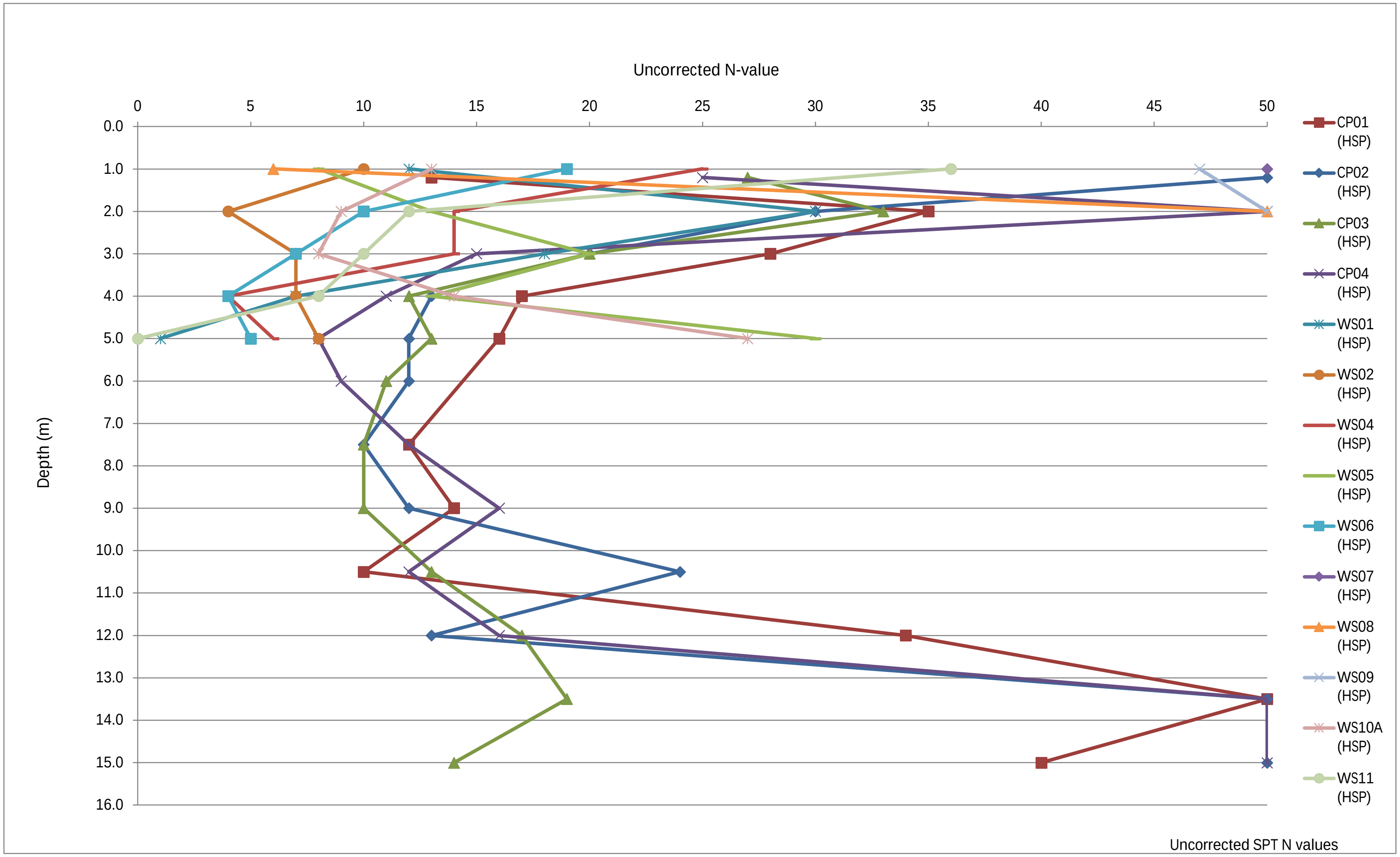


Design values corrected for use of solid cone and sandy soils where applicable

BURNT MILL ACADEMY, HARLOW
AREA OF PROPOSED SCHOOL, SPORTS CENTRE AND MUGA

HSP CONSULTING STANDARD PENETRATION TESTING (SPT)

ENGINEERS
GEOLOGISTS
SCIENTISTS



Appendix I ESP Results of Spot Gas and Groundwater Monitoring (Visits 1 to 9)

PROPOSED SCHOOL DEVELOPMENT
BURNT MILL ACADEMY, HARLOW
Results of Hazardous Gas and Groundwater Monitoring
(Spot Monitoring)

Project Ref. 8511.02

Monitoring Event 1

Date:	13/03/2023	**Atmospheric Pressure (start):**	982 mb	**Trend:**	Falling
Time:	12:00	**Atmospheric Pressure (end):**	979 mb		
Engineer:	SG	**Site Status:**	Developed & open field		
Weather:	Dry, intermittent wind	**Ground Conditions:**	hard surfaced and open grass		
Instrument:	Gas Data LMSxi G3,18e meter	**Next Calibration Due Date:**	26/07/2023		
Instrument:	Phocheck 2000+ PID	**Next Calibration Due Date:**	15/07/2023		

Well ID:	BH101	**Well dia.(mm):**	50	**Date installed:**	24/02/2023	**Response stratum:**	Glaciofluvial Deposits
		Well depth (m):	19.32			**Groundwater depth (m):**	14.44

Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	4.0	0.0	79.2	0.0	0.0	20.8	0.0	3.9	0.5
After 30 Seconds	-13.0	0.0	81.2	6.6	0.0	12.2	0.0	-2.5	0.6
After 1 Minute	-17.0	0.0	81.3	6.7	0.0	12.0	0.0	6.0	0.7
After 2 Minutes	56.0	56.0	81.4	6.8	0.0	11.8	0.0	5.9	0.6
Steady State	0.0	0.0	81.4	6.8	0.0	11.8	0.0	0.0	0.6
min	*-17.0*	*0.0*	*79.2*	*0.0*	*0.0*	*11.8*	*0.0*	*-2.5*	*0.5*
max	*56.0*	*56.0*	*81.4*	*6.8*	*0.0*	*20.8*	*0.0*	*6.0*	*0.7*

Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)	**Methane:**	**0 L/hr**	**Carbon Dioxide**	**0.41 L/hr**
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)	**Methane:**	**0.00 L/hr**	**Carbon Dioxide**	**0 L/hr**
Comments:				

Well ID:	BH102	**Well dia.(mm):**	50	**Date installed:**	17/02/2023	**Response stratum:**	Glaciofluvial Deposits
		Well depth (m):	13.94			**Groundwater depth (m):**	8.49

Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	79.1	0.0	0.0	20.9	0.0	14.4	0.0
After 30 Seconds	0.0	0.0	79.7	0.9	0.0	19.4	0.0	0.0	0.1
After 1 Minute	0.0	0.0	79.7	1.0	0.0	19.3	0.0	0.0	0.0
After 2 Minutes	0.0	0.0	79.7	1.0	0.0	19.3	0.0	0.0	0.1
Steady State	0.0	0.0	79.7	1.0	0.0	19.3	0.0	0.0	0.0
min	*0.0*	*0.0*	*79.1*	*0.0*	*0.0*	*19.3*	*0.0*	*0.0*	*0.0*
max	*0.0*	*0.0*	*79.7*	*1.0*	*0.0*	*20.9*	*0.0*	*14.4*	*0.1*

Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)	**Methane:**	**0 L/hr**	**Carbon Dioxide**	**0.14 L/hr**
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)	**Methane:**	**0.00 L/hr**	**Carbon Dioxide**	**0 L/hr**
Comments:	(Believe this is WS04)			

Well ID:	BH105s	**Well dia.(mm):**	50	**Date installed:**	03/03/2023	**Response stratum:**	Made Ground & Glaciofluvial Deposits
		Well depth (m):	5.10			**Groundwater depth (m):**	4.92

Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	65.0	0.0	79.2	0.0	0.0	20.8	0.0	6.6	0.4
After 30 Seconds	42.0	0.0	83.4	2.4	0.0	14.2	0.0	4.8	0.3
After 1 Minute	42.0	0.0	83.6	2.4	0.0	14.0	0.0	4.9	0.2
After 2 Minutes	43.0	0.0	83.8	2.4	0.0	13.8	0.0	4.9	0.3
Steady State	41.0	0.0	83.8	2.4	0.0	13.8	0.0	4.8	0.3
min	*41.0*	*0.0*	*79.2*	*0.0*	*0.0*	*13.8*	*0.0*	*4.8*	*0.2*
max	*65.0*	*0.0*	*83.8*	*2.4*	*0.0*	*20.8*	*0.0*	*6.6*	*0.4*

Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)	**Methane:**	**0 L/hr**	**Carbon Dioxide**	**0.16 L/hr**
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)	**Methane:**	**0.00 L/hr**	**Carbon Dioxide**	**0.1152 L/hr**
Comments:				

Well ID:	BH105d	**Well dia.(mm):**	50	**Date installed:**	03/03/2023	**Response stratum:**	Glaciofluvial Deposits & London Clay Formation
		Well depth (m):	20.01			**Groundwater depth (m):**	16.5

Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	622.0	0.0	79.9	0.0	0.0	20.1	0.0	38.8	0.2
After 30 Seconds	611.0	0.0	83.4	2.3	0.0	14.3	0.0	38.4	0.5
After 1 Minute	606.0	0.0	83.5	2.4	0.0	14.1	0.0	38.2	0.1
After 2 Minutes	625.0	0.0	83.7	2.4	0.0	13.9	0.0	39.0	0.5
Steady State	627.0	0.0	83.9	2.4	0.0	13.7	0.0	38.8	0.2
min	*606.0*	*0.0*	*79.9*	*0.0*	*0.0*	*13.7*	*0.0*	*38.2*	*0.1*
max	*627.0*	*0.0*	*83.9*	*2.4*	*0.0*	*20.1*	*0.0*	*39.0*	*0.5*

Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)	**Methane:**	**0 L/hr**	**Carbon Dioxide**	**0.94 L/hr**
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)	**Methane:**	**0.00 L/hr**	**Carbon Dioxide**	**0.9312 L/hr**
Comments:	Steady state at 5 minutes.			

Well ID: WS103
Well dia.(mm): 50
Date installed: 15/02/2023
Response stratum: Glacialfluvial Deposits
Well depth (m): 2.82
Groundwater depth (m): Dry

Monitored Variables	dP (Pa)	LEL (%)	N_2 (%)	CO_2 (%)	CH_4 (%)	O_2 (%)	H_2S (ppm)	Flow (L/hr)	PID (ppm)
Immediate Reading	0.0	0.0	79.2	0.0	0.0	20.8	0.0	0.0	0.0
After 30 Seconds	0.0	0.0	79.5	1.3	0.0	19.2	0.0	0.0	0.1
After 1 Minute	0.0	0.0	79.6	1.3	0.0	19.1	0.0	0.0	0.0
After 2 Minutes	0.0	0.0	79.6	1.3	0.0	19.1	0.0	0.0	0.1
Steady State	0.0	0.0	79.6	1.3	0.0	19.1	0.0	0.0	0.0
min	*0.0*	*0.0*	*79.2*	*0.0*	*0.0*	*19.1*	*0.0*	*0.0*	*0.0*
max	*0.0*	*0.0*	*79.6*	*1.3*	*0.0*	*20.8*	*0.0*	*0.0*	*0.1*

Borehole Hazardous Gas Flow Rates Q $_{hg}$ (max gas conc)	**Methane:**	**0 L/hr**	**Carbon Dioxide**	**0.00 L/hr**
Borehole Hazardous Gas Flow Rates Q $_{hg}$ (steady state gas conc)	**Methane:**	**0.00 L/hr**	**Carbon Dioxide**	**0 L/hr**
Comments:				

Well ID: WS104
Well dia.(mm): 50
Date installed: 15/02/2023
Response stratum: Glacialfluvial Deposits
Well depth (m): 3.05
Groundwater depth (m): Dry

Monitored Variables	dP (Pa)	LEL (%)	N_2 (%)	CO_2 (%)	CH_4 (%)	O_2 (%)	H_2S (ppm)	Flow (L/hr)	PID (ppm)
Immediate Reading	0.0	0.0	79.1	0.0	0.0	20.9	0.0	0.0	0.0
After 30 Seconds	0.0	0.0	79.4	2.0	0.0	18.6	0.0	0.0	0.1
After 1 Minute	0.0	0.0	79.5	2.0	0.0	18.5	0.0	0.0	0.0
After 2 Minutes	0.0	0.0	79.5	2.0	0.0	18.5	0.0	0.0	0.2
Steady State	0.0	0.0	79.5	2.0	0.0	18.5	0.0	0.0	0.0
min	*0.0*	*0.0*	*79.1*	*0.0*	*0.0*	*18.5*	*0.0*	*0.0*	*0.0*
max	*0.0*	*0.0*	*79.5*	*2.0*	*0.0*	*20.9*	*0.0*	*0.0*	*0.2*

Borehole Hazardous Gas Flow Rates Q $_{hg}$ (max gas conc)	**Methane:**	**0 L/hr**	**Carbon Dioxide**	**0.00 L/hr**
Borehole Hazardous Gas Flow Rates Q $_{hg}$ (steady state gas conc)	**Methane:**	**0.00 L/hr**	**Carbon Dioxide**	**0 L/hr**
Comments:				

Well ID: WS105
Well dia.(mm): 50
Date installed: 15/02/2023
Response stratum: Made Ground & Lowestoft Fomarmation
Well depth (m): 4.16
Groundwater depth (m): 0.85

Monitored Variables	dP (Pa)	LEL (%)	N_2 (%)	CO_2 (%)	CH_4 (%)	O_2 (%)	H_2S (ppm)	Flow (L/hr)	PID (ppm)
Immediate Reading	-110.0	0.0	79.2	0.0	0.0	20.8	0.0	-63.0	0.2
After 30 Seconds	-26.0	0.0	90.8	1.6	0.0	7.6	0.0	-2.8	0.3
After 1 Minute	-12.0	0.0	91.3	1.6	0.0	7.1	0.0	-2.4	0.2
After 2 Minutes	-7.0	0.0	91.4	1.6	0.0	7.0	0.0	-1.3	0.2
Steady State	0.0	0.0	91.5	1.6	0.0	6.9	0.0	0.0	0.2
min	*-110.0*	*0.0*	*79.2*	*0.0*	*0.0*	*6.9*	*0.0*	*-63.0*	*0.2*
max	*0.0*	*0.0*	*91.5*	*1.6*	*0.0*	*20.8*	*0.0*	*0.0*	*0.3*

Borehole Hazardous Gas Flow Rates Q $_{hg}$ (max gas conc)	**Methane:**	**0 L/hr**	**Carbon Dioxide**	**0.00 L/hr**
Borehole Hazardous Gas Flow Rates Q $_{hg}$ (steady state gas conc)	**Methane:**	**0.00 L/hr**	**Carbon Dioxide**	**0 L/hr**
Comments:				

Well ID: WS106
Well dia.(mm): 50
Date installed: 16/02/2023
Response stratum: Made Ground
Well depth (m): 5.04
Groundwater depth (m): 4.21

Monitored Variables	dP (Pa)	LEL (%)	N_2 (%)	CO_2 (%)	CH_4 (%)	O_2 (%)	H_2S (ppm)	Flow (L/hr)	PID (ppm)
Immediate Reading	43.0	0.0	79.2	0.0	0.0	20.8	0.0	5.0	0.3
After 30 Seconds	8.0	0.0	93.4	5.2	0.0	1.4	0.0	1.5	0.4
After 1 Minute	27.0	0.0	93.8	5.2	0.0	1.0	0.0	3.0	0.3
After 2 Minutes	12.0	0.0	94.0	5.0	0.0	1.0	0.0	2.2	0.4
Steady State	1.0	0.0	94.1	4.8	0.0	1.1	0.0	0.1	0.3
min	*1.0*	*0.0*	*79.2*	*0.0*	*0.0*	*1.0*	*0.0*	*0.1*	*0.3*
max	*43.0*	*0.0*	*94.1*	*5.2*	*0.0*	*20.8*	*0.0*	*5.0*	*0.4*

Borehole Hazardous Gas Flow Rates Q $_{hg}$ (max gas conc)	**Methane:**	**0 L/hr**	**Carbon Dioxide**	**0.26 L/hr**
Borehole Hazardous Gas Flow Rates Q $_{hg}$ (steady state gas conc)	**Methane:**	**0.00 L/hr**	**Carbon Dioxide**	**0.0048 L/hr**
Comments:				

Key:

dP - differential pressure (well-atmosphere)
LEL - Lower Explosive Limit (methane)
N_2 - nitrogen
CO_2 - carbon dioxide
CH_4 - methane
O_2 - oxygen
H_2S - Hydrogen sulphide
PID - measure of volatile organic compounds

PROPOSED SCHOOL DEVELOPMENT
BURNT MILL ACADEMY, HARLOW
Results of Hazardous Gas and Groundwater Monitoring
(Spot Monitoring)

Project Ref. 8511.02

Monitoring Event 2

Date:	06/04/2023	**Atmospheric Pressure (start):**	1,005 mb	**Trend:**	Falling
Time:	9:30	**Atmospheric Pressure (end):**	1,004 mb		
Engineer:	JA	**Site Status:**	Developed & open field		
Weather:	Dry, warm	**Ground Conditions:**	hard surfaced and open grass		
Instrument:	Gas Data LMSxi G3,18e meter	**Next Calibration Due Date:**	26/07/2023		
Instrument:	Phocheck 2000+ PID	**Next Calibration Due Date:**	15/07/2023		

Well ID:	BH101	**Well dia.(mm):**	50	**Date installed:**	24/02/2023	**Response stratum:**	Glaciofluvial Deposits
		Well depth (m):	19.30			**Groundwater depth (m):**	14.32

Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	79.2	0.0	0.0	20.8	0.0	0.0	0.5
After 30 Seconds	0.0	0.0	81.4	6.2	0.0	12.4	0.0	0.0	0.7
After 1 Minute	0.0	0.0	81.4	6.3	0.0	12.3	0.0	0.0	0.6
After 2 Minutes	0.0	56.0	81.6	6.4	0.0	12.0	0.0	0.0	0.6
Steady State	0.0	0.0	81.6	6.4	0.0	12.0	0.0	0.0	0.6
min	*0.0*	*0.0*	*79.2*	*0.0*	*0.0*	*12.0*	*0.0*	*0.0*	*0.5*
max	*0.0*	*56.0*	*81.6*	*6.4*	*0.0*	*20.8*	*0.0*	*0.0*	*0.7*

Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)	**Methane:**	**0 L/hr**	**Carbon Dioxide**	**0.00 L/hr**
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)	**Methane:**	**0.00 L/hr**	**Carbon Dioxide**	**0 L/hr**
Comments:				

Well ID:	BH102	**Well dia.(mm):**	50	**Date installed:**	17/02/2023	**Response stratum:**	Glaciofluvial Deposits
		Well depth (m):	13.91			**Groundwater depth (m):**	8.44

Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	79.3	0.0	0.0	20.7	0.0	0.0	0.0
After 30 Seconds	0.0	0.0	80.4	0.4	0.0	19.2	0.0	0.0	0.1
After 1 Minute	0.0	0.0	80.3	0.7	0.0	19.0	0.0	0.0	0.2
After 2 Minutes	0.0	0.0	80.2	0.8	0.0	19.0	0.0	0.0	0.2
Steady State	0.0	0.0	80.1	0.9	0.0	19.0	0.0	0.0	0.2
min	*0.0*	*0.0*	*79.3*	*0.0*	*0.0*	*19.0*	*0.0*	*0.0*	0.0
max	*0.0*	*0.0*	*80.4*	*0.9*	*0.0*	*20.7*	*0.0*	*0.0*	0.2

Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)	**Methane:**	**0 L/hr**	**Carbon Dioxide**	**0.00 L/hr**
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)	**Methane:**	**0.00 L/hr**	**Carbon Dioxide**	**0 L/hr**
Comments:				

Well ID:	BH105s	**Well dia.(mm):**	50	**Date installed:**	03/03/2023	**Response stratum:**	Made Ground & Glaciofluvial Deposits
		Well depth (m):	5.09			**Groundwater depth (m):**	4.63

Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	9.0	0.0	79.0	0.0	0.0	21.0	0.0	1.8	0.2
After 30 Seconds	9.0	0.0	78.6	0.7	0.0	20.7	0.0	1.7	0.2
After 1 Minute	13.0	0.0	78.6	1.1	0.0	20.3	0.0	2.3	0.2
After 2 Minutes	13.0	0.0	78.6	1.2	0.0	20.2	0.0	2.3	0.2
Steady State	13.0	0.0	78.6	1.2	0.0	20.2	0.0	2.3	0.2
min	*9.0*	*0.0*	*78.6*	*0.0*	*0.0*	*20.2*	*0.0*	*1.7*	*0.2*
max	*13.0*	*0.0*	*79.0*	*1.2*	*0.0*	*21.0*	*0.0*	*2.3*	*0.2*

Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)	**Methane:**	**0 L/hr**	**Carbon Dioxide**	**0.03 L/hr**
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)	**Methane:**	**0.00 L/hr**	**Carbon Dioxide**	**0.0276 L/hr**
Comments:	Flow and dP remained constant after 1 minute. The values didn't return to zero.			

Well ID:	BH105d	**Well dia.(mm):**	50	**Date installed:**	03/03/2023	**Response stratum:**	Glaciofluvial Deposits & London Clay Formation
		Well depth (m):	20.00			**Groundwater depth (m):**	16.5

Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	353.0	0.0	79.0	0.0	0.0	21.0	0.0	27.6	0.0
After 30 Seconds	353.0	0.0	78.6	0.9	0.0	20.5	0.0	27.6	0.1
After 1 Minute	352.0	0.0	78.6	1.2	0.0	20.2	0.0	27.6	0.0
After 2 Minutes	352.0	0.0	78.5	1.3	0.0	20.2	0.0	27.6	0.1
After 3 Minutes	352.0	0.0	78.5	1.3	0.0	20.2	0.0	27.6	0.0
Steady State	352.0	0.0	78.5	1.3	0.0	20.2	0.0	27.6	0.0
min	*352.0*	*0.0*	*78.5*	*0.0*	*0.0*	*20.2*	*0.0*	*27.6*	*0.0*
max	*353.0*	*0.0*	*79.0*	*1.3*	*0.0*	*21.0*	*0.0*	*27.6*	*0.1*

Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)	**Methane:**	**0 L/hr**	**Carbon Dioxide**	**0.36 L/hr**
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)	**Methane:**	**0.00 L/hr**	**Carbon Dioxide**	**0.3588 L/hr**
Comments:	Steady state at 4 minutes.			

Well ID:	WS103	**Well dia.(mm):**	50	**Date installed:**	15/02/2023	**Response stratum:**	Glacialfluvial Deposits
		Well depth (m):	2.82			**Groundwater depth (m):**	Dry

Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	79.0	0.0	0.0	21.0	0.0	0.0	0.0
After 30 Seconds	0.0	0.0	78.7	1.1	0.0	20.2	0.0	0.0	0.2
After 1 Minute	0.0	0.0	79.9	2.1	0.0	18.0	0.0	0.0	0.3
After 2 Minutes	0.0	0.0	80.2	2.2	0.0	17.6	0.0	0.0	0.1
Steady State	0.0	0.0	80.2	2.2	0.0	17.6	0.0	0.0	0.1
min	*0.0*	*0.0*	*78.7*	*0.0*	*0.0*	*17.6*	*0.0*	*0.0*	*0.0*
max	*0.0*	*0.0*	*80.2*	*2.2*	*0.0*	*21.0*	*0.0*	*0.0*	*0.3*

Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)	**Methane:**	**0 L/hr**	**Carbon Dioxide**	**0.00 L/hr**
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)	**Methane:**	**0.00 L/hr**	**Carbon Dioxide**	**0 L/hr**
Comments:				

Well ID: WS104	**Well dia.(mm):**	50	**Date installed:**	15/02/2023	**Response stratum:**		Glacialfluvial Deposits		
	Well depth (m):	3.06			**Groundwater depth (m):**		Dry		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	79.2	0.0	0.0	20.8	0.0	0.0	0.0
After 30 Seconds	-1.0	0.0	78.6	1.1	0.0	20.3	0.0	-0.3	0.2
After 1 Minute	0.0	0.0	79.3	2.0	0.0	18.7	0.0	0.0	0.1
After 2 Minutes	0.0	0.0	79.5	2.1	0.0	18.4	0.0	0.0	0.1
Steady State	0.0	0.0	79.5	2.1	0.0	18.4	0.0	0.0	0.1
min	*-1.0*	*0.0*	*78.6*	*0.0*	*0.0*	*18.4*	*0.0*	*-0.3*	*0.0*
max	*0.0*	*0.0*	*79.5*	*2.1*	*0.0*	*20.8*	*0.0*	*0.0*	*0.2*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:									

Well ID: WS105	**Well dia.(mm):**	50	**Date installed:**	15/02/2023	**Response stratum:**		Made Ground & Lowestoft Fomarmation		
	Well depth (m):	4.16			**Groundwater depth (m):**		0.83		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	79.2	0.0	0.0	20.8	0.0	0.0	0.3
After 30 Seconds	0.0	0.0	79.6	0.5	0.0	19.9	0.0	0.0	0.8
After 1 Minute	0.0	0.0	81.2	0.7	0.0	18.1	0.0	0.0	1.3
After 2 Minutes	0.0	0.0	82.3	0.9	0.0	16.8	0.0	0.0	1.4
Steady State	0.0	0.0	82.9	0.9	0.0	16.2	0.0	0.0	1.1
min	*0.0*	*0.0*	*79.2*	*0.0*	*0.0*	*16.2*	*0.0*	*0.0*	*0.3*
max	*0.0*	*0.0*	*82.9*	*0.9*	*0.0*	*20.8*	*0.0*	*0.0*	*1.4*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:									

Well ID: WS106	**Well dia.(mm):**	50	**Date installed:**	16/02/2023	**Response stratum:**		Made Ground		
	Well depth (m):	5.02			**Groundwater depth (m):**		3.09		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	79.3	0.0	0.0	20.7	0.0	0.0	0.4
After 30 Seconds	0.0	0.0	81.0	2.0	0.0	17.0	0.0	0.0	0.7
After 1 Minute	0.0	0.0	87.7	3.6	0.0	8.7	0.0	0.0	0.5
After 2 Minutes	0.0	0.0	90.0	4.3	0.0	5.7	0.0	0.0	0.4
After 3 Minutes	0.0	0.0	91.1	4.7	0.0	4.2	0.0	0.0	0.4
After 4 Minutes	0.0	0.0	91.9	4.9	0.0	3.2	0.0	0.0	0.4
After 5 Minutes	0.0	0.0	92.5	5.3	0.0	2.2	0.0	0.0	0.4
After 6 Minutes	0.0	0.0	92.6	5.4	0.0	2.0	0.0	0.0	0.4
Steady State	0.0	0.0	92.6	5.4	0.0	2.0	0.0	0.0	0.4
min	*0.0*	*0.0*	*79.3*	*0.0*	*0.0*	*2.0*	*0.0*	*0.0*	*0.4*
max	*0.0*	*0.0*	*92.6*	*5.4*	*0.0*	*20.7*	*0.0*	*0.0*	*0.7*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:									

Well ID: WS10A	**Well dia.(mm):**	50	**Date installed:**	15/02/2022	**Response stratum:**		Lowestoft Formation		
	Well depth (m):	4.94			**Groundwater depth (m):**		3.24		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	79.5	0.1	0.0	20.4	0.0	0.0	0.3
After 30 Seconds	0.0	0.0	78.5	1.4	0.0	20.1	0.0	0.0	0.4
After 1 Minute	0.0	0.0	81.6	3.7	0.0	14.7	0.0	0.0	0.3
After 2 Minutes	0.0	0.0	82.5	4.2	0.0	13.3	0.0	0.0	0.3
Steady State	0.0	0.0	82.5	4.2	0.0	13.3	0.0	0.0	0.3
min	*0.0*	*0.0*	*78.5*	*0.1*	*0.0*	*13.3*	*0.0*	*0.0*	*0.3*
max	*0.0*	*0.0*	*82.5*	*4.2*	*0.0*	*20.4*	*0.0*	*0.0*	*0.4*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:	Historic Well								

Well ID: WS11	**Well dia.(mm):**	50	**Date installed:**	15/02/2022	**Response stratum:**		Glaciofluvial Deposits		
	Well depth (m):	4.80			**Groundwater depth (m):**		4.52		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	79.1	0.1	0.0	20.8	0.0	0.0	0.3
After 30 Seconds	0.0	0.0	79.9	0.0	0.0	20.1	0.0	0.0	0.4
After 1 Minute	0.0	0.0	85.3	0.0	0.0	14.7	0.0	0.0	0.3
After 2 Minutes	0.0	0.0	86.7	0.0	0.0	13.3	0.0	0.0	0.3
Steady State	0.0	0.0	86.7	0.0	0.0	13.3	0.0	0.0	0.3
min	*0.0*	*0.0*	*79.1*	*0.0*	*0.0*	*13.3*	*0.0*	*0.0*	*0.3*
max	*0.0*	*0.0*	*86.7*	*0.1*	*0.0*	*20.8*	*0.0*	*0.0*	*0.4*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:	Historic Well								

Key:

dP - differential pressure (well-atmosphere)

LEL - Lower Explosive Limit (methane)

N_2 - nitrogen

CO_2 - carbon dioxide

CH_4 - methane

O_2 - oxygen

H_2S - Hydrogen sulphide

PID - measure of volatile organic compounds

PROPOSED SCHOOL DEVELOPMENT
BURNT MILL ACADEMY, HARLOW
Results of Hazardous Gas and Groundwater Monitoring
(Spot Monitoring)

Project Ref. 8511.02

Monitoring Event 3

Date:	18/04/2023	**Atmospheric Pressure (start):**	1,020 mb	**Trend:**	Falling
Time:	12	**Atmospheric Pressure (end):**	1,019 mb		
Engineer:	JA	**Site Status:**	Developed and open field		
Weather:	Dry, cold	**Ground Conditions:**	hard surfaced and dry grass		
Instrument:	Gas Data LMSxi G3,18e meter	**Next Calibration Due Date:**	26/07/2023		
Instrument:	Phocheck 2000+ PID	**Next Calibration Due Date:**	15/07/2023		

Well ID:	BH101	**Well dia.(mm):**	50	**Date installed:**	24/02/2023	**Response stratum:**		Glaciofluvial Deposits	
		Well depth (m):	19.16			**Groundwater depth (m):**		14.3	
Monitored Variables		**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading		0.0	0.0	79.4	0.0	0.0	20.6	0.0	0.0	n/a
After 30 Seconds		0.0	0.0	79.2	0.1	0.0	20.7	0.0	0.0	n/a
After 1 Minute		0.0	0.0	79.3	0.0	0.0	20.7	0.0	0.0	n/a
After 2 Minutes		0.0	0.0	79.1	0.0	0.0	20.9	0.0	0.0	n/a
Steady State		0.0	0.0	79.1	0.0	0.0	20.9	0.0	0.0	n/a
min		*0.0*	*0.0*	*79.1*	*0.0*	*0.0*	*20.6*	*0.0*	*0.0*	n/a
max		*0.0*	*0.0*	*79.4*	*0.1*	*0.0*	*20.9*	*0.0*	*0.0*	n/a
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:									

Well ID:	BH102	**Well dia.(mm):**	50	**Date installed:**	17/02/2023	**Response stratum:**		Glaciofluvial Deposits	
		Well depth (m):	13.92			**Groundwater depth (m):**		8.41	
Monitored Variables		**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading		0.0	0.0	79.1	0.0	0.0	20.9	0.0	0.0	n/a
After 30 Seconds		0.0	0.0	80.1	0.6	0.0	19.3	0.0	0.0	n/a
After 1 Minute		0.0	0.0	80.0	0.8	0.0	19.2	0.0	0.0	n/a
After 2 Minutes		0.0	0.0	79.9	0.9	0.0	19.2	0.0	0.0	n/a
Steady State		0.0	0.0	79.9	0.9	0.0	19.2	0.0	0.0	n/a
min		*0.0*	*0.0*	*79.1*	*0.0*	*0.0*	*19.2*	*0.0*	*0.0*	n/a
max		*0.0*	*0.0*	*80.1*	*0.9*	*0.0*	*20.9*	*0.0*	*0.0*	n/a
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:									

Well ID:	BH105s	**Well dia.(mm):**	50	**Date installed:**	03/03/2023	**Response stratum:**		Made Ground & Glaciofluvial Deposits	
		Well depth (m):	5.09			**Groundwater depth (m):**		4.49	
Monitored Variables		**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading		0.0	0.0	79.1	0.0	0.0	20.9	0.0	0.0	n/a
After 30 Seconds		0.0	0.0	78.5	0.8	0.0	20.7	0.0	0.0	n/a
After 1 Minute		0.0	0.0	78.6	2.0	0.0	19.4	0.0	0.0	n/a
After 2 Minutes		0.0	0.0	78.9	2.2	0.0	18.9	0.0	0.0	n/a
Steady State		0.0	0.0	78.9	2.2	0.0	18.9	0.0	0.0	n/a
min		*0.0*	*0.0*	*78.5*	*0.0*	*0.0*	*18.9*	*0.0*	*0.0*	n/a
max		*0.0*	*0.0*	*79.1*	*2.2*	*0.0*	*20.9*	*0.0*	*0.0*	n/a
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:									

Well ID:	BH105d	**Well dia.(mm):**	50	**Date installed:**	03/03/2023	**Response stratum:**		Glaciofluvial Deposits & London Clay Formation	
		Well depth (m):	19.95			**Groundwater depth (m):**		16.5	
Monitored Variables		**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading		141.0	0.0	79.2	0.0	0.0	20.8	0.0	12.1	n/a
After 30 Seconds		150.0	0.0	78.7	0.4	0.0	20.9	0.0	12.0	n/a
After 1 Minute		146.0	0.0	78.5	2.0	0.0	19.5	0.0	12.1	n/a
After 2 Minutes		141.0	0.0	78.7	2.3	0.0	19.0	0.0	12.1	n/a
After 3 Minutes		141.0	0.0	78.7	2.3	0.0	19.0	0.0	12.1	n/a
After 4 Minutes		141.0	0.0	78.7	2.3	0.0	19.0	0.0	12.1	n/a
Steady State		141.0	0.0	78.7	2.3	0.0	19.0	0.0	12.1	n/a
min		*141.0*	*0.0*	*78.5*	*0.0*	*0.0*	*19.0*	*0.0*	*12.0*	n/a
max		*150.0*	*0.0*	*79.2*	*2.3*	*0.0*	*20.9*	*0.0*	*12.1*	n/a
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.28 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0.2783 L/hr**	
Comments:									

Well ID:	WS103	**Well dia.(mm):**	50	**Date installed:**	15/02/2023	**Response stratum:**		Glacialfluvial Deposits	
		Well depth (m):	2.82			**Groundwater depth (m):**		Dry	
Monitored Variables		**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading		0.0	0.0	79.1	0.0	0.0	20.9	0.0	0.0	n/a
After 30 Seconds		0.0	0.0	78.5	0.8	0.0	20.7	0.0	0.0	n/a
After 1 Minute		0.0	0.0	79.5	2.3	0.0	18.2	0.0	0.0	n/a
After 2 Minutes		0.0	0.0	80.0	2.6	0.0	17.4	0.0	0.0	n/a
Steady State		0.0	0.0	80.1	2.6	0.0	17.3	0.0	0.0	n/a
min		*0.0*	*0.0*	*78.5*	*0.0*	*0.0*	*17.3*	*0.0*	*0.0*	n/a
max		*0.0*	*0.0*	*80.1*	*2.6*	*0.0*	*20.9*	*0.0*	*0.0*	n/a
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:									

Well ID:	WS104	**Well dia.(mm):**	50	**Date installed:**	15/02/2023	**Response stratum:**		Glacialfluvial Deposits	
		Well depth (m):	3.06			**Groundwater depth (m):**		Dry	
Monitored Variables		**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading		0.0	0.0	79.2	0.0	0.0	20.8	0.0	0.0	n/a
After 30 Seconds		0.0	0.0	78.6	0.7	0.0	20.7	0.0	0.0	n/a
After 1 Minute		0.0	0.0	79.1	2.0	0.0	18.9	0.0	0.0	n/a
After 2 Minutes		0.0	0.0	79.4	2.3	0.0	18.3	0.0	0.0	n/a
Steady State		0.0	0.0	79.4	2.3	0.0	18.3	0.0	0.0	n/a
min		*0.0*	*0.0*	*78.6*	*0.0*	*0.0*	*18.3*	*0.0*	*0.0*	n/a
max		*0.0*	*0.0*	*79.4*	*2.3*	*0.0*	*20.8*	*0.0*	*0.0*	n/a
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:									

Well ID: WS105	Well dia.(mm):	50	Date installed:	15/02/2023	Response stratum:		Made Ground & Lowestoft Fomarmation		
	Well depth (m):	4.15			Groundwater depth (m):		0.92		
Monitored Variables	dP (Pa)	LEL (%)	N_2 (%)	CO_2 (%)	CH_4 (%)	O_2 (%)	H_2S (ppm)	Flow (L/hr)	PID (ppm)
Immediate Reading	0.0	0.0	78.9	0.0	0.0	21.1	0.0	0.0	n/a
After 30 Seconds	0.0	0.0	81.9	0.7	0.0	17.4	0.0	0.0	n/a
After 1 Minute	0.0	0.0	82.4	1.3	0.0	16.3	0.0	0.0	n/a
After 2 Minutes	0.0	0.0	90.2	1.6	0.0	8.2	0.0	0.0	n/a
Steady State	0.0	0.0	90.5	1.7	0.0	7.8	0.0	0.0	n/a
min	*0.0*	*0.0*	*78.9*	*0.0*	*0.0*	*7.8*	*0.0*	*0.0*	n/a
max	*0.0*	*0.0*	*90.5*	*1.7*	*0.0*	*21.1*	*0.0*	*0.0*	n/a
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				Methane:	0 L/hr		Carbon Dioxide	0.00 L/hr	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				Methane:	0.00 L/hr		Carbon Dioxide	0 L/hr	
Comments:									

Well ID: WS106	Well dia.(mm):	50	Date installed:	#REF!	Response stratum:		Made Ground		
	Well depth (m):	5.03			Groundwater depth (m):		3.14		
Monitored Variables	dP (Pa)	LEL (%)	N_2 (%)	CO_2 (%)	CH_4 (%)	O_2 (%)	H_2S (ppm)	Flow (L/hr)	PID (ppm)
Immediate Reading	-4.0	0.0	79.2	0.0	0.0	20.8	0.0	-0.6	n/a
After 30 Seconds	-1.0	0.0	79.9	0.9	0.0	19.2	0.0	-0.2	n/a
After 1 Minute	0.0	0.0	83.3	2.0	0.0	14.7	0.0	0.0	n/a
After 2 Minutes	0.0	0.0	86.3	2.8	0.0	10.9	0.0	0.0	n/a
After 3 Minutes	0.0	0.0	87.6	3.4	0.0	9.0	0.0	0.0	n/a
After 4 Minutes	0.0	0.0	88.6	3.8	0.0	7.6	0.0	0.0	n/a
After 5 Minutes	0.0	0.0	89.2	4.2	0.0	6.6	0.0	0.0	n/a
Steady State	0.0	0.0	89.2	4.2	0.0	6.6	0.0	0.0	n/a
min	*-4.0*	*0.0*	*79.2*	*0.0*	*0.0*	*6.6*	*0.0*	*-0.6*	n/a
max	*0.0*	*0.0*	*89.2*	*4.2*	*0.0*	*20.8*	*0.0*	*0.0*	n/a
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				Methane:	0 L/hr		Carbon Dioxide	0.00 L/hr	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				Methane:	0.00 L/hr		Carbon Dioxide	0 L/hr	
Comments:									

Well ID: WS01	Well dia.(mm):	50	Date installed:	26/11/2021	Response stratum:		Lowestoft Formation and Glaciofluvial Deposits		
	Well depth (m):	5.00			Groundwater depth (m):		4.95		
Monitored Variables	dP (Pa)	LEL (%)	N_2 (%)	CO_2 (%)	CH_4 (%)	O_2 (%)	H_2S (ppm)	Flow (L/hr)	PID (ppm)
Immediate Reading	0.0	0.0	79.1	0.1	0.0	20.8	0.0	0.0	n/a
After 30 Seconds	0.0	0.0	78.9	0.4	0.0	20.7	0.0	0.0	n/a
After 1 Minute	0.0	0.0	79.4	0.9	0.0	19.7	0.0	0.0	n/a
After 2 Minutes	0.0	0.0	79.2	1.2	0.0	19.6	0.0	0.0	n/a
Steady State	0.0	0.0	79.2	1.5	0.0	19.3	0.0	0.0	n/a
min	*0.0*	*0.0*	*78.9*	*0.1*	*0.0*	*19.3*	*0.0*	*0.0*	n/a
max	*0.0*	*0.0*	*79.4*	*1.5*	*0.0*	*20.8*	*0.0*	*0.0*	n/a
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				Methane:	0 L/hr		Carbon Dioxide	0.00 L/hr	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				Methane:	0.00 L/hr		Carbon Dioxide	0 L/hr	
Comments:	Historic Well								

Well ID: WS09	Well dia.(mm):	50	Date installed:	15/02/2022	Response stratum:		Lowestoft Formation and Glaciofluvial Deposits		
	Well depth (m):	2.03			Groundwater depth (m):		Dry		
Monitored Variables	dP (Pa)	LEL (%)	N_2 (%)	CO_2 (%)	CH_4 (%)	O_2 (%)	H_2S (ppm)	Flow (L/hr)	PID (ppm)
Immediate Reading	0.0	0.0	79.3	0.0	0.0	20.7	0.0	0.0	0.0
After 30 Seconds	0.0	0.0	79.4	1.3	0.0	19.3	0.0	0.0	0.0
After 1 Minute	0.0	0.0	80.0	2.2	0.0	17.8	0.0	0.0	0.0
After 2 Minutes	0.0	0.0	80.0	2.5	0.0	17.5	0.0	0.0	0.0
Steady State	0.0	0.0	79.9	2.7	0.0	17.4	0.0	0.0	0.0
min	*0.0*	*0.0*	*79.3*	*0.0*	*0.0*	*17.4*	*0.0*	*0.0*	*0.0*
max	*0.0*	*0.0*	*80.0*	*2.7*	*0.0*	*20.7*	*0.0*	*0.0*	*0.0*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				Methane:	0 L/hr		Carbon Dioxide	0.00 L/hr	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				Methane:	0.00 L/hr		Carbon Dioxide	0 L/hr	
Comments:	Historic Well								

Well ID: WS10A	Well dia.(mm):	50	Date installed:	15/02/2022	Response stratum:		Lowestoft Formation		
	Well depth (m):	4.95			Groundwater depth (m):		2.19		
Monitored Variables	dP (Pa)	LEL (%)	N_2 (%)	CO_2 (%)	CH_4 (%)	O_2 (%)	H_2S (ppm)	Flow (L/hr)	PID (ppm)
Immediate Reading	0.0	0.0	79.2	0.0	0.0	20.8	0.0	0.0	n/a
After 30 Seconds	0.0	0.0	78.5	2.0	0.0	19.5	0.0	0.0	n/a
After 1 Minute	0.0	0.0	82.0	4.4	0.0	13.6	0.0	0.0	n/a
After 2 Minutes	0.0	0.0	83.8	4.9	0.0	11.3	0.0	0.0	n/a
Steady State	0.0	0.0	83.9	5.0	0.0	11.1	0.0	0.0	n/a
min	*0.0*	*0.0*	*78.5*	*0.0*	*0.0*	*11.1*	*0.0*	*0.0*	n/a
max	*0.0*	*0.0*	*83.9*	*5.0*	*0.0*	*20.8*	*0.0*	*0.0*	n/a
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				Methane:	0 L/hr		Carbon Dioxide	0.00 L/hr	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				Methane:	0.00 L/hr		Carbon Dioxide	0 L/hr	
Comments:	Historic Well								

Well ID: WS11	Well dia.(mm):	50	Date installed:	15/02/2022	Response stratum:		Glaciofluvial Deposits		
	Well depth (m):				Groundwater depth (m):				
Monitored Variables	dP (Pa)	LEL (%)	N_2 (%)	CO_2 (%)	CH_4 (%)	O_2 (%)	H_2S (ppm)	Flow (L/hr)	PID (ppm)
Immediate Reading	-1.0	0.0	79.2	0.0	0.0	20.8	0.0	-0.1	n/a
After 30 Seconds	0.0	0.0	79.0	0.0	0.0	21.0	0.0	0.0	n/a
After 1 Minute	0.0	0.0	79.0	0.0	0.0	21.0	0.0	0.0	n/a
After 2 Minutes	0.0	0.0	79.0	0.0	0.0	21.0	0.0	0.0	n/a
Steady State	0.0	0.0	79.0	0.0	0.0	21.0	0.0	0.0	n/a
min	*-1.0*	*0.0*	*79.0*	*0.0*	*0.0*	*20.8*	*0.0*	*-0.1*	n/a
max	*0.0*	*0.0*	*79.2*	*0.0*	*0.0*	*21.0*	*0.0*	*0.0*	n/a
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				Methane:	0 L/hr		Carbon Dioxide	0.00 L/hr	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				Methane:	0.00 L/hr		Carbon Dioxide	0 L/hr	
Comments:	Historic Well								

Key:

dP - differential pressure
(well-atmosphere)

LEL - Lower Explosive Limit (methane)
N_2 - nitrogen
CO_2 - carbon dioxide

CH_4 - methane

O_2 - oxygen
H_2S - Hydrogen sulphide
PID - measure of volatile organic compounds

PROPOSED SCHOOL DEVELOPMENT
BURNT MILL ACADEMY, HARLOW
Results of Hazardous Gas and Groundwater Monitoring
(Spot Monitoring)

Project Ref. 8511.02

Monitoring Event 4

Date:	09/05/2023	**Atmospheric Pressure (start):**	1,003 mb	**Trend:**	Falling
Time:	13:00	**Atmospheric Pressure (end):**	999 mb		
Engineer:	JA	**Site Status:**	Developed and open field		
Weather:	Dry, cold	**Ground Conditions:**	hard surfaced and grass		
Instrument:	Gas Data LMSxi G3,18e meter	**Next Calibration Due Date:**	26/07/2023		
Instrument:	Phocheck 2000+ PID	**Next Calibration Due Date:**	15/07/2023		

Well ID:	BH101	**Well dia.(mm):**	50	**Date installed:**	24/02/2023	**Response stratum:**		Glaciofluvial Deposits		
		Well depth (m):	19.17			**Groundwater depth (m):**		13.4		
Monitored Variables		**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading		3.0	0.0	79.5	0.0	0.0	20.5	0.0	0.6	0.7
After 30 Seconds		2.0	0.0	78.6	0.7	0.0	20.7	0.0	0.4	0.8
After 1 Minute		0.0	0.0	79.0	1.1	0.0	19.9	0.0	0.0	0.7
After 2 Minutes		0.0	0.0	79.1	1.3	0.0	19.6	0.0	0.0	0.7
Steady State		0.0	0.0	79.1	1.3	0.0	19.6	0.0	0.0	0.7
min		*0.0*	*0.0*	*78.6*	*0.0*	*0.0*	*19.6*	*0.0*	*0.0*	0.7
max		*3.0*	*0.0*	*79.5*	*1.3*	*0.0*	*20.7*	*0.0*	*0.6*	0.8
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)					**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.01 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)					**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:										

Well ID:	BH102	**Well dia.(mm):**	50	**Date installed:**	17/02/2023	**Response stratum:**		Glaciofluvial Deposits		
		Well depth (m):	13.91			**Groundwater depth (m):**		8.42		
Monitored Variables		**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading		0.0	0.0	79.0	0.0	0.0	21.0	0.0	0.0	0.2
After 30 Seconds		0.0	0.0	78.8	0.7	0.0	20.5	0.0	0.0	0.1
After 1 Minute		0.0	0.0	79.5	0.9	0.0	19.6	0.0	0.0	0.2
After 2 Minutes		0.0	0.0	79.5	1.1	0.0	19.4	0.0	0.0	0.2
Steady State		0.0	0.0	79.5	1.1	0.0	19.4	0.0	0.0	0.2
min		*0.0*	*0.0*	*78.8*	*0.0*	*0.0*	*19.4*	*0.0*	*0.0*	*0.1*
max		*0.0*	*0.0*	*79.5*	*1.1*	*0.0*	*21.0*	*0.0*	*0.0*	*0.2*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)					**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)					**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:										

Well ID:	BH105s	**Well dia.(mm):**	50	**Date installed:**	03/03/2023	**Response stratum:**		Made Ground & Glaciofluvial Deposits		
		Well depth (m):	5.10			**Groundwater depth (m):**		5.02		
Monitored Variables		**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading		4.0	0.0	79.6	0.1	0.0	20.3	0.0	0.7	0.5
After 30 Seconds		3.0	0.0	78.5	1.4	0.0	20.1	0.0	0.5	1.3
After 1 Minute		3.0	0.0	80.1	2.4	0.0	17.5	0.0	0.6	1.3
After 2 Minutes		3.0	0.0	80.6	2.6	0.0	16.8	0.0	0.6	1.3
Steady State		3.0	0.0	80.6	2.6	0.0	16.8	0.0	0.6	1.3
min		*3.0*	*0.0*	*78.5*	*0.1*	*0.0*	*16.8*	*0.0*	*0.5*	0.5
max		*4.0*	*0.0*	*80.6*	*2.6*	*0.0*	*20.3*	*0.0*	*0.7*	1.3
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)					**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.02 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)					**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0.0156 L/hr**	
Comments:										

Well ID:	BH105d	**Well dia.(mm):**	50	**Date installed:**	03/03/2023	**Response stratum:**		Glaciofluvial Deposits & London Clay Formation		
		Well depth (m):	19.84			**Groundwater depth (m):**		16.47		
Monitored Variables		**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading		164.0	0.0	78.9	0.0	0.0	21.1	0.0	13.8	0.3
After 30 Seconds		166.0	0.0	79.3	1.6	0.0	19.1	0.0	14.0	0.4
After 1 Minute		166.0	0.0	80.3	2.2	0.0	17.5	0.0	14.0	0.4
After 2 Minutes		166.0	0.0	80.5	2.3	0.0	17.2	0.0	14.0	0.4
After 3 Minutes		166.0	0.0	80.5	2.3	0.0	17.2	0.0	14.0	0.4
Steady State		166.0	0.0	80.5	2.3	0.0	17.2	0.0	14.0	0.4
min		*164.0*	*0.0*	*78.9*	*0.0*	*0.0*	*17.2*	*0.0*	*13.8*	0.3
max		*166.0*	*0.0*	*80.5*	*2.3*	*0.0*	*21.1*	*0.0*	*14.0*	0.4
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)					**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.32 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)					**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0.322 L/hr**	
Comments:										

Well ID:	WS103	**Well dia.(mm):**	50	**Date installed:**	15/02/2023	**Response stratum:**		Glacialfluvial Deposits		
		Well depth (m):	2.82			**Groundwater depth (m):**		Dry		
Monitored Variables		**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading		0.0	0.0	78.9	0.0	0.0	21.1	0.0	0.0	0.3
After 30 Seconds		0.0	0.0	78.1	1.6	0.0	20.3	0.0	0.0	0.2
After 1 Minute		0.0	0.0	79.0	2.6	0.0	18.4	0.0	0.0	0.2
After 2 Minutes		0.0	0.0	79.1	2.9	0.0	18.0	0.0	0.0	0.2
Steady State		0.0	0.0	79.1	2.9	0.0	18.0	0.0	0.0	0.2
min		*0.0*	*0.0*	*78.1*	*0.0*	*0.0*	*18.0*	*0.0*	*0.0*	0.2
max		*0.0*	*0.0*	*79.1*	*2.9*	*0.0*	*21.1*	*0.0*	*0.0*	0.3
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)					**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)					**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:										

Well ID:	WS104	**Well dia.(mm):**	50	**Date installed:**	15/02/2023	**Response stratum:**		Glacialfluvial Deposits		
		Well depth (m):	3.06			**Groundwater depth (m):**		Dry		
Monitored Variables		**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading		0.0	0.0	78.0	1.0	0.0	21.0	0.0	0.0	0.2
After 30 Seconds		1.0	0.0	78.5	1.2	0.0	20.3	0.0	0.2	0.4
After 1 Minute		0.0	0.0	79.2	2.2	0.0	18.6	0.0	0.0	0.4
After 2 Minutes		0.0	0.0	79.3	2.3	0.0	18.4	0.0	0.0	0.4
Steady State		0.0	0.0	79.4	2.3	0.0	18.3	0.0	0.0	0.4
min		*0.0*	*0.0*	*78.0*	*1.0*	*0.0*	*18.3*	*0.0*	*0.0*	0.2
max		*1.0*	*0.0*	*79.4*	*2.3*	*0.0*	*21.0*	*0.0*	*0.2*	0.4
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)					**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)					**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:										

Well ID: WS105	**Well dia.(mm):**	50	**Date installed:**	16/02/2023	**Response stratum:**		Made Ground		
	Well depth (m):	4.16			**Groundwater depth (m):**		1.2		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	79.2	0.0	0.0	20.8	0.0	0.0	0.6
After 30 Seconds	0.0	0.0	82.5	0.9	0.0	16.6	0.0	0.0	0.7
After 1 Minute	0.0	0.0	86.0	1.6	0.0	12.4	0.0	0.0	1.0
After 2 Minutes	0.0	0.0	90.7	2.1	0.0	7.2	0.0	0.0	1.0
Steady State	0.0	0.0	90.8	2.3	0.0	6.9	0.0	0.0	1.0
min	*0.0*	*0.0*	*79.2*	*0.0*	*0.0*	6.9	*0.0*	*0.0*	0.2
max	*0.0*	*0.0*	*90.8*	*2.3*	*0.0*	*20.8*	*0.0*	*0.0*	0.4
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:									

Well ID: WS106	**Well dia.(mm):**	50	**Date installed:**	#REF!	**Response stratum:**		Made Ground		
	Well depth (m):	5.02			**Groundwater depth (m):**		4.05		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	79.2	0.0	0.0	20.8	0.0	0.1	0.5
After 30 Seconds	0.0	0.0	80.8	2.9	0.0	16.3	0.0	0.0	0.8
After 1 Minute	0.0	3.4	91.0	5.6	0.1	3.3	0.0	0.0	0.8
After 2 Minutes	0.0	4.1	92.7	6.8	0.1	0.4	0.0	0.0	0.8
After 3 Minutes	0.0	3.7	92.9	6.8	0.1	0.2	0.0	0.0	0.8
Steady State	0.0	3.7	92.9	6.8	0.1	0.2	0.0	0.0	0.8
min	*0.0*	*0.0*	*79.2*	*0.0*	*0.0*	*0.2*	*0.0*	*0.0*	0.5
max	*0.0*	*4.1*	*92.9*	*6.8*	*0.1*	*20.8*	*0.0*	*0.1*	0.8
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0.0001 L/hr**		**Carbon Dioxide**	**0.01 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:									

Well ID: WS01	**Well dia.(mm):**	50	**Date installed:**	26/11/2021	**Response stratum:**		Lowestoft Formation and Glaciofluvial Deposits		
	Well depth (m):	5.00			**Groundwater depth (m):**		4.89		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	78.9	0.0	0.0	21.1	0.0	0.0	0.2
After 30 Seconds	0.0	0.0	78.4	1.0	0.0	20.6	0.0	0.0	0.6
After 1 Minute	0.0	0.0	79.1	3.7	0.0	17.2	0.0	0.0	0.9
After 2 Minutes	0.0	0.0	79.7	4.2	0.0	16.1	0.0	0.0	1.5
Steady State	0.0	0.0	79.6	4.3	0.0	16.1	0.0	0.0	0.8
min	*0.0*	*0.0*	*78.4*	*0.0*	*0.0*	*16.1*	*0.0*	*0.0*	0.2
max	*0.0*	*0.0*	*79.7*	*4.3*	*0.0*	*21.1*	*0.0*	*0.0*	1.5
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:	Historic Well								

Well ID: WS09	**Well dia.(mm):**	50	**Date installed:**	15/02/2022	**Response stratum:**		Lowestoft Formation and Glaciofluvial Deposits		
	Well depth (m):	2.02			**Groundwater depth (m):**		Dry		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	78.8	0.0	0.0	21.2	0.0	0.0	0.2
After 30 Seconds	0.0	0.0	78.5	0.9	0.0	20.6	0.0	0.0	0.4
After 1 Minute	0.0	0.0	79.5	2.2	0.0	18.3	0.0	0.0	0.4
After 2 Minutes	0.0	0.0	79.9	2.3	0.0	17.8	0.0	0.0	0.4
Steady State	0.0	0.0	79.8	2.4	0.0	17.8	0.0	0.0	0.4
min	*0.0*	*0.0*	*78.5*	*0.0*	*0.0*	*17.8*	*0.0*	*0.0*	*0.2*
max	*0.0*	*0.0*	*79.9*	*2.4*	*0.0*	*21.2*	*0.0*	*0.0*	*0.4*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:	Historic Well								

Well ID: WS10A	**Well dia.(mm):**	50	**Date installed:**	15/02/2022	**Response stratum:**		Lowestoft Formation		
	Well depth (m):	4.94			**Groundwater depth (m):**		3.51		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	79.1	0.1	0.0	20.8	0.0	0.0	0.5
After 30 Seconds	0.0	0.0	78.4	2.9	0.0	18.7	0.0	0.0	0.5
After 1 Minute	0.0	0.0	83.6	7.2	0.0	9.2	0.0	0.0	0.7
After 2 Minutes	0.0	0.0	84.9	8.0	0.0	7.1	0.0	0.0	0.7
Steady State	0.0	0.0	85.0	8.0	0.0	7.0	0.0	0.0	0.7
min	*0.0*	*0.0*	*78.4*	*0.1*	*0.0*	*7.0*	*0.0*	*0.0*	0.5
max	*0.0*	*0.0*	*85.0*	*8.0*	*0.0*	*20.8*	*0.0*	*0.0*	0.7
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:	Historic Well								

Well ID: WS11	**Well dia.(mm):**	50	**Date installed:**	15/02/2022	**Response stratum:**		Glaciofluvial Deposits		
	Well depth (m):	4.78			**Groundwater depth (m):**		4.76		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	78.8	0.0	0.0	21.2	0.0	0.0	0.3
After 30 Seconds	0.0	0.0	78.6	0.5	0.0	20.9	0.0	0.0	0.2
After 1 Minute	0.0	0.0	79.7	0.9	0.0	19.4	0.0	0.0	0.2
After 2 Minutes	0.0	0.0	80.0	1.0	0.0	19.0	0.0	0.0	0.2
Steady State	0.0	0.0	80.0	1.0	0.0	19.0	0.0	0.0	0.2
min	*0.0*	*0.0*	*78.6*	*0.0*	*0.0*	*19.0*	*0.0*	*0.0*	0.2
max	*0.0*	*0.0*	*80.0*	*1.0*	*0.0*	*21.2*	*0.0*	*0.0*	0.3
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:	Historic Well								

Key:

dP - differential pressure (well-atmosphere)

LEL - Lower Explosive Limit (methane)

N_2 - nitrogen

CO_2 - carbon dioxide

CH_4 - methane

O_2 - oxygen

H_2S - Hydrogen sulphide

PID - measure of volatile organic compounds

PROPOSED SCHOOL DEVELOPMENT
BURNT MILL ACADEMY, HARLOW
Results of Hazardous Gas and Groundwater Monitoring
(Spot Monitoring)

Project Ref. 8511.02

Monitoring Event 5

Date:	22/05/2023	**Atmospheric Pressure (start):**	1,013 mb	**Trend:**	Falling
Time:	11:30	**Atmospheric Pressure (end):**	1,004 mb		
Engineer:	SG	**Site Status:**	Developed & open field		
Weather:	Overcast, windy	**Ground Conditions:**	hard surfaced and open grass - dry		
Instrument:	Gas Data LMSxi G3,18e meter	**Next Calibration Due Date:**	26/07/2023		
Instrument:	Phocheck 2000+ PID	**Next Calibration Due Date:**	15/07/2023		

Well ID:	**BH101**	**Well dia.(mm):**	50	**Date installed:**	24/02/2023	**Response stratum:**	Glaciofluvial Deposits
		Well depth (m):	19.06			**Groundwater depth (m):**	14.3

Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	78.2	0.0	0.0	21.8	0.0	0.0	0.5
After 30 Seconds	0.0	0.0	78.6	0.6	0.0	20.8	0.0	0.0	0.4
After 1 Minute	0.0	0.0	79.0	0.8	0.0	20.2	0.0	0.0	0.6
After 2 Minutes	0.0	56.0	79.1	0.8	0.0	20.1	0.0	0.0	0.4
Steady State	0.0	0.0	79.2	0.8	0.0	20.0	0.0	0.0	0.5
min	*0.0*	*0.0*	*78.2*	*0.0*	*0.0*	*20.0*	*0.0*	*0.0*	*0.4*
max	*0.0*	*56.0*	*79.2*	*0.8*	*0.0*	*21.8*	*0.0*	*0.0*	*0.6*

Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)	**Methane:**	**0 L/hr**	**Carbon Dioxide**	**0.00 L/hr**
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)	**Methane:**	**0.00 L/hr**	**Carbon Dioxide**	**0 L/hr**
Comments:	Well initially under water. Bung opened to drain. Replaced 13:25, monitored 16:45. Steady State achieved after 4 minutes.			

Well ID:	**BH102**	**Well dia.(mm):**	50	**Date installed:**	17/02/2023	**Response stratum:**	Glaciofluvial Deposits
		Well depth (m):	13.90			**Groundwater depth (m):**	8.42

Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	78.8	0.0	0.0	21.2	0.0	0.0	0.1
After 30 Seconds	0.0	0.0	78.6	0.7	0.0	20.7	0.0	0.1	0.4
After 1 Minute	0.0	0.0	78.9	1.2	0.0	19.9	0.0	0.0	0.2
After 2 Minutes	0.0	0.0	78.9	1.3	0.0	19.8	0.0	0.0	0.3
Steady State	0.0	0.0	78.9	1.3	0.0	19.8	0.0	0.0	0.2
min	*0.0*	*0.0*	*78.6*	*0.0*	*0.0*	*19.8*	*0.0*	*0.0*	*0.1*
max	*0.0*	*0.0*	*78.9*	*1.3*	*0.0*	*21.2*	*0.0*	*0.1*	*0.4*

Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)	**Methane:**	**0 L/hr**	**Carbon Dioxide**	**0.00 L/hr**
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)	**Methane:**	**0.00 L/hr**	**Carbon Dioxide**	**0 L/hr**
Comments:				

Well ID:	**BH105s**	**Well dia.(mm):**	50	**Date installed:**	03/03/2023	**Response stratum:**	Made Ground & Glaciofluvial Deposits
		Well depth (m):	5.07			**Groundwater depth (m):**	4.99

Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	79.0	0.0	0.0	21.0	0.0	1.8	0.2
After 30 Seconds	0.0	0.0	78.8	0.9	0.0	20.3	0.0	1.7	0.2
After 1 Minute	0.0	0.2	79.6	1.0	0.0	19.4	0.0	2.3	0.2
After 2 Minutes	0.0	0.7	79.8	1.7	0.0	18.5	0.0	2.3	0.2
After 8 Minutes	0.0	2.3	79.7	1.6	0.1	18.6	0.0	Not recorded	Not recorded
After 13 Minutes	Not recorded	1.6	80.5	2.5	0.0	17.0	0.0	Not recorded	Not recorded
After 20 Minutes	Not recorded	0.0	79.6	1.9	0.0	18.5	0.0	Not recorded	Not recorded
Steady State	-	-	-	-	-	-	0.0	-	-
min	*0.0*	*0.0*	*78.8*	*0.0*	*0.0*	*17.0*	*0.0*	*1.7*	*0.2*
max	*0.0*	*2.3*	*80.5*	*2.5*	*0.1*	*21.0*	*0.0*	*2.3*	*0.2*

Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)	**Methane:**	**0.0023 L/hr**	**Carbon Dioxide**	**0.06 L/hr**
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)	**Methane:**	**N/A L/hr**	**Carbon Dioxide**	**N/A L/hr**
Comments:	Steady state not achieved after 20 minutes of monitoring. Steady state gas concentration cannot be calculated.			

Well ID:	**BH105d**	**Well dia.(mm):**	50	**Date installed:**	03/03/2023	**Response stratum:**	Glaciofluvial Deposits & London Clay Formation
		Well depth (m):	20.00			**Groundwater depth (m):**	16.49

Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	78.4	0.0	0.0	21.6	0.0	0.0	0.4
After 30 Seconds	0.0	0.0	78.7	1.2	0.0	20.1	0.0	0.0	0.5
After 1 Minute	0.0	0.0	80.2	2.2	0.0	17.6	0.0	0.0	0.6
After 2 Minutes	0.0	0.0	80.5	2.4	0.0	17.1	0.0	0.0	0.5
After 3 Minutes	0.0	0.0	80.6	2.4	0.0	17.0	0.0	0.0	0.4
Steady State	0.0	0.0	80.6	2.4	0.0	17.0	0.0	0.0	0.5
min	*0.0*	*0.0*	*78.4*	*0.0*	*0.0*	*17.0*	*0.0*	*0.0*	*0.4*
max	*0.0*	*0.0*	*80.6*	*2.4*	*0.0*	*21.6*	*0.0*	*0.0*	*0.6*

Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)	**Methane:**	**0 L/hr**	**Carbon Dioxide**	**0.00 L/hr**
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)	**Methane:**	**0.00 L/hr**	**Carbon Dioxide**	**0 L/hr**
Comments:	Steady state at 4 minutes.			

Well ID:	**WS103**	**Well dia.(mm):**	50	**Date installed:**	15/02/2023	**Response stratum:**	Glacialfluvial Deposits
		Well depth (m):	2.80			**Groundwater depth (m):**	Dry

Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.2	78.9	0.0	0.0	21.1	0.0	0.0	0.0
After 30 Seconds	0.0	0.0	77.8	1.4	0.0	20.8	0.0	0.0	0.2
After 1 Minute	0.0	0.0	78.2	3.3	0.0	18.5	0.0	0.0	0.1
After 2 Minutes	0.0	0.0	78.4	3.8	0.0	17.8	0.0	0.0	0.0
Steady State	0.0	0.0	78.5	3.8	0.0	17.7	0.0	0.0	0.1
min	*0.0*	*0.0*	*77.8*	*0.0*	*0.0*	*17.7*	*0.0*	*0.0*	*0.0*
max	*0.0*	*0.2*	*78.9*	*3.8*	*0.0*	*21.1*	*0.0*	*0.0*	*0.2*

Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)	**Methane:**	**0 L/hr**	**Carbon Dioxide**	**0.00 L/hr**
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)	**Methane:**	**0.00 L/hr**	**Carbon Dioxide**	**0 L/hr**
Comments:	LEL would not zero in ambient air. Steady state at 4 minutes.			

Well ID:	**WS104**	**Well dia.(mm):**	50	**Date installed:**	15/02/2023	**Response stratum:**	Glacialfluvial Deposits
		Well depth (m):	3.30			**Groundwater depth (m):**	Dry

Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	79.0	0.0	0.0	21.0	0.0	0.0	0.0
After 30 Seconds	0.0	0.0	78.5	0.9	0.0	20.6	0.0	0.0	0.2
After 1 Minute	0.0	0.0	79.0	2.2	0.0	18.8	0.0	0.0	0.1
After 2 Minutes	0.0	0.0	79.3	2.5	0.0	18.2	0.0	0.0	0.0
Steady State	0.0	0.0	79.4	2.5	0.0	18.1	0.0	0.0	0.1
min	*0.0*	*0.0*	*78.5*	*0.0*	*0.0*	*18.1*	*0.0*	*0.0*	*0.0*
max	*0.0*	*0.0*	*79.4*	*2.5*	*0.0*	*21.0*	*0.0*	*0.0*	*0.2*

Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)	**Methane:**	**0 L/hr**	**Carbon Dioxide**	**0.00 L/hr**
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)	**Methane:**	**0.00 L/hr**	**Carbon Dioxide**	**0 L/hr**
Comments:	Steady state at 5 minutes. At 3min40 O2 dropped to 17.7.			

Well ID:	WS105	Well dia.(mm):	50	Date installed:	15/02/2023	Response stratum:		Made Ground & Lowestoft Fomarmation		
		Well depth (m):	4.14			Groundwater depth (m):		1.48		
Monitored Variables		dP (Pa)	LEL (%)	N_2 (%)	CO_2 (%)	CH_4 (%)	O_2 (%)	H_2S (ppm)	Flow (L/hr)	PID (ppm)
Immediate Reading		0.0	0.0	79.0	0.0	0.0	21.0	0.0	0.0	0.7
After 30 Seconds		0.0	0.0	81.9	1.5	0.0	16.6	0.0	0.0	0.9
After 1 Minute		0.0	0.0	91.5	2.7	0.0	5.8	0.0	0.0	0.8
After 2 Minutes		0.0	0.0	92.6	3.0	0.0	4.4	0.0	0.0	1.0
Steady State		0.0	0.0	92.7	3.0	0.0	4.3	0.0	0.0	0.9
min		*0.0*	*0.0*	*79.0*	*0.0*	*0.0*	*4.3*	*0.0*	*0.0*	*0.7*
max		*0.0*	*0.0*	*92.7*	*3.0*	*0.0*	*21.0*	*0.0*	*0.0*	*1.0*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)					Methane:	0 L/hr		Carbon Dioxide	0.00 L/hr	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)					Methane:	0.00 L/hr		Carbon Dioxide	0 L/hr	
Comments:		Steady at 4 minutes.								

Well ID:	WS106	Well dia.(mm):	50	Date installed:	16/02/2023	Response stratum:		Made Ground		
		Well depth (m):	4.99			Groundwater depth (m):		3.85		
Monitored Variables		dP (Pa)	LEL (%)	N_2 (%)	CO_2 (%)	CH_4 (%)	O_2 (%)	H_2S (ppm)	Flow (L/hr)	PID (ppm)
Immediate Reading		0.0	0.0	78.8	0.0	0.0	21.2	0.0	0.0	0.5
After 30 Seconds		0.0	0.0	79.6	3.5	0.0	16.9	0.0	0.0	0.6
After 1 Minute		0.0	0.7	90.2	6.6	0.0	3.2	0.0	0.0	0.7
After 2 Minutes		0.0	1.2	92.4	7.2	0.0	0.4	0.0	0.0	0.8
After 3 Minutes		0.0	1.6	92.6	7.2	0.0	0.2	0.0	0.0	0.9
After 4 Minutes		0.0	1.6	92.7	7.2	0.0	0.1	0.0	0.0	0.8
After 5 Minutes		0.0	2.0	92.7	7.2	0.0	0.1	0.0	0.0	0.9
Steady State		0.0	-	92.7	7.2	0.0	0.1	0.0	0.0	0.8
min		*0.0*	*0.0*	*78.8*	*0.0*	*0.0*	*0.1*	*0.0*	*0.0*	*0.5*
max		*0.0*	*2.0*	*92.7*	*7.2*	*0.0*	*21.2*	*0.0*	*0.0*	*0.9*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)					Methane:	0 L/hr		Carbon Dioxide	0.00 L/hr	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)					Methane:	0.00 L/hr		Carbon Dioxide	0 L/hr	
Comments:		Steady after 5 minutes.								

Well ID:	WS01	Well dia.(mm):	50	Date installed:	26/11/2021	Response stratum:		Lowestoft Formation and Glaciofluvial Deposits		
		Well depth (m):	4.99			Groundwater depth (m):		4.9		
Monitored Variables		dP (Pa)	LEL (%)	N_2 (%)	CO_2 (%)	CH_4 (%)	O_2 (%)	H_2S (ppm)	Flow (L/hr)	PID (ppm)
Immediate Reading		0.0	0.2	78.8	0.0	0.0	21.2	0.0	0.0	0.1
After 30 Seconds		0.0	0.0	78.5	2.4	0.0	19.1	0.0	0.0	0.2
After 1 Minute		0.0	0.0	79.6	4.2	0.0	16.2	0.0	0.0	0.1
After 2 Minutes		0.0	0.0	79.9	4.4	0.0	15.7	0.0	0.0	0.2
Steady State		0.0	0.0	79.9	4.5	0.0	15.6	0.0	0.0	0.1
min		*0.0*	*0.0*	*78.5*	*0.0*	*0.0*	*15.6*	*0.0*	*0.0*	*0.1*
max		*0.0*	*0.2*	*79.9*	*4.5*	*0.0*	*21.2*	*0.0*	*0.0*	*0.2*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)					Methane:	0 L/hr		Carbon Dioxide	0.00 L/hr	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)					Methane:	0.00 L/hr		Carbon Dioxide	0 L/hr	
Comments:		Historic Well. Steady after 4 minutes								

Well ID:	WS09	Well dia.(mm):	50	Date installed:	15/02/2022	Response stratum:		Lowestoft Formation and Glaciofluvial Deposits		
		Well depth (m):	2.30			Groundwater depth (m):		Dry		
Monitored Variables		dP (Pa)	LEL (%)	N_2 (%)	CO_2 (%)	CH_4 (%)	O_2 (%)	H_2S (ppm)	Flow (L/hr)	PID (ppm)
Immediate Reading		0.0	0.2	78.7	0.0	0.0	21.3	0.0	0.0	0.3
After 30 Seconds		0.0	0.0	78.5	1.4	0.0	20.1	0.0	0.0	0.5
After 1 Minute		0.0	0.0	79.8	2.6	0.0	17.6	0.0	0.0	0.4
After 2 Minutes		0.0	0.0	79.9	3.0	0.0	17.1	0.0	0.0	0.4
Steady State		0.0	0.0	80.0	3.0	0.0	17.0	0.0	0.0	0.3
min		*0.0*	*0.0*	*78.5*	*0.0*	*0.0*	*17.0*	*0.0*	*0.0*	*0.3*
max		*0.0*	*0.2*	*80.0*	*3.0*	*0.0*	*21.3*	*0.0*	*0.0*	*0.5*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)					Methane:	0 L/hr		Carbon Dioxide	0.00 L/hr	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)					Methane:	0.00 L/hr		Carbon Dioxide	0 L/hr	
Comments:		Historic Well. Steady after 4 minutes								

Well ID:	WS10A	Well dia.(mm):	50	Date installed:	15/02/2022	Response stratum:		Lowestoft Formation		
		Well depth (m):	4.94			Groundwater depth (m):		3.35		
Monitored Variables		dP (Pa)	LEL (%)	N_2 (%)	CO_2 (%)	CH_4 (%)	O_2 (%)	H_2S (ppm)	Flow (L/hr)	PID (ppm)
Immediate Reading		0.0	0.0	79.1	0.0	0.0	20.9	0.0	0.0	0.4
After 30 Seconds		0.0	0.0	79.4	4.8	0.0	15.8	0.0	0.0	0.3
After 1 Minute		0.0	0.0	83.1	8.7	0.0	8.2	0.0	0.0	0.2
After 2 Minutes		0.0	0.0	84.2	9.2	0.0	6.6	0.0	0.0	0.3
Steady State		0.0	0.0	74.1	9.3	0.0	16.6	0.0	0.0	0.4
min		*0.0*	*0.0*	*74.1*	*0.0*	*0.0*	*6.6*	*0.0*	*0.0*	*0.2*
max		*0.0*	*0.0*	*84.2*	*9.3*	*0.0*	*20.9*	*0.0*	*0.0*	*0.4*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)					Methane:	0 L/hr		Carbon Dioxide	0.00 L/hr	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)					Methane:	0.00 L/hr		Carbon Dioxide	0 L/hr	
Comments:		Historic Well. Steady after 4 minutes								

Well ID:	WS11	Well dia.(mm):	50	Date installed:	15/02/2022	Response stratum:		Glaciofluvial Deposits		
		Well depth (m):	4.75			Groundwater depth (m):		4.72		
Monitored Variables		dP (Pa)	LEL (%)	N_2 (%)	CO_2 (%)	CH_4 (%)	O_2 (%)	H_2S (ppm)	Flow (L/hr)	PID (ppm)
Immediate Reading		0.0	0.0	79.0	0.0	0.0	21.0	0.0	0.0	0.1
After 30 Seconds		0.0	0.0	78.7	0.4	0.0	20.9	0.0	0.0	0.0
After 1 Minute		-4.0	0.0	79.2	0.9	0.0	19.9	0.0	-1.0	0.2
After 2 Minutes		0.0	0.0	79.5	1.0	0.0	19.5	0.0	0.0	0.1
Steady State		0.0	0.0	79.5	1.0	0.0	19.5	0.0	0.0	0.1
min		*-4.0*	*0.0*	*78.7*	*0.0*	*0.0*	*19.5*	*0.0*	*-1.0*	*0.0*
max		*0.0*	*0.0*	*79.5*	*1.0*	*0.0*	*21.0*	*0.0*	*0.0*	*0.2*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)					Methane:	0 L/hr		Carbon Dioxide	0.00 L/hr	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)					Methane:	0.00 L/hr		Carbon Dioxide	0 L/hr	
Comments:		Historic Well. Steady after 4 minutes								

Key:

dP - differential pressure (well-atmosphere)
LEL - Lower Explosive Limit (methane)
N_2 - nitrogen
CO_2 - carbon dioxide
CH_4 - methane
O_2 - oxygen
H_2S - Hydrogen sulphide
PID - measure of volatile organic compounds

PROPOSED SCHOOL DEVELOPMENT
BURNT MILL ACADEMY, HARLOW
Results of Hazardous Gas and Groundwater Monitoring
(Spot Monitoring)

Project Ref. 8511.02

Monitoring Event 6

Date:	06/06/2023	**Atmospheric Pressure (start):**	1,019 mb	**Trend:**	Falling
Time:	08:00	**Atmospheric Pressure (end):**	1,017 mb		
Engineer:	MRS	**Site Status:**	Developed & open field		
Weather:	Dry and overcast	**Ground Conditions:**	hard surfaced and open grass - dry		
Instrument:	Gas Data LMSxi G3,18e meter	**Next Calibration Due Date:**	26/07/2023		
Instrument:	Phocheck 2000+ PID	**Next Calibration Due Date:**	15/07/2023		

Well ID: BH101	**Well dia.(mm):**	50	**Date installed:**	24/02/2023	**Response stratum:**		Glaciofluvial Deposits		
	Well depth (m):	19.16			**Groundwater depth (m):**		11.35		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	83.0	3.0	0.0	14.0	0.0	0.0	0.8
After 30 Seconds	0.0	0.9	81.9	4.3	0.0	13.8	0.0	0.0	0.2
After 1 Minute	0.0	0.4	81.1	5.7	0.0	13.2	0.0	0.0	0.6
After 2 Minutes	0.0	0.4	80.9	6.4	0.0	12.7	0.0	0.0	0.0
Steady State	0.0	0.0	80.9	6.4	0.0	12.7	0.0	0.0	0.0
min	*0.0*	*0.0*	*80.9*	*3.0*	*0.0*	*12.7*	*0.0*	*0.0*	*0.0*
max	*0.0*	*0.9*	*83.0*	*6.4*	*0.0*	*14.0*	*0.0*	*0.0*	*0.8*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:	Steady state after 3 minutes								

Well ID: BH102	**Well dia.(mm):**	50	**Date installed:**	17/02/2023	**Response stratum:**		Glaciofluvial Deposits		
	Well depth (m):	13.90			**Groundwater depth (m):**		8.45		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.9	79.3	2.1	0.7	17.9	0.0	0.0	0.0
After 30 Seconds	0.0	0.0	78.6	2.1	0.0	19.3	0.0	0.0	0.0
After 1 Minute	0.0	0.0	78.6	2.3	0.0	19.1	0.0	0.0	0.0
After 2 Minutes	0.0	0.0	78.5	2.4	0.0	19.1	0.0	0.0	0.0
Steady State	0.0	0.0	78.5	2.4	0.0	19.1	0.0	0.0	0.0
min	*0.0*	*0.0*	*78.5*	*2.1*	*0.0*	*17.9*	*0.0*	*0.0*	*0.0*
max	*0.0*	*0.9*	*79.3*	*2.4*	*0.7*	*19.3*	*0.0*	*0.0*	*0.0*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:	Steady state after 2 minutes								

Well ID: BH105s	**Well dia.(mm):**	50	**Date installed:**	03/03/2023	**Response stratum:**		Made Ground & Glaciofluvial Deposits		
	Well depth (m):	5.07			**Groundwater depth (m):**		5.03		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	78.5	4.8	0.0	16.7	0.0	0.0	0.0
After 30 Seconds	0.0	0.0	79.7	1.8	0.0	18.5	0.0	0.0	0.0
After 1 Minute	0.0	0.0	79.4	1.5	0.0	19.1	0.0	0.0	0.0
After 2 Minutes	0.0	0.0	79.2	1.6	0.0	19.2	0.0	0.0	0.0
Steady State	0.0	0.0	79.1	1.8	0.0	19.1	0.0	0.0	0.0
min	*0.0*	*0.0*	*78.5*	*1.5*	*0.0*	*16.7*	*0.0*	*0.0*	*0.0*
max	*0.0*	*0.0*	*79.7*	*4.8*	*0.0*	*19.2*	*0.0*	*0.0*	*0.0*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:	CO2 fluctuating between 1.6 and 1.8 between 2 to 4 minutes of monitoring								

Well ID: BH105d	**Well dia.(mm):**	50	**Date installed:**	03/03/2023	**Response stratum:**		Glaciofluvial Deposits & London Clay Formation		
	Well depth (m):	20.00			**Groundwater depth (m):**		16.48		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	79.3	2.2	0.0	18.5	0.0	0.0	0.0
After 30 Seconds	0.0	0.0	79.6	2.3	0.0	18.1	0.0	0.0	0.0
After 1 Minute	0.0	0.0	80.2	2.9	0.0	16.9	0.0	0.0	0.0
After 2 Minutes	0.0	0.0	80.5	3.1	0.0	16.4	0.0	0.0	0.0
Steady State	0.0	0.0	80.5	3.1	0.0	16.4	0.0	0.0	0.0
min	*0.0*	*0.0*	*79.3*	*2.2*	*0.0*	*16.4*	*0.0*	*0.0*	*0.0*
max	*0.0*	*0.0*	*80.5*	*3.1*	*0.0*	*18.5*	*0.0*	*0.0*	*0.0*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:	Steady state at 2 minutes.								

Well ID: WS103	**Well dia.(mm):**	50	**Date installed:**	15/02/2023	**Response stratum:**		Glacialfluvial Deposits		
	Well depth (m):	2.80			**Groundwater depth (m):**		Dry		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	10.5	79.3	2.1	0.7	17.9	0.0	0.0	0.0
After 30 Seconds	0.0	0.7	78.6	2.1	0.0	19.3	0.0	0.0	0.0
After 1 Minute	0.0	0.2	78.6	2.3	0.0	19.1	0.0	0.0	0.0
After 2 Minutes	0.0	0.0	78.5	2.4	0.0	19.1	0.0	0.0	0.0
Steady State	0.0	0.0	78.5	2.4	0.0	19.1	0.0	0.0	0.0
min	*0.0*	*0.0*	*78.5*	*2.1*	*0.0*	*17.9*	*0.0*	*0.0*	*0.0*
max	*0.0*	*10.5*	*79.3*	*2.4*	*0.7*	*19.3*	*0.0*	*0.0*	*0.0*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:	Steady state after 2 minutes								

Well ID: WS104	**Well dia.(mm):**	50	**Date installed:**	15/02/2023	**Response stratum:**		Glacialfluvial Deposits		
	Well depth (m):	3.30			**Groundwater depth (m):**		Dry		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	6.6	83.0	5.3	0.3	11.4	0.0	0.0	0.2
After 30 Seconds	0.0	1.8	79.4	1.6	0.0	19.0	0.0	0.0	0.0
After 1 Minute	0.0	1.8	79.2	2.4	0.0	18.4	0.0	0.0	0.0
After 2 Minutes	0.0	1.6	79.2	2.6	0.0	18.2	0.0	0.0	0.0
Steady State	0.0	0.7	79.2	2.6	0.0	18.2	0.0	0.0	0.0
min	*0.0*	*0.7*	*79.2*	*1.6*	*0.0*	*11.4*	*0.0*	*0.0*	*0.0*
max	*0.0*	*6.6*	*83.0*	*5.3*	*0.3*	*19.0*	*0.0*	*0.0*	*0.2*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:	Steady state after 4 minutes								

Well ID: WS105
Well dia.(mm): 50
Date installed: 15/02/2023
Response stratum: Made Ground & Lowestoft Fomarmation
Well depth (m): 4.14
Groundwater depth (m): 1.55

Monitored Variables	dP (Pa)	LEL (%)	N_2 (%)	CO_2 (%)	CH_4 (%)	O_2 (%)	H_2S (ppm)	Flow (L/hr)	PID (ppm)
Immediate Reading	0.0	0.0	79.5	0.4	0.0	20.1	0.0	0.0	0.0
After 30 Seconds	0.0	0.0	80.2	0.5	0.0	19.3	0.0	0.0	0.0
After 1 Minute	0.0	0.0	84.7	3.3	0.0	12.0	0.0	0.0	0.0
After 2 Minutes	0.0	0.0	93.8	4.0	0.0	2.2	0.0	0.0	0.0
Steady State	0.0	0.0	94.1	4.0	0.0	1.9	0.0	0.0	0.0
min	*0.0*	*0.0*	*79.5*	*0.4*	*0.0*	*1.9*	*0.0*	*0.0*	*0.0*
max	*0.0*	*0.0*	*94.1*	*4.0*	*0.0*	*20.1*	*0.0*	*0.0*	*0.0*

Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)	Methane:	0 L/hr	Carbon Dioxide	0.00 L/hr
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)	Methane:	0.00 L/hr	Carbon Dioxide	0 L/hr

Comments: Steady at 3 minutes.

Well ID: WS106
Well dia.(mm): 50
Date installed: 16/02/2023
Response stratum: Made Ground
Well depth (m): 4.99
Groundwater depth (m): 4.3

Monitored Variables	dP (Pa)	LEL (%)	N_2 (%)	CO_2 (%)	CH_4 (%)	O_2 (%)	H_2S (ppm)	Flow (L/hr)	PID (ppm)
Immediate Reading	0.0	0.0	74.3	4.4	5.3	16.0	0.0	0.0	0.0
After 30 Seconds	0.0	6.1	84.7	5.0	0.2	10.1	0.0	0.0	0.0
After 1 Minute	0.0	7.0	90.5	7.0	0.3	2.2	0.0	0.0	0.0
After 2 Minutes	0.0	7.3	91.8	7.4	0.4	0.4	0.0	0.0	0.0
Steady State	0.0	6.6	92.1	7.4	0.2	0.3	0.0	0.0	0.0
min	*0.0*	*0.0*	*74.3*	*4.4*	*0.2*	*0.3*	*0.0*	*0.0*	*0.0*
max	*0.0*	*7.3*	*92.1*	*7.4*	*5.3*	*16.0*	*0.0*	*0.0*	*0.0*

Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)	Methane:	0 L/hr	Carbon Dioxide	0.00 L/hr
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)	Methane:	0.00 L/hr	Carbon Dioxide	0 L/hr

Comments: Steady after 4 minutes.

Well ID: WS01
Well dia.(mm): 50
Date installed: 26/11/2021
Response stratum: Lowestoft Formation and Glaciofluvial Deposits
Well depth (m): Unable to lift bung
Groundwater depth (m): Unable to lift bung

Monitored Variables	dP (Pa)	LEL (%)	N_2 (%)	CO_2 (%)	CH_4 (%)	O_2 (%)	H_2S (ppm)	Flow (L/hr)	PID (ppm)
Immediate Reading	0.0	0.0	74.7	9.6	0.0	15.7	0.0	0.0	0.0
After 30 Seconds	0.0	0.0	80.1	4.6	0.0	15.3	0.0	0.0	0.0
After 1 Minute	0.0	0.0	80.1	4.8	0.0	15.1	0.0	0.0	0.0
After 2 Minutes	0.0	0.0	80.2	4.8	0.0	15.0	0.0	0.0	0.0
Steady State	0.0	0.0	80.2	4.8	0.0	15.0	0.0	0.0	0.0
min	*0.0*	*0.0*	*74.7*	*4.6*	*0.0*	*15.0*	*0.0*	*0.0*	*0.0*
max	*0.0*	*0.0*	*80.2*	*9.6*	*0.0*	*15.7*	*0.0*	*0.0*	*0.0*

Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)	Methane:	0 L/hr	Carbon Dioxide	0.00 L/hr
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)	Methane:	0.00 L/hr	Carbon Dioxide	0 L/hr

Comments: Historic Well. Steady after 3 minutes.

Well ID: WS09
Well dia.(mm): 50
Date installed: 15/02/2022
Response stratum: Lowestoft Formation and Glaciofluvial Deposits
Well depth (m): 2.30
Groundwater depth (m): Dry

Monitored Variables	dP (Pa)	LEL (%)	N_2 (%)	CO_2 (%)	CH_4 (%)	O_2 (%)	H_2S (ppm)	Flow (L/hr)	PID (ppm)
Immediate Reading	0.0	2.1	79.7	2.8	0.0	17.5	0.0	0.0	0.0
After 30 Seconds	0.0	0.4	78.9	2.6	0.0	18.5	0.0	0.0	0.1
After 1 Minute	0.0	0.0	78.5	2.9	0.0	18.6	0.0	0.0	0.0
After 2 Minutes	0.0	0.0	78.5	2.9	0.0	18.6	0.0	0.0	0.1
Steady State	0.0	0.0	78.5	2.9	0.0	18.6	0.0	0.0	0.0
min	*0.0*	*0.0*	*78.5*	*2.6*	*0.0*	*17.5*	*0.0*	*0.0*	*0.0*
max	*0.0*	*2.1*	*79.7*	*2.9*	*0.0*	*18.6*	*0.0*	*0.0*	*0.1*

Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)	Methane:	0 L/hr	Carbon Dioxide	0.00 L/hr
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)	Methane:	0.00 L/hr	Carbon Dioxide	0 L/hr

Comments: Historic Well. Steady after 1 minute.

Well ID: WS10A
Well dia.(mm): 50
Date installed: 15/02/2022
Response stratum: Lowestoft Formation
Well depth (m): 4.94
Groundwater depth (m): 3.67

Monitored Variables	dP (Pa)	LEL (%)	N_2 (%)	CO_2 (%)	CH_4 (%)	O_2 (%)	H_2S (ppm)	Flow (L/hr)	PID (ppm)
Immediate Reading	0.0	18.7	78.7	1.1	2.1	20.2	0.0	0.0	0.0
After 30 Seconds	0.0	0.0	78.0	7.0	0.0	15.0	0.0	0.0	0.1
After 1 Minute	0.0	0.0	79.2	9.5	0.0	11.3	0.0	0.0	0.0
After 2 Minutes	0.0	0.0	79.4	9.9	0.0	10.7	0.0	0.0	0.1
Steady State	0.0	0.0	79.3	10.0	0.0	10.7	0.0	0.0	0.0
min	*0.0*	*0.0*	*78.0*	*1.1*	*0.0*	*10.7*	*0.0*	*0.0*	*0.0*
max	*0.0*	*18.7*	*79.4*	*10.0*	*2.1*	*20.2*	*0.0*	*0.0*	*0.1*

Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)	Methane:	0 L/hr	Carbon Dioxide	0.00 L/hr
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)	Methane:	0.00 L/hr	Carbon Dioxide	0 L/hr

Comments: Historic Well. Steady after 3 minutes.

Well ID: WS11
Well dia.(mm): 50
Date installed: 15/02/2022
Response stratum: Glaciofluvial Deposits
Well depth (m): 4.75
Groundwater depth (m): 4.72

Monitored Variables	dP (Pa)	LEL (%)	N_2 (%)	CO_2 (%)	CH_4 (%)	O_2 (%)	H_2S (ppm)	Flow (L/hr)	PID (ppm)
Immediate Reading	0.0	6.1	78.9	1.7	0.4	19.4	0.0	0.0	0.2
After 30 Seconds	0.0	1.1	79.2	1.6	0.0	19.2	0.0	0.0	0.0
After 1 Minute	0.0	1.1	79.3	1.2	0.0	19.5	0.0	0.0	0.0
After 2 Minutes	0.0	0.7	79.2	0.7	0.0	20.1	0.0	0.0	0.1
Steady State	0.0	0.0	79.4	0.2	0.0	20.4	0.0	0.0	0.0
min	*0.0*	*0.0*	*78.9*	*0.2*	*0.0*	*19.2*	*0.0*	*0.0*	*0.0*
max	*0.0*	*6.1*	*79.4*	*1.7*	*0.4*	*20.4*	*0.0*	*0.0*	*0.2*

Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)	Methane:	0 L/hr	Carbon Dioxide	0.00 L/hr
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)	Methane:	0.00 L/hr	Carbon Dioxide	0 L/hr

Comments: Historic Well. Steady after 3 minutes

Key:

dP - differential pressure (well-atmosphere)
LEL - Lower Explosive Limit (methane)
N_2 - nitrogen
CO_2 - carbon dioxide
CH_4 - methane
O_2 - oxygen
H_2S - Hydrogen sulphide
PID - measure of volatile organic compounds

PROPOSED SCHOOL DEVELOPMENT
BURNT MILL ACADEMY, HARLOW
Results of Hazardous Gas and Groundwater Monitoring
(Spot Monitoring)

Project Ref. 8511.02

Monitoring Event 7

Date:	03/07/2023	**Atmospheric Pressure (start):**	1,002 mb	**Trend:**	Falling
Time:	11:30	**Atmospheric Pressure (end):**	999 mb		
Engineer:	SG	**Site Status:**	Developed and open field		
Weather:	Windy, overcast	**Ground Conditions:**	open field and hard surfaced		
Instrument:	Gas Data LMSxi G3,18e meter	**Next Calibration Due Date:**	26/07/2023		
Instrument:	Phocheck 2000+ PID	**Next Calibration Due Date:**	15/07/2023		

Well ID: BH101	**Well dia.(mm):**	50	**Date installed:**	24/02/2023	**Response stratum:**		Glaciofluvial Deposits		
	Well depth (m):	19.10			**Groundwater depth (m):**		14.37		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	11.0	0.0	78.7	0.0	0.0	21.3	0.0	2.0	1.8
After 30 Seconds	27.0	0.0	79.0	4.4	0.0	16.6	0.0	3.3	1.7
After 1 Minute	20.0	0.0	80.6	6.8	0.0	12.6	0.0	3.3	1.5
After 2 Minutes	7.0	0.0	80.9	7.2	0.0	11.9	0.0	1.2	1.4
Steady State	45.0	0.0	81.0	7.2	0.0	11.8	0.0	5.7	1.6
min	*7.0*	*0.0*	*78.7*	*0.0*	*0.0*	*11.8*	*0.0*	*1.2*	*1.4*
max	*45.0*	*0.0*	*81.0*	*7.2*	*0.0*	*21.3*	*0.0*	*5.7*	*1.8*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.41 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0.4104 L/hr**	
Comments:	Exposed & windy.								

Well ID: BH102	**Well dia.(mm):**	50	**Date installed:**	12/02/2023	**Response stratum:**		Glaciofluvial Deposits		
	Well depth (m):	13.89			**Groundwater depth (m):**		8.44		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	78.6	0.0	0.0	21.4	0.0	0.0	0.8
After 30 Seconds	2.0	0.0	78.5	1.0	0.0	20.5	0.0	0.5	0.7
After 1 Minute	0.0	0.0	78.7	1.6	0.0	19.7	0.0	0.0	0.4
After 2 Minutes	0.0	0.0	78.7	1.7	0.0	19.6	0.0	0.0	0.3
Steady State	0.0	0.0	78.7	1.7	0.0	19.6	0.0	0.0	0.5
min	*0.0*	*0.0*	*78.5*	*0.0*	*0.0*	*19.6*	*0.0*	*0.0*	*0.3*
max	*2.0*	*0.0*	*78.7*	*1.7*	*0.0*	*21.4*	*0.0*	*0.5*	*0.8*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.01 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:									

Well ID: BH105s	**Well dia.(mm):**	50	**Date installed:**	03/03/2023	**Response stratum:**		Made Ground & Glaciofluvial Deposits		
	Well depth (m):	5.08			**Groundwater depth (m):**		4.99		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	78.7	0.0	0.0	21.3	0.0	0.0	0.1
After 30 Seconds	0.0	0.0	78.4	0.7	0.0	20.9	0.0	0.0	0.2
After 1 Minute	0.0	0.0	78.6	1.1	0.0	20.3	0.0	0.0	0.5
After 2 Minutes	0.0	0.0	78.6	1.2	0.0	20.2	0.0	0.0	0.3
Steady State	0.0	0.0	78.6	1.2	0.0	20.2	0.0	0.0	0.4
min	*0.0*	*0.0*	*78.4*	*0.0*	*0.0*	*20.2*	*0.0*	*0.0*	*0.1*
max	*0.0*	*0.0*	*78.7*	*1.2*	*0.0*	*21.3*	*0.0*	*0.0*	*0.5*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:	Flow monitored for 3 minutes. Atmospheric pressure fluctuated between 1003/1004mb.								

Well ID: BH105d	**Well dia.(mm):**	50	**Date installed:**	03/03/2023	**Response stratum:**		Glaciofluvial Deposits & London Clay		
	Well depth (m):	20.00			**Groundwater depth (m):**		16.49		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	BH not monitored for ground gas.								
After 30 Seconds									
After 1 Minute									
After 2 Minutes									
Steady State									
min	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
max	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:	BH not monitored for ground gas.								

Well ID: WS103	**Well dia.(mm):**	50	**Date installed:**	15/02/2023	**Response stratum:**		Glaciofluvial Deposits		
	Well depth (m):	2.80			**Groundwater depth (m):**		Dry		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	78.7	0.0	0.0	21.3	0.0	0.0	0.3
After 30 Seconds	0.0	0.0	78.1	1.2	0.0	20.7	0.0	0.0	0.2
After 1 Minute	0.0	0.0	78.4	2.0	0.0	19.6	0.0	0.0	0.1
After 2 Minutes	0.0	0.0	78.4	2.2	0.0	19.4	0.0	0.0	0.0
Steady State	0.0	0.0	78.4	2.2	0.0	19.4	0.0	0.0	0.0
min	*0.0*	*0.0*	*78.1*	*0.0*	*0.0*	*19.4*	*0.0*	*0.0*	*0.0*
max	*0.0*	*0.0*	*78.7*	*2.2*	*0.0*	*21.3*	*0.0*	*0.0*	*0.3*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:									

Well ID: WS104	**Well dia.(mm):**	50	**Date installed:**	15/02/2023	**Response stratum:**		Glaciofluvial Deposits		
	Well depth (m):	3.04			**Groundwater depth (m):**		Dry		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	78.7	0.0	0.0	21.3	0.0	0.0	0.3
After 30 Seconds	1.0	0.0	78.2	1.6	0.0	20.2	0.0	0.3	0.2
After 1 Minute	0.0	0.0	78.7	2.6	0.0	18.7	0.0	0.0	0.1
After 2 Minutes	0.0	0.0	78.9	2.8	0.0	18.3	0.0	0.0	0.0
Steady State	0.0	0.0	78.9	2.8	0.0	18.3	0.0	0.0	0.0
min	*0.0*	*0.0*	*78.2*	*0.0*	*0.0*	*18.3*	*0.0*	*0.0*	*0.0*
max	*1.0*	*0.0*	*78.9*	*2.8*	*0.0*	*21.3*	*0.0*	*0.3*	*0.3*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.01 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:	dP & Flow readings during gust of wind. Atmospheric pressure fluctuated between 1002/1003mb.								

Well ID: WS105	**Well dia.(mm):**	50	**Date installed:**	15/02/2023	**Response stratum:**		Made Ground & Lowestoft Formation		
	Well depth (m):	4.11			**Groundwater depth (m):**		1.51		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	79.1	0.0	0.0	20.9	0.0	0.0	0.7
After 30 Seconds	0.0	0.0	83.9	3.7	0.0	12.4	0.0	0.0	0.8
After 1 Minute	0.0	0.0	92.3	5.4	0.0	2.3	0.0	0.0	0.9
After 2 Minutes	0.0	0.0	93.9	5.9	0.0	0.2	0.0	0.0	1.0
Steady State	0.0	0.0	93.7	5.9	0.0	0.4	0.0	0.0	1.0
min	*0.0*	*0.0*	*79.1*	*0.0*	*0.0*	*0.2*	*0.0*	*0.0*	*0.7*
max	*0.0*	*0.0*	*93.9*	*5.9*	*0.0*	*20.9*	*0.0*	*0.0*	*1.0*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:	Steady state after 4 minutes.								

Well ID: WS106	**Well dia.(mm):**	50	**Date installed:**	16/02/2023	**Response stratum:**		Made Ground		
	Well depth (m):	4.99			**Groundwater depth (m):**		4.87		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	1.0	0.0	78.8	0.0	0.0	21.2	0.0	0.4	0.5
After 30 Seconds	-1.0	0.0	81.7	4.9	0.0	13.4	0.0	-0.3	0.6
After 1 Minute	0.0	0.0	88.4	7.9	0.0	3.7	0.0	0.0	0.4
After 2 Minutes	-6.0	0.0	89.5	8.4	0.0	2.1	0.0	-1.1	0.7
Steady State	0.0	0.0	89.6	8.5	0.0	1.9	0.0	0.0	0.6
min	*-6.0*	*0.0*	*78.8*	*0.0*	*0.0*	*1.9*	*0.0*	*-1.1*	*0.4*
max	*1.0*	*0.0*	*89.6*	*8.5*	*0.0*	*21.2*	*0.0*	*0.4*	*0.7*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.03 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:	Light rain & windy.								

Well ID: WS01	**Well dia.(mm):**	50	**Date installed:**	26/11/2021	**Response stratum:**		Lowestoft Formation & Glaciofluvial Deposits		
	Well depth (m):	4.99			**Groundwater depth (m):**		4.92		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	-1.0	0.0	78.7	0.0	0.0	21.3	0.0	-0.1	0.5
After 30 Seconds	0.0	0.0	77.9	3.8	0.0	18.3	0.0	0.0	0.1
After 1 Minute	-2.0	0.0	79.2	5.6	0.0	15.2	0.0	-0.3	0.0
After 2 Minutes	0.0	0.0	79.2	6.0	0.0	14.8	0.0	0.0	0.0
Steady State	5.0	0.0	79.3	6.0	0.0	14.7	0.0	1.5	0.0
min	*-2.0*	*0.0*	*77.9*	*0.0*	*0.0*	*14.7*	*0.0*	*-0.3*	*0.0*
max	*5.0*	*0.0*	*79.3*	*6.0*	*0.0*	*21.3*	*0.0*	*1.5*	*0.5*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.09 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0.09 L/hr**	
Comments:	Historic Well. Steady state after 3 minutes.								

Well ID: WS09	**Well dia.(mm):**	50	**Date installed:**	15/02/2022	**Response stratum:**		Lowestoft Formation & Glaciofluvial Deposits		
	Well depth (m):	2.02			**Groundwater depth (m):**		Dry		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	78.6	0.0	0.0	21.4	0.0	0.0	0.4
After 30 Seconds	0.0	0.0	78.0	1.3	0.0	20.7	0.0	0.0	0.3
After 1 Minute	0.0	0.0	78.3	2.3	0.0	19.4	0.0	0.0	0.1
After 2 Minutes	0.0	0.0	78.4	2.4	0.0	19.2	0.0	0.0	0.0
Steady State	0.0	0.0	78.4	2.4	0.0	19.2	0.0	0.0	0.6
min	*0.0*	*0.0*	*78.0*	*0.0*	*0.0*	*19.2*	*0.0*	*0.0*	*0.0*
max	*0.0*	*0.0*	*78.6*	*2.4*	*0.0*	*21.4*	*0.0*	*0.0*	*0.6*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:	Historic Well.								

Well ID: WS10A	**Well dia.(mm):**	50	**Date installed:**	15/02/2022	**Response stratum:**		Lowestoft Formation		
	Well depth (m):	4.97			**Groundwater depth (m):**		3.91		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	78.7	0.0	0.0	21.3	0.0	0.0	0.6
After 30 Seconds	0.0	0.0	77.6	5.0	0.0	17.4	0.0	0.0	0.2
After 1 Minute	0.0	0.0	78.7	8.9	0.0	12.4	0.0	0.0	0.3
After 2 Minutes	0.0	0.0	79.1	9.4	0.0	11.5	0.0	0.0	0.4
Steady State	0.0	0.0	79.1	9.5	0.0	11.4	0.0	0.0	0.3
min	*0.0*	*0.0*	*77.6*	*0.0*	*0.0*	*11.4*	*0.0*	*0.0*	*0.2*
max	*0.0*	*0.0*	*79.1*	*9.5*	*0.0*	*21.3*	*0.0*	*0.0*	*0.6*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:	Historic Well. Steady state after 5 minutes.								

Well ID: WS11	**Well dia.(mm):**	50	**Date installed:**	15/02/2022	**Response stratum:**		Glaciofluvial Deposits		
	Well depth (m):	4.75			**Groundwater depth (m):**		Dry		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	78.8	0.0	0.0	21.2	0.0	0.0	0.1
After 30 Seconds	0.0	0.0	78.5	0.3	0.0	21.2	0.0	0.0	0.2
After 1 Minute	0.0	0.0	78.7	0.7	0.0	20.6	0.0	0.0	0.3
After 2 Minutes	0.0	0.0	78.8	0.7	0.0	20.5	0.0	0.0	0.0
Steady State	0.0	0.0	78.8	0.7	0.0	20.5	0.0	0.0	0.0
min	*0.0*	*0.0*	*78.5*	*0.0*	*0.0*	*20.5*	*0.0*	*0.0*	*0.0*
max	*0.0*	*0.0*	*78.8*	*0.7*	*0.0*	*21.2*	*0.0*	*0.0*	*0.3*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:	Historic Well.								

Well ID:	**WS201**	**Well dia.(mm):**	50	**Date installed:**	12/06/2023	**Response stratum:**		Made Ground & Lowestoft Formation		
		Well depth (m):	4.88			**Groundwater depth (m):**		Dry		
Monitored Variables		**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading		0.0	0.0	79.5	0.0	0.0	20.5	0.0	0.0	0.2
After 30 Seconds		0.0	0.0	77.7	3.9	0.0	18.4	0.0	0.0	0.3
After 1 Minute		0.0	0.0	78.7	5.5	0.0	15.8	0.0	0.0	0.4
After 2 Minutes		0.0	0.0	78.7	5.9	0.0	15.4	0.0	0.0	0.5
Steady State		0.0	0.0	78.7	5.9	0.0	15.4	0.0	0.0	0.6
min		*0.0*	*0.0*	*77.7*	*0.0*	*0.0*	*15.4*	*0.0*	*0.0*	*0.2*
max		*0.0*	*0.0*	*79.5*	*5.9*	*0.0*	*20.5*	*0.0*	*0.0*	*0.6*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)					**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)					**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:										

Well ID:	**WS202**	**Well dia.(mm):**	50	**Date installed:**	13/06/2023	**Response stratum:**		Made Ground		
		Well depth (m):	4.44			**Groundwater depth (m):**		3.36		
Monitored Variables		**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading		0.0	0.0	78.9	0.1	0.0	21.0	0.0	0.0	0.5
After 30 Seconds		0.0	2.5	77.9	1.6	0.1	20.4	0.0	0.0	0.2
After 1 Minute		0.0	3.2	78.6	2.2	0.1	19.1	0.0	0.0	0.3
After 2 Minutes		0.0	3.4	78.7	2.3	0.1	18.9	0.0	0.0	0.4
Steady State		0.0	3.2	78.7	2.3	0.1	18.9	0.0	0.0	0.4
min		*0.0*	*0.0*	*77.9*	*0.1*	*0.0*	*18.9*	*0.0*	*0.0*	*0.2*
max		*0.0*	*3.4*	*78.9*	*2.3*	*0.1*	*21.0*	*0.0*	*0.0*	*0.5*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)					**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)					**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:		Steady state after 3 minutes.								

Well ID:	**WS204**	**Well dia.(mm):**	50	**Date installed:**	13/06/2023	**Response stratum:**		Made Ground & Lowestoft Formation		
		Well depth (m):	2.83			**Groundwater depth (m):**		Dry		
Monitored Variables		**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading		0.0	0.0	78.8	0.0	0.0	21.2	0.0	0.0	0.3
After 30 Seconds		0.0	15.0	84.8	2.1	0.5	12.6	0.0	0.0	0.4
After 1 Minute		0.0	23.2	89.7	2.8	1.0	6.5	0.0	0.0	0.6
After 2 Minutes		0.0	24.3	90.7	3.0	1.0	5.3	0.0	0.0	0.7
After 10 Minutes		0.0	38.6	91.6	3.4	1.6	3.4	0.0	0.0	Not recorded.
After 20 Minutes		0.0	50.1	92.1	3.6	2.1	2.2	0.0	0.0	Not recorded.
Steady State		0.0	-	-	-	-	-	0.0	0.0	-
min		*0.0*	*0.0*	*78.8*	*0.0*	*0.0*	*2.2*	*0.0*	*0.0*	*0.3*
max		*0.0*	*50.1*	*92.1*	*3.6*	*2.1*	*21.2*	*0.0*	*0.0*	*0.7*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)					**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)					**Methane:**	**N/A L/hr**		**Carbon Dioxide**	**N/A L/hr**	
Comments:		Steady state not achieved after 20 minutes of monitoring. Steady state gas concentration cannot be calculated.								

Well ID:	**BH201**	**Well dia.(mm):**	50	**Date installed:**	06/06/2023	**Response stratum:**		Made Ground & Possible Lowestoft Formation		
		Well depth (m):	5.72			**Groundwater depth (m):**		4.13		
Monitored Variables		**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading		0.0	0.0	79.1	0.0	0.0	20.9	0.0	0.0	0.8
After 30 Seconds		0.0	0.0	83.2	3.8	0.0	13.0	0.0	0.4	0.9
After 1 Minute		0.0	0.0	91.1	5.5	0.0	3.4	0.0	0.0	1.0
After 2 Minutes		0.0	0.0	92.3	5.9	0.0	1.8	0.0	0.0	0.9
Steady State		0.0	0.0	92.5	6.0	0.0	1.5	0.0	0.0	0.9
min		*0.0*	*0.0*	*79.1*	*0.0*	*0.0*	*1.5*	*0.0*	*0.0*	*0.8*
max		*0.0*	*0.0*	*92.5*	*6.0*	*0.0*	*20.9*	*0.0*	*0.4*	*1.0*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)					**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.02 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)					**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:		Steady state achieved after 7 minutes.								

Key:

dP - differential pressure (well-atmosphere)	**CH_4 - methane**
LEL - Lower Explosive Limit (methane)	**O_2 - oxygen**
N_2 - nitrogen	**H_2S - Hydrogen sulphide**
CO_2 - carbon dioxide	**PID - measure of volatile organic compounds**

PROPOSED SCHOOL DEVELOPMENT
BURNT MILL ACADEMY, HARLOW
Results of Hazardous Gas and Groundwater Monitoring
(Spot Monitoring)

Project Ref. 8511.02

Monitoring Event 8

Date:	18/07/2023	**Atmospheric Pressure (start):**	1,012 mb	**Trend:**	Falling
Time:	11:30	**Atmospheric Pressure (end):**	1,006 mb		
Engineer:	SG	**Site Status:**	Developed & open field		
Weather:	Dry, light breeze	**Ground Conditions:**	hard surfaced & open field		
Instrument:	Gas Data LMSxi G3,18e meter	**Next Calibration Due Date:**	26/07/2023		
Instrument:	Phocheck 2000+ PID	**Next Calibration Due Date:**	23/11/2023		

Well ID: BH101	**Well dia.(mm):**	50	**Date installed:**	24/02/2023	**Response stratum:**		Glaciofluvial Deposits		
	Well depth (m):	19.12			**Groundwater depth (m):**		14.39		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	78.3	0.0	0.0	21.7	0.0	0.0	0.0
After 30 Seconds	0.0	0.0	79.2	5.1	0.0	15.7	0.0	0.0	0.0
After 1 Minute	0.0	0.0	80.5	7.4	0.0	12.1	0.0	0.0	0.0
After 2 Minutes	0.0	0.0	80.8	7.7	0.0	11.5	0.0	0.0	0.0
Steady State	0.0	0.0	80.7	7.8	0.0	11.5	0.0	0.0	0.0
min	*0.0*	*0.0*	*78.3*	*0.0*	*0.0*	*11.5*	*0.0*	*0.0*	*0.0*
max	*0.0*	*0.0*	*80.8*	*7.8*	*0.0*	*21.7*	*0.0*	*0.0*	*0.0*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:	Steady state reached after 3 minutes. Time: 16:50 - atmospheric pressure 1006mb. CO: 0.								

Well ID: BH102	**Well dia.(mm):**	50	**Date installed:**	12/02/2023	**Response stratum:**		Glaciofluvial Deposits		
	Well depth (m):	13.88			**Groundwater depth (m):**		8.47		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	78.3	0.0	0.0	21.7	0.0	0.0	0.7
After 30 Seconds	0.0	0.0	78.3	0.9	0.0	20.8	0.0	0.0	0.7
After 1 Minute	0.0	0.0	78.7	1.3	0.0	20.0	0.0	0.0	0.7
After 2 Minutes	0.0	0.0	78.7	1.4	0.0	19.9	0.0	0.0	0.7
Steady State	0.0	0.0	78.7	1.4	0.0	19.9	0.0	0.0	0.6
min	*0.0*	*0.0*	*78.3*	*0.0*	*0.0*	*19.9*	*0.0*	*0.0*	*0.6*
max	*0.0*	*0.0*	*78.7*	*1.4*	*0.0*	*21.7*	*0.0*	*0.0*	*0.7*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:	Time: 15:45 - atmospheric pressure 1006mb. CO: 0.								

Well ID: BH105s	**Well dia.(mm):**	50	**Date installed:**	03/03/2023	**Response stratum:**		Made Ground & Glaciofluvial Deposits		
	Well depth (m):	5.06			**Groundwater depth (m):**		4.99		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	78.4	0.0	0.0	21.6	0.0	0.0	0.4
After 30 Seconds	0.0	0.0	78.1	0.8	0.0	21.1	0.0	0.0	0.5
After 1 Minute	0.0	0.0	78.3	1.0	0.0	20.7	0.0	0.0	0.5
After 2 Minutes	0.0	0.0	78.4	1.0	0.0	20.6	0.0	0.0	0.5
Steady State	0.0	0.0	78.3	1.1	0.0	20.6	0.0	0.0	0.4
min	*0.0*	*0.0*	*78.1*	*0.0*	*0.0*	*20.6*	*0.0*	*0.0*	*0.4*
max	*0.0*	*0.0*	*78.4*	*1.1*	*0.0*	*21.6*	*0.0*	*0.0*	*0.5*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:	Steady state achieved after 3 minutes. Time: 16:10 - atmospheric pressure 1007/8mb. CO: 0.								

Well ID: BH105d	**Well dia.(mm):**	50	**Date installed:**	03/03/2023	**Response stratum:**		Glaciofluvial Deposits & London Clay		
	Well depth (m):	20.00			**Groundwater depth (m):**		16.47		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	78.3	0.0	0.0	21.7	0.0	0.0	0.3
After 30 Seconds	0.0	0.0	78.2	0.8	0.0	21.0	0.0	0.0	0.4
After 1 Minute	0.0	0.0	78.2	1.2	0.0	20.6	0.0	0.0	0.4
After 2 Minutes	0.0	0.0	78.1	1.3	0.0	20.6	0.0	0.0	0.4
Steady State	0.0	0.0	78.2	1.3	0.0	20.5	0.0	0.0	0.4
min	*0.0*	*0.0*	*78.1*	*0.0*	*0.0*	*20.5*	*0.0*	*0.0*	*0.3*
max	*0.0*	*0.0*	*78.3*	*1.3*	*0.0*	*21.7*	*0.0*	*0.0*	*0.4*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:	Steady state achieved after 4 mins. Time: 16:25 - atmospheric pressure 1006mb. CO: 0.								

Well ID: WS103	**Well dia.(mm):**	50	**Date installed:**	15/02/2023	**Response stratum:**		Glaciofluvial Deposits		
	Well depth (m):	2.78			**Groundwater depth (m):**		Dry		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	78.6	0.0	0.0	21.4	0.0	0.0	0.4
After 30 Seconds	0.0	0.0	78.1	0.7	0.0	21.2	0.0	0.0	0.5
After 1 Minute	0.0	0.0	78.4	1.4	0.0	20.2	0.0	0.0	0.4
After 2 Minutes	0.0	0.0	78.5	1.6	0.0	19.9	0.0	0.0	0.4
Steady State	0.0	0.0	78.5	1.7	0.0	19.8	0.0	0.0	0.3
min	*0.0*	*0.0*	*78.1*	*0.0*	*0.0*	*19.8*	*0.0*	*0.0*	*0.3*
max	*0.0*	*0.0*	*78.6*	*1.7*	*0.0*	*21.4*	*0.0*	*0.0*	*0.5*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:	Steady state reached after 10 mins. Time: 11:50 - Atmospheric pressure 1009mb. CO: 0.								

Well ID: WS104	**Well dia.(mm):**	50	**Date installed:**	15/02/2023	**Response stratum:**		Glaciofluvial Deposits		
	Well depth (m):	3.03			**Groundwater depth (m):**		Dry		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	78.5	0.0	0.0	21.5	0.0	0.0	0.3
After 30 Seconds	0.0	0.0	78.0	1.3	0.0	20.7	0.0	0.0	0.2
After 1 Minute	0.0	0.0	78.7	2.4	0.0	18.9	0.0	0.0	0.2
After 2 Minutes	0.0	0.0	78.8	2.8	0.0	18.4	0.0	0.0	0.2
Steady State	0.0	0.0	78.8	2.8	0.0	18.4	0.0	0.0	0.2
min	*0.0*	*0.0*	*78.0*	*0.0*	*0.0*	*18.4*	*0.0*	*0.0*	*0.2*
max	*0.0*	*0.0*	*78.8*	*2.8*	*0.0*	*21.5*	*0.0*	*0.0*	*0.3*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:	Time: 12:20 - Atmospheric pressure 1009mb. CO: 0.								

Well ID: **WS105**	**Well dia.(mm):**	50	**Date installed:**	15/02/2023	**Response stratum:**		Made Ground & Lowestoft Formation		
	Well depth (m):	4.17			**Groundwater depth (m):**		1.39		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	78.6	0.0	0.0	21.4	0.0	0.0	0.5
After 30 Seconds	0.0	0.0	82.0	3.2	0.0	14.8	0.0	0.0	1.0
After 1 Minute	0.0	0.0	88.1	4.7	0.0	7.2	0.0	0.0	0.9
After 2 Minutes	0.0	0.0	89.1	4.9	0.0	6.0	0.0	0.0	0.9
Steady State	0.0	0.0	89.3	4.9	0.0	5.8	0.0	0.0	0.7
min	*0.0*	*0.0*	*78.6*	*0.0*	*0.0*	*5.8*	*0.0*	*0.0*	*0.5*
max	*0.0*	*0.0*	*89.3*	*4.9*	*0.0*	*21.4*	*0.0*	*0.0*	*1.0*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:	Steady state reached after 5 mins. Time: 13:00 - atmospheric pressure 1008mb. CO:0.								

Well ID: **WS106**	**Well dia.(mm):**	50	**Date installed:**	16/02/2023	**Response stratum:**		Made Ground		
	Well depth (m):	5.00			**Groundwater depth (m):**		4.87		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	80.4	0.1	0.0	19.5	0.0	0.0	0.4
After 30 Seconds	1.0	0.0	80.8	3.6	0.0	15.6	0.0	0.6	0.5
After 1 Minute	0.0	0.0	84.6	5.3	0.0	10.1	0.0	0.0	0.5
After 2 Minutes	1.0	0.0	85.2	5.7	0.0	9.1	0.0	0.1	0.4
After 10 Minutes	0.0	0.0	85.9	6.1	0.0	8.0	0.0	0.0	Not recorded.
After 20 Minutes	0.0	0.0	86.9	7.9	0.0	5.2	0.0	0.0	Not recorded.
Steady State	0.0	-	-	-	-	-	0.0	0.0	-
min	*0.0*	*0.0*	*80.4*	*0.1*	*0.0*	*5.2*	*0.0*	*0.0*	*0.4*
max	*1.0*	*0.0*	*86.9*	*7.9*	*0.0*	*19.5*	*0.0*	*0.6*	*0.5*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.05 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**N/A L/hr**		**Carbon Dioxide**	**N/A L/hr**	
Comments:	Steady state not achieved after 20 minutes of monitoring. Steady state gas concentration cannot be calculated.								

Well ID: **WS01**	**Well dia.(mm):**	50	**Date installed:**	26/11/2021	**Response stratum:**		Lowestoft Formation & Glaciofluvial Deposits		
	Well depth (m):	4.98			**Groundwater depth (m):**		4.87		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	80.4	0.0	0.0	19.6	0.0	0.0	0.2
After 30 Seconds	0.0	0.0	77.7	3.4	0.0	18.9	0.0	0.0	0.1
After 1 Minute	0.0	0.0	78.4	5.0	0.0	16.6	0.0	0.0	0.1
After 2 Minutes	0.0	0.0	78.3	5.4	0.0	16.3	0.0	0.0	0.1
Steady State	0.0	0.0	78.4	5.4	0.0	16.2	0.0	0.0	0.0
min	*0.0*	*0.0*	*77.7*	*0.0*	*0.0*	*16.2*	*0.0*	*0.0*	*0.0*
max	*0.0*	*0.0*	*80.4*	*5.4*	*0.0*	*19.6*	*0.0*	*0.0*	*0.2*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:	Historic Well. Steady state after 3 minutes. Time: 15:20 - atmospheric pressure 1005mb. CO: 0.								

Well ID: **WS09**	**Well dia.(mm):**	50	**Date installed:**	15/02/2022	**Response stratum:**		Lowestoft Formation & Glaciofluvial Deposits		
	Well depth (m):	2.04			**Groundwater depth (m):**		Dry		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	78.3	0.0	0.0	21.7	0.0	0.0	0.2
After 30 Seconds	0.0	0.0	78.0	1.2	0.0	20.8	0.0	0.0	0.6
After 1 Minute	0.0	0.0	78.2	1.9	0.0	19.9	0.0	0.0	0.5
After 2 Minutes	0.0	0.0	78.3	2.0	0.0	19.7	0.0	0.0	0.5
Steady State	0.0	0.0	78.3	2.0	0.0	19.7	0.0	0.0	0.5
min	*0.0*	*0.0*	*78.0*	*0.0*	*0.0*	*19.7*	*0.0*	*0.0*	*0.2*
max	*0.0*	*0.0*	*78.3*	*2.0*	*0.0*	*21.7*	*0.0*	*0.0*	*0.6*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:	Historic Well. Time: 16:00 - atmospheric pressure 1006mb. CO: 0.								

Well ID: **WS10A**	**Well dia.(mm):**	50	**Date installed:**	15/02/2022	**Response stratum:**		Lowestoft Formation		
	Well depth (m):	4.93			**Groundwater depth (m):**		4.04		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	78.5	0.0	0.0	21.5	0.0	0.0	0,592
After 30 Seconds	0.0	0.0	78.1	4.4	0.0	17.5	0.0	0.0	0.5
After 1 Minute	0.0	0.0	78.7	6.7	0.0	14.6	0.0	0.0	0.4
After 2 Minutes	0.0	0.0	79.1	7.6	0.0	13.3	0.0	0.0	0.3
Steady State	0.0	0.0	79.3	7.6	0.0	13.1	0.0	0.0	0.2
min	*0.0*	*0.0*	*78.1*	*0.0*	*0.0*	*13.1*	*0.0*	*0.0*	*0.2*
max	*0.0*	*0.0*	*79.3*	*7.6*	*0.0*	*21.5*	*0.0*	*0.0*	*0.5*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:	Historic Well. Steady state achieved after 11 mins due to CO2 fluctuations. Time: 12:40 - atmospheric pressure 1009/10mb. CO: 0.								

Well ID: **WS11**	**Well dia.(mm):**	50	**Date installed:**	15/02/2022	**Response stratum:**		Glaciofluvial Deposits		
	Well depth (m):	4.75			**Groundwater depth (m):**		4.73		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	78.8	0.0	0.0	21.2	0.0	0.0	0.2
After 30 Seconds	0.0	0.0	78.6	0.1	0.0	21.3	0.0	0.0	0.3
After 1 Minute	0.0	0.0	78.6	0.5	0.0	20.9	0.0	0.0	0.2
After 2 Minutes	0.0	0.0	78.6	0.6	0.0	20.8	0.0	0.0	0.1
Steady State	0.0	0.0	78.7	0.6	0.0	20.7	0.0	0.0	0.0
min	*0.0*	*0.0*	*78.6*	*0.0*	*0.0*	*20.7*	*0.0*	*0.0*	*0.0*
max	*0.0*	*0.0*	*78.8*	*0.6*	*0.0*	*21.3*	*0.0*	*0.0*	*0.3*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:	Historic Well. Steady state achieved after 6 minutes. Time: 11:30 - atmospheric pressure 1011/12mb. CO: 0.								

Well ID: WS201	**Well dia.(mm):**	50	**Date installed:**	12/06/2023	**Response stratum:**		Made Ground & Lowestoft Formation		
	Well depth (m):	4.87			**Groundwater depth (m):**		Dry		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	78.8	0.0	0.0	21.2	0.0	0.0	0.5
After 30 Seconds	0.0	0.0	77.8	3.0	0.0	19.2	0.0	0.0	0.7
After 1 Minute	0.0	0.0	78.4	4.4	0.0	17.2	0.0	0.0	0.7
After 2 Minutes	0.0	0.0	78.4	4.4	0.0	17.2	0.0	0.0	0.7
Steady State	0.0	0.0	78.4	4.4	0.0	17.2	0.0	0.0	0.7
min	*0.0*	*0.0*	*77.8*	*0.0*	*0.0*	*17.2*	*0.0*	*0.0*	*0.5*
max	*0.0*	*0.0*	*78.8*	*4.4*	*0.0*	*21.2*	*0.0*	*0.0*	*0.7*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:	Time: 14:30 - atmospheric pressure 1006/7mb. CO: 0.								

Well ID: WS202	**Well dia.(mm):**	50	**Date installed:**	13/06/2023	**Response stratum:**		Made Ground		
	Well depth (m):	4.46			**Groundwater depth (m):**		3.48		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	78.4	0.0	0.0	21.6	0.0	0.0	0.3
After 30 Seconds	0.0	16.8	79.5	2.0	0.5	18.0	0.0	0.0	0.4
After 1 Minute	0.0	23.9	80.3	2.5	1.0	16.2	0.0	0.0	0.4
After 2 Minutes	0.0	24.7	80.5	2.7	1.0	15.8	0.0	0.0	0.4
After 5 Minutes	0.0	27.7	80.7	2.8	1.2	15.3	0.0	0.0	Not recorded.
After 10 Minutes	0.0	33.8	80.9	3.1	1.5	14.5	0.0	0.0	Not recorded.
Steady State	0.0	-	-	-	-	-	0.0	0.0	0.4
min	*0.0*	*0.0*	*78.4*	*0.0*	*0.0*	*14.5*	*0.0*	*0.0*	*0.3*
max	*0.0*	*33.8*	*80.9*	*3.1*	*1.5*	*21.6*	*0.0*	*0.0*	*0.4*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**N/A L/hr**		**Carbon Dioxide**	**N/A L/hr**	
Comments:	Steady state not achieved after 10 minutes of monitoring. Steady state gas concentration cannot be calculated.								

Well ID: WS204	**Well dia.(mm):**	50	**Date installed:**	13/06/2023	**Response stratum:**		Made Ground & Lowestoft Formation		
	Well depth (m):	2.81			**Groundwater depth (m):**		2.6		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	78.6	0.0	0.0	21.4	0.0	0.0	0.5
After 30 Seconds	0.0	0.0	85.4	1.1	0.0	13.5	0.0	0.0	1.0
After 1 Minute	0.0	0.0	90.6	1.7	0.0	7.7	0.0	0.0	1.1
After 2 Minutes	0.0	0.0	91.5	1.7	0.0	6.8	0.0	0.0	1.2
After 5 Minutes	0.0	0.0	91.6	1.8	0.0	6.6	0.0	0.0	Not recorded.
After 10 Minutes	0.0	0.0	92.1	1.9	0.0	6.0	0.0	0.0	Not recorded.
Steady State	0.0	-	-	-	-	-	0.0	0.0	-
min	*0.0*	*0.0*	*78.6*	*0.0*	*0.0*	*6.0*	*0.0*	*0.0*	*0.5*
max	*0.0*	*0.0*	*92.1*	*1.9*	*0.0*	*21.4*	*0.0*	*0.0*	*1.2*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**N/A L/hr**		**Carbon Dioxide**	**N/A L/hr**	
Comments:	Steady state not achieved after 10 minutes of monitoring. Steady state gas concentration cannot be calculated.								

Well ID: BH201	**Well dia.(mm):**	50	**Date installed:**	06/06/2023	**Response stratum:**		Made Ground & Possible Lowestoft Formation		
	Well depth (m):	5.72			**Groundwater depth (m):**		4.22		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	79.3	0.1	0.0	20.6	0.0	0.0	0.5
After 30 Seconds	0.0	0.0	81.9	2.6	0.0	15.5	0.0	0.0	0.7
After 1 Minute	0.0	0.0	86.1	4.0	0.0	9.9	0.0	0.0	0.7
After 2 Minutes	0.0	0.0	86.7	4.2	0.0	9.1	0.0	0.0	0.6
After 10 Minutes	0.0	0.0	87.3	4.3	0.0	8.4	25.0	0.0	-
After 20 Minutes	0.0	0.0	88.9	4.6	0.0	6.5	0.0	0.0	-
Steady State	0.0	-	-	-	-	-	0.0	0.0	-
min	*0.0*	*0.0*	*79.3*	*0.1*	*0.0*	*6.5*	*0.0*	*0.0*	*0.5*
max	*0.0*	*0.0*	*88.9*	*4.6*	*0.0*	*20.6*	*25.0*	*0.0*	*0.7*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**N/A L/hr**		**Carbon Dioxide**	**N/A L/hr**	
Comments:	Steady state not achieved after 10 minutes of monitoring. Steady state gas concentration cannot be calculated.								

Key:

dP - differential pressure (well-atmosphere)
LEL - Lower Explosive Limit (methane)
N_2 - nitrogen
CO_2 - carbon dioxide
CH_4 - methane
O_2 - oxygen
H_2S - Hydrogen sulphide
PID - measure of volatile organic compounds

PROPOSED SCHOOL DEVELOPMENT
BURNT MILL ACADEMY, HARLOW
Results of Hazardous Gas and Groundwater Monitoring
(Spot Monitoring)

Project Ref. 8511.02

Monitoring Event 9

Date:	19/07/2023	**Atmospheric Pressure (start):**	1,008 mb	**Trend:**	Fluctuating
Time:	10/;15	**Atmospheric Pressure (end):**	1,007 mb		
Engineer:	SG	**Site Status:**	Developed & open field		
Weather:	Dry, overcast	**Ground Conditions:**	hard surfaced & open field		
Instrument:	Gas Data LMSxi G3,18e meter	**Next Calibration Due Date:**	26/07/2023		
Instrument:	Phocheck 2000+ PID	**Next Calibration Due Date:**	23/11/2023		

Well ID: BH101	**Well dia.(mm):**	50	**Date installed:**	24/02/2023	**Response stratum:**		Glaciofluvial Deposits		
	Well depth (m):	19.12			**Groundwater depth (m):**		14.41		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	78.4	0.0	0.0	21.6	0.0	0.0	0.4
After 30 Seconds	2.0	0.0	78.7	4.8	0.0	16.5	0.0	0.4	1.5
After 1 Minute	4.0	0.0	80.4	7.2	0.0	12.4	0.0	0.7	1.5
After 2 Minutes	18.0	0.0	80.5	7.6	0.0	11.9	0.0	1.6	1.4
Steady State	1.0	0.0	80.5	7.6	0.0	11.9	0.0	0.2	1.3
min	*0.0*	*0.0*	*78.4*	*0.0*	*0.0*	*11.9*	*0.0*	*0.0*	*0.4*
max	*18.0*	*0.0*	*80.5*	*7.6*	*0.0*	*21.6*	*0.0*	*1.6*	*1.5*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.12 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0.0152 L/hr**	
Comments:	Time: 14:10 - atmospheric pressure 1007/8mb. CO: 0.								

Well ID: BH102	**Well dia.(mm):**	50	**Date installed:**	12/02/2023	**Response stratum:**		Glaciofluvial Deposits		
	Well depth (m):	13.85			**Groundwater depth (m):**		8.47		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	78.7	0.0	0.0	21.3	0.0	0.0	0.1
After 30 Seconds	0.0	0.0	78.4	1.1	0.0	20.5	0.0	0.0	0.6
After 1 Minute	0.0	0.0	78.4	1.3	0.0	20.3	0.0	0.0	0.6
After 2 Minutes	0.0	0.0	78.4	1.3	0.0	20.3	0.0	0.0	0.5
Steady State	0.0	0.0	78.4	1.3	0.0	20.3	0.0	0.0	0.5
min	*0.0*	*0.0*	*78.4*	*0.0*	*0.0*	*20.3*	*0.0*	*0.0*	*0.1*
max	*0.0*	*0.0*	*78.7*	*1.3*	*0.0*	*21.3*	*0.0*	*0.0*	*0.6*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:	Time: 13:05 - atmospheric pressure 1005mb. CO: 0.								

Well ID: BH105s	**Well dia.(mm):**	50	**Date installed:**	03/03/2023	**Response stratum:**		Made Ground & Glaciofluvial Deposits		
	Well depth (m):	5.05			**Groundwater depth (m):**		4.99		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	77.1	1.3	0.0	21.6	0.0	0.0	0.1
After 30 Seconds	0.0	0.0	77.6	1.8	0.0	20.6	0.0	0.0	0.4
After 1 Minute	0.0	0.0	78.1	1.8	0.0	20.1	0.0	0.0	0.3
After 2 Minutes	0.0	0.0	78.1	1.8	0.0	20.1	0.0	0.0	0.3
Steady State	0.0	0.0	-	-	-	-	0.0	0.0	-
min	*0.0*	*0.0*	*77.1*	*1.3*	*0.0*	*20.1*	*0.0*	*0.0*	*0.1*
max	*0.0*	*0.0*	*78.1*	*1.8*	*0.0*	*21.6*	*0.0*	*0.0*	*0.4*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**N/A L/hr**		**Carbon Dioxide**	**N/A L/hr**	
Comments:	Steady state not achieved after 10 minutes of monitoring. Steady state gas concentration cannot be calculated.								

Comments: BH105d	**Well dia.(mm):**	50	**Date installed:**	03/03/2023	**Response stratum:**		Glaciofluvial Deposits & London Clay		
	Well depth (m):	20.01			**Groundwater depth (m):**		16.47		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	78.4	0.0	0.0	21.6	0.0	0.0	0.1
After 30 Seconds	0.0	0.0	78.0	1.1	0.0	20.9	0.0	0.0	0.5
After 1 Minute	0.0	0.0	77.9	2.0	0.0	20.1	0.0	0.0	0.4
After 2 Minutes	0.0	0.0	77.9	2.1	0.0	20.0	0.0	0.0	0.4
Steady State	0.0	0.0	77.9	2.1	0.0	20.0	0.0	0.0	0.3
min	*0.0*	*0.0*	*77.9*	*0.0*	*0.0*	*20.0*	*0.0*	*0.0*	*0.1*
max	*0.0*	*0.0*	*78.4*	*2.1*	*0.0*	*21.6*	*0.0*	*0.0*	*0.5*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:	Time: 13:50 - atmospheric pressure 1005mb. CO: 0.								

Well ID: WS103	**Well dia.(mm):**	50	**Date installed:**	15/02/2023	**Response stratum:**		Glaciofluvial Deposits		
	Well depth (m):	2.78			**Groundwater depth (m):**		Dry		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	78.7	0.0	0.0	21.3	0.0	0.0	0.4
After 30 Seconds	0.0	0.0	78.3	0.8	0.0	20.9	0.0	0.0	0.6
After 1 Minute	0.0	0.0	78.4	1.7	0.0	19.9	0.0	0.0	0.5
After 2 Minutes	0.0	0.0	78.5	1.8	0.0	19.7	0.0	0.0	0.5
Steady State	0.0	0.0	78.5	1.8	0.0	19.7	0.0	0.0	0.4
min	*0.0*	*0.0*	*78.3*	*0.0*	*0.0*	*19.7*	*0.0*	*0.0*	*0.4*
max	*0.0*	*0.0*	*78.7*	*1.8*	*0.0*	*21.3*	*0.0*	*0.0*	*0.6*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:	Time: 10:30 - atmospheric pressure 1008mb. CO: 0.								

Well ID: WS104	**Well dia.(mm):**	50	**Date installed:**	15/02/2023	**Response stratum:**		Glaciofluvial Deposits		
	Well depth (m):	3.04			**Groundwater depth (m):**		Dry		
Monitored Variables	**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading	0.0	0.0	78.7	0.0	0.0	21.3	0.0	0.0	0.3
After 30 Seconds	0.0	0.0	78.0	1.9	0.0	20.1	0.0	0.0	0.2
After 1 Minute	0.0	0.0	78.8	2.6	0.0	18.6	0.0	0.0	0.2
After 2 Minutes	0.0	0.0	78.9	2.8	0.0	18.3	0.0	0.0	0.2
Steady State	0.0	0.0	78.9	2.8	0.0	18.3	0.0	0.0	0.2
min	*0.0*	*0.0*	*78.0*	*0.0*	*0.0*	*18.3*	*0.0*	*0.0*	*0.2*
max	*0.0*	*0.0*	*78.9*	*2.8*	*0.0*	*21.3*	*0.0*	*0.0*	*0.3*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)				**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)				**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:	Time: 10:45 - atmospheric pressure 1006mb. CO: 0.								

Well ID:	**WS105**	**Well dia.(mm):**	50	**Date installed:**	15/02/2023	**Response stratum:**		Made Ground & Lowestoft Formation		
		Well depth (m):	4.12			**Groundwater depth (m):**		1.43		
Monitored Variables		**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading		0.0	0.0	78.6	0.0	0.0	21.4	0.0	0.0	0.1
After 30 Seconds		0.0	0.0	86.1	4.2	0.0	9.7	0.0	0.0	0.8
After 1 Minute		0.0	0.0	86.9	4.4	0.0	8.7	0.0	0.0	0.8
After 2 Minutes		0.0	0.0	86.8	4.5	0.0	8.7	0.0	0.0	0.7
Steady State		0.0	0.0	86.8	4.5	0.0	8.7	0.0	0.0	0.6
min		*0.0*	*0.0*	*78.6*	*0.0*	*0.0*	*8.7*	*0.0*	*0.0*	*0.1*
max		*0.0*	*0.0*	*86.9*	*4.5*	*0.0*	*21.4*	*0.0*	*0.0*	*0.8*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)					**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)					**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:		Time: 11:20 - atmospheric pressure 1005/6mb. CO: 0.								

Well ID:	**WS106**	**Well dia.(mm):**	50	**Date installed:**	16/02/2023	**Response stratum:**		Made Ground		
		Well depth (m):	4.95			**Groundwater depth (m):**		4.88		
Monitored Variables		**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading		0.0	0.0	79.0	0.0	0.0	21.0	0.0	0.0	0.1
After 30 Seconds		0.0	0.0	80.9	4.4	0.0	14.7	0.0	0.0	0.8
After 1 Minute		0.0	0.0	84.8	6.4	0.0	8.8	0.0	0.0	0.7
After 2 Minutes		0.0	0.0	85.4	6.7	0.0	7.9	0.0	0.0	0.6
Steady State		0.0	0.0	85.5	6.8	0.0	7.7	0.0	0.0	0.5
min		*0.0*	*0.0*	*79.0*	*0.0*	*0.0*	*7.7*	*0.0*	*0.0*	*0.1*
max		*0.0*	*0.0*	*85.5*	*6.8*	*0.0*	*21.0*	*0.0*	*0.0*	*0.8*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)					**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)					**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:		Steady state achieved after 4 minutes. Time: 11:35 - atmospheric pressure 1004/5mb. CO: 0.								

Well ID:	**WS01**	**Well dia.(mm):**	50	**Date installed:**	26/11/2021	**Response stratum:**		Lowestoft Formation & Glaciofluvial Deposits		
		Well depth (m):	4.97			**Groundwater depth (m):**		4.92		
Monitored Variables		**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading		0.0	0.0	79.2	0.0	0.0	20.8	0.0	0.0	0.1
After 30 Seconds		0.0	0.0	77.9	3.7	0.0	18.4	0.0	0.0	0.2
After 1 Minute		0.0	0.0	79.0	4.9	0.0	16.1	0.0	0.0	0.2
After 2 Minutes		0.0	0.0	79.1	5.1	0.0	15.8	0.0	0.0	0.2
Steady State		0.0	0.0	79.1	5.1	0.0	15.8	0.0	0.0	0.1
min		*0.0*	*0.0*	*77.9*	*0.0*	*0.0*	*15.8*	*0.0*	*0.0*	*0.1*
max		*0.0*	*0.0*	*79.2*	*5.1*	*0.0*	*20.8*	*0.0*	*0.0*	*0.2*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)					**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)					**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:		Historic Well. Time: 12:50 - atmospheric pressure 1005mb. CO: 0.								

Well ID:	**WS09**	**Well dia.(mm):**	50	**Date installed:**	15/02/2022	**Response stratum:**		Lowestoft Formation & Glaciofluvial Deposits		
		Well depth (m):	2.01			**Groundwater depth (m):**		Dry		
Monitored Variables		**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading		0.0	0.0	78.6	0.0	0.0	21.4	0.0	0.0	0.3
After 30 Seconds		0.0	0.0	77.9	1.4	0.0	20.7	0.0	0.0	0.6
After 1 Minute		0.0	0.0	78.3	2.1	0.0	19.6	0.0	0.0	0.5
After 2 Minutes		0.0	0.0	78.3	2.2	0.0	19.5	0.0	0.0	0.4
Steady State		0.0	0.0	78.3	2.2	0.0	19.5	0.0	0.0	0.4
min		*0.0*	*0.0*	*77.9*	*0.0*	*0.0*	*19.5*	*0.0*	*0.0*	*0.3*
max		*0.0*	*0.0*	*78.6*	*2.2*	*0.0*	*21.4*	*0.0*	*0.0*	*0.6*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)					**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)					**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:		Historic Well. Time: 13:05 - atmospheric pressure 1006mb. CO: 0.								

Well ID:	**WS10A**	**Well dia.(mm):**	50	**Date installed:**	15/02/2022	**Response stratum:**		Lowestoft Formation		
		Well depth (m):	4.93			**Groundwater depth (m):**		4.03		
Monitored Variables		**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading		0.0	0.0	78.7	0.0	0.0	21.3	0.0	0.0	0.5
After 30 Seconds		0.0	0.0	77.5	4.3	0.0	18.2	0.0	0.0	0.7
After 1 Minute		0.0	0.0	79.2	6.9	0.0	13.9	0.0	0.0	0.6
After 2 Minutes		0.0	0.0	79.4	7.4	0.0	13.2	0.0	0.0	0.6
Steady State		0.0	0.0	79.4	7.4	0.0	13.2	0.0	0.0	0.5
min		*0.0*	*0.0*	*77.5*	*0.0*	*0.0*	*13.2*	*0.0*	*0.0*	*0.5*
max		*0.0*	*0.0*	*79.4*	*7.4*	*0.0*	*21.3*	*0.0*	*0.0*	*0.7*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)					**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)					**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:		Historic Well. Time: 11:00 - atmospheric pressure 1006mb. CO: 0.								

Well ID:	**WS11**	**Well dia.(mm):**	50	**Date installed:**	15/02/2022	**Response stratum:**		Glaciofluvial Deposits		
		Well depth (m):	4.76			**Groundwater depth (m):**		4.75		
Monitored Variables		**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading		0.0	0.0	78.8	0.0	0.0	21.2	0.0	0.0	0.2
After 30 Seconds		0.0	0.0	78.5	0.3	0.0	21.2	0.0	0.0	0.4
After 1 Minute		0.0	0.0	78.6	0.6	0.0	20.8	0.0	0.0	0.3
After 2 Minutes		0.0	0.0	78.6	0.7	0.0	20.7	0.0	0.0	0.1
Steady State		0.0	0.0	78.6	0.7	0.0	20.7	0.0	0.0	0.0
min		*0.0*	*0.0*	*78.5*	*0.0*	*0.0*	*20.7*	*0.0*	*0.0*	*0.0*
max		*0.0*	*0.0*	*78.8*	*0.7*	*0.0*	*21.2*	*0.0*	*0.0*	*0.4*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)					**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)					**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:		Historic Well. Time: 10:15 - atmospheric pressure 1006/7/8mb. CO: 0.								

Well ID:	**WS201**	**Well dia.(mm):**	50	**Date installed:**	12/06/2023	**Response stratum:**		Made Ground & Lowestoft Formation		
		Well depth (m):	4.87			**Groundwater depth (m):**		Dry		
Monitored Variables		**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading		0.0	0.0	79.1	0.0	0.0	20.9	0.0	0.0	0.1
After 30 Seconds		0.0	0.0	78.1	2.9	0.0	19.0	0.0	0.0	0.6
After 1 Minute		0.0	0.0	78.6	4.1	0.0	17.3	0.0	0.0	0.6
After 2 Minutes		0.0	0.0	78.6	4.3	0.0	17.1	0.0	0.0	0.6
Steady State		0.0	0.0	78.6	4.3	0.0	17.1	0.0	0.0	0.6
min		*0.0*	*0.0*	*78.1*	*0.0*	*0.0*	*17.1*	*0.0*	*0.0*	*0.1*
max		*0.0*	*0.0*	*79.1*	*4.3*	*0.0*	*20.9*	*0.0*	*0.0*	*0.6*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)					**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)					**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:		Time: 12:05 - atmospheric pressure 1006mb. CO: 0.								

Well ID:	**WS202**	**Well dia.(mm):**	50	**Date installed:**	13/06/2023	**Response stratum:**		Made Ground		
		Well depth (m):	4.45			**Groundwater depth (m):**		3.48		
Monitored Variables		**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading		0.0	0.0	78.7	0.0	0.0	21.3	0.0	0.0	0.3
After 30 Seconds		0.0	1.1	78.4	1.8	0.0	19.8	0.0	0.0	0.4
After 1 Minute		0.0	2.0	79.6	2.4	0.0	18.0	0.0	0.0	0.3
After 2 Minutes		0.0	1.6	79.5	2.6	0.0	17.9	0.0	0.0	0.3
Steady State		0.0	0.0	79.5	2.5	0.0	18.0	0.0	0.0	0.2
min		*0.0*	*0.0*	*78.4*	*0.0*	*0.0*	*17.9*	*0.0*	*0.0*	*0.2*
max		*0.0*	*2.0*	*79.6*	*2.6*	*0.0*	*21.3*	*0.0*	*0.0*	*0.4*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)					**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)					**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:		Steady state achieved after 8 minutes. CO2 fluctuations at 3 minutes. CO2 &O2 fluctuations at 5 minutes. Time: 12: 20 - atmospheric pressure 1005mb. CO: 0.								

Well ID:	**WS204**	**Well dia.(mm):**	50	**Date installed:**	13/06/2023	**Response stratum:**		Made Ground & Lowestoft Formation		
		Well depth (m):	2.81			**Groundwater depth (m):**		2.59		
Monitored Variables		**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading		0.0	0.0	78.6	0.0	0.0	21.4	0.0	0.0	0.3
After 30 Seconds		0.0	?	84.3	2.3	0.4	13.0	0.0	0.0	1.1
After 1 Minute		0.0	20.5	89.7	3.2	0.9	6.2	0.0	0.0	1.2
After 2 Minutes		0.0	20.9	90.6	3.4	0.9	5.1	0.0	0.0	1.2
Steady State		0.0	18.4	90.7	3.4	0.8	5.1	0.0	0.0	1.1
min		*0.0*	*0.0*	*78.6*	*0.0*	*0.0*	*5.1*	*0.0*	*0.0*	*0.3*
max		*0.0*	*20.9*	*90.7*	*3.4*	*0.9*	*21.4*	*0.0*	*0.0*	*1.2*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)					**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)					**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:		Steady state achieved after 4 minutes. Time: 12:35 - atmospheric pressure 1005mb. CO: 0.								

Well ID:	**BH201**	**Well dia.(mm):**	50	**Date installed:**	06/06/2023	**Response stratum:**		Made Ground & Possible Lowestoft Formation		
		Well depth (m):	5.68			**Groundwater depth (m):**		4.24		
Monitored Variables		**dP (Pa)**	**LEL (%)**	**N_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**O_2 (%)**	**H_2S (ppm)**	**Flow (L/hr)**	**PID (ppm)**
Immediate Reading		0.0	0.0	79.0	0.0	0.0	21.0	0.0	0.0	0.4
After 30 Seconds		0.0	0.0	83.7	3.8	0.0	12.5	0.0	0.0	0.8
After 1 Minute		0.0	0.0	90.0	5.4	0.0	4.6	0.0	0.0	0.8
After 2 Minutes		0.0	0.0	90.4	5.5	0.0	4.1	0.0	0.0	0.8
Steady State		0.0	0.0	90.4	5.5	0.0	4.1	0.0	0.0	0.7
min		*0.0*	*0.0*	*79.0*	*0.0*	*0.0*	*4.1*	*0.0*	*0.0*	*0.4*
max		*0.0*	*0.0*	*90.4*	*5.5*	*0.0*	*21.0*	*0.0*	*0.0*	*0.8*
Borehole Hazardous Gas Flow Rates Q_{hg} (max gas conc)					**Methane:**	**0 L/hr**		**Carbon Dioxide**	**0.00 L/hr**	
Borehole Hazardous Gas Flow Rates Q_{hg} (steady state gas conc)					**Methane:**	**0.00 L/hr**		**Carbon Dioxide**	**0 L/hr**	
Comments:		Time: 11:50 - atmospheric pressure 1006mb. CO: 0.								

Key:

dP - differential pressure (well-atmosphere)	CH_4 - methane
LEL - Lower Explosive Limit (methane)	O_2 - oxygen
N_2 - nitrogen	H_2S - Hydrogen sulphide
CO_2 - carbon dioxide	PID - measure of volatile organic compounds

Appendix J ESP Results of Soakaway Infiltration Testing

SOAKAWAY INFILTRATION TEST RESULTS

BRE 365 method

esp
ENGINEERS
GEOLOGISTS
SCIENTISTS

Project Name:	Burnt Mill Academy, Harlow
Project Ref:	8511
Date of Testing:	14/02/2023
Test Location:	TP101
Fill Number:	1
Soil Infiltration Rate	test failed m/sec

Test results:

Time (mins)	Water Level (m bgl)
0	0.98
1	0.98
2	0.98
3	0.98
4	0.98
5	0.99
10	1.00
15	1.01
20	1.02
30	1.04
45	1.05
70	1.07
130	1.13
240	1.24
1200	1.71
1320	1.72
1440	1.72
1560	1.73
1680	1.73
2580	1.74
3060	1.75

Pit Dimensions (m)

Length	2.60
Width	0.50
Depth	2.10

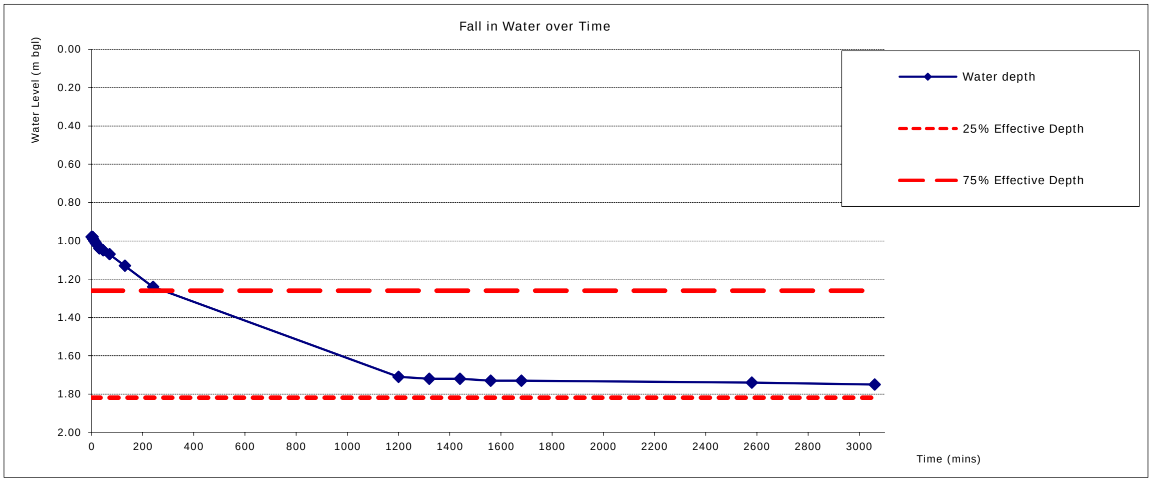
Assumed Invert Level (m bgl)	0.98

Ground Conditions:

0.0 - 0.3m	Firm, dark brown, sandy SILT. Sand is fine to coarse. (MADE GROUND - TOPSOIL).
0.3 - 1.6m	Yellowish brown, sandy silty clayey GRAVEL. Sand is fine to coarse, gravel is fine to coarse rounded to subrounded consisting of chert and chalk fragments. Rare brick and rebar present. (MADE GROUND - REWORKED LOWESTOFT FORMATION).
1.6 - 2.1m	Stiff, grey, gravelly sandy CLAY. Sand is fine to coarse, gravel is fine to coarse rounded to subrounded consisting of mudstone and chert. In-tact buried petrified tree at base of pit between 2.0-2.1m. (PROBABLE LOWESTOFT FORMATION).

Remarks:

1. Testing undertaken in general accordance with BRE Digest 365:2016.
2. Trial pit was not filled with aggregate for test.
3. Minor spalling of sidewall, generally stable.
4. No groundwater encountered.
5. Water failed to drain 75% of original fill volume in 3060 minutes.



Soil Infiltration Rate (m/sec)

$$f = \frac{V_{p75-25}}{\alpha_{p50} \times t_{p75-25}}$$

V_{p75-25}	Effective depth storage volume of water in the trial pit between 75% and 25% effective depth	0.73
α_{p50}	The internal surface area of the trial pit up to 50% effective depth and including the base area	4.772
t_{p75-25}	The time for the water level to fall from 75% to 25% effective depth	n/a

Soil Infiltration Rate (m/sec)

f 0.728 / no value

f **test failed**

SOAKAWAY INFILTRATION TEST RESULTS

BRE 365 method

esp
ENGINEERS
GEOLOGISTS
SCIENTISTS

Project Name:	Burnt Mill Academy, Harlow

Project Ref:	8511	Date of Testing:	14/02/2023

Test Location:	TP102	Soil Infiltration Rate	test failed m/sec
Fill Number:	1		

Test results:

Time (mins)	Water Level (m bgl)
0	0.69
1	0.69
2	0.69
3	0.70
4	0.70
5	0.70
6	0.70
7	0.70
10	0.71
30	0.73
60	0.75
90	0.76
120	0.77
180	0.79
1080	0.92
1200	0.92
1320	0.93
1440	0.94
1560	0.95
1680	0.96
2580	1.02
3060	1.03

Pit Dimensions (m)

Length	2.20
Width	0.50
Depth	2.00

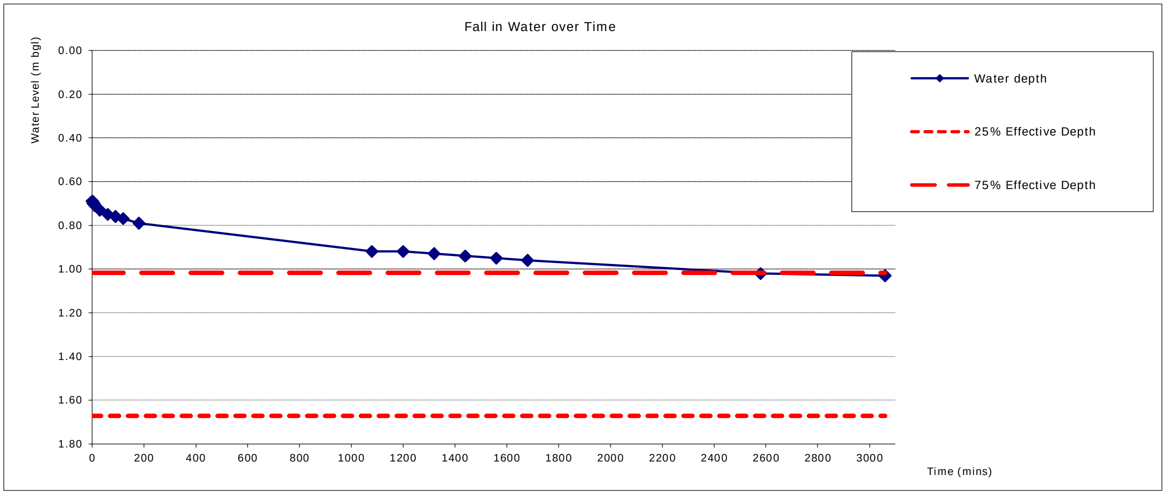
Assumed Invert Level (m bgl)	0.69

Ground Conditions:

0.0 - 0.45m	Firm, dark brown, sandy SILT. Sand is fine to coarse. (TOPSOIL).
0.45 - 0.9m	Firm to stiff, brown mottled white, very gravelly slightly sandy CLAY. Sand is fine to coarse, gravel is fine to coarse rounded to subrounded consisting of mudstone and chalk. (PROBABLE LOWESTOFT FORMATION).
0.9 - 2.0m	Firm to stiff, brown mottled white, slightly gravelly slightly sandy CLAY. Sand is fine to coarse, gravel is fine to coarse rounded to subrounded consisting of mudstone and chalk. (PROBABLE LOWESTOFT FORMATION).

Remarks:

1. Testing undertaken in general accordance with BRE Digest 365:2016.
2. Trial pit was not filled with aggregate for test.
3. Pit walls vertical and stable.
4. No groundwater encountered.
5. Water failed to drain 75% of original fill volume in 3060 minutes.



Soil Infiltration Rate (m/sec) $f \; \frac{V_{p75-25}}{\alpha_{p50} \times t_{p75-25}}$

V_{p75-25}	Effective depth storage volume of water in the trial pit between 75% and 25% effective depth	0.72
α_{p50}	The internal surface area of the trial pit up to 50% effective depth and including the base area	4.637
t_{p75-25}	The time for the water level to fall from 75% to 25% effective depth	n/a

Soil Infiltration Rate (m/sec) $f \; \frac{0.721}{\text{no value}}$

f test failed

SOAKAWAY INFILTRATION TEST RESULTS

BRE 365 method

Project Name:	Burnt Mill Academy, Harlow

Project Ref:	8511	**Date of Testing:**	15/02/2023
Test Location:	TP104	**Soil Infiltration Rate**	test failed m/sec
Fill Number:	1		

Test results:

Time (mins)	Water Level (m bgl)
0	0.48
1	0.48
2	0.48
3	0.48
4	0.48
5	0.48
10	0.49
30	0.51
45	0.53
60	0.54
90	0.56
120	0.58
180	0.61
240	0.65
300	0.69
360	0.72
450	0.74
1380	1.00
1560	1.02
1680	1.05
1800	1.07
1920	1.08
2805	1.21

Pit Dimensions (m)

Length	1.60
Width	0.60
Depth	1.50

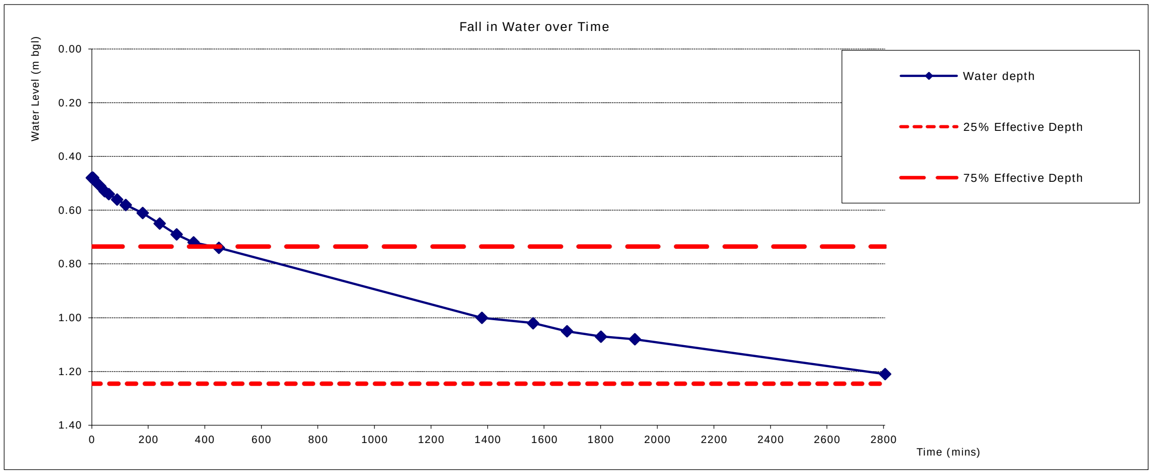
Assumed Invert Level (m bgl)	0.48

Ground Conditions:

0.0 - 0.1m	Firm, dark brown, sandy SILT. Sand is fine to coarse. (TOPSOIL).
0.1 - 1.5m	Loose, light brown, very gravelly slightly silty SAND with low cobble content. Sand is fine to coarse, gravel is fine to coarse rounded to subrounded consisting of chert. Chert cobbles are rounded to subrounded measuring up to 75mm. (PROBABLE GLACIOFLUVIAL DEPOSITS).

Remarks:

1. Testing undertaken in general accordance with BRE Digest 365:2016.
2. Trial pit was not filled with aggregate for test.
3. Pit walls vertical and stable.
4. No groundwater encountered.
5. Water failed to drain 75% of original fill volume in 2805 minutes.



Soil Infiltration Rate (m/sec)

$$f = \frac{V_{p75-25}}{\alpha_{p50} \times t_{p75-25}}$$

V_{p75-25}	Effective depth storage volume of water in the trial pit between 75% and 25% effective depth	0.49
α_{p50}	The internal surface area of the trial pit up to 50% effective depth and including the base area	3.204
t_{p75-25}	The time for the water level to fall from 75% to 25% effective depth	n/a

Soil Infiltration Rate (m/sec)

f 0.490 / no value

f test failed

Appendix K ESP Results of Dynamic Cone Penetrometer (DCP) Testing

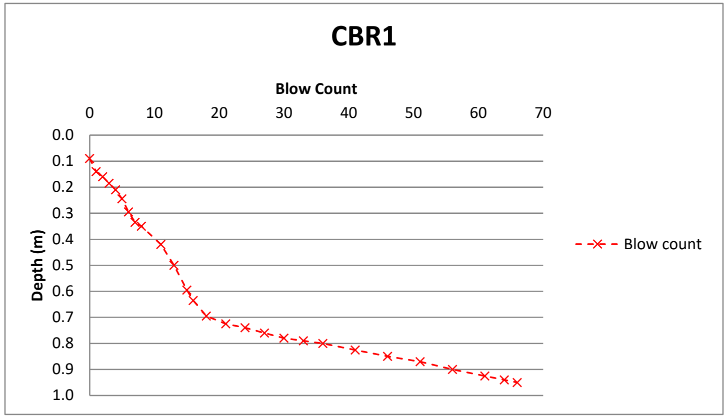
RESULTS OF DYNAMIC CONE PENETROMETER (DCP) TESTING

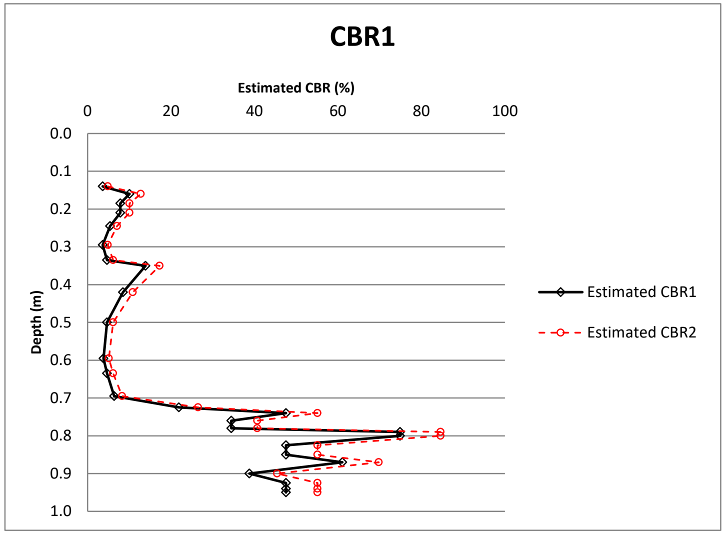
esp
ENGINEERS
GEOLOGISTS
SCIENTISTS

Project:	Burnt Mill Academy, Harlow
Project No.	8511
Test No.	CBR1

Date of Test:	21-Feb-23
Operator:	MRS
Soil type:	Possible Made Ground over Lowestoft Formation
Soil condition:	Unsaturated

Blow count	Penetration (mm)	Penetration (m)	Penetration Index (DPI) mm/blow	Estimated CBR1 (%)[1]	Estimated CBR2 (%)[2]
0	90	0.090			
1	140	0.140	50.0	4	5
2	160	0.160	20.0	10	13
3	185	0.185	25.0	8	10
4	210	0.210	25.0	8	10
5	245	0.245	35.0	5	7
6	295	0.295	50.0	4	5
7	335	0.335	40.0	5	6
8	350	0.350	15.0	14	17
11	420	0.420	23.3	8	11
13	500	0.500	40.0	5	6
15	595	0.595	47.5	4	5
16	635	0.635	40.0	5	6
18	695	0.695	30.0	6	8
21	725	0.725	10.0	22	26
24	740	0.740	5.0	48	55
27	760	0.760	6.7	34	41
30	780	0.780	6.7	34	41
33	790	0.790	3.3	75	85
36	800	0.800	3.3	75	85
41	825	0.825	5.0	48	55
46	850	0.850	5.0	48	55
51	870	0.870	4.0	61	70
56	900	0.900	6.0	39	45
61	925	0.925	5.0	48	55
64	940	0.940	5.0	48	55
66	950	0.950	5.0	48	55





Notes:

1. CBR calculated based on Webster et al, 1992.
2. CBR calculated based on DMRB, 2008.
3. CBR values less than 2.5% highlighted in red and bold. Soils unsuitable in pavements.

Reference:

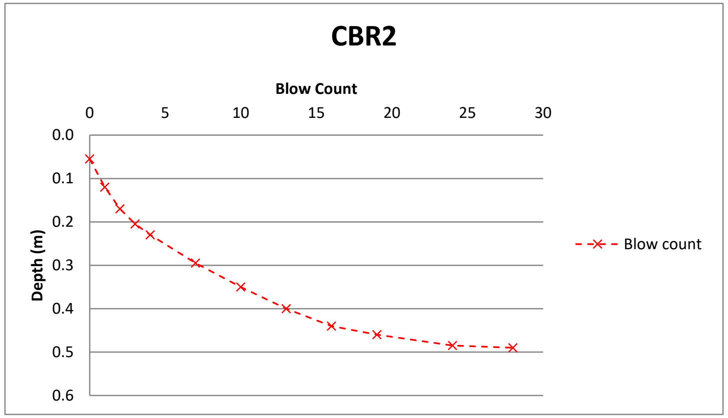
- Webster S, Grau R and Williams T. 1992. Description and Application of Dual Mass Dynamic Cone Penetrometer. Dept of Army Waterways Equipment Station, Instruction rpt GL-92-3.
- Highways Agency, 2008. Design Manual for Roads and Bridges (DMRB), Data for Pavement Assessment. HD29/08.

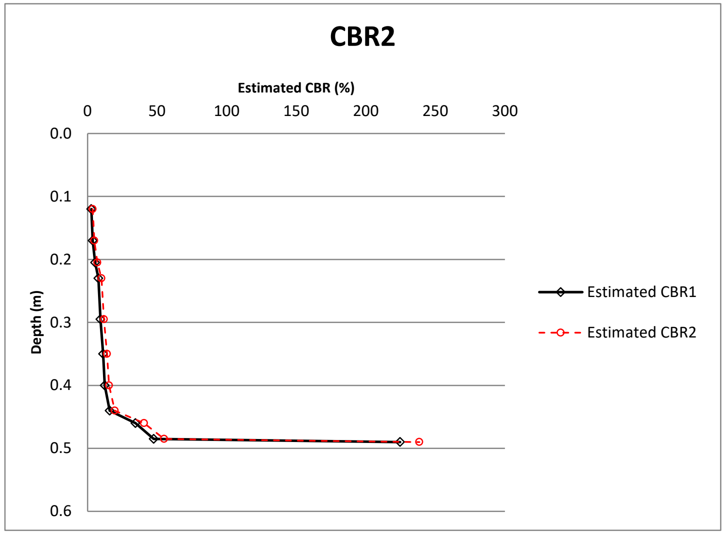
RESULTS OF DYNAMIC CONE PENETROMETER (DCP) TESTING

Project:	Burnt Mill Academy, Harlow
Project No.	8511
Test No.	CBR2

Date of Test:	20-Feb-23
Operator:	MRS
Soil type:	Made Ground over Lowestoft Formation
Soil condition:	Unsaturated

Blow count	Penetration (mm)	Penetration (m)	Penetration Index (DPI) mm/blow	Estimated CBR1 (%)[1]	Estimated CBR2 (%)[2]
0	55	0.055			
1	120	0.120	65.0	3	4
2	170	0.170	50.0	4	5
3	205	0.205	35.0	5	7
4	230	0.230	25.0	8	10
7	295	0.295	21.7	9	12
10	350	0.350	18.3	11	14
13	400	0.400	16.7	12	15
16	440	0.440	13.3	15.9	19.5
19	460	0.460	6.7	34	41
24	485	0.485	5.0	48	55
28	490	0.490	1.3	225	239





Notes:

1. CBR calculated based on Webster et al, 1992.
2. CBR calculated based on DMRB, 2008.
3. CBR values less than 2.5% highlighted in red and bold. Soils unsuitable in pavements.
4. Weight bouncing at 490 mm, test terminated

Reference:

- Webster S, Grau R and Williams T. 1992. Description and Application of Dual Mass Dynamic Cone Penetrometer. Dept of Army Waterways Equipment Station, Instruction rpt GL-92-3.
- Highways Agency, 2008. Design Manual for Roads and Bridges (DMRB), Data for Pavement Assessment. HD29/08.

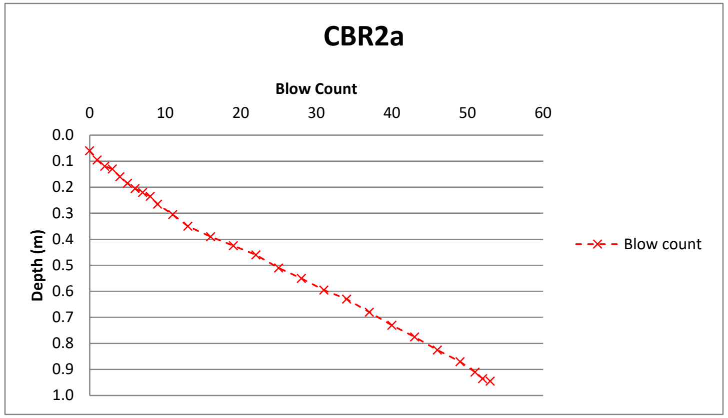
RESULTS OF DYNAMIC CONE PENETROMETER (DCP) TESTING

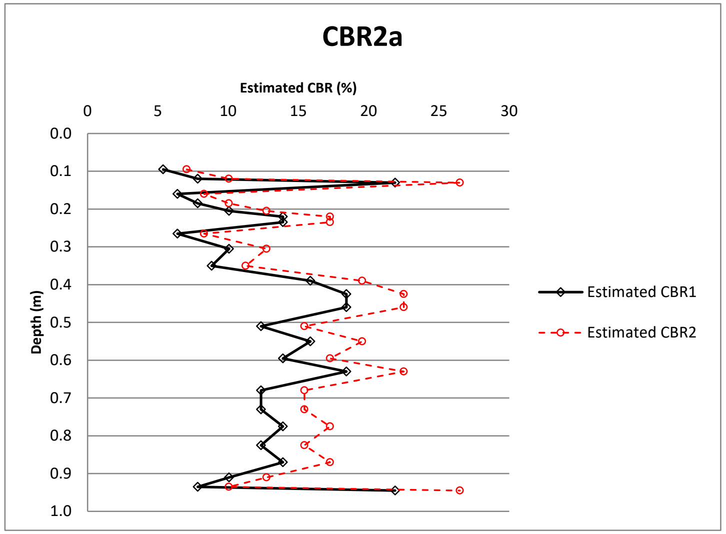
esp
ENGINEERS
GEOLOGISTS
SCIENTISTS

Project:	Burnt Mill Academy, Harlow
Project No.	8511
Test No.	CBR2a

Date of Test:	20-Feb-23
Operator:	MRS
Soil type:	Made Ground over Lowestoft Formation
Soil condition:	Unsaturated

Blow count	Penetration (mm)	Penetration (m)	Penetration Index (DPI) mm/blow	Estimated CBR1 (%)[1]	Estimated CBR2 (%)[2]
0	60	0.060			
1	95	0.095	35.0	5	7
2	120	0.120	25.0	8	10
3	130	0.130	10.0	22	26
4	160	0.160	30.0	6	8
5	185	0.185	25.0	8	10
6	205	0.205	20.0	10	13
7	220	0.220	15.0	14	17
8	235	0.235	15.0	14	17
9	265	0.265	30.0	6	8
11	305	0.305	20.0	10	13
13	350	0.350	22.5	9	11
16	390	0.390	13.3	16	20
19	425	0.425	11.7	18	23
22	460	0.460	11.7	18	23
25	510	0.510	16.7	12	15
28	550	0.550	13.3	16	20
31	595	0.595	15.0	14	17
34	630	0.630	11.7	18	23
37	680	0.680	16.7	12	15
40	730	0.730	16.7	12	15
43	775	0.775	15.0	14	17
46	825	0.825	16.7	12	15
49	870	0.870	15.0	14	17
51	910	0.910	20.0	10	13
52	935	0.935	25.0	8	10
53	945	0.945	10.0	22	26





Notes:

1. CBR calculated based on Webster et al, 1992.
2. CBR calculated based on DMRB, 2008.
3. CBR values less than 2.5% highlighted in red and bold. Soils unsuitable in pavements.

Reference:

- Webster S, Grau R and Williams T. 1992. Description and Application of Dual Mass Dynamic Cone Penetrometer. Dept of Army Waterways Equipment Station, Instruction rpt GL-92-3.
- Highways Agency, 2008. Design Manual for Roads and Bridges (DMRB), Data for Pavement Assessment. HD29/08.

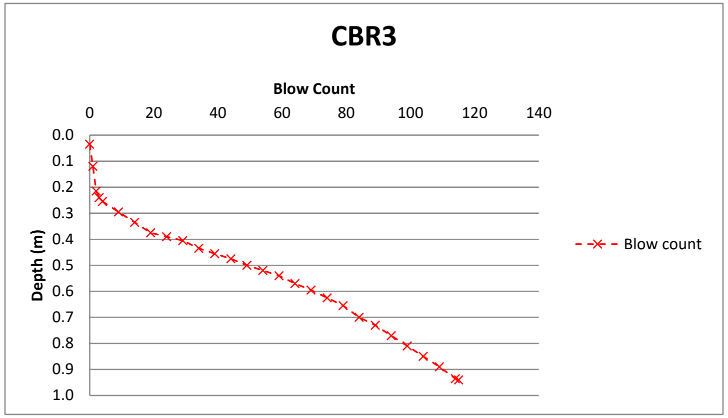
RESULTS OF DYNAMIC CONE PENETROMETER (DCP) TESTING

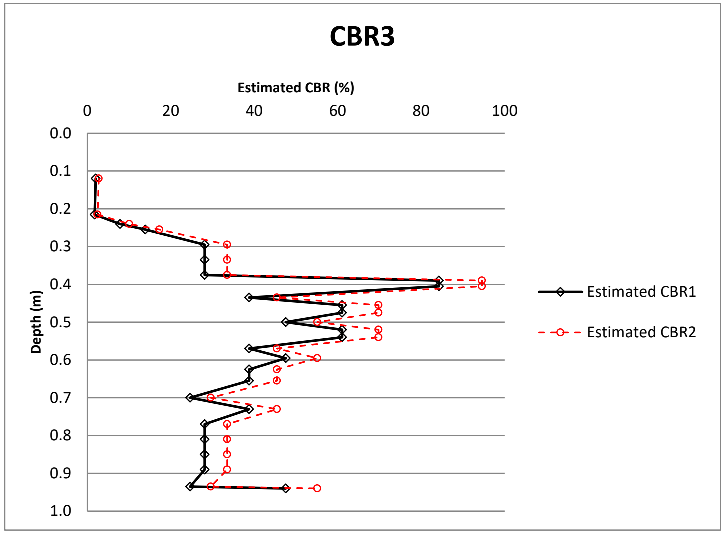
esp
ENGINEERS
GEOLOGISTS
SCIENTISTS

Project:	Burnt Mill Academy, Harlow
Project No.	8511
Test No.	CBR3

Date of Test:	21-Feb-23
Operator:	MRS
Soil type:	Made Ground
Soil condition:	Unsaturated

Blow count	Penetration (mm)	Penetration (m)	Penetration Index (DPI) mm/blow	Estimated CBR1 (%)[1]	Estimated CBR2 (%)[2]
0	35	0.035			
1	120	0.120	85.0	2	3
2	215	0.215	95.0	2	2
3	240	0.240	25.0	8	10
4	255	0.255	15.0	14	17
9	295	0.295	8.0	28	34
14	335	0.335	8.0	28	34
19	375	0.375	8.0	28	34
24	390	0.390	3.0	84	95
29	405	0.405	3.0	84	95
34	435	0.435	6.0	39	45
39	455	0.455	4.0	61	70
44	475	0.475	4.0	61	70
49	500	0.500	5.0	48	55
54	520	0.520	4.0	61	70
59	540	0.540	4.0	61	70
64	570	0.570	6.0	39	45
69	595	0.595	5.0	48	55
74	625	0.625	6.0	39	45
79	655	0.655	6.0	39	45
84	700	0.700	9.0	25	30
89	730	0.730	6.0	39	45
94	770	0.770	8.0	28	34
99	810	0.810	8.0	28	34
104	850	0.850	8.0	28	34
109	890	0.890	8.0	28	34
114	935	0.935	9.0	25	30
115	940	0.940	5.0	48	55





Notes:

1. CBR calculated based on Webster et al, 1992.
2. CBR calculated based on DMRB, 2008.
3. CBR values less than 2.5% highlighted in red and bold. Soils unsuitable in pavements.

Reference:

- Webster S, Grau R and Williams T. 1992. Description and Application of Dual Mass Dynamic Cone Penetrometer. Dept of Army Waterways Equipment Station, Instruction rpt GL-92-3.
- Highways Agency, 2008. Design Manual for Roads and Bridges (DMRB), Data for Pavement Assessment. HD29/08.

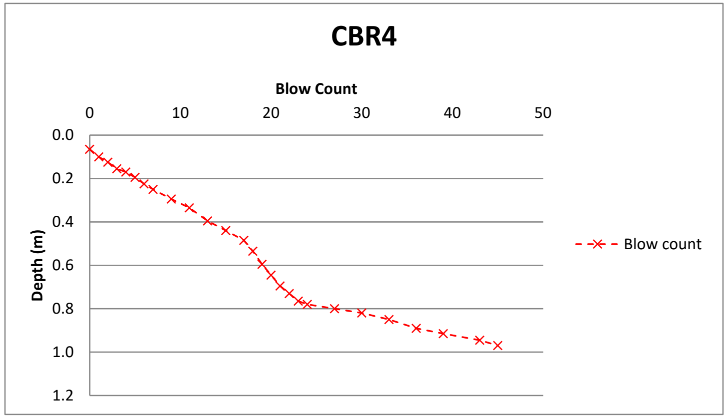
RESULTS OF DYNAMIC CONE PENETROMETER (DCP) TESTING

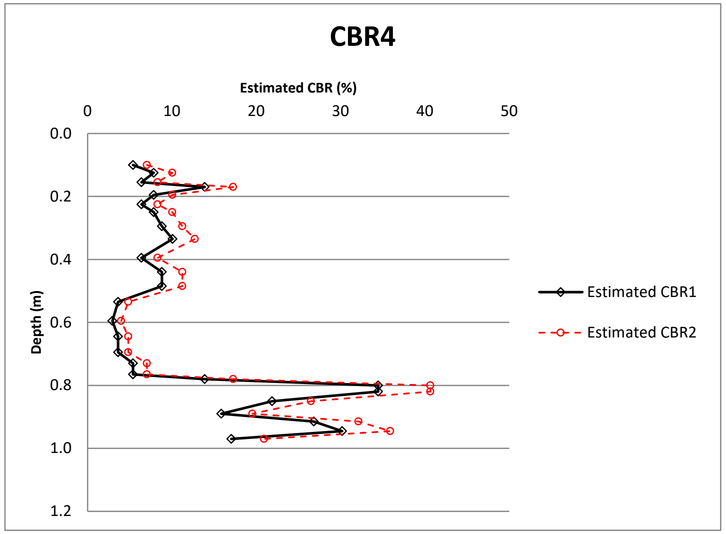
esp
ENGINEERS
GEOLOGISTS
SCIENTISTS

Project:	Burnt Mill Academy, Harlow
Project No.	8511
Test No.	CBR4

Date of Test:	21-Feb-23
Operator:	MRS
Soil type:	Topsoil over Glaciofluvial Deposits
Soil condition:	Unsaturated

Blow count	Penetration (mm)	Penetration (m)	Penetration Index (DPI) mm/blow	Estimated CBR1 (%)[1]	Estimated CBR2 (%)[2]
0	65	0.065			
1	100	0.100	35.0	5	7
2	125	0.125	25.0	8	10
3	155	0.155	30.0	6	8
4	170	0.170	15.0	14	17
5	195	0.195	25.0	8	10
6	225	0.225	30.0	6	8
7	250	0.250	25.0	8	10
9	295	0.295	22.5	9	11
11	335	0.335	20.0	10	13
13	395	0.395	30.0	6	8
15	440	0.440	22.5	9	11
17	485	0.485	22.5	9	11
18	535	0.535	50.0	4	5
19	595	0.595	60.0	3	4
20	645	0.645	50.0	4	5
21	695	0.695	50.0	4	5
22	730	0.730	35.0	5	7
23	765	0.765	35.0	5	7
24	780	0.780	15.0	14	17
27	800	0.800	6.7	34	41
30	820	0.820	6.7	34	41
33	850	0.850	10.0	22	26
36	890	0.890	13.3	16	20
39	915	0.915	8.3	27	32
43	945	0.945	7.5	30	36
45	970	0.970	12.5	17	21





Notes:

1. CBR calculated based on Webster et al, 1992.
2. CBR calculated based on DMRB, 2008.
3. CBR values less than 2.5% highlighted in red and bold. Soils unsuitable in pavements.

Reference:

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- Highways Agency, 2008. Design Manual for Roads and Bridges (DMRB), Data for Pavement Assessment. HD29/08.

Appendix L ESP Geotechnical Laboratory Test Results

Laboratory Report

2788

GEOTECHNICAL SITE & TESTING LABORATORIES
A PHENNA GROUP COMPANY

Contract Number: 65166

Client Ref: **8511**
Client PO: **11382**

Date Received: **09-03-2023**
Date Completed: **29-03-2023**
Report Date: **29-03-2023**

Client: **Earth Science Partnership**
33 Cardiff Road
Taff's Well
Cardiff
CF15 7RB

Contract Title: **Burnt Mill Academy**
For the attention of: **Matthew Rowe-Smith**

This report has been checked and approved by:

Richard John
Quality/Technical Manager

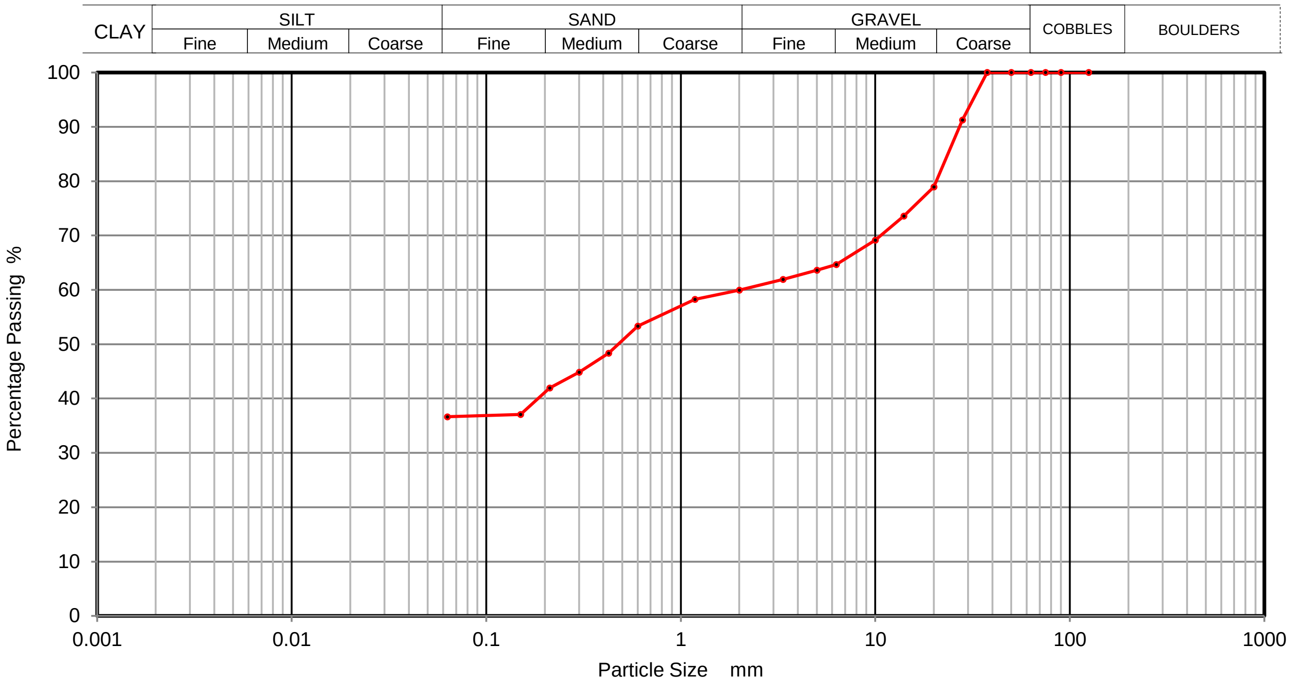
Test Description	Qty
Samples Received - @ Non Accredited Test	16
PSD Wet Sieve method BS 1377:1990 - Part 2 : 9.2 - * UKAS	4
Disposal of samples for job	1

Notes: **Observations and Interpretations are outside the UKAS Accreditation**
*** - denotes test included in laboratory scope of accreditation**
 # - denotes test carried out by approved contractor
@ - denotes non accredited tests

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This test report/certificate shall not be reproduced except in full, without the approval of GEO Site & Testing Services Ltd. Any opinions or interpretations stated - within this report/certificate are excluded from the laboratories UKAS accreditation.

Approved Signatories:
Brendan Evans (Office Administrator) - Darren Bourne (Quality Senior Technician) - Paul Evans (Director)
Richard John (Quality/Technical Manager) - Shaun Jones (Laboratory manager) - Shaun Thomas (Site Manager)
Wayne Honey (Human Resources/ Health and Safety Manager)

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve, Clause 9.2**	Contract Number	65166
		Borehole/Pit No.	TP101
Project Name	Burnt Mill Academy	Sample No.	
Soil Description	Brown/ grey fine to coarse sandy fine to coarse gravelly SILT/ CLAY	Depth Top	2.00
		Depth Base	
Date Tested	27/03/2023	Sample Type	B



Sieving		**Sedimentation**	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	91		
20	79		
14	74		
10	69		
6.3	65		
5	64		
3.35	62		
2	60		
1.18	58		
0.6	53		
0.425	48		
0.3	45		
0.212	42		
0.15	37		
0.063	37		

Sample Proportions	% dry mass
Cobbles	0
Gravel	40
Sand	23
Silt and Clay	37

Remarks

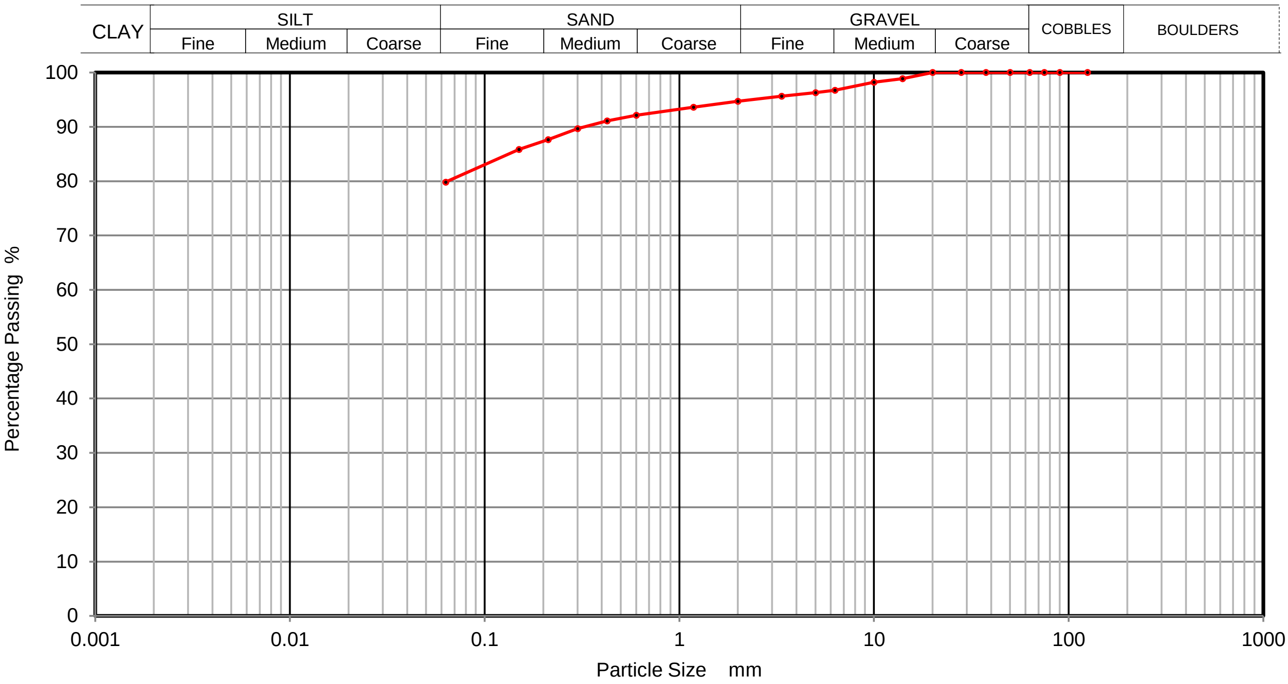
Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING 2788

PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

		Contract Number	65166
		Borehole/Pit No.	TP102
Project Name	Burnt Mill Academy	Sample No.	
Soil Description	Off white slightly gravelly fine to coarse sandy SILT/ CLAY	Depth Top	1.80
		Depth Base	
Date Tested	27/03/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	99		
10	98		
6.3	97		
5	96		
3.35	96		
2	95		
1.18	94		
0.6	92		
0.425	91		
0.3	90		
0.212	88		
0.15	86		
0.063	80		

Sample Proportions	% dry mass
Cobbles	0
Gravel	5
Sand	15
Silt and Clay	80

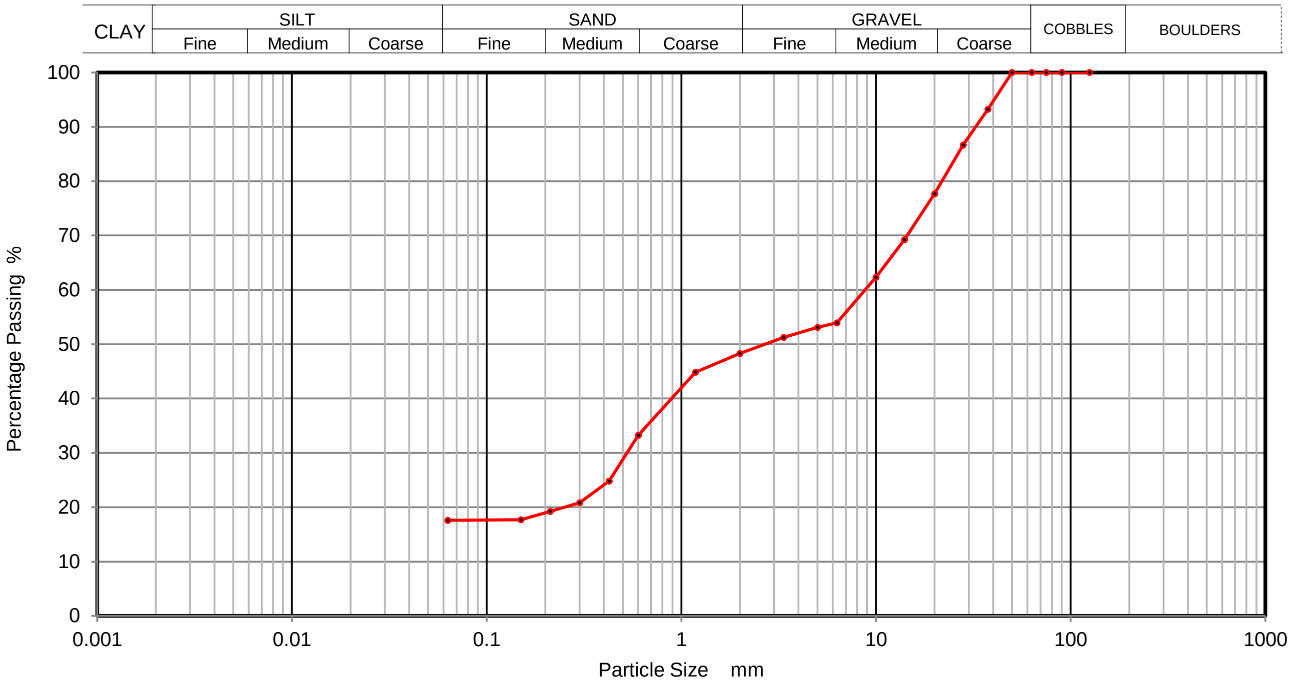
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING 2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve, Clause 9.2**	Contract Number	65166
		Borehole/Pit No.	TP103
Project Name	Burnt Mill Academy	Sample No.	
Soil Description	Brown silty/ clayey fine to coarse sandy fine to coarse GRAVEL	Depth Top	1.60
		Depth Base	
Date Tested	27/03/2023	Sample Type	B



Sieving		**Sedimentation**	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	93		
28	87		
20	78		
14	69		
10	62		
6.3	54		
5	53		
3.35	51		
2	48		
1.18	45		
0.6	33		
0.425	25		
0.3	21		
0.212	19		
0.15	18		
0.063	18		

Sample Proportions	% dry mass
Cobbles	0
Gravel	52
Sand	30
Silt and Clay	18

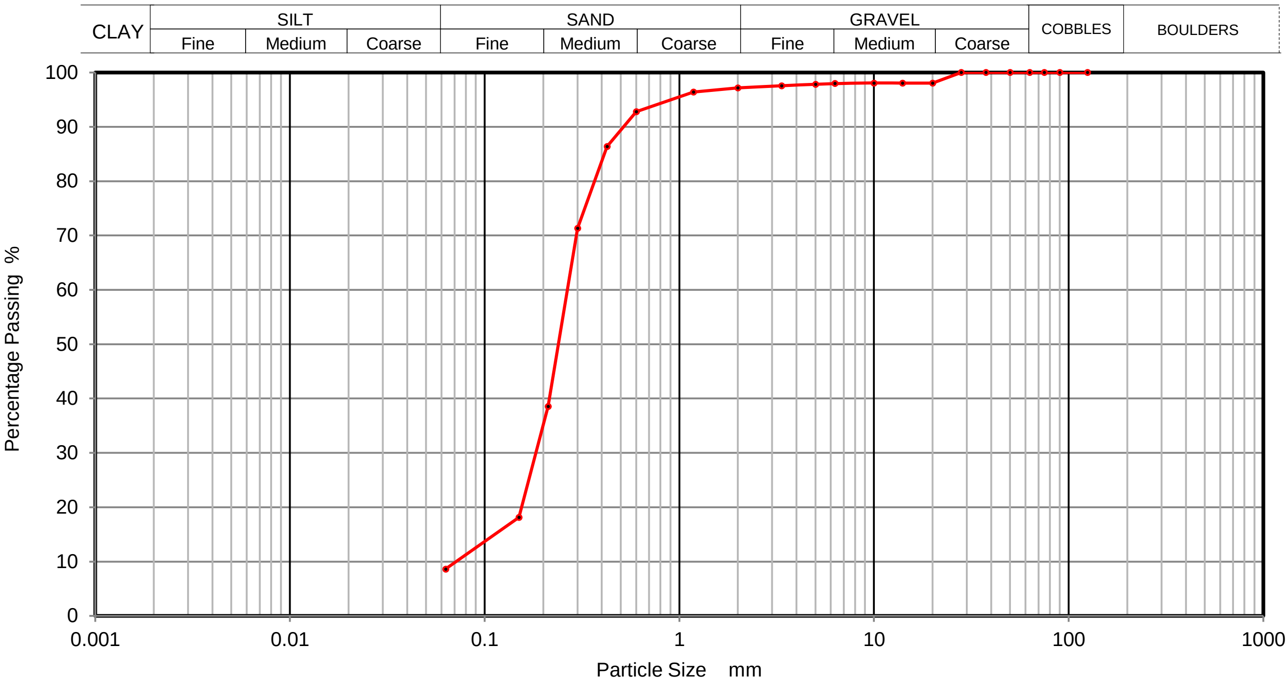
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING 2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve, Clause 9.2**	Contract Number	65166
		Borehole/Pit No.	WS104
Project Name	Burnt Mill Academy	Sample No.	
Soil Description	Brown slightly gravelly slightly silty/ clayey fine to coarse SAND	Depth Top	1.20
		Depth Base	2.00
Date Tested	27/03/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	98		
14	98		
10	98		
6.3	98		
5	98		
3.35	98		
2	97		
1.18	96		
0.6	93		
0.425	86		
0.3	71		
0.212	39		
0.15	18		
0.063	9		

Sample Proportions	% dry mass
Cobbles	0
Gravel	3
Sand	88
Silt and Clay	9

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING 2788

UKAS
TESTING
2788

Laboratory Report

GSTL
GEOTECHNICAL SITE & TESTING LABORATORIES
A PHENNA GROUP COMPANY

Contract Number: 65392

Client Ref: **8511**
Client PO: **11403**

Date Received: **23-03-2023**
Date Completed: **14-04-2023**
Report Date: **14-04-2023**

Client: **Earth Science Partnership**
33 Cardiff Road
Taff's Well
Cardiff
CF15 7RB

This report has been checked and approved by:

B. Evans

Brendan Evans
Office Administrator

Contract Title: **Burnt Mill Academy**
For the attention of: **Matthew Rowe-Smith**

Test Description	Qty
Samples Received - @ Non Accredited Test	29
Moisture Content BS 1377:1990 - Part 2 : 3.2 - * UKAS	7
4 Point Liquid & Plastic Limit BS 1377:1990 - Part 2 : 4.3 & 5.3 - * UKAS	16
PSD Wet Sieve method BS 1377:1990 - Part 2 : 9.2 - * UKAS	19
One-dimensional Consolidation 75mm or 50mm diameter specimens (up to 5 stages/days) BS 1377:1990 - Part 5 : 3 - * UKAS	6
As 5.01, 5.03 & 5.04 each extra additional stage/day BS 1377:1990 - Part 5 : 3	8
Quick Undrained Triaxial Compression Test - Multi-stage Loading of a single specimen (100mm diameter) BS 1377:1990 - Part 7 : 9 - * UKAS	9
Disposal of samples for job	1

Notes: **Observations and Interpretations are outside the UKAS Accreditation**
*** - denotes test included in laboratory scope of accreditation**
 # - denotes test carried out by approved contractor
@ - denotes non accredited tests

Approved Signatories:
Brendan Evans (Office Administrator) - Darren Bourne (Quality Senior Technician) - Paul Evans (Director)
Richard John (Quality/Technical Manager) - Shaun Jones (Laboratory manager) - Shaun Thomas (Site Manager)
Wayne Honey (Human Resources/ Health and Safety Manager)

Summary of Soil Descriptions

Contract Number	65392	
Project Name	Burnt Mill Academy	
Client Reference		

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Descriptions
BH101		UT	1.20	-	1.65	Brown silty CLAY
BH101		UT	3.00	-	3.45	Brown slightly silty/ clayey fine to coarse sandy fine to coarse GRAVEL
BH101		B	5.00	-	5.45	Brown slightly sandy fine to coarse gravelly SILT/ CLAY
BH101		B	16.00	-		Brown slightly gravelly fine to coarse sandy SILT/ CLAY
BH103		UT	1.20	-	1.65	Brown fine to medium gravelly sandy silty CLAY
BH103		UT	3.00	-	3.45	Brown sandy silty CLAY
BH103		B	5.00	-	5.50	Brown slightly silty/ clayey fine to coarse gravelly fine to coarse SAND
BH103		B	17.00	-	17.50	Brown fine to coarse gravelly fine to coarse sandy SILT/ CLAY
BH103		UT	19.50	-	19.95	Brown silty CLAY
BH103		UT	24.00	-	24.45	Brown silty CLAY
BH104		B	1.20	-	1.70	Brown slightly silty/ clayey fine to coarse sandy fine to coarse GRAVEL
BH104		B	3.00	-	3.50	Brown fine to coarse gravelly silty/ clayey fine to coarse SAND
BH104		B	5.00	-	5.50	Brown slightly silty/ clayey fine to coarse gravelly fine to coarse SAND
BH104		UT	12.00	-	12.45	Brown silty/ clayey fine to coarse gravelly fine to coarse SAND
BH104		UT	15.00	-	15.45	Brown fine to medium gravelly sandy silty CLAY
BH104		B	16.50	-	16.95	Brown slightly silty/ clayey slightly sandy fine to coarse GRAVEL
BH104		D	20.00	-		Brown fine to medium gravelly sandy silty CLAY
BH104		UT	21.00	-	21.50	Brown sandy silty CLAY
BH104		UT	24.00	-	24.45	Brown silty CLAY
BH105		B	3.00	-	3.50	Brown silty/ clayey fine to coarse sandy fine to coarse GRAVEL
BH105		B	5.00	-	5.50	Brown fine to coarse gravelly silty/ clayey fine to coarse SAND
BH105		D	11.00	-		Brown fine to medium gravelly sandy chalky silty CLAY
BH105		UT	12.00	-	12.45	Brown fine to coarse gravelly sandy chalky silty CLAY
BH105		D	14.00	-		Grey fine to medium gravelly sandy chalky silty CLAY
BH105		UT	15.00	-	15.45	Brown silty/ clayey fine to coarse gravelly fine to coarse SAND
BH105		B	19.50	-	20.00	Brown slightly silty/ clayey fine to coarse sandy fine to coarse GRAVEL
BH105		D	20.00	-		Brown fine to medium gravelly sandy silty CLAY
WS103		B	1.20, 3.00	-	2.00, 4.00	Brown slightly silty/ clayey fine to coarse sandy fine to coarse GRAVEL
WS105		D	2.60	-		Brown fine to medium gravelly sandy chalky silty CLAY
WS106		B	2.00	-	2.50	Brown silty/ clayey fine to coarse gravelly fine to coarse SAND
WS107		D	3.30	-		Brown fine to medium gravelly sandy silty CLAY
WS107		D	4.50	-		Brown fine to medium gravelly sandy chalky silty CLAY
WS108		B	1.20	-	2.00	Brown silty/ clayey fine to coarse SAND
WS108		D	3.10	-		Brown fine to medium gravelly sandy silty CLAY
WS108		B	4.00	-	5.00	Brown fine to coarse gravelly silty/ clayey fine to coarse SAND
BH102		B	1.20	-	1.70	Brown slightly silty/ clayey fine to coarse sandy fine to coarse GRAVEL
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		

GSTL
GEOTECHNICAL SITE & TESTING LABORATORIES

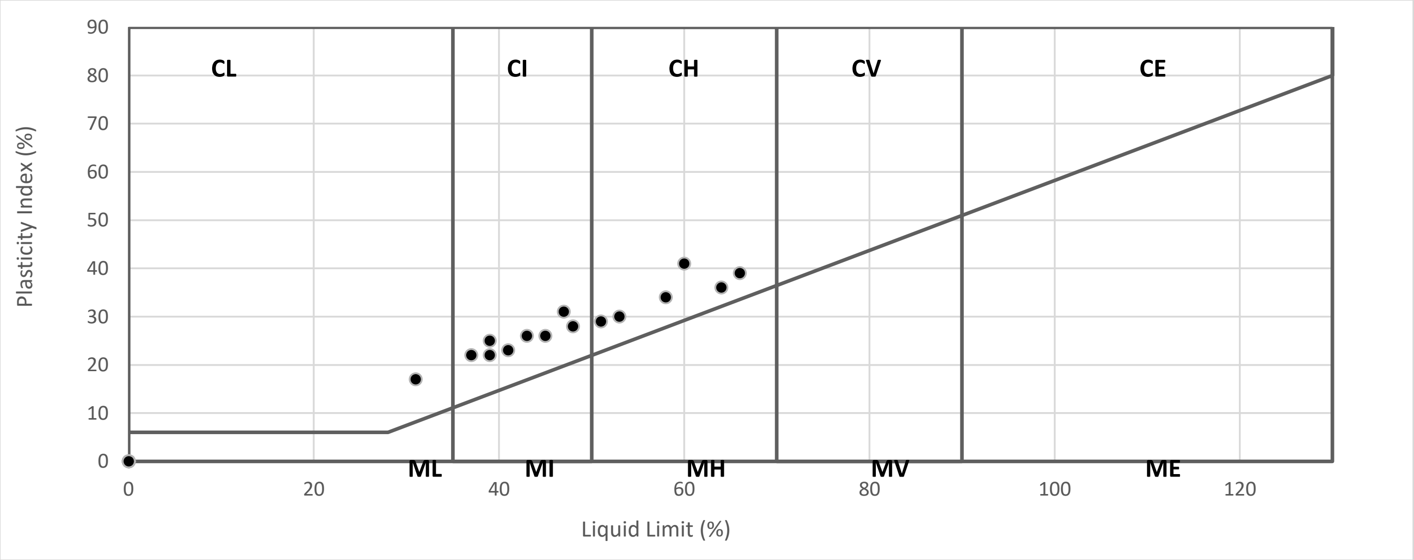
NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX
(BS 1377:1990 - Part 2 : 4.3 & 5.3)

Contract Number	65392
Project Name	Burnt Mill Academy
Date Tested	04/04/2023

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity index %	Passing 0.425mm %	Remarks
BH101		UT	1.20	-	1.65	22	48	20	28	100	CI Intermediate Plasticity
BH103		UT	1.20	-	1.65	8.9		NP		65	
BH103		UT	3.00	-	3.45	18	41	18	23	100	CI Intermediate Plasticity
BH103		UT	19.50	-	19.95	26	58	24	34	100	CH High Plasticity
BH103		UT	24.00	-	24.45	25	53	23	30	100	CH High Plasticity
BH104		UT	12.00	-	12.45	17	37	15	22	73	CI Intermediate Plasticity
BH104		UT	15.00	-	15.45	13	31	14	17	88	CL Low Plasticity
BH104		UT	20.00	-		31	64	28	36	97	CH High Plasticity
BH104		UT	24.00	-	24.45	24	51	22	29	100	CH High Plasticity
BH105		D	11.00	-	12.45	19	47	16	31	95	CI Intermediate Plasticity
BH105		D	14.00	-		15	39	14	25	94	CI Intermediate Plasticity
BH105		D	20.00	-		29	66	27	39	91	CH High Plasticity
WS105		D	2.60	-		18	43	17	26	90	CI Intermediate Plasticity
WS107		D	3.30	-		26	60	19	41	90	CH High Plasticity
WS107		D	4.50	-		19	39	17	22	88	CI Intermediate Plasticity
WS108		D	3.10	-		23	45	19	26	99	CI Intermediate Plasticity
				-							
				-							
				-							
				-							
				-							
				-							
				-							
				-							

Symbols: NP : Non Plastic # : Liquid Limit and Plastic Limit Wet Sieved

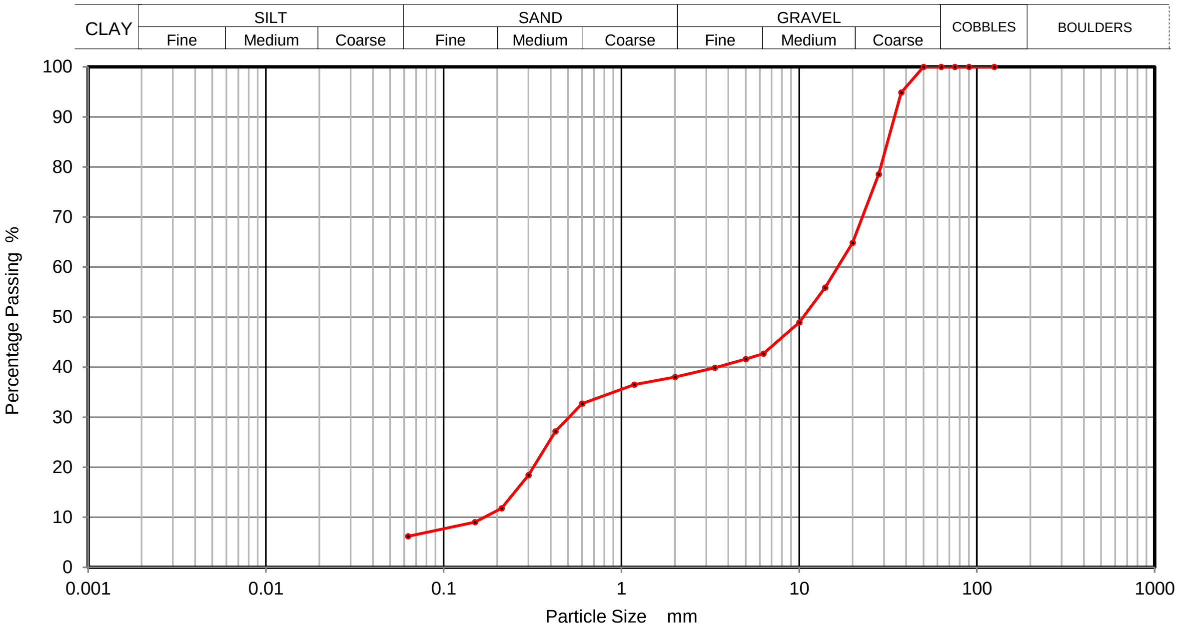
PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION
BS 5930:2015+A1:2020



Operator
Rhydian Williams

2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve, Clause 9.2**	Contract Number	65392
		Borehole/Pit No.	BH101
Project Name	Burnt Mill Academy	Sample No.	
Soil Description	*See sample description sheet	Depth Top	3.00
		Depth Base	3.45
Date Tested	05/04/2023	Sample Type	UT



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	95		
28	79		
20	65		
14	56		
10	49		
6.3	43		
5	42		
3.35	40		
2	38		
1.18	37		
0.6	33		
0.425	27		
0.3	18		
0.212	12		
0.15	9		
0.063	6		

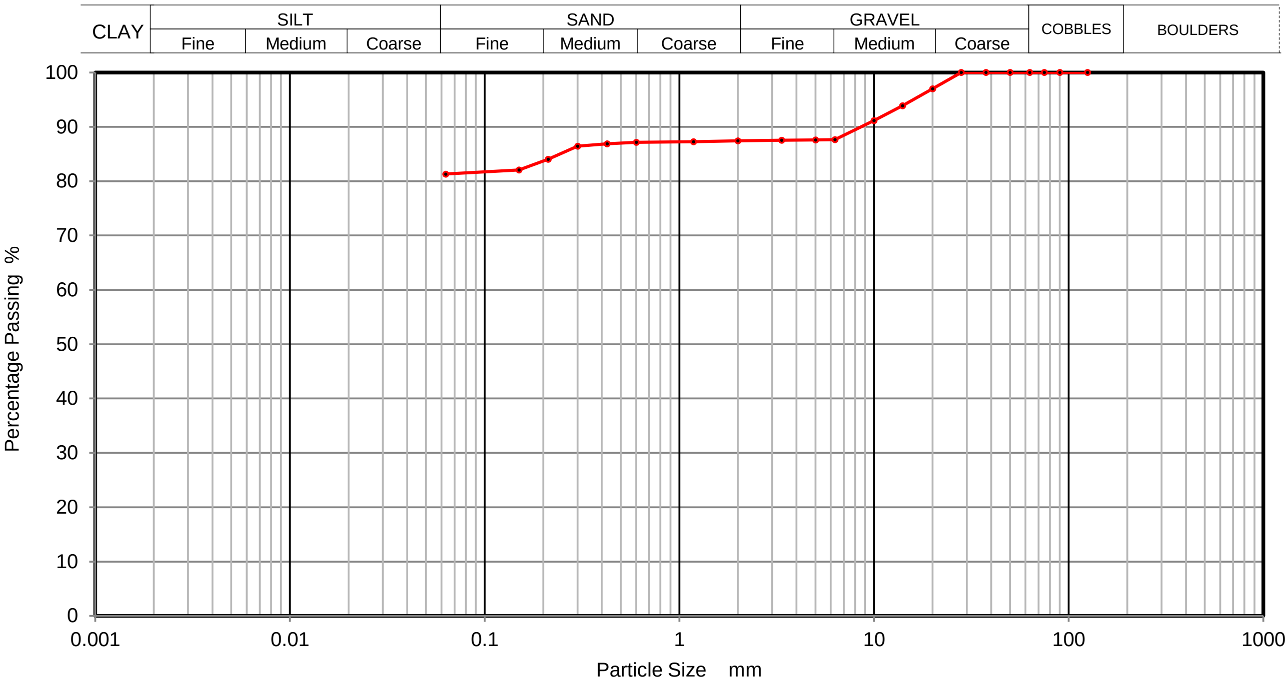
Sample Proportions	% dry mass
Cobbles	0
Gravel	62
Sand	32
Silt and Clay	6

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve, Clause 9.2**	Contract Number	65392
		Borehole/Pit No.	BH101
Project Name	Burnt Mill Academy	Sample No.	
Soil Description	*See sample description sheet	Depth Top	5.00
		Depth Base	5.45
Date Tested	05/04/2023	Sample Type	B



Sieving		**Sedimentation**	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	97		
14	94		
10	91		
6.3	88		
5	88		
3.35	88		
2	87		
1.18	87		
0.6	87		
0.425	87		
0.3	86		
0.212	84		
0.15	82		
0.063	81		

Sample Proportions	% dry mass
Cobbles	0
Gravel	13
Sand	6
Silt and Clay	81

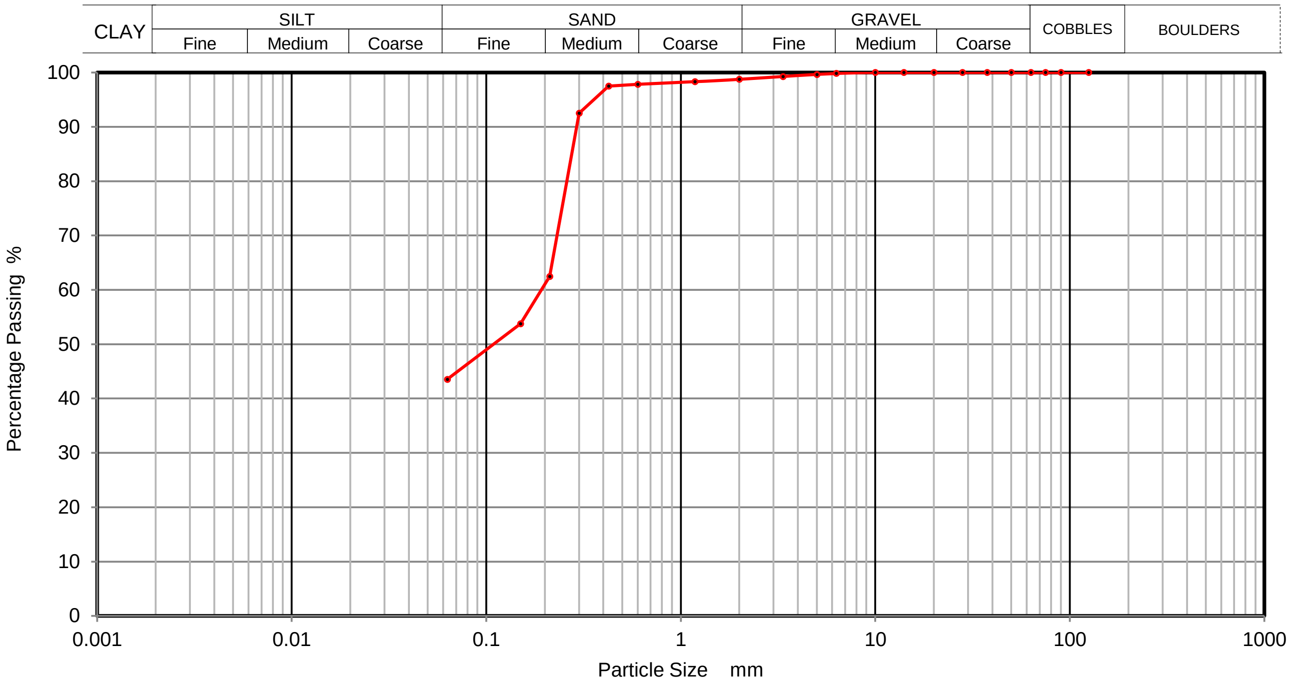
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING 2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve, Clause 9.2**	Contract Number	65392
		Borehole/Pit No.	BH101
Project Name	Burnt Mill Academy	Sample No.	
Soil Description	*See sample description sheet	Depth Top	16.00
		Depth Base	
Date Tested	05/04/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	99		
2	99		
1.18	98		
0.6	98		
0.425	98		
0.3	93		
0.212	62		
0.15	54		
0.063	44		

Sample Proportions	% dry mass
Cobbles	0
Gravel	1
Sand	55
Silt and Clay	44

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

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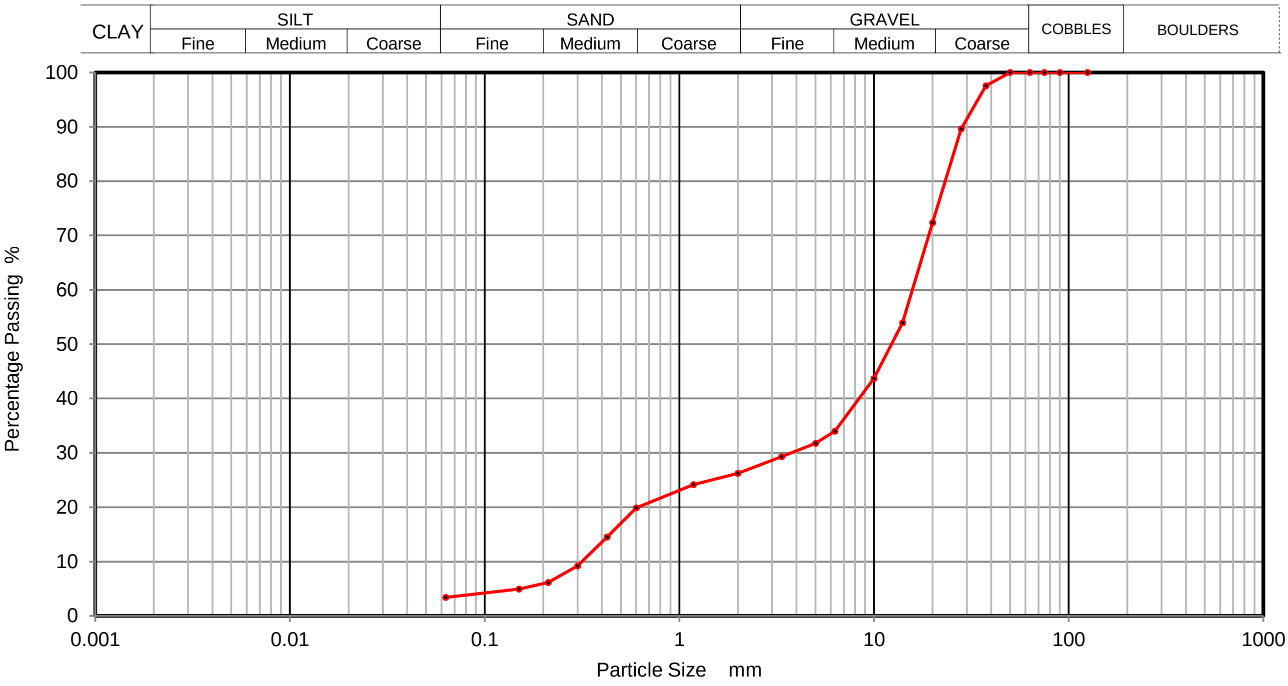
GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve, Clause 9.2**	Contract Number	65392
		Borehole/Pit No.	BH102
Project Name	Burnt Mill Academy	Sample No.	
Soil Description	*See sample description sheet	Depth Top	1.20
		Depth Base	1.70
Date Tested	05/04/2023	Sample Type	B



Sieving		**Sedimentation**	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	98		
28	90		
20	72		
14	54		
10	44		
6.3	34		
5	32		
3.35	29		
2	26		
1.18	24		
0.6	20		
0.425	15		
0.3	9		
0.212	6		
0.15	5		
0.063	3		

Sample Proportions	% dry mass
Cobbles	0
Gravel	74
Sand	23
Silt and Clay	3

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

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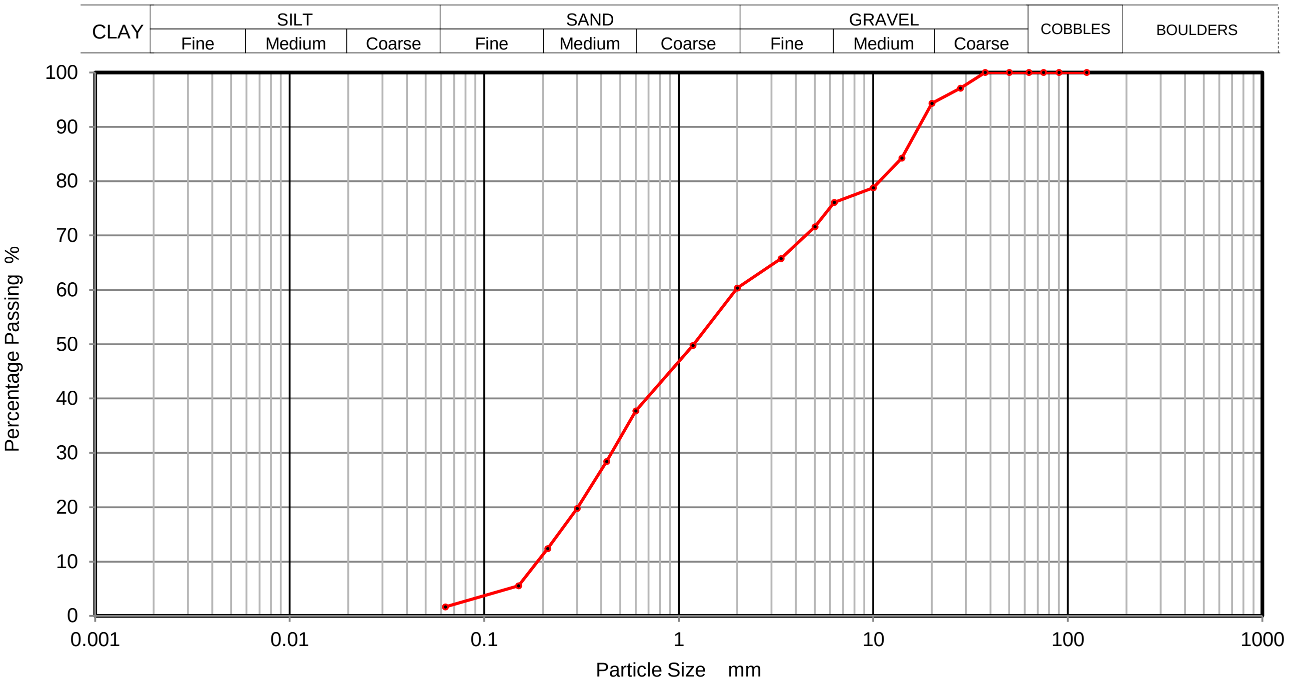
GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve, Clause 9.2**	Contract Number	65392
		Borehole/Pit No.	BH103
Project Name	Burnt Mill Academy	Sample No.	
Soil Description	*See sample description sheet	Depth Top	5.00
		Depth Base	5.50
Date Tested	05/04/2023	Sample Type	B



Sieving		**Sedimentation**	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	97		
20	94		
14	84		
10	79		
6.3	76		
5	72		
3.35	66		
2	60		
1.18	50		
0.6	38		
0.425	28		
0.3	20		
0.212	12		
0.15	6		
0.063	2		

Sample Proportions	% dry mass
Cobbles	0
Gravel	40
Sand	58
Silt and Clay	2

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

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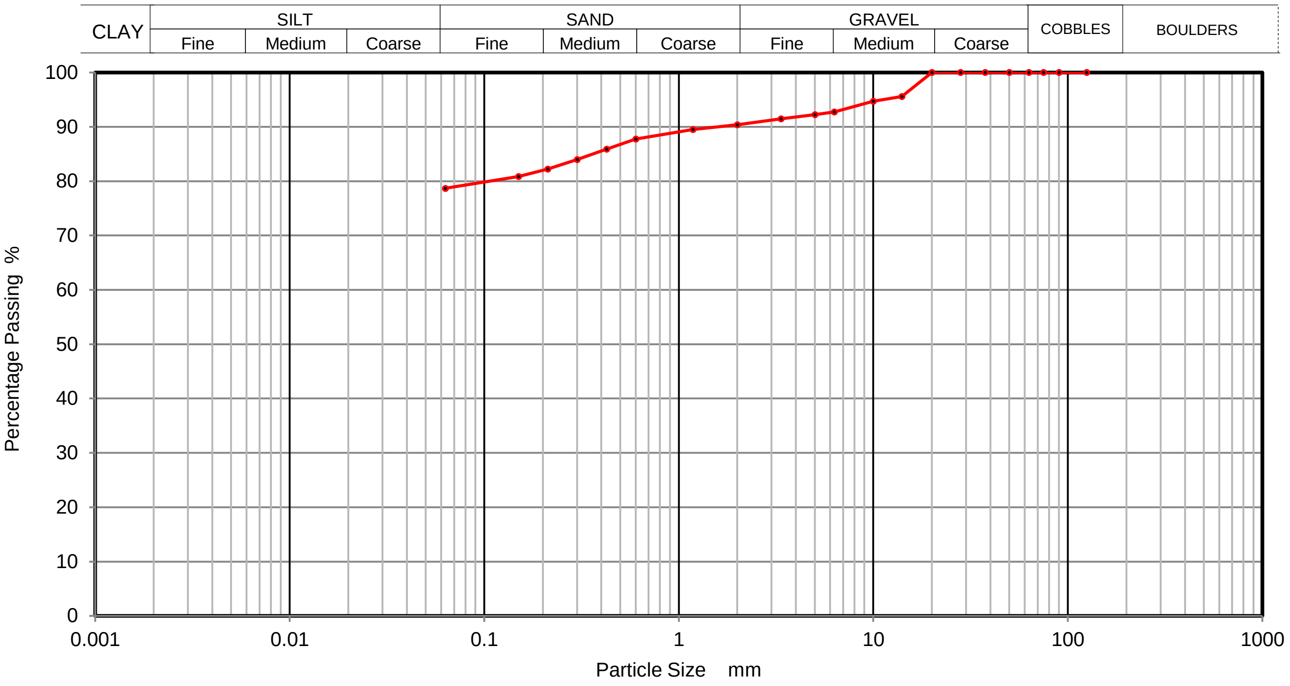
	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	65392
		Borehole/Pit No.	BH103
Project Name	Burnt Mill Academy	Sample No.	
Soil Description	*See sample description sheet	Depth Top	17.00
		Depth Base	17.50
Date Tested	05/04/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	96		
10	95		
6.3	93		
5	92		
3.35	91		
2	90		
1.18	90		
0.6	88		
0.425	86		
0.3	84		
0.212	82		
0.15	81		
0.063	79		

Sample Proportions	% dry mass
Cobbles	0
Gravel	10
Sand	11
Silt and Clay	79

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

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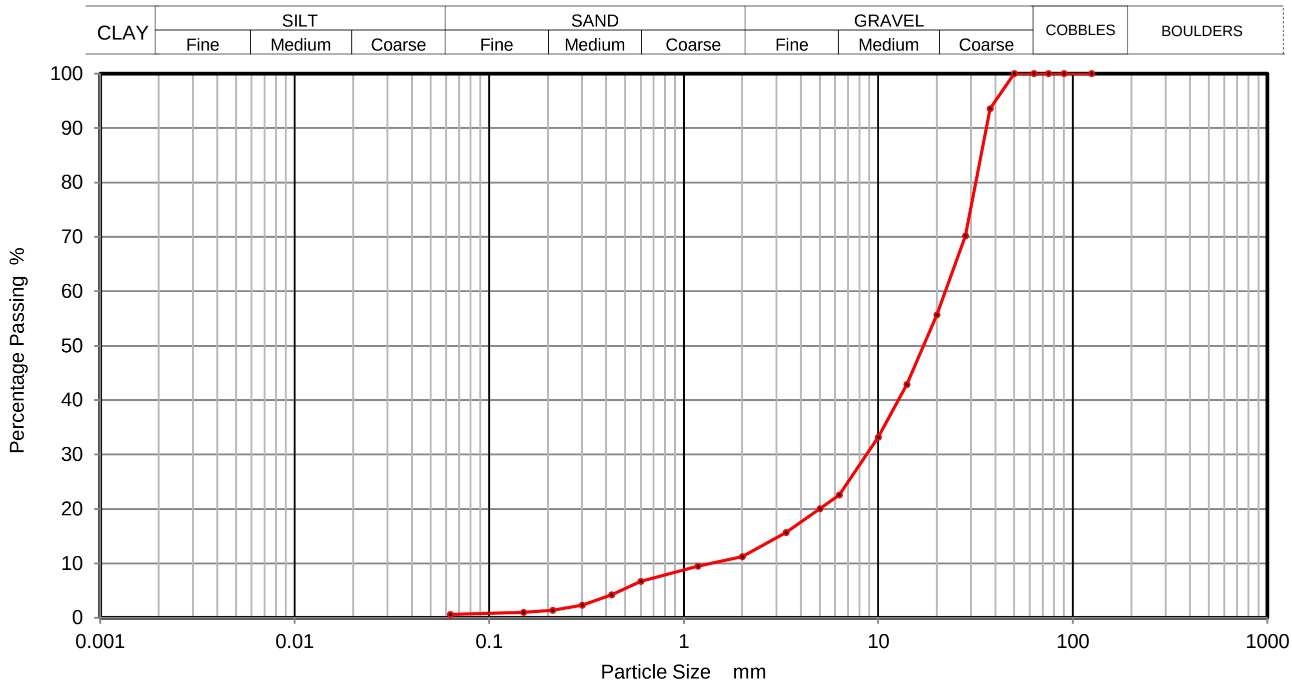
GSTL
GEOTECHNICAL SITE & TESTING LABORATORIES

PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

		Contract Number	65392
		Borehole/Pit No.	BH104
Project Name	Burnt Mill Academy	Sample No.	
Soil Description	*See sample description sheet	Depth Top	1.20
		Depth Base	1.70
Date Tested	05/04/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	94		
28	70		
20	56		
14	43		
10	33		
6.3	23		
5	20		
3.35	16		
2	11		
1.18	9		
0.6	7		
0.425	4		
0.3	2		
0.212	1		
0.15	1		
0.063	1		

Sample Proportions	% dry mass
Cobbles	0
Gravel	89
Sand	10
Silt and Clay	1

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

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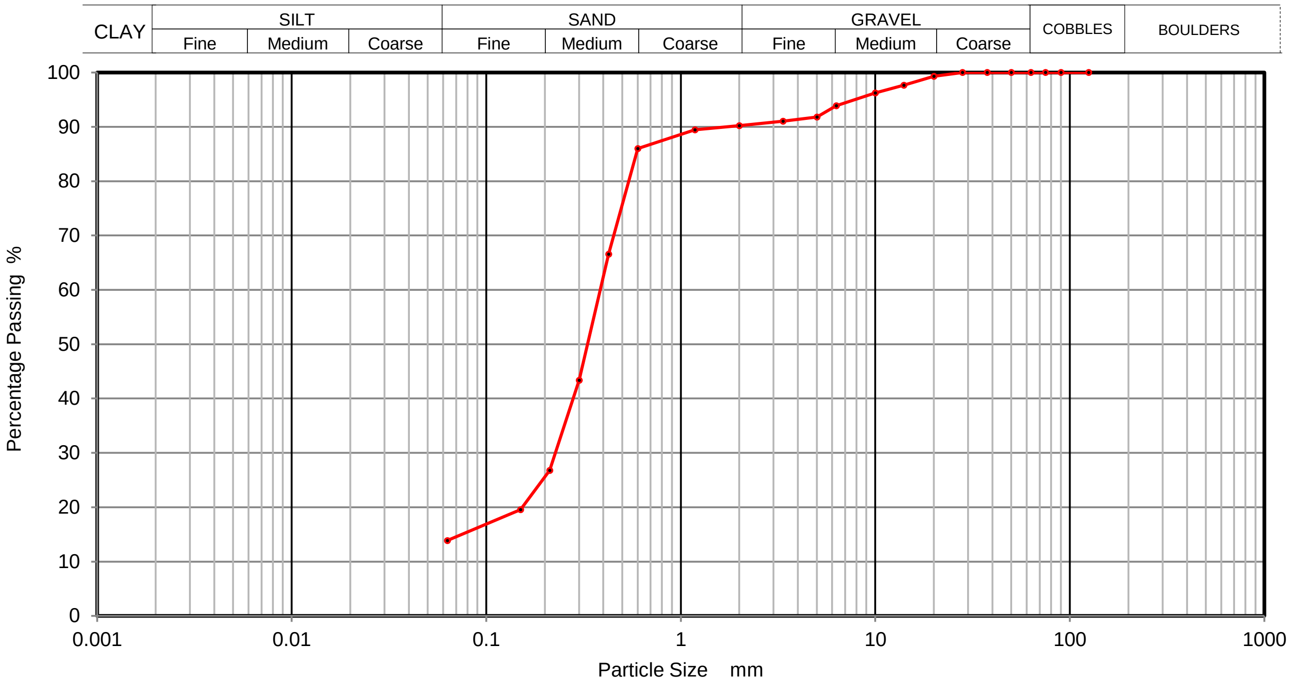
GEOTECHNICAL SITE & TESTING LABORATORIES

PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

		Contract Number	65392
		Borehole/Pit No.	BH104
Project Name	Burnt Mill Academy	Sample No.	
Soil Description	*See sample description sheet	Depth Top	3.00
		Depth Base	3.45
Date Tested	05/04/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	99		
14	98		
10	96		
6.3	94		
5	92		
3.35	91		
2	90		
1.18	89		
0.6	86		
0.425	67		
0.3	43		
0.212	27		
0.15	20		
0.063	14		

Sample Proportions	% dry mass
Cobbles	0
Gravel	10
Sand	76
Silt and Clay	14

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING
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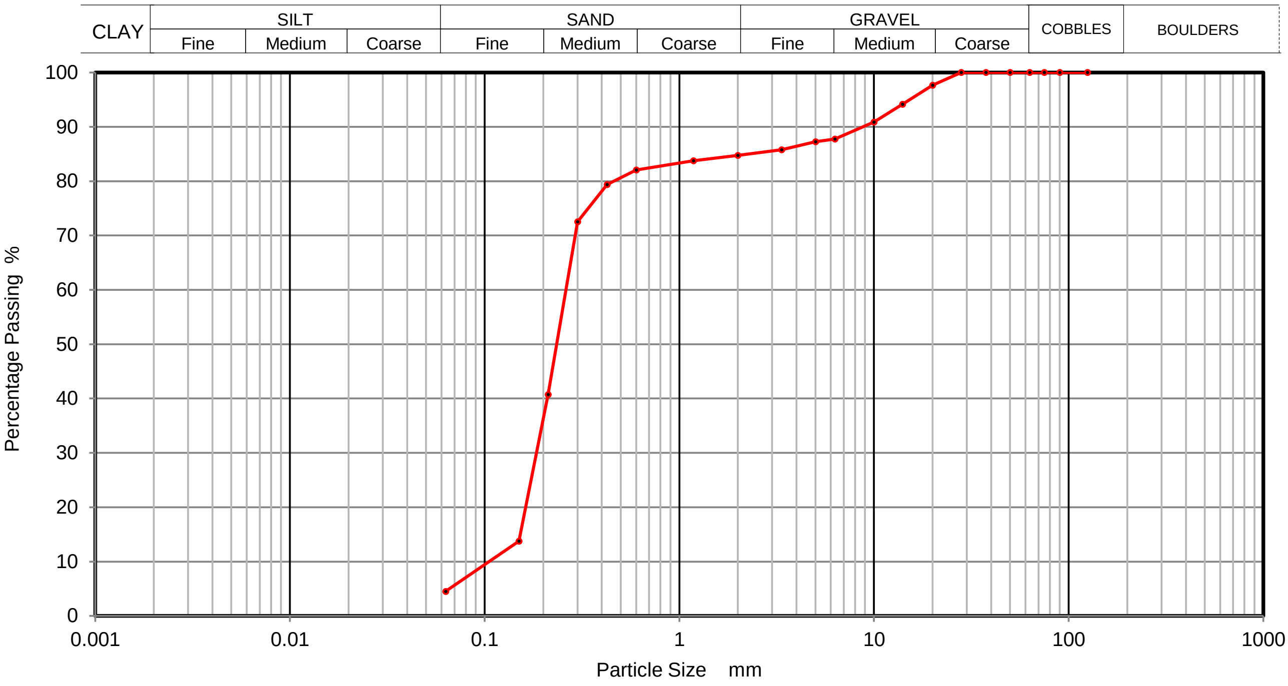
GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve, Clause 9.2**	Contract Number	65392
		Borehole/Pit No.	BH104
Project Name	Burnt Mill Academy	Sample No.	
Soil Description	*See sample description sheet	Depth Top	5.00
		Depth Base	5.50
Date Tested	05/04/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	98		
14	94		
10	91		
6.3	88		
5	87		
3.35	86		
2	85		
1.18	84		
0.6	82		
0.425	79		
0.3	73		
0.212	41		
0.15	14		
0.063	5		

Sample Proportions	% dry mass
Cobbles	0
Gravel	15
Sand	80
Silt and Clay	5

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING
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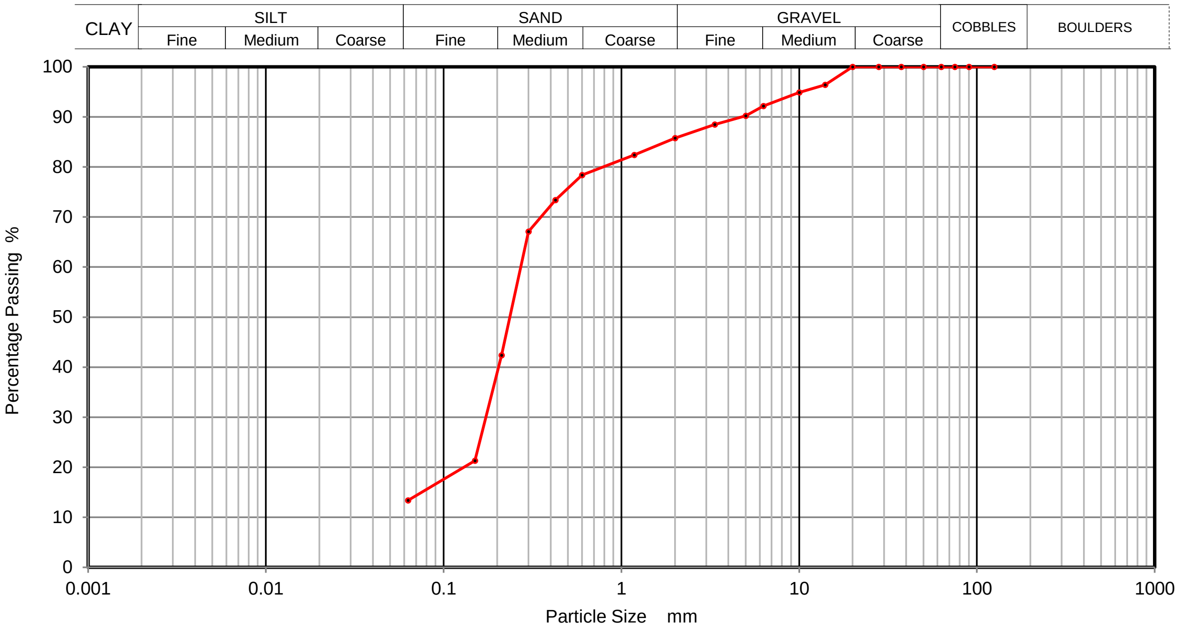
GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve, Clause 9.2**	Contract Number	65392
		Borehole/Pit No.	BH104
Project Name	Burnt Mill Academy	Sample No.	
Soil Description	*See sample description sheet	Depth Top	12.00
		Depth Base	12.45
Date Tested	05/04/2023	Sample Type	UT



Sieving		**Sedimentation**	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	96		
10	95		
6.3	92		
5	90		
3.35	89		
2	86		
1.18	82		
0.6	78		
0.425	73		
0.3	67		
0.212	42		
0.15	21		
0.063	13		

Sample Proportions	% dry mass
Cobbles	0
Gravel	14
Sand	73
Silt and Clay	13

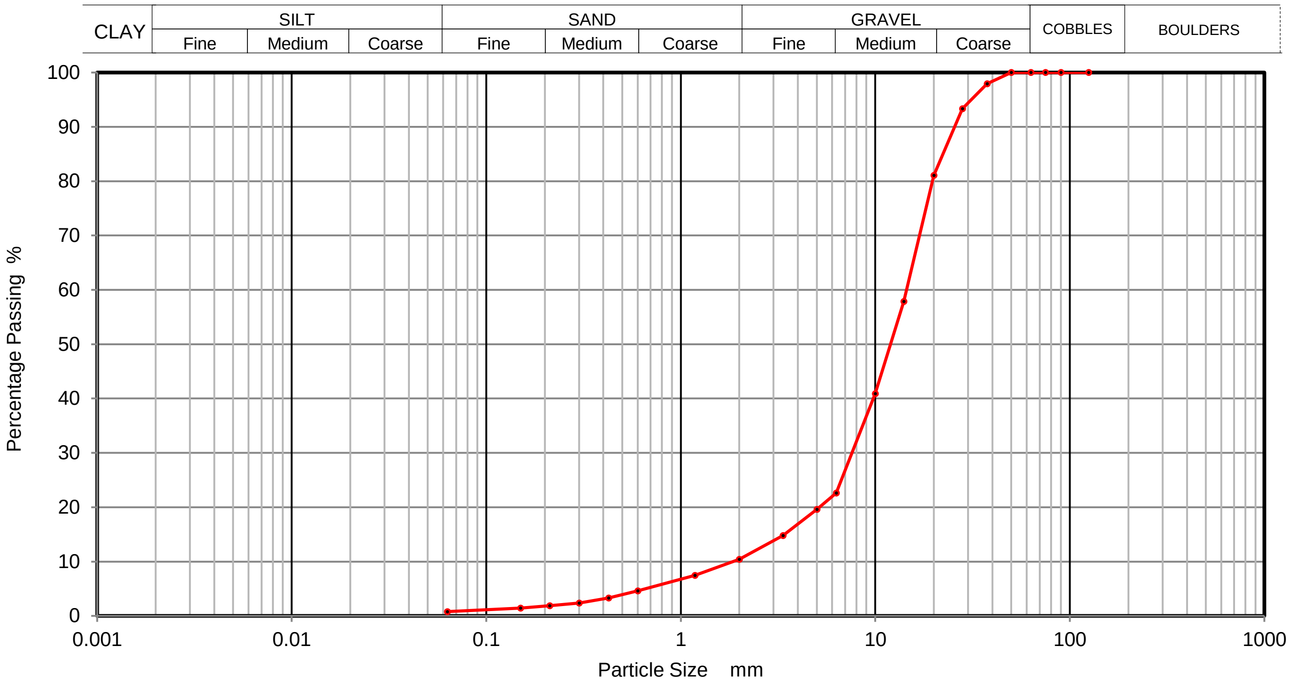
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING 2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve, Clause 9.2**	Contract Number	65392
		Borehole/Pit No.	BH104
Project Name	Burnt Mill Academy	Sample No.	
Soil Description	*See sample description sheet	Depth Top	16.50
		Depth Base	16.95
Date Tested	05/04/2023	Sample Type	B



Sieving		**Sedimentation**	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	98		
28	93		
20	81		
14	58		
10	41		
6.3	23		
5	20		
3.35	15		
2	10		
1.18	7		
0.6	5		
0.425	3		
0.3	2		
0.212	2		
0.15	1		
0.063	1		

Sample Proportions	% dry mass
Cobbles	0
Gravel	90
Sand	9
Silt and Clay	1

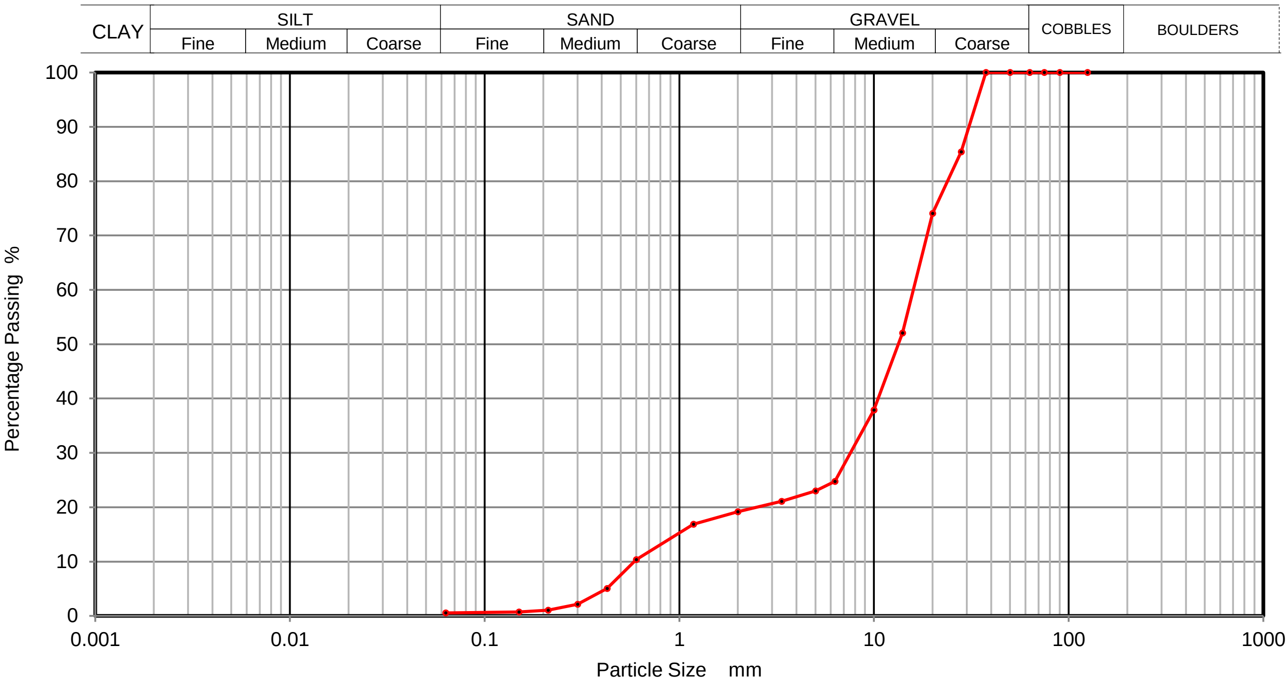
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING
2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve, Clause 9.2**	Contract Number	65392
		Borehole/Pit No.	BH105
Project Name	Burnt Mill Academy	Sample No.	
Soil Description	*See sample description sheet	Depth Top	3.00
		Depth Base	3.50
Date Tested	05/04/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	85		
20	74		
14	52		
10	38		
6.3	25		
5	23		
3.35	21		
2	19		
1.18	17		
0.6	10		
0.425	5		
0.3	2		
0.212	1		
0.15	1		
0.063	1		

Sample Proportions	% dry mass
Cobbles	0
Gravel	81
Sand	18
Silt and Clay	1

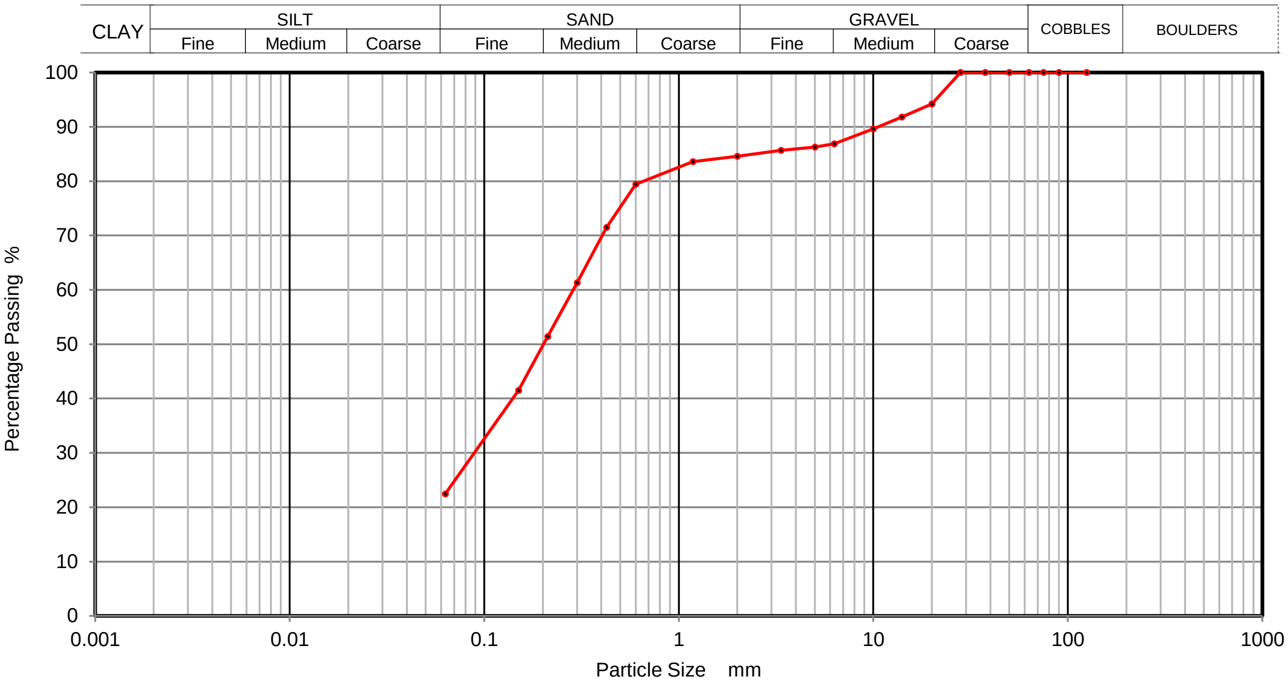
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING 2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve, Clause 9.2**	Contract Number	65392
		Borehole/Pit No.	BH105
Project Name	Burnt Mill Academy	Sample No.	
Soil Description	*See sample description sheet	Depth Top	5.00
		Depth Base	5.50
Date Tested	05/04/2023	Sample Type	B



Sieving		**Sedimentation**	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	94		
14	92		
10	90		
6.3	87		
5	86		
3.35	86		
2	85		
1.18	84		
0.6	79		
0.425	72		
0.3	61		
0.212	51		
0.15	41		
0.063	22		

Sample Proportions	% dry mass
Cobbles	0
Gravel	15
Sand	63
Silt and Clay	22

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

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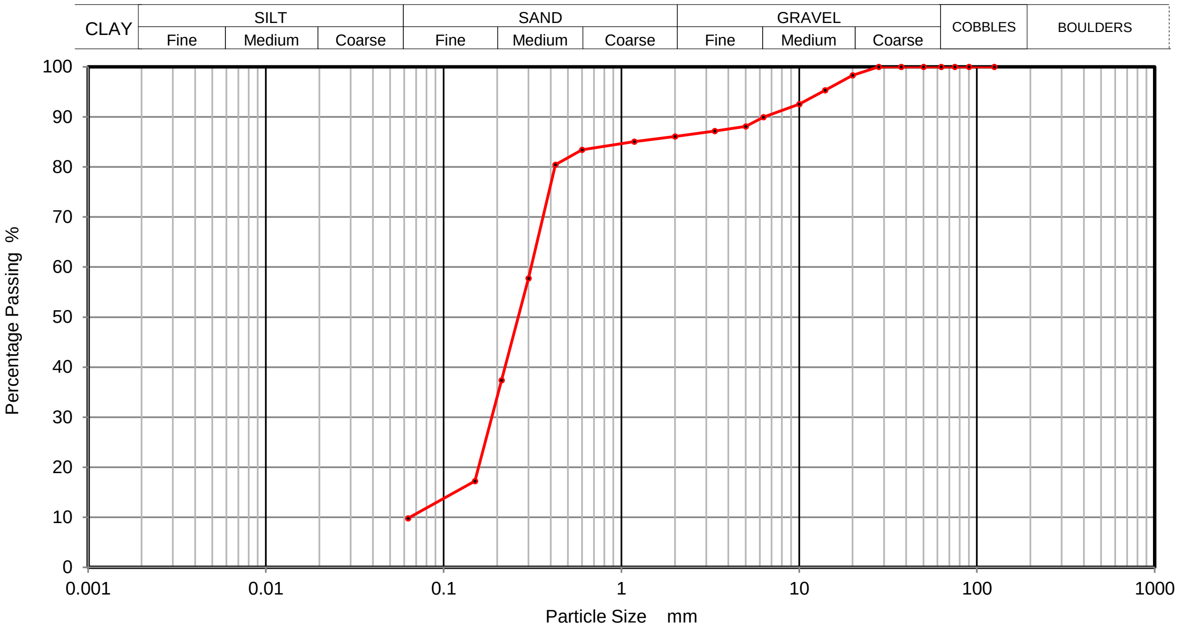
GEOTECHNICAL SITE & TESTING LABORATORIES

PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

		Contract Number	65392
		Borehole/Pit No.	BH105
Project Name	Burnt Mill Academy	Sample No.	
Soil Description	*See sample description sheet	Depth Top	15.00
		Depth Base	15.45
Date Tested	05/04/2023	Sample Type	UT



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	98		
14	95		
10	93		
6.3	90		
5	88		
3.35	87		
2	86		
1.18	85		
0.6	83		
0.425	80		
0.3	58		
0.212	37		
0.15	17		
0.063	10		

Sample Proportions	% dry mass
Cobbles	0
Gravel	14
Sand	76
Silt and Clay	10

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

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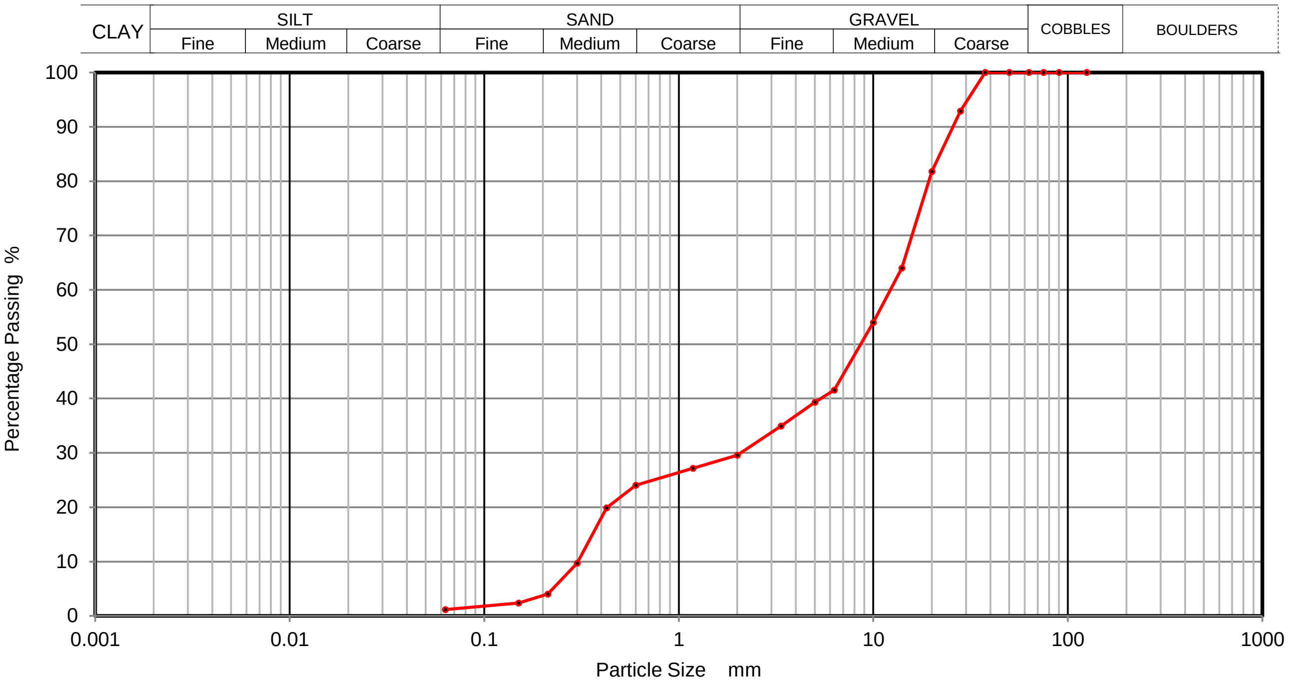
GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve, Clause 9.2**	Contract Number	65392
		Borehole/Pit No.	BH105
Project Name	Burnt Mill Academy	Sample No.	
Soil Description	*See sample description sheet	Depth Top	19.50
		Depth Base	20.00
Date Tested	05/04/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	93		
20	82		
14	64		
10	54		
6.3	42		
5	39		
3.35	35		
2	30		
1.18	27		
0.6	24		
0.425	20		
0.3	10		
0.212	4		
0.15	2		
0.063	1		

Sample Proportions	% dry mass
Cobbles	0
Gravel	70
Sand	29
Silt and Clay	1

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

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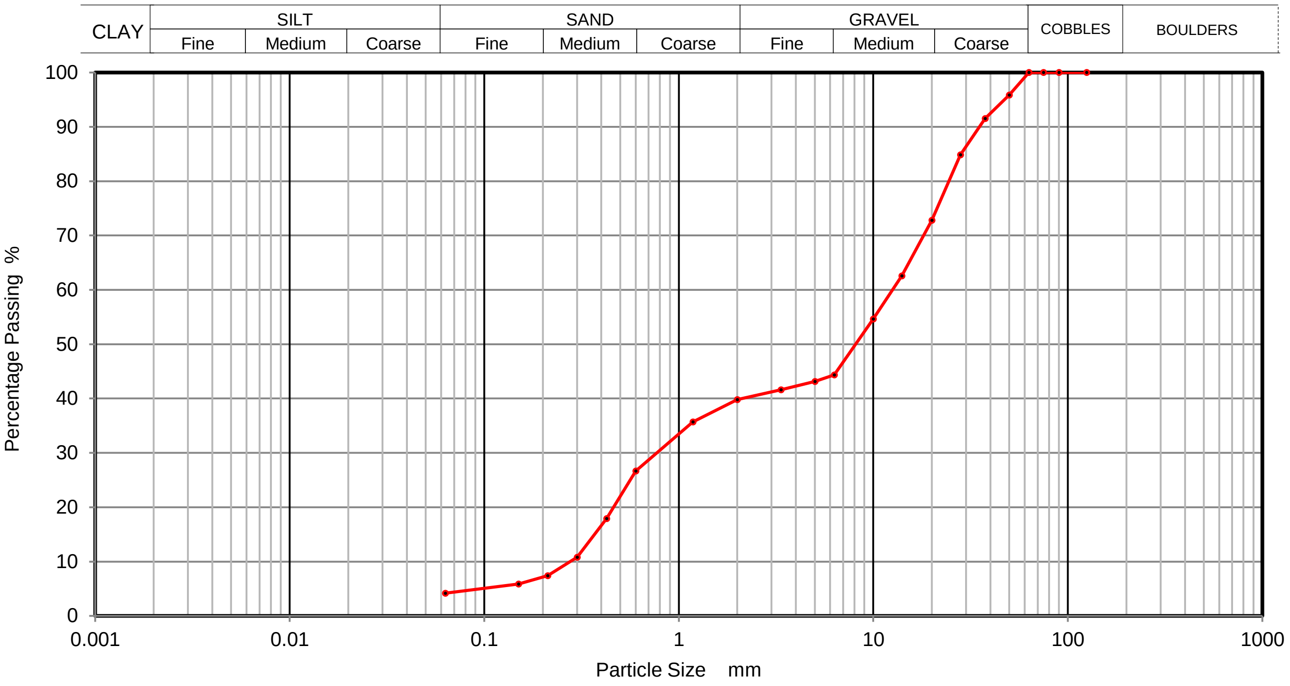
GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve, Clause 9.2**	Contract Number	65392
		Borehole/Pit No.	WS103
Project Name	Burnt Mill Academy	Sample No.	
Soil Description	*See sample description sheet	Depth Top	1.20, 3.00
		Depth Base	2.00, 4.00
Date Tested	05/04/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	96		
37.5	92		
28	85		
20	73		
14	63		
10	55		
6.3	44		
5	43		
3.35	42		
2	40		
1.18	36		
0.6	27		
0.425	18		
0.3	11		
0.212	7		
0.15	6		
0.063	4		

Sample Proportions	% dry mass
Cobbles	0
Gravel	60
Sand	36
Silt and Clay	4

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
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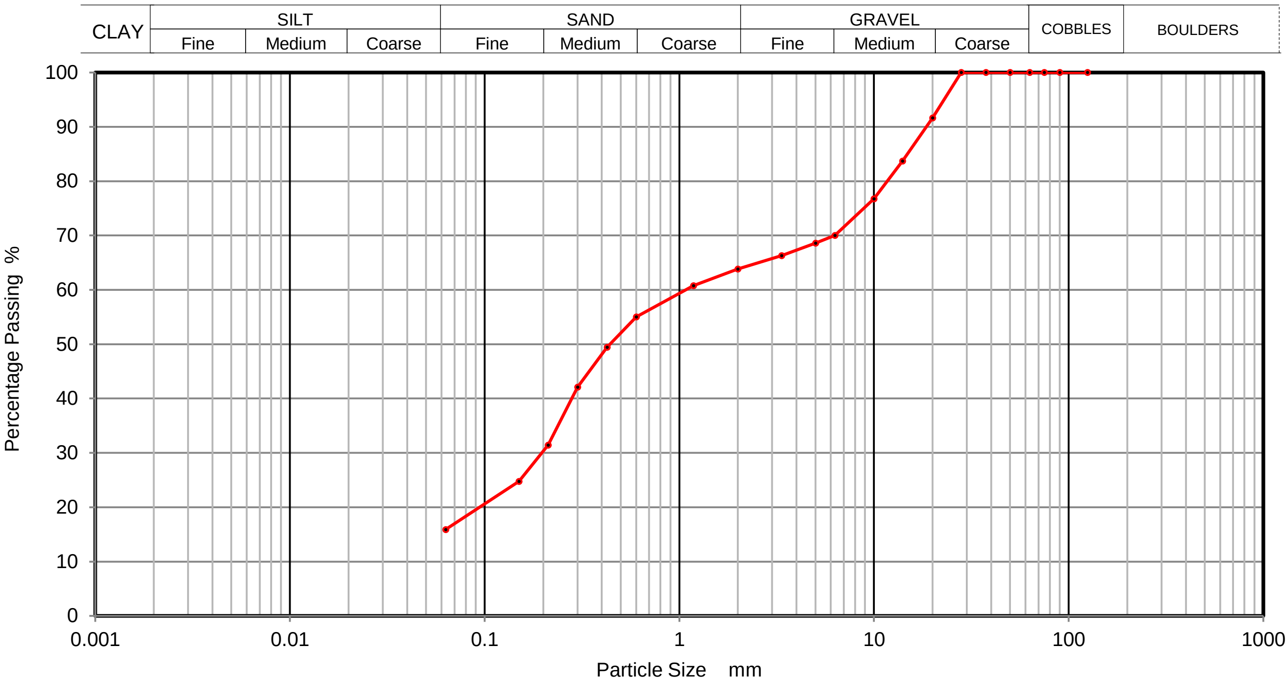
GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve, Clause 9.2**	Contract Number	65392
		Borehole/Pit No.	WS106
Project Name	Burnt Mill Academy	Sample No.	
Soil Description	*See sample description sheet	Depth Top	2.00
		Depth Base	2.45
Date Tested	05/04/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	92		
14	84		
10	77		
6.3	70		
5	69		
3.35	66		
2	64		
1.18	61		
0.6	55		
0.425	49		
0.3	42		
0.212	31		
0.15	25		
0.063	16		

Sample Proportions	% dry mass
Cobbles	0
Gravel	36
Sand	48
Silt and Clay	16

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

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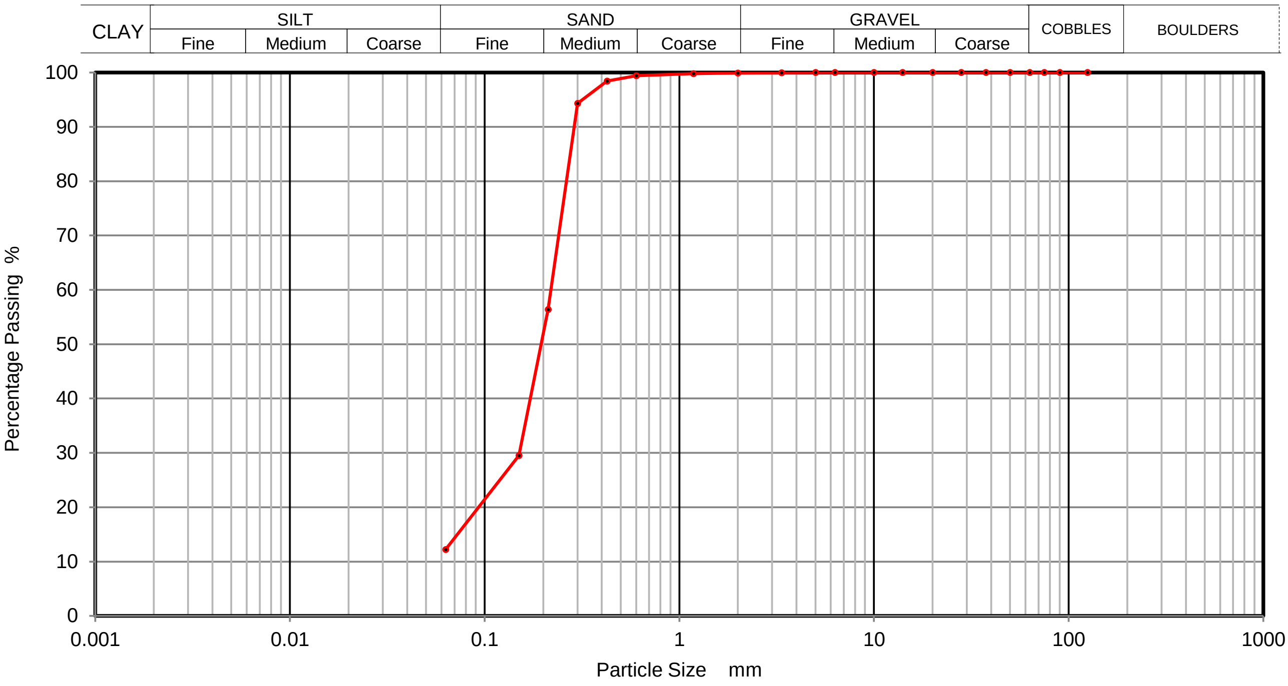
	PARTICLE SIZE DISTRIBUTION **BS 1377 Part 2:1990** **Wet Sieve, Clause 9.2**	Contract Number	65392
		Borehole/Pit No.	WS108
Project Name	Burnt Mill Academy	Sample No.	
Soil Description	*See sample description sheet	Depth Top	1.20
		Depth Base	2.00
Date Tested	05/04/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	99		
0.425	98		
0.3	94		
0.212	56		
0.15	30		
0.063	12		

Sample Proportions	% dry mass
Cobbles	0
Gravel	0
Sand	88
Silt and Clay	12

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

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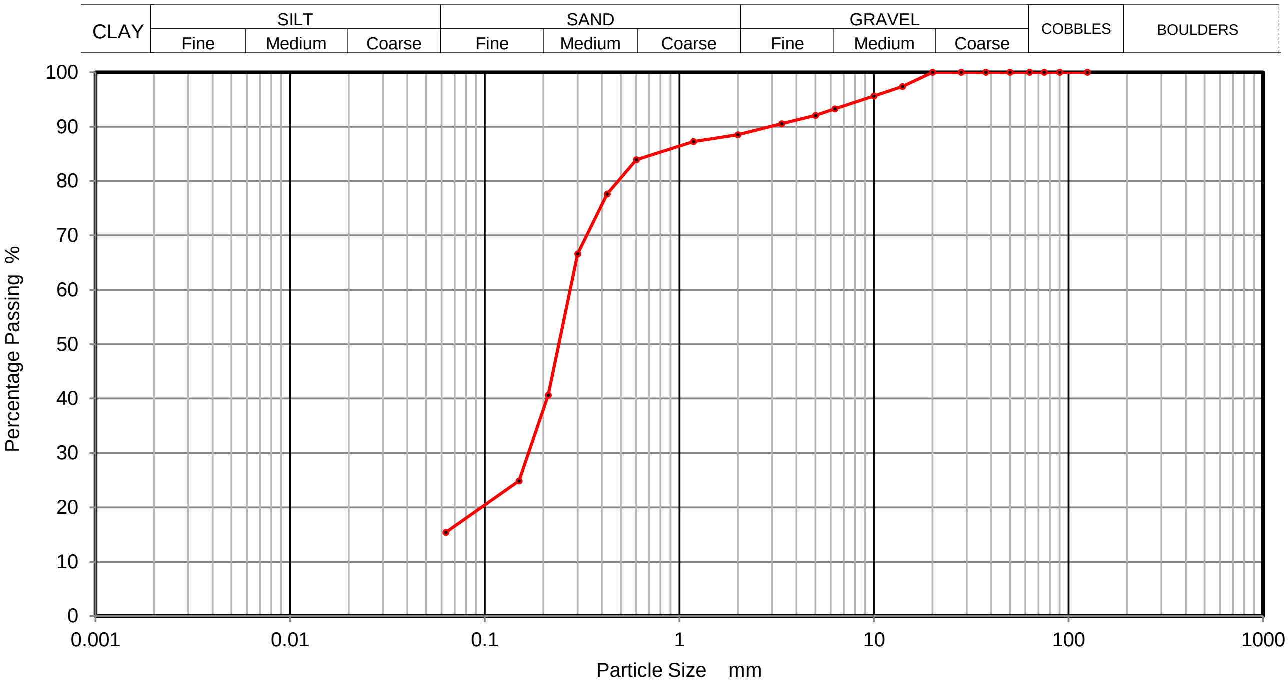
GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve, Clause 9.2**	Contract Number	65392
		Borehole/Pit No.	WS108
Project Name	Burnt Mill Academy	Sample No.	
Soil Description	*See sample description sheet	Depth Top	4.00
		Depth Base	5.00
Date Tested	05/04/2023	Sample Type	B



Sieving		**Sedimentation**	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	97		
10	96		
6.3	93		
5	92		
3.35	91		
2	89		
1.18	87		
0.6	84		
0.425	78		
0.3	67		
0.212	41		
0.15	25		
0.063	15		

Sample Proportions	% dry mass
Cobbles	0
Gravel	11
Sand	74
Silt and Clay	15

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

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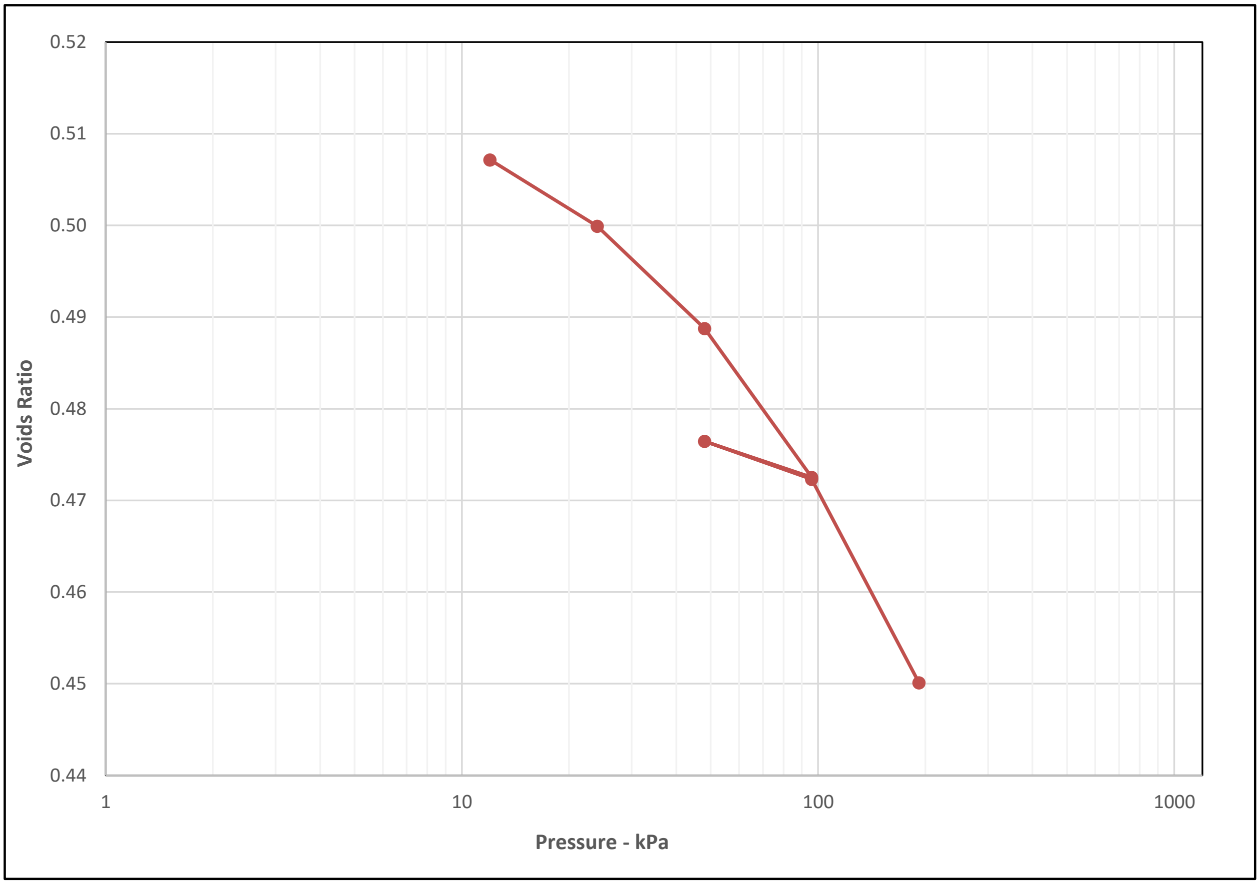
GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**ONE DIMENSIONAL CONSOLIDATION TEST BS1377:Part 5:1990, clause 3**	Contract Number	65392
		Borehole/Trialpit No.	BH101
Project Name	Burnt Mill Academy	Sample No.	
Soil Description	*See Sample Description Sheet	Depth Top (m)	1.20
		Depth Base (m)	1.65
Lab Temperature	20°c	Sample Location	Top
Remarks	Cv Calculated Using T90 Particle Density Assumed Unless Stated Otherwise	Sample Type	UT
Date Tested	06/04/2023		



Initial Sample Conditions		Pressure Range			Mv m2/MN	Cv m2/yr	Pressure Range			Mv m2/MN	Cv m2/yr
Moisture Content (%)	22	0	-	12	0.60	11		-			
Bulk Density (Mg/m3)	2.13	12	-	24	0.40	4.7		-			
Dry Density (Mg/m3)	1.75	24	-	48	0.31	7.6		-			
Voids Ratio	0.5181	48	-	96	0.23	6.4		-			
Degree of saturation	111.4	96	-	48	0.056	17		-			
Height (mm)	20.12	48	-	96	0.059	9.2		-			
Diameter (mm)	74.98	96	-	192	0.16	0.71		-			
Particle Density (Mg/m3)	2.65		-					-			

Operator
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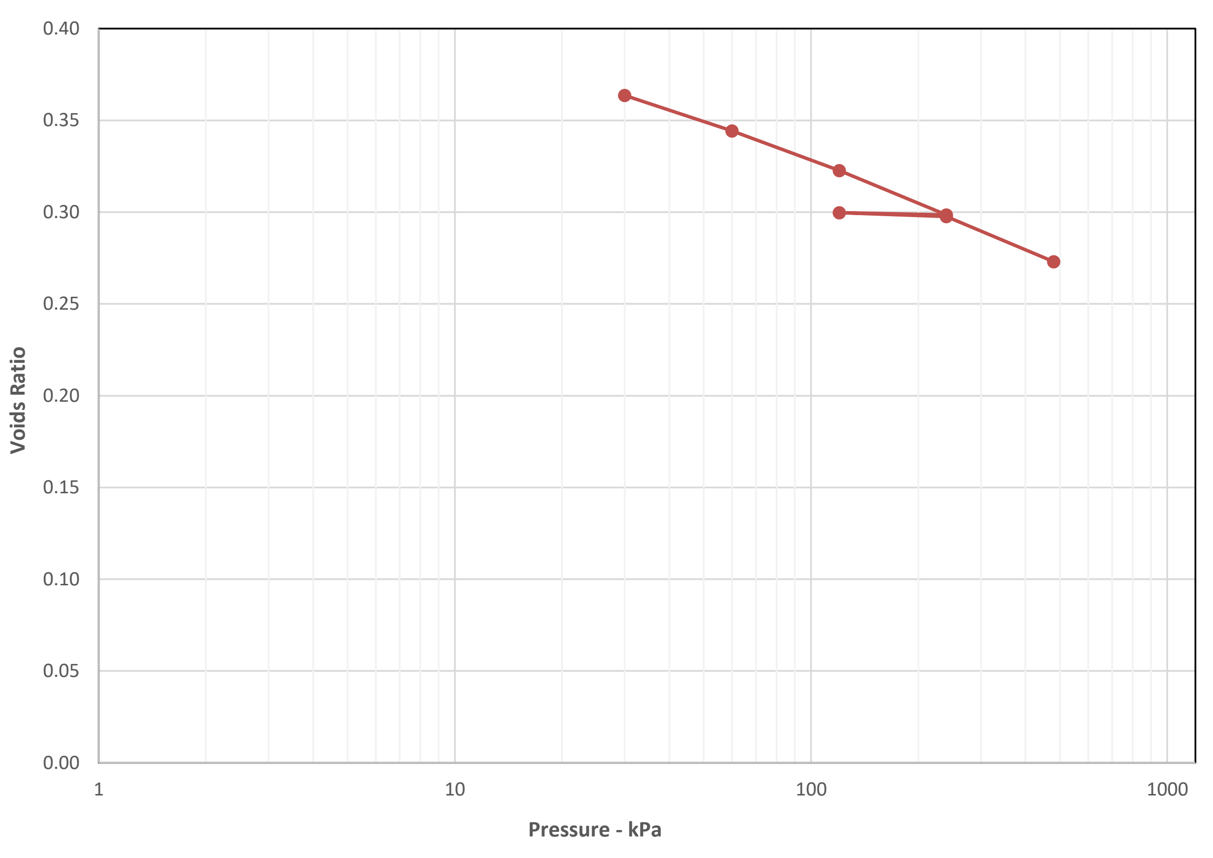
ONE DIMENSIONAL CONSOLIDATION TEST
BS1377:Part 5:1990, clause 3

		Contract Number	65392
		Borehole/Trialpit No.	BH103
Project Name	Burnt Mill Academy	Sample No.	
Soil Description	*See Sample Description Sheet	Depth Top (m)	3.00
		Depth Base (m)	3.45
Lab Temperature	20°c	Sample Location	Top
Remarks	Cv Calculated Using T90 Particle Density Assumed Unless Stated Otherwise	Sample Type	UT
Date Tested	06/04/2023		



Initial Sample Conditions		Pressure Range			Mv m2/MN	Cv m2/yr	Pressure Range			Mv m2/MN	Cv m2/yr
Moisture Content (%)	21	0	-	30	1.6	0.78		-			
Bulk Density (Mg/m3)	2.24	30	-	60	0.47	1.1		-			
Dry Density (Mg/m3)	1.85	60	-	120	0.27	1.5		-			
Voids Ratio	0.4302	120	-	240	0.15	1.7		-			
Degree of saturation	128.2	240	-	120	0.0073	140		-			
Height (mm)	20.07	120	-	240	0.013	74		-			
Diameter (mm)	74.98	240	-	480	0.079	2.7		-			
Particle Density (Mg/m3)	2.65		-					-			

Operator
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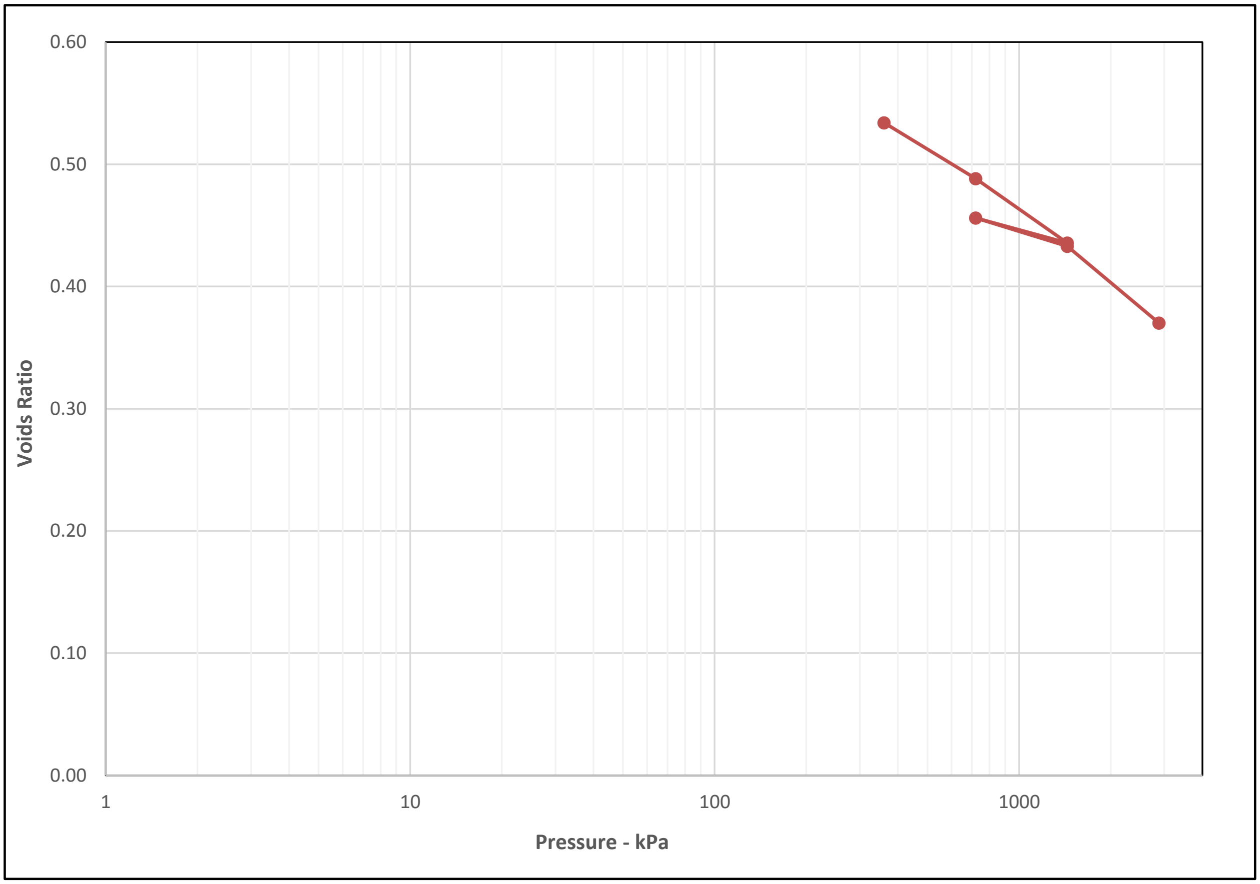
GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**ONE DIMENSIONAL CONSOLIDATION TEST** **BS1377:Part 5:1990, clause 3**	Contract Number Borehole/Trialpit No.	65392 BH103
Project Name	Burnt Mill Academy	Sample No.	
Soil Description	*See Sample Description Sheet	Depth Top (m) Depth Base (m)	19.50 19.95
Lab Temperature	20°c	Sample Location	Top
Remarks	Cv Calculated Using T90 Particle Density Assumed Unless Stated Otherwise	Sample Type	UT
Date Tested	06/04/2023		



Initial Sample Conditions		Pressure Range			Mv m2/MN	Cv m2/yr	Pressure Range			Mv m2/MN	Cv m2/yr
Moisture Content (%)	27	0	-	360	0.20	4.4		-			
Bulk Density (Mg/m3)	2.03	360	-	720	0.083	1.1		-			
Dry Density (Mg/m3)	1.60	720	-	1440	0.049	0.48		-			
Voids Ratio	0.6561	1440	-	720	0.020	1.2		-			
Degree of saturation	109.6	720	-	1440	0.022	0.96		-			
Height (mm)	20.15	1440	-	2880	0.030	0.32		-			
Diameter (mm)	75.01		-					-			
Particle Density (Mg/m3)	2.65		-					-			

Operator
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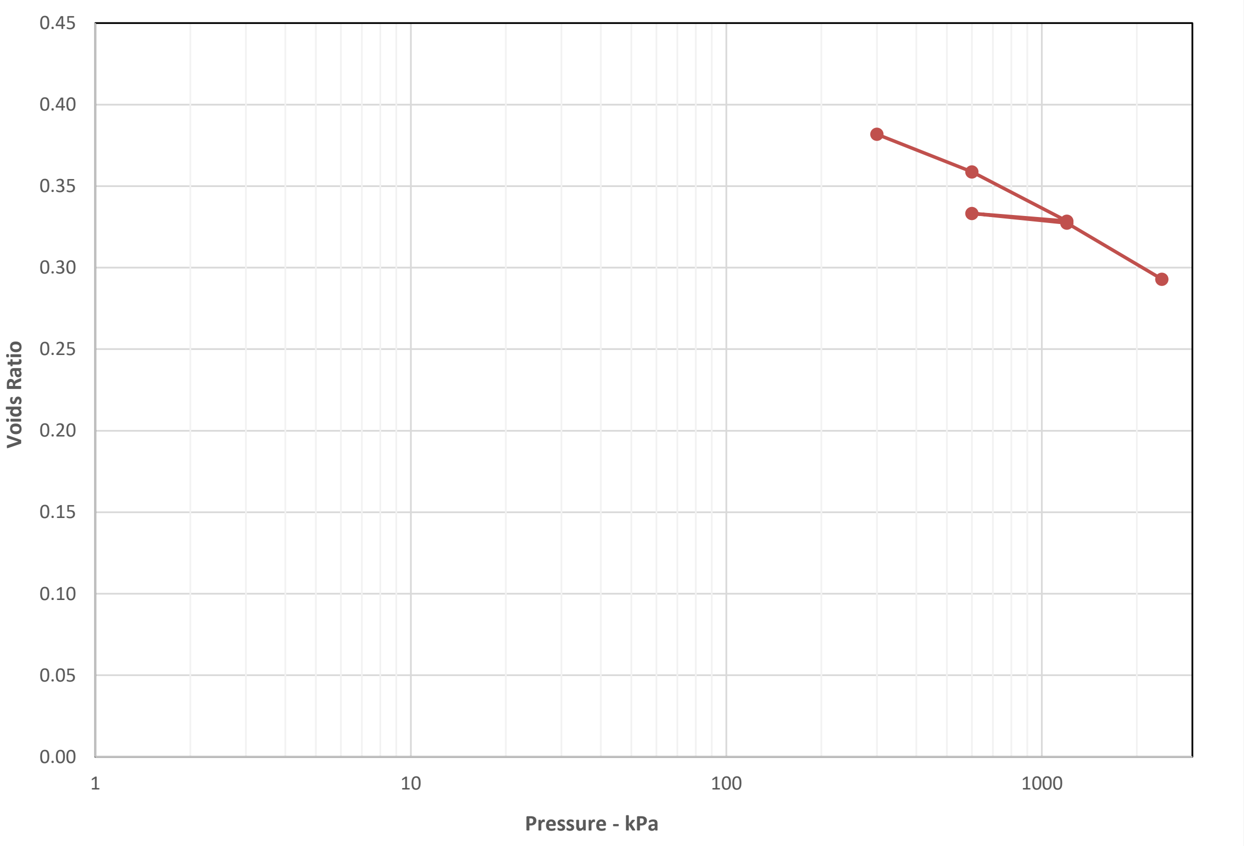
GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**ONE DIMENSIONAL CONSOLIDATION TEST** **BS1377:Part 5:1990, clause 3**	Contract Number	65392
		Borehole/Trialpit No.	BH104
Project Name	Burnt Mill Academy	Sample No.	
Soil Description	*See Sample Description Sheet	Depth Top (m)	15.00
		Depth Base (m)	15.45
Lab Temperature	20°c	Sample Location	Top
Remarks	Cv Calculated Using T90 Particle Density Assumed Unless Stated Otherwise	Sample Type	UT
Date Tested	06/04/2023		



Initial Sample Conditions		Pressure Range			Mv m2/MN	Cv m2/yr	Pressure Range			Mv m2/MN	Cv m2/yr
Moisture Content (%)	17	0	-	300	0.062	0.46		-			
Bulk Density (Mg/m3)	2.20	300	-	600	0.056	0.66		-			
Dry Density (Mg/m3)	1.88	600	-	1200	0.037	0.93		-			
Voids Ratio	0.4082	1200	-	600	0.0059	6.7		-			
Degree of saturation	110.8	600	-	1200	0.0073	5.3		-			
Height (mm)	20.1	1200	-	2400	0.022	0.95		-			
Diameter (mm)	75		-					-			
Particle Density (Mg/m3)	2.65		-					-			

Operator
Wayne W

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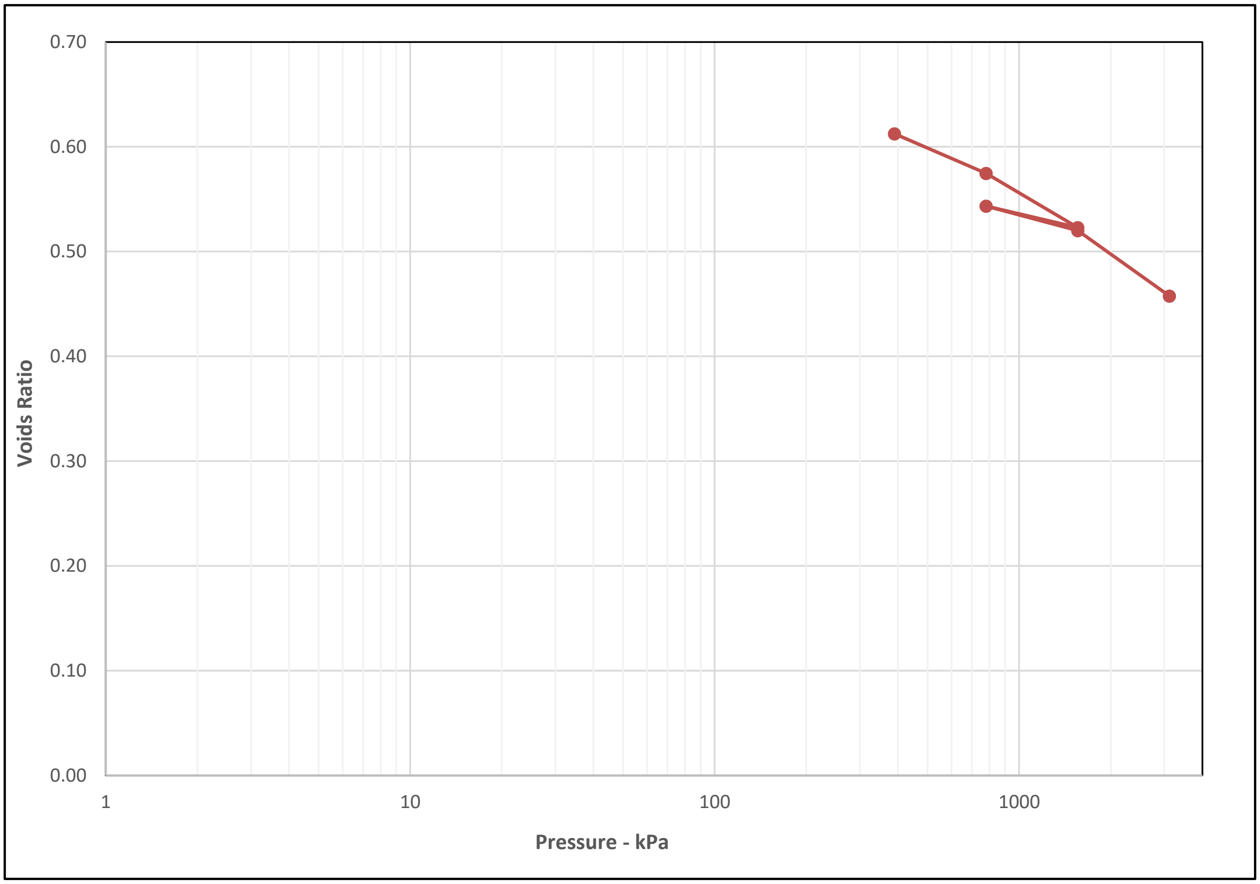
GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**ONE DIMENSIONAL CONSOLIDATION TEST BS1377:Part 5:1990, clause 3**	Contract Number	65392
		Borehole/Trialpit No.	BH104
Project Name	Burnt Mill Academy	Sample No.	
Soil Description	*See Sample Description Sheet	Depth Top (m)	24.00
		Depth Base (m)	24.45
Lab Temperature	20°c	Sample Location	Top
Remarks	Cv Calculated Using T90 Particle Density Assumed Unless Stated Otherwise	Sample Type	UT
Date Tested	06/04/2023		



Initial Sample Conditions		Pressure Range			Mv m2/MN	Cv m2/yr	Pressure Range			Mv m2/MN	Cv m2/yr
Moisture Content (%)	27	0	-	390	0.071	6.0		-			
Bulk Density (Mg/m3)	2.02	390	-	780	0.060	1.8		-			
Dry Density (Mg/m3)	1.60	780	-	1560	0.042	0.52		-			
Voids Ratio	0.6585	1560	-	780	0.017	1.5		-			
Degree of saturation	107.5	780	-	1560	0.019	1.6		-			
Height (mm)	19.81	1560	-	3120	0.026	0.35		-			
Diameter (mm)	74.95		-					-			
Particle Density (Mg/m3)	2.65		-					-			

Operator
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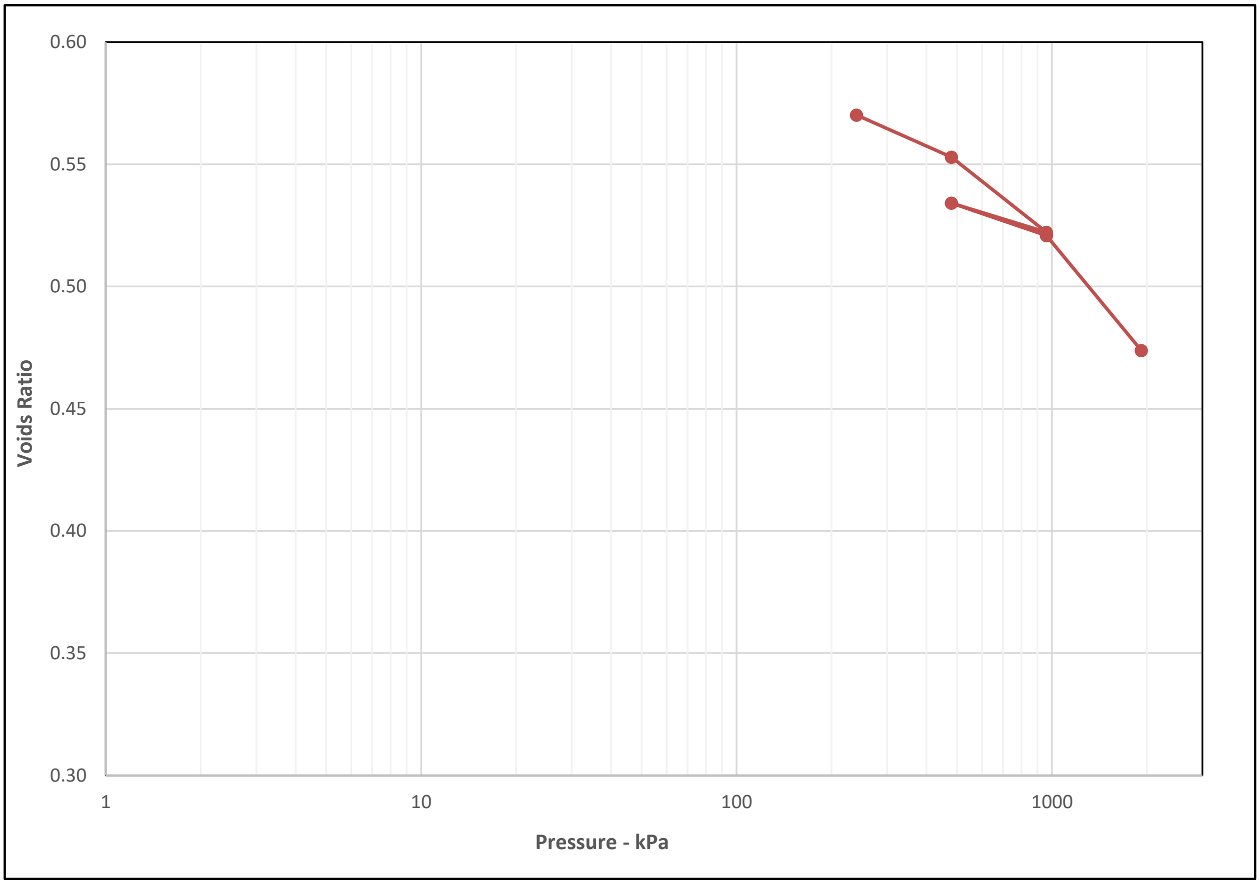
ONE DIMENSIONAL CONSOLIDATION TEST
BS1377:Part 5:1990, clause 3

		Contract Number	65392
		Borehole/Trialpit No.	BH105
Project Name	Burnt Mill Academy	Sample No.	
Soil Description	*See Sample Description Sheet	Depth Top (m)	12.00
		Depth Base (m)	12.45
Lab Temperature	20°c	Sample Location	Top
Remarks	Cv Calculated Using T90 Particle Density Assumed Unless Stated Otherwise	Sample Type	UT
Date Tested	06/04/2023		



Initial Sample Conditions		Pressure Range			Mv m2/MN	Cv m2/yr	Pressure Range			Mv m2/MN	Cv m2/yr
Moisture Content (%)	25	0	-	240	0.19	24		-			
Bulk Density (Mg/m3)	2.02	240	-	480	0.046	3.9		-			
Dry Density (Mg/m3)	1.61	480	-	960	0.041	2.1		-			
Voids Ratio	0.6470	960	-	480	0.016	17		-			
Degree of saturation	103.7	480	-	960	0.018	9.6		-			
Height (mm)	19.99	960	-	1920	0.032	0.59		-			
Diameter (mm)	74.96		-					-			
Particle Density (Mg/m3)	2.65		-					-			

Operator
Wayne W

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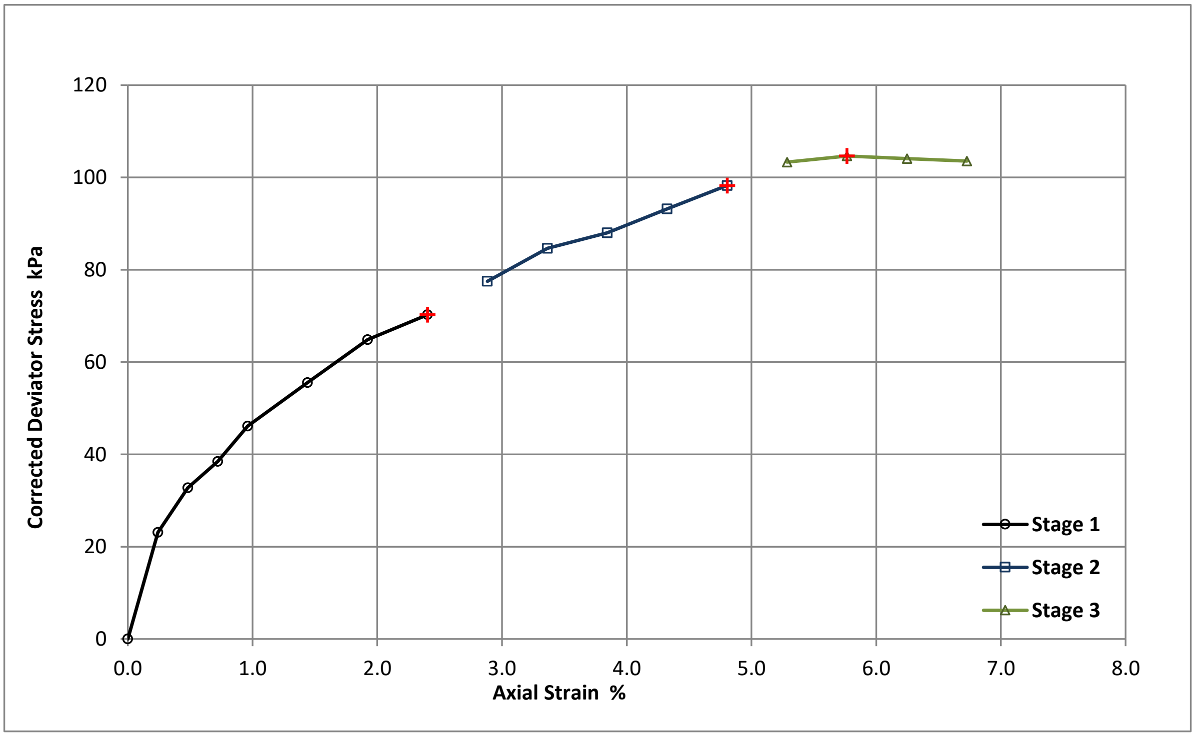
	Multi Stage Unconsolidated-Undrained Triaxial Test **BS 1377 : 1990 Part 7 : 9**	Contract Number	65392
		Borehole/Pit No.	BH103
Project Name	Burnt Mill Academy	Sample No.	
Soil Description	*See Sample Description Sheet	Depth Top	1.20
		Depth Base	1.65
Date Tested	04/03/2023	Sample Type	UT
		Operator	Jordan



Moisture Content (%)	8.9		
Bulk Density (Mg/m^3)	2.05		
Dry Density (Mg/m^3)	1.88		
Specimen Length (mm)	208.1		
Specimen Diamteter (mm)	103.1		
Cell Pressures (kPa)	12	24	48
Deviator Stress (kPa)	70	98	105
Undrained Shear Strength (kPa)	35	49	52
Failure Strain (%)	2.4	4.8	5.8
Mode Of Failure	Compound		
Membrane Used/Thickness	Rubber/0.3mm		
Rate of Strain (%/min)	3.00		

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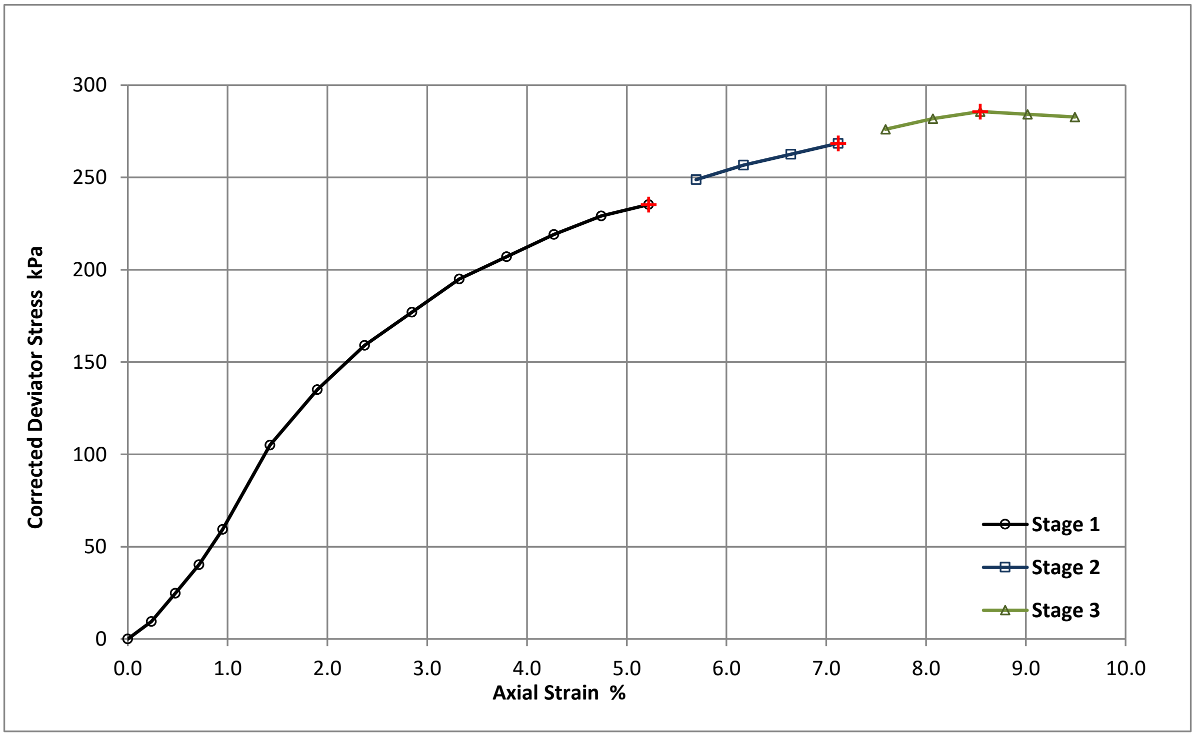
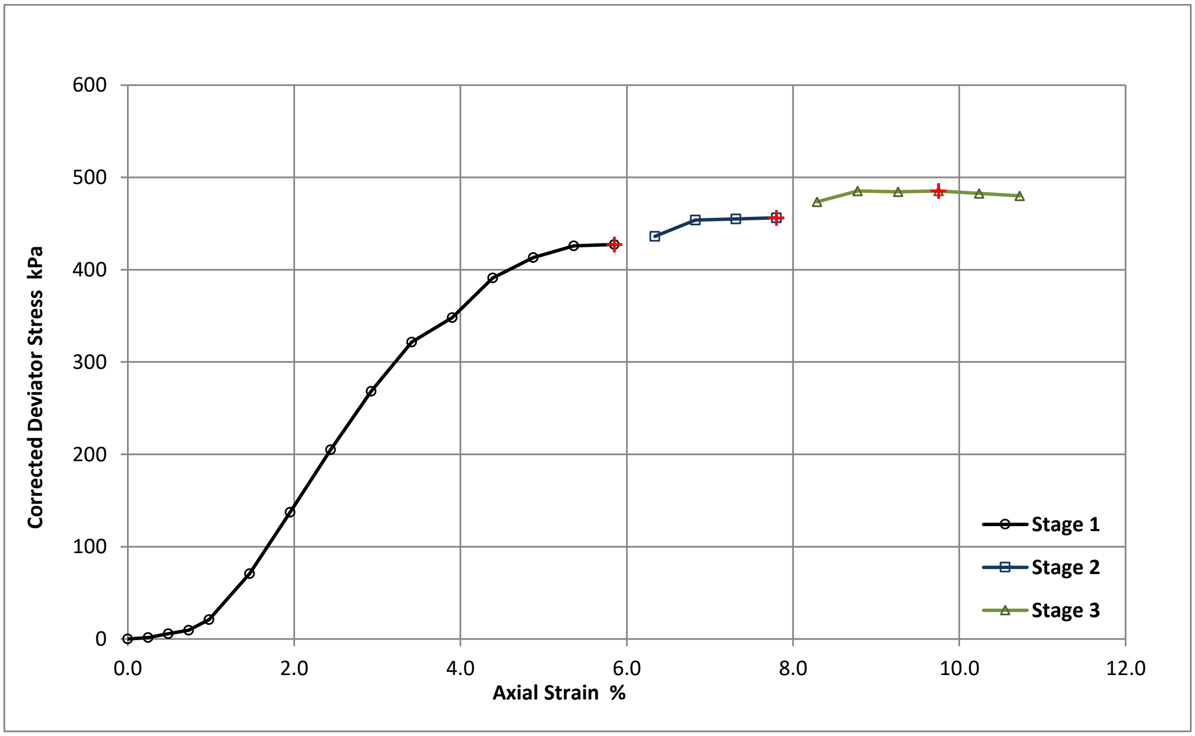
Multi Stage Unconsolidated-Undrained Triaxial Test
BS 1377 : 1990 Part 7 : 9

		Contract Number	65392
		Borehole/Pit No.	BH103
Project Name	Burnt Mill Academy	Sample No.	
Soil Description	*See Sample Description Sheet	Depth Top	19.50
		Depth Base	19.95
Date Tested	04/03/2023	Sample Type	UT
		Operator	Jordan



Moisture Content (%)	26		
Bulk Density (Mg/m^3)	1.99		
Dry Density (Mg/m^3)	1.58		
Specimen Length (mm)	210.7		
Specimen Diamteter (mm)	103.4		
Cell Pressures (kPa)	180	360	720
Deviator Stress (kPa)	235	268	286
Undrained Shear Strength (kPa)	120	130	140
Failure Strain (%)	5.2	7.1	8.5
Mode Of Failure	Compound		
Membrane Used/Thickness	Rubber/0.3mm		
Rate of Strain (%/min)	3.00		

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**Multi Stage Unconsolidated-Undrained Triaxial Test** **BS 1377 : 1990 Part 7 : 9**	Contract Number	65392
		Borehole/Pit No.	BH103
Project Name	Burnt Mill Academy	Sample No.	
Soil Description	*See Sample Description Sheet	Depth Top	24.00
		Depth Base	24.45
Date Tested	04/03/2023	Sample Type	UT
		Operator	Jordan



Moisture Content (%)	25		
Bulk Density (Mg/m^3)	1.97		
Dry Density (Mg/m^3)	1.57		
Specimen Length (mm)	205.1		
Specimen Diamteter (mm)	103.2		
Cell Pressures (kPa)	195	390	780
Deviator Stress (kPa)	427	456	485
Undrained Shear Strength (kPa)	210	230	240
Failure Strain (%)	5.9	7.8	9.8
Mode Of Failure	Brittle		
Membrane Used/Thickness	Rubber/0.3mm		
Rate of Strain (%/min)	3.00		

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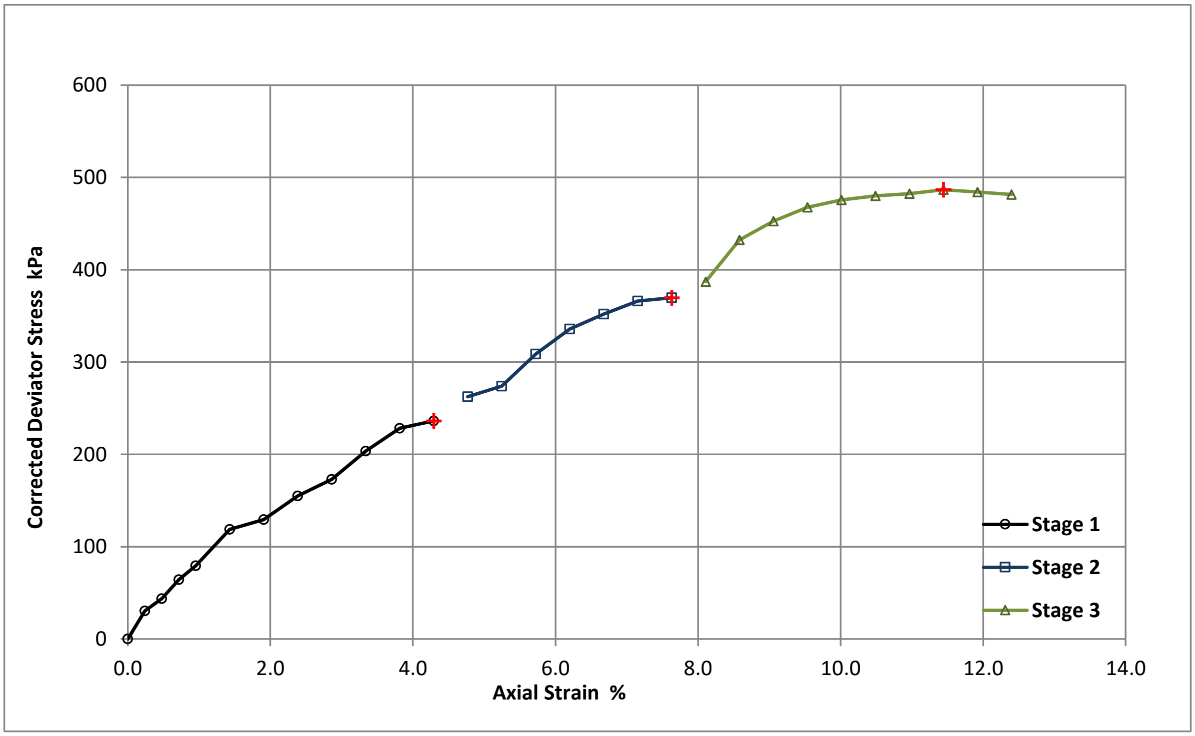
GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**Multi Stage Unconsolidated-Undrained Triaxial Test BS 1377 : 1990 Part 7 : 9**	Contract Number	65392
		Borehole/Pit No.	BH104
Project Name	Burnt Mill Academy	Sample No.	
Soil Description	*See Sample Description Sheet	Depth Top	12.00
		Depth Base	12.45
Date Tested	04/03/2023	Sample Type	UT
		Operator	Jordan



Moisture Content (%)	16		
Bulk Density (Mg/m^3)	2.09		
Dry Density (Mg/m^3)	1.80		
Specimen Length (mm)	209.7		
Specimen Diamteter (mm)	104.1		
Cell Pressures (kPa)	120	240	480
Deviator Stress (kPa)	236	370	487
Undrained Shear Strength (kPa)	120	180	240
Failure Strain (%)	4.3	7.6	11
Mode Of Failure	Compound		
Membrane Used/Thickness	Rubber/0.3mm		
Rate of Strain (%/min)	3.00		

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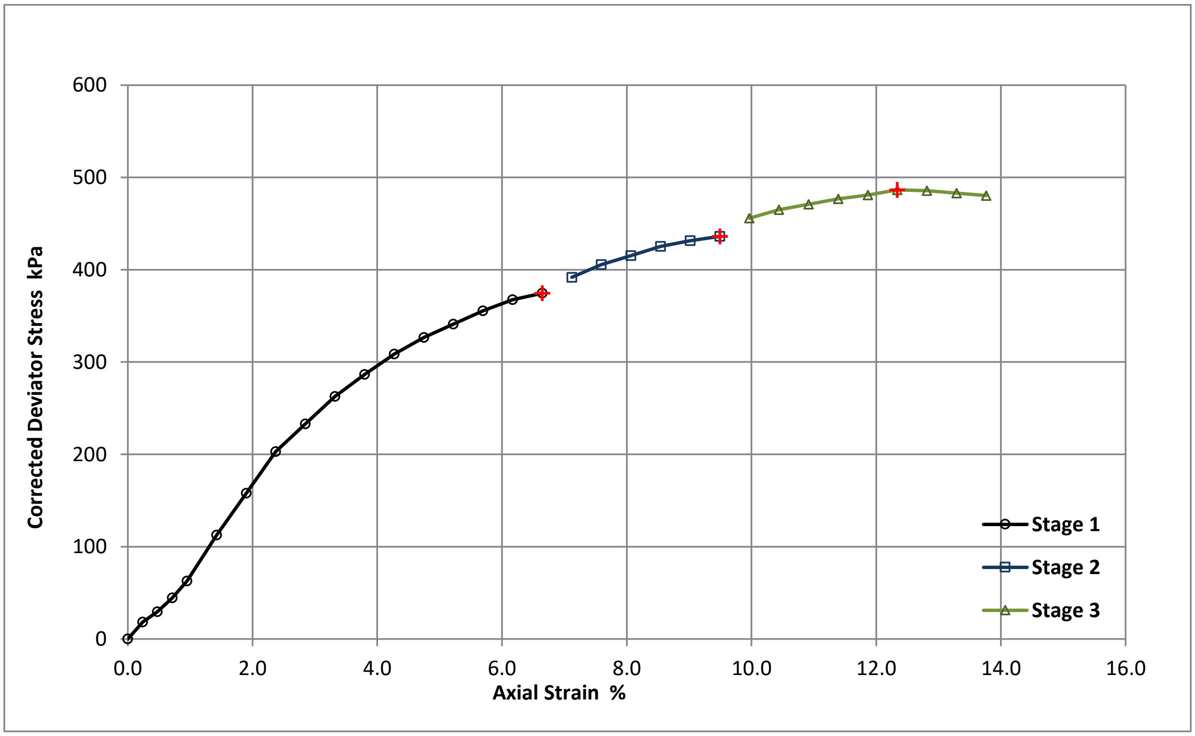
GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**Multi Stage Unconsolidated-Undrained Triaxial Test** **BS 1377 : 1990 Part 7 : 9**	Contract Number	65392
		Borehole/Pit No.	BH104
Project Name	Burnt Mill Academy	Sample No.	
Soil Description	*See Sample Description Sheet	Depth Top	15.00
		Depth Base	15.45
Date Tested	04/03/2023	Sample Type	UT
		Operator	Jordan



Moisture Content (%)	13		
Bulk Density (Mg/m^3)	2.00		
Dry Density (Mg/m^3)	1.77		
Specimen Length (mm)	210.7		
Specimen Diamteter (mm)	105.2		
Cell Pressures (kPa)	150	300	600
Deviator Stress (kPa)	375	436	487
Undrained Shear Strength (kPa)	190	220	240
Failure Strain (%)	6.6	9.5	12
Mode Of Failure	Plastic		
Membrane Used/Thickness	Rubber/0.3mm		
Rate of Strain (%/min)	3.00		

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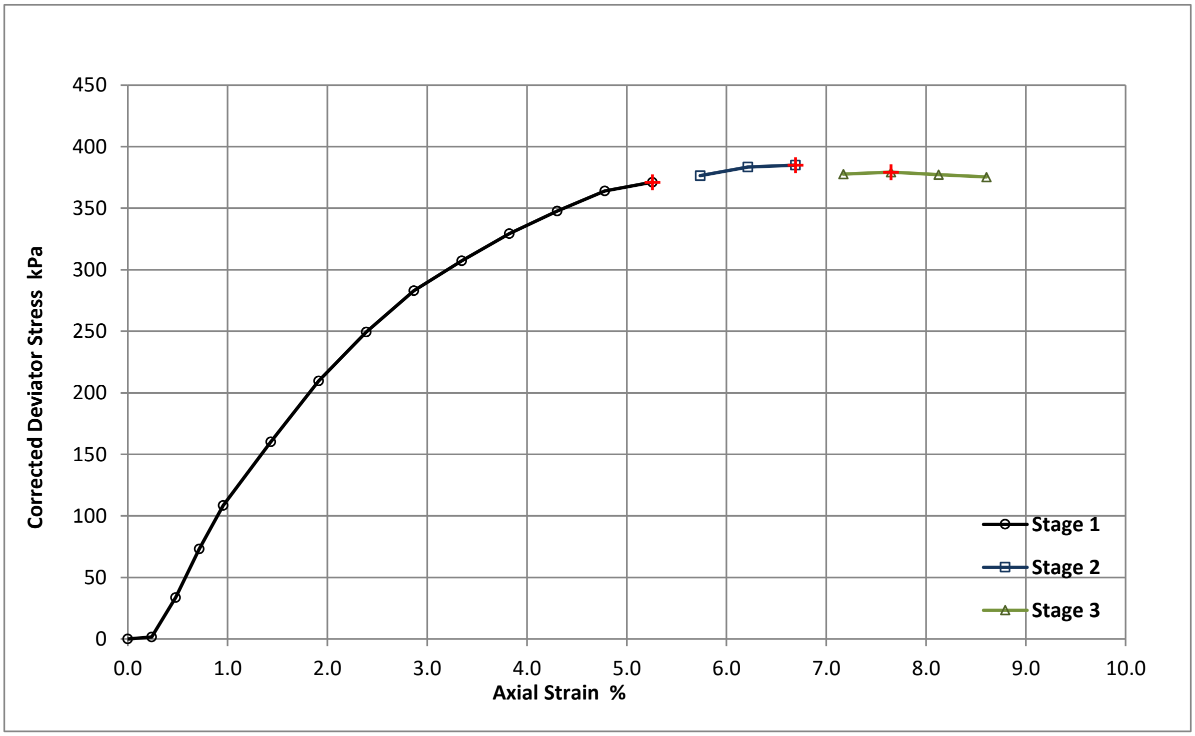
GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**Multi Stage Unconsolidated-Undrained Triaxial Test BS 1377 : 1990 Part 7 : 9**	Contract Number	65392
		Borehole/Pit No.	BH104
Project Name	Burnt Mill Academy	Sample No.	
Soil Description	*See Sample Description Sheet	Depth Top	21.00
		Depth Base	21.45
Date Tested	04/03/2023	Sample Type	UT
		Operator	Jordan



Moisture Content (%)	28		
Bulk Density (Mg/m^3)	1.93		
Dry Density (Mg/m^3)	1.51		
Specimen Length (mm)	209.2		
Specimen Diamteter (mm)	104.7		
Cell Pressures (kPa)	180	360	720
Deviator Stress (kPa)	371	385	379
Undrained Shear Strength (kPa)	190	190	190
Failure Strain (%)	5.3	6.7	7.6
Mode Of Failure	Compound		
Membrane Used/Thickness	Rubber/0.3mm		
Rate of Strain (%/min)	3.00		

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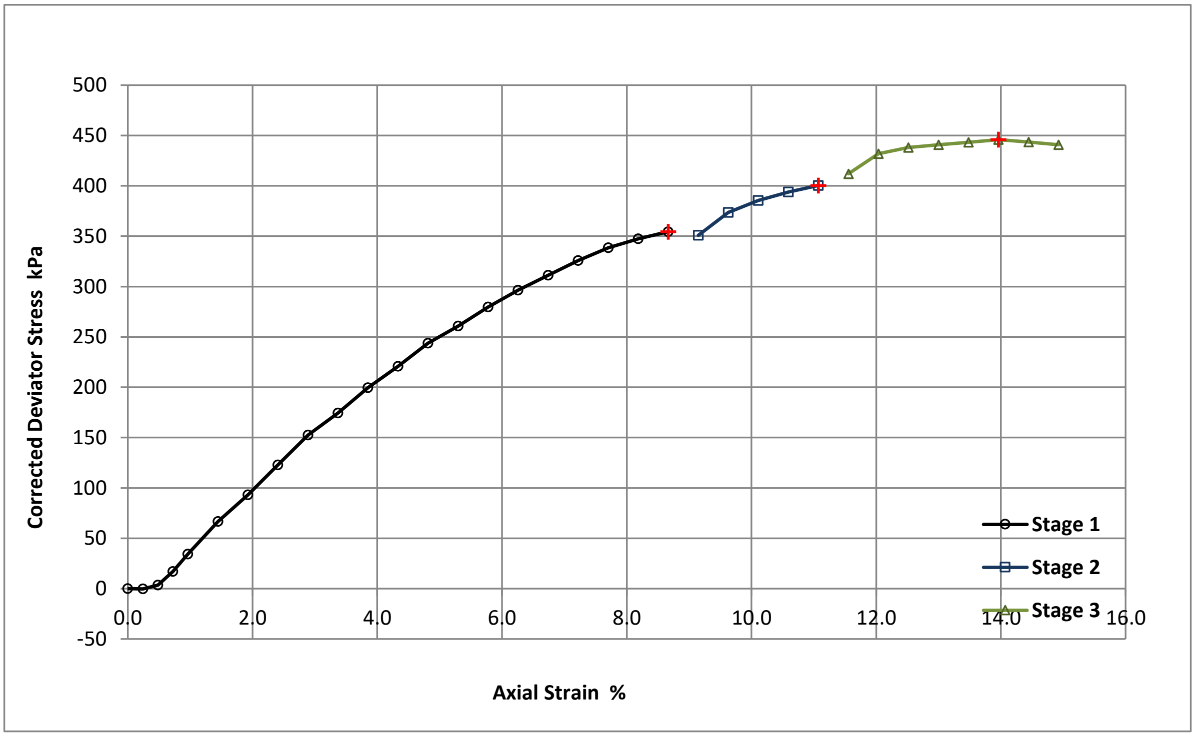
GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**Multi Stage Unconsolidated-Undrained Triaxial Test** **BS 1377 : 1990 Part 7 : 9**	Contract Number	65392
		Borehole/Pit No.	BH104
Project Name	Burnt Mill Academy	Sample No.	
Soil Description	*See Sample Description Sheet	Depth Top	24.00
		Depth Base	24.45
Date Tested	04/03/2023	Sample Type	UT
		Operator	Jordan



Moisture Content (%)	24		
Bulk Density (Mg/m^3)	1.97		
Dry Density (Mg/m^3)	1.59		
Specimen Length (mm)	207.7		
Specimen Diamteter (mm)	103.4		
Cell Pressures (kPa)	195	390	780
Deviator Stress (kPa)	354	400	446
Undrained Shear Strength (kPa)	180	200	220
Failure Strain (%)	8.7	11	14
Mode Of Failure	Compound		
Membrane Used/Thickness	Rubber/0.3mm		
Rate of Strain (%/min)	3.00		

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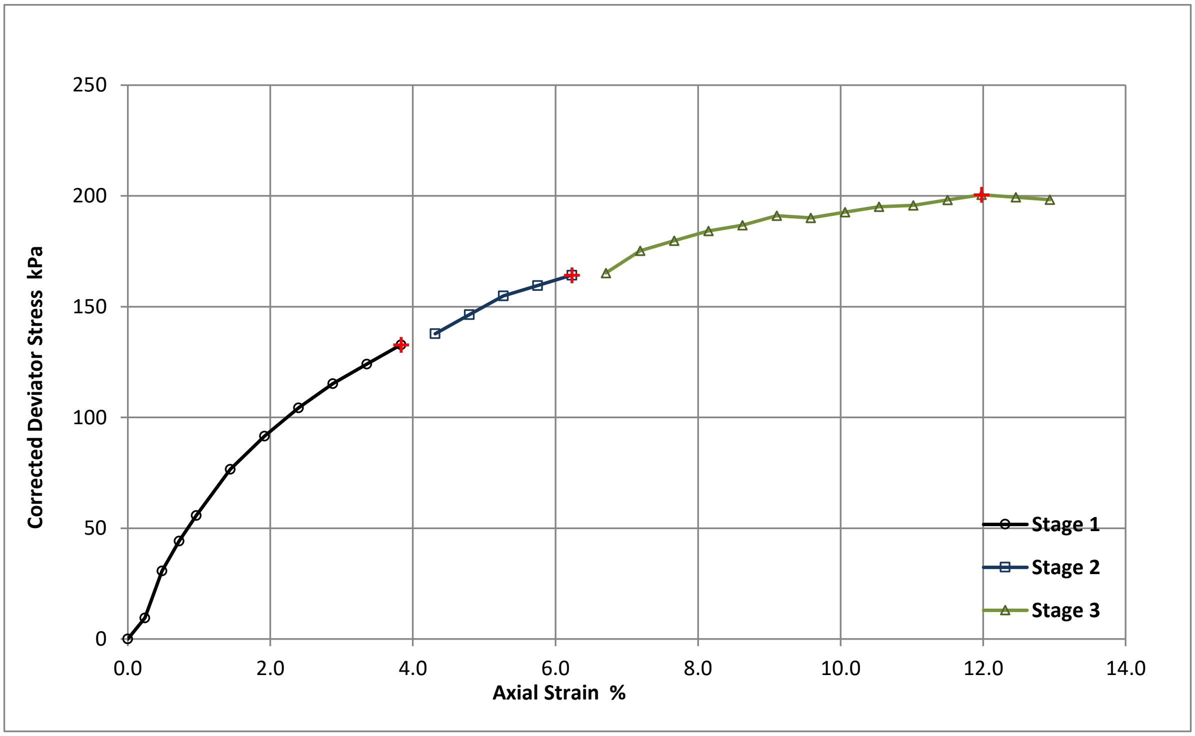
Multi Stage Unconsolidated-Undrained Triaxial Test
BS 1377 : 1990 Part 7 : 9

		Contract Number	65392
		Borehole/Pit No.	BH105
Project Name	Burnt Mill Academy	Sample No.	
Soil Description	*See Sample Description Sheet	Depth Top	12.00
		Depth Base	12.45
Date Tested	04/03/2023	Sample Type	UT
		Operator	Jordan



Moisture Content (%)	16		
Bulk Density (Mg/m^3)	2.14		
Dry Density (Mg/m^3)	1.85		
Specimen Length (mm)	208.7		
Specimen Diamteter (mm)	103.2		
Cell Pressures (kPa)	120	240	480
Deviator Stress (kPa)	133	164	201
Undrained Shear Strength (kPa)	66	82	100
Failure Strain (%)	3.8	6.2	12
Mode Of Failure	Plastic		
Membrane Used/Thickness	Rubber/0.3mm		
Rate of Strain (%/min)	3.00		

UKAS TESTING
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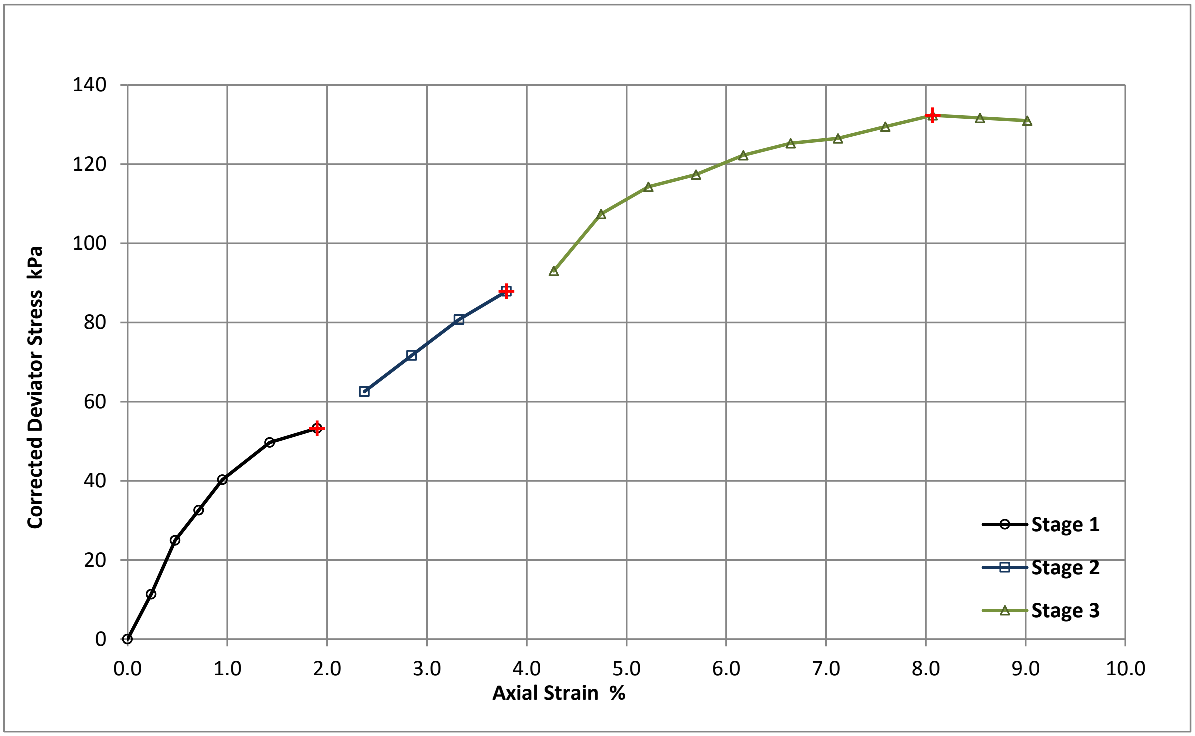
GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**Multi Stage Unconsolidated-Undrained Triaxial Test BS 1377 : 1990 Part 7 : 9**	Contract Number	65392
		Borehole/Pit No.	BH105
Project Name	Burnt Mill Academy	Sample No.	
Soil Description	*See Sample Description Sheet	Depth Top	15.00
		Depth Base	15.45
Date Tested	04/03/2023	Sample Type	UT
		Operator	Jordan



Moisture Content (%)	17		
Bulk Density (Mg/m^3)	2.03		
Dry Density (Mg/m^3)	1.74		
Specimen Length (mm)	210.7		
Specimen Diamteter (mm)	103.2		
Cell Pressures (kPa)	150	300	600
Deviator Stress (kPa)	53	88	132
Undrained Shear Strength (kPa)	27	44	66
Failure Strain (%)	1.9	3.8	8.1
Mode Of Failure	Compound		
Membrane Used/Thickness	Rubber/0.3mm		
Rate of Strain (%/min)	3.00		

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Appendix M ESP Geo-environmental Laboratory Test Results (February and March 2023)

DETS

Certificate of Analysis

Certificate Number	23-05780	*Issued:*	21-Mar-23
Client	Earth Science Partnership 33 Cardiff Road Taffs Well Cardiff CF15 7RB		
Our Reference	23-05780		
Client Reference	8511		
Order No	11373		
Contract Title	Burnt Mill Academy		
Description	31 Soil samples.		
Date Received	09-Mar-23		
Date Started	09-Mar-23		
Date Completed	21-Mar-23		
Test Procedures	Identified by prefix DETSn (details on request).		
Notes	Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.		

Approved By

Kirk Bridgewood
General Manager

ilac-MRA

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Summary of Chemical Analysis
Soil Samples

Our Ref 23-05780
Client Ref 8511
Contract Title Burnt Mill Academy

			Lab No	2137902	2137905	2137906	2137907	2137908	2137910
			.Sample ID	HP06	HP07	HP08	HP09	HP10	HP11
			Depth	0.45	0.50	0.10	0.30	0.10	0.40
			Other ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	28/02/2023	28/02/2023	28/02/2023	28/02/2023	01/03/2023	01/03/2023
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
Metals									
Arsenic	DETSC 2301#	0.2	mg/kg	10	12	19	17	15	13
Barium	DETSC 2301#	1.5	mg/kg	91	58	110	99	96	65
Beryllium	DETSC 2301#	0.2	mg/kg	0.5	0.5	0.8	0.7	0.6	0.8
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	0.9	0.7	0.5	1.2	0.7	0.3
Cadmium	DETSC 2301#	0.1	mg/kg	0.4	0.3	0.4	0.3	0.3	0.4
Chromium	DETSC 2301#	0.15	mg/kg	16	18	25	24	20	25
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	54	24	97	77	88	32
Lead	DETSC 2301#	0.3	mg/kg	49	24	110	70	65	41
Mercury	DETSC 2325#	0.05	mg/kg	0.08	0.12	0.13	0.10	0.11	0.05
Nickel	DETSC 2301#	1	mg/kg	15	16	22	18	15	23
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Vanadium	DETSC 2301#	0.8	mg/kg	50	33	48	48	37	48
Zinc	DETSC 2301#	1	mg/kg	100	58	120	99	85	70
Inorganics									
pH	DETSC 2008#		pH	8.2	8.3	8.6	9.1	9.0	8.2
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.1	< 0.1	0.1	0.1	< 0.1	< 0.1
Organic matter	DETSC 2002#	0.1	%	3.2	1.2	2.1	2.0	3.2	0.7
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l						
Sulphur as S, Total	DETSC 2320	0.01	%						
Sulphate as SO4, Total	DETSC 2321#	0.01	%						
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	6.7	< 3.4	< 3.4	< 3.4	14	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	14	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	1.2	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	23	< 1.4	< 1.4	< 1.4	57	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	24	< 10	< 10	< 10	57	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	24	< 10	< 10	< 10	72	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 23-05780
Client Ref 8511
Contract Title Burnt Mill Academy

			Lab No	2137902	2137905	2137906	2137907	2137908	2137910
			.Sample ID	HP06	HP07	HP08	HP09	HP10	HP11
			Depth	0.45	0.50	0.10	0.30	0.10	0.40
			Other ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	28/02/2023	28/02/2023	28/02/2023	28/02/2023	01/03/2023	01/03/2023
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PAHs									
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	0.12
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Anthracene	DETSC 3303	0.03	mg/kg	0.05	0.05	0.06	0.08	0.06	0.28
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	0.18	0.15	0.35	0.33	0.35	1.2
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	0.21	0.13	0.37	0.38	0.34	0.85
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	0.32	0.21	0.55	0.58	0.57	1.1
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	0.15	0.10	0.29	0.27	0.25	0.38
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	0.14	0.10	0.24	0.21	0.20	0.54
Chrysene	DETSC 3303	0.03	mg/kg	0.24	0.17	0.39	0.33	0.45	1.2
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	0.06	0.05	0.06	0.07
Fluoranthene	DETSC 3303#	0.03	mg/kg	0.42	0.34	0.77	0.73	0.75	3.8
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	0.10
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	0.12	0.09	0.22	0.21	0.21	0.27
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	0.15	0.17	0.23	0.24	0.25	1.7
Pyrene	DETSC 3303#	0.03	mg/kg	0.40	0.32	0.75	0.71	0.72	3.5
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	2.4	1.8	4.3	4.1	4.2	15
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3

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Summary of Chemical Analysis
Soil Samples

Our Ref 23-05780
Client Ref 8511
Contract Title Burnt Mill Academy

			Lab No	2137911	2137912	2137913	2137914	2137915	2137916
			.Sample ID	BH01	BH01	BH101	BH101	BH102	BH102
			Depth	0.30-0.60	3.00	15.00	20.00	1.00	9.00
			Other ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	20/02/2023	20/02/2023	21/02/2023	21/02/2023	15/02/2023	15/02/2023
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
Metals									
Arsenic	DETSC 2301#	0.2	mg/kg						
Barium	DETSC 2301#	1.5	mg/kg						
Beryllium	DETSC 2301#	0.2	mg/kg						
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg						
Cadmium	DETSC 2301#	0.1	mg/kg						
Chromium	DETSC 2301#	0.15	mg/kg						
Chromium, Hexavalent	DETSC 2204*	1	mg/kg						
Copper	DETSC 2301#	0.2	mg/kg						
Lead	DETSC 2301#	0.3	mg/kg						
Mercury	DETSC 2325#	0.05	mg/kg						
Nickel	DETSC 2301#	1	mg/kg						
Selenium	DETSC 2301#	0.5	mg/kg						
Vanadium	DETSC 2301#	0.8	mg/kg						
Zinc	DETSC 2301#	1	mg/kg						
Inorganics									
pH	DETSC 2008#		pH	8.4	8.5	8.7	8.4	8.4	8.5
Cyanide, Total	DETSC 2130#	0.1	mg/kg						
Organic matter	DETSC 2002#	0.1	%						
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	27	120	22	31	< 10	17
Sulphur as S, Total	DETSC 2320	0.01	%	< 0.01	0.03	0.02	0.02	< 0.01	0.02
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.02	0.08	0.05	0.04	0.01	0.03
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg						
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg						
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg						
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg						
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg						
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg						
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg						
Aliphatic C5-C35	DETSC 3072*	10	mg/kg						
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg						
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg						
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg						
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg						
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg						
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg						
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg						
Aromatic C5-C35	DETSC 3072*	10	mg/kg						
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg						
Benzene	DETSC 3321#	0.01	mg/kg						
Ethylbenzene	DETSC 3321#	0.01	mg/kg						
Toluene	DETSC 3321#	0.01	mg/kg						

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 23-05780
Client Ref 8511
Contract Title Burnt Mill Academy

			Lab No	2137911	2137912	2137913	2137914	2137915	2137916
			.Sample ID	BH01	BH01	BH101	BH101	BH102	BH102
			Depth	0.30-0.60	3.00	15.00	20.00	1.00	9.00
			Other ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	20/02/2023	20/02/2023	21/02/2023	21/02/2023	15/02/2023	15/02/2023
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
Xylene	DETSC 3321#	0.01	mg/kg						
PAHs									
Acenaphthene	DETSC 3303#	0.03	mg/kg						
Acenaphthylene	DETSC 3303#	0.03	mg/kg						
Anthracene	DETSC 3303	0.03	mg/kg						
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg						
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg						
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg						
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg						
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg						
Chrysene	DETSC 3303	0.03	mg/kg						
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg						
Fluoranthene	DETSC 3303#	0.03	mg/kg						
Fluorene	DETSC 3303	0.03	mg/kg						
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg						
Naphthalene	DETSC 3303#	0.03	mg/kg						
Phenanthrene	DETSC 3303#	0.03	mg/kg						
Pyrene	DETSC 3303#	0.03	mg/kg						
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg						
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg						

Summary of Chemical Analysis
Soil Samples

Our Ref 23-05780
Client Ref 8511
Contract Title Burnt Mill Academy

			Lab No	2137917	2137918	2137919	2137920	2137921	2137922
			.Sample ID	BH102	BH103	BH103	BH103	BH104	BH104
			Depth	15.00	2.00	16.50-17.00	22.00	0.30	2.00
			Other ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	16/02/2023	14/02/2023	15/02/2023	15/02/2023	27/02/2023	27/02/2023
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
Metals									
Arsenic	DETSC 2301#	0.2	mg/kg					7.3	
Barium	DETSC 2301#	1.5	mg/kg					36	
Beryllium	DETSC 2301#	0.2	mg/kg					0.3	
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg					1.2	
Cadmium	DETSC 2301#	0.1	mg/kg					< 0.1	
Chromium	DETSC 2301#	0.15	mg/kg					11	
Chromium, Hexavalent	DETSC 2204*	1	mg/kg					< 1.0	
Copper	DETSC 2301#	0.2	mg/kg					10	
Lead	DETSC 2301#	0.3	mg/kg					13	
Mercury	DETSC 2325#	0.05	mg/kg					< 0.05	
Nickel	DETSC 2301#	1	mg/kg					11	
Selenium	DETSC 2301#	0.5	mg/kg					< 0.5	
Vanadium	DETSC 2301#	0.8	mg/kg					19	
Zinc	DETSC 2301#	1	mg/kg					30	
Inorganics									
pH	DETSC 2008#		pH	8.3	7.7	8.5	8.4	8.8	8.5
Cyanide, Total	DETSC 2130#	0.1	mg/kg					0.6	
Organic matter	DETSC 2002#	0.1	%					7.5	
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	21	29	13	150	54	11
Sulphur as S, Total	DETSC 2320	0.01	%	0.03	0.01	0.01	0.29	0.02	< 0.01
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.08	0.02	0.02	0.18	0.05	0.01
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg					< 0.01	
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg					< 0.01	
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg					< 0.01	
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg					< 1.5	
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg					< 1.2	
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg					< 1.5	
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg					< 3.4	
Aliphatic C5-C35	DETSC 3072*	10	mg/kg					< 10	
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg					< 0.01	
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg					< 0.01	
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg					< 0.01	
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg					< 0.9	
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg					< 0.5	
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg					< 0.6	
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg					< 1.4	
Aromatic C5-C35	DETSC 3072*	10	mg/kg					< 10	
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg					< 10	
Benzene	DETSC 3321#	0.01	mg/kg					< 0.01	
Ethylbenzene	DETSC 3321#	0.01	mg/kg					< 0.01	
Toluene	DETSC 3321#	0.01	mg/kg					< 0.01	

Summary of Chemical Analysis
Soil Samples

Our Ref 23-05780
Client Ref 8511
Contract Title Burnt Mill Academy

			Lab No	2137917	2137918	2137919	2137920	2137921	2137922
			.Sample ID	BH102	BH103	BH103	BH103	BH104	BH104
			Depth	15.00	2.00	16.50-17.00	22.00	0.30	2.00
			Other ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	16/02/2023	14/02/2023	15/02/2023	15/02/2023	27/02/2023	27/02/2023
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
Xylene	DETSC 3321#	0.01	mg/kg					< 0.01	
PAHs									
Acenaphthene	DETSC 3303#	0.03	mg/kg					< 0.03	
Acenaphthylene	DETSC 3303#	0.03	mg/kg					< 0.03	
Anthracene	DETSC 3303	0.03	mg/kg					< 0.03	
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg					< 0.03	
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg					< 0.03	
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg					< 0.03	
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg					< 0.03	
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg					< 0.03	
Chrysene	DETSC 3303	0.03	mg/kg					< 0.03	
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg					< 0.03	
Fluoranthene	DETSC 3303#	0.03	mg/kg					< 0.03	
Fluorene	DETSC 3303	0.03	mg/kg					< 0.03	
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg					< 0.03	
Naphthalene	DETSC 3303#	0.03	mg/kg					< 0.03	
Phenanthrene	DETSC 3303#	0.03	mg/kg					< 0.03	
Pyrene	DETSC 3303#	0.03	mg/kg					< 0.03	
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg					< 0.10	
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg					< 0.3	

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 23-05780
Client Ref 8511
Contract Title Burnt Mill Academy

			Lab No	2137923	2137924	2137925	2137926	2137927	2137928
			.Sample ID	BH104	BH104	BH104	BH105	BH105	BH105
			Depth	7.00	14.00	22.00	0.30	4.00	8.00
			Other ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	27/02/2023	28/02/2023	28/02/2023	01/03/2023	01/03/2023	01/03/2023
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
Metals									
Arsenic	DETSC 2301#	0.2	mg/kg				10		
Barium	DETSC 2301#	1.5	mg/kg				57		
Beryllium	DETSC 2301#	0.2	mg/kg				0.5		
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg				< 0.2		
Cadmium	DETSC 2301#	0.1	mg/kg				0.3		
Chromium	DETSC 2301#	0.15	mg/kg				17		
Chromium, Hexavalent	DETSC 2204*	1	mg/kg				< 1.0		
Copper	DETSC 2301#	0.2	mg/kg				16		
Lead	DETSC 2301#	0.3	mg/kg				20		
Mercury	DETSC 2325#	0.05	mg/kg				< 0.05		
Nickel	DETSC 2301#	1	mg/kg				17		
Selenium	DETSC 2301#	0.5	mg/kg				< 0.5		
Vanadium	DETSC 2301#	0.8	mg/kg				34		
Zinc	DETSC 2301#	1	mg/kg				50		
Inorganics									
pH	DETSC 2008#		pH	8.3	8.0	8.2	7.4	8.5	8.4
Cyanide, Total	DETSC 2130#	0.1	mg/kg				0.2		
Organic matter	DETSC 2002#	0.1	%				1.2		
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	16	67	92	10	14	14
Sulphur as S, Total	DETSC 2320	0.01	%	0.01	0.61	0.40	0.03	0.02	< 0.01
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.04	0.17	0.16	0.04	0.02	0.02
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg						
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg						
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg						
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg						
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg						
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg						
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg						
Aliphatic C5-C35	DETSC 3072*	10	mg/kg						
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg						
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg						
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg						
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg						
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg						
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg						
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg						
Aromatic C5-C35	DETSC 3072*	10	mg/kg						
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg						
Benzene	DETSC 3321#	0.01	mg/kg						
Ethylbenzene	DETSC 3321#	0.01	mg/kg						
Toluene	DETSC 3321#	0.01	mg/kg						

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 23-05780
Client Ref 8511
Contract Title Burnt Mill Academy

			Lab No	2137923	2137924	2137925	2137926	2137927	2137928
			.Sample ID	BH104	BH104	BH104	BH105	BH105	BH105
			Depth	7.00	14.00	22.00	0.30	4.00	8.00
			Other ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	27/02/2023	28/02/2023	28/02/2023	01/03/2023	01/03/2023	01/03/2023
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
Xylene	DETSC 3321#	0.01	mg/kg						
PAHs									
Acenaphthene	DETSC 3303#	0.03	mg/kg				< 0.03		
Acenaphthylene	DETSC 3303#	0.03	mg/kg				< 0.03		
Anthracene	DETSC 3303	0.03	mg/kg				< 0.03		
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg				< 0.03		
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg				< 0.03		
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg				< 0.03		
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg				< 0.03		
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg				< 0.03		
Chrysene	DETSC 3303	0.03	mg/kg				< 0.03		
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg				< 0.03		
Fluoranthene	DETSC 3303#	0.03	mg/kg				0.07		
Fluorene	DETSC 3303	0.03	mg/kg				< 0.03		
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg				< 0.03		
Naphthalene	DETSC 3303#	0.03	mg/kg				< 0.03		
Phenanthrene	DETSC 3303#	0.03	mg/kg				0.04		
Pyrene	DETSC 3303#	0.03	mg/kg				0.06		
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg				0.18		
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg				< 0.3		

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 23-05780
Client Ref 8511
Contract Title Burnt Mill Academy

			Lab No	2137929	2137930	2137931
			.Sample ID	BH105	BH105	BH105
			Depth	13.00	17.00	19.70
			Other ID			
			Sample Type	SOIL	SOIL	SOIL
			Sampling Date	02/03/2023	02/03/2023	02/03/2023
			Sampling Time	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**			
Metals						
Arsenic	DETSC 2301#	0.2	mg/kg			
Barium	DETSC 2301#	1.5	mg/kg			
Beryllium	DETSC 2301#	0.2	mg/kg			
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg			
Cadmium	DETSC 2301#	0.1	mg/kg			
Chromium	DETSC 2301#	0.15	mg/kg			
Chromium, Hexavalent	DETSC 2204*	1	mg/kg			
Copper	DETSC 2301#	0.2	mg/kg			
Lead	DETSC 2301#	0.3	mg/kg			
Mercury	DETSC 2325#	0.05	mg/kg			
Nickel	DETSC 2301#	1	mg/kg			
Selenium	DETSC 2301#	0.5	mg/kg			
Vanadium	DETSC 2301#	0.8	mg/kg			
Zinc	DETSC 2301#	1	mg/kg			
Inorganics						
pH	DETSC 2008#		pH	8.1	8.6	8.6
Cyanide, Total	DETSC 2130#	0.1	mg/kg			
Organic matter	DETSC 2002#	0.1	%			
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	96	15	120
Sulphur as S, Total	DETSC 2320	0.01	%	0.62	0.01	0.34
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.21	0.02	0.13
Petroleum Hydrocarbons						
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg			
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg			
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg			
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg			
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg			
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg			
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg			
Aliphatic C5-C35	DETSC 3072*	10	mg/kg			
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg			
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg			
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg			
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg			
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg			
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg			
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg			
Aromatic C5-C35	DETSC 3072*	10	mg/kg			
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg			
Benzene	DETSC 3321#	0.01	mg/kg			
Ethylbenzene	DETSC 3321#	0.01	mg/kg			
Toluene	DETSC 3321#	0.01	mg/kg			

Summary of Chemical Analysis
Soil Samples

Our Ref 23-05780
Client Ref 8511
Contract Title Burnt Mill Academy

			Lab No	2137929	2137930	2137931
			.Sample ID	BH105	BH105	BH105
			Depth	13.00	17.00	19.70
			Other ID			
			Sample Type	SOIL	SOIL	SOIL
			Sampling Date	02/03/2023	02/03/2023	02/03/2023
			Sampling Time	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**			
Xylene	DETSC 3321#	0.01	mg/kg			
PAHs						
Acenaphthene	DETSC 3303#	0.03	mg/kg			
Acenaphthylene	DETSC 3303#	0.03	mg/kg			
Anthracene	DETSC 3303	0.03	mg/kg			
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg			
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg			
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg			
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg			
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg			
Chrysene	DETSC 3303	0.03	mg/kg			
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg			
Fluoranthene	DETSC 3303#	0.03	mg/kg			
Fluorene	DETSC 3303	0.03	mg/kg			
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg			
Naphthalene	DETSC 3303#	0.03	mg/kg			
Phenanthrene	DETSC 3303#	0.03	mg/kg			
Pyrene	DETSC 3303#	0.03	mg/kg			
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg			
Phenols						
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg			

Summary of Asbestos Analysis
Soil Samples

Our Ref 23-05780
Client Ref 8511
Contract Title Burnt Mill Academy

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2137901	HP06 0.10	SOIL	NAD	none	Josh Best
2137902	HP06 0.45	SOIL	NAD	none	Josh Best
2137903	HP06 0.65	SOIL	NAD	none	Josh Best
2137904	HP07 0.10	SOIL	Amosite	Amosite present in microscopic board debris	Josh Best
2137905	HP07 0.50	SOIL	NAD	none	Josh Best
2137906	HP08 0.10	SOIL	Amosite	Amosite present as fibre bundles	Josh Best
2137907	HP09 0.30	SOIL	NAD	none	Josh Best
2137908	HP10 0.10	SOIL	NAD	none	Josh Best
2137909	HP11 0.10	SOIL	NAD	none	Josh Best
2137910	HP11 0.40	SOIL	NAD	none	Josh Best
2137911	BH01 0.30-0.60	SOIL	NAD	none	Josh Best
2137921	BH104 0.30	SOIL	NAD	none	Josh Best
2137926	BH105 0.30	SOIL	NAD	none	Josh Best

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * -not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 23-05780
Client Ref 8511
Contract Burnt Mill Academy

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2137901	HP06 0.10 SOIL	28/02/23	GJ 250ml, PT 1L		
2137902	HP06 0.45 SOIL	28/02/23	PT 1L	pH + Conductivity (7 days)	Aliphatics/Aromatics, BTEX, Naphthalene, PAH MS
2137903	HP06 0.65 SOIL	28/02/23	GJ 250ml, PT 1L		
2137904	HP07 0.10 SOIL	28/02/23	GJ 250ml, PT 1L		
2137905	HP07 0.50 SOIL	28/02/23	GJ 250ml, PT 1L	pH + Conductivity (7 days)	
2137906	HP08 0.10 SOIL	28/02/23	GJ 250ml, PT 1L	pH + Conductivity (7 days)	
2137907	HP09 0.30 SOIL	28/02/23	GJ 250ml, PT 1L	pH + Conductivity (7 days)	
2137908	HP10 0.10 SOIL	01/03/23	GJ 250ml, PT 1L	pH + Conductivity (7 days)	
2137909	HP11 0.10 SOIL	01/03/23	GJ 250ml, PT 1L		
2137910	HP11 0.40 SOIL	01/03/23	GJ 250ml, PT 1L	pH + Conductivity (7 days)	
2137911	BH01 0.30-0.60 SOIL	20/02/23	PT 1L	Total Sulphur ICP (7 days), pH + Conductivity (7 days)	
2137912	BH01 3.00 SOIL	20/02/23	PT 1L	Total Sulphur ICP (7 days), pH + Conductivity (7 days)	
2137913	BH101 15.00 SOIL	21/02/23	PT 1L	Total Sulphur ICP (7 days), pH + Conductivity (7 days)	
2137914	BH101 20.00 SOIL	21/02/23	PT 1L	Total Sulphur ICP (7 days), pH + Conductivity (7 days)	
2137915	BH102 1.00 SOIL	15/02/23	PT 1L	Total Sulphur ICP (7 days), pH + Conductivity (7 days)	
2137916	BH102 9.00 SOIL	15/02/23	PT 1L	Total Sulphur ICP (7 days), pH + Conductivity (7 days)	
2137917	BH102 15.00 SOIL	16/02/23	PT 1L	Total Sulphur ICP (7 days), pH + Conductivity (7 days)	
2137918	BH103 2.00 SOIL	14/02/23	PT 1L	Total Sulphur ICP (7 days), pH + Conductivity (7 days)	
2137919	BH103 16.50-17.00 SOIL	15/02/23	PT 1L	Total Sulphur ICP (7 days), pH + Conductivity (7 days)	
2137920	BH103 22.00 SOIL	15/02/23	PT 1L	Total Sulphur ICP (7 days), pH + Conductivity (7 days)	
2137921	BH104 0.30 SOIL	27/02/23	GJ 250ml, PT 1L	Total Sulphur ICP (7 days), pH + Conductivity (7 days)	
2137922	BH104 2.00 SOIL	27/02/23	PT 1L	Total Sulphur ICP (7 days), pH + Conductivity (7 days)	
2137923	BH104 7.00 SOIL	27/02/23	PT 1L	Total Sulphur ICP (7 days), pH + Conductivity (7 days)	
2137924	BH104 14.00 SOIL	28/02/23	PT 1L	Total Sulphur ICP (7 days), pH + Conductivity (7 days)	
2137925	BH104 22.00 SOIL	28/02/23	PT 1L	Total Sulphur ICP (7 days), pH + Conductivity (7 days)	
2137926	BH105 0.30 SOIL	01/03/23	GJ 250ml, PT 1L	Total Sulphur ICP (7 days), pH + Conductivity (7 days)	
2137927	BH105 4.00 SOIL	01/03/23	PT 1L	Total Sulphur ICP (7 days), pH + Conductivity (7 days)	
2137928	BH105 8.00 SOIL	01/03/23	PT 1L	Total Sulphur ICP (7 days), pH + Conductivity (7 days)	
2137929	BH105 13.00 SOIL	02/03/23	PT 1L		
2137930	BH105 17.00 SOIL	02/03/23	PT 1L		
2137931	BH105 19.70 SOIL	02/03/23	PT 1L		

Information in Support of the Analytical Results

Our Ref 23-05780
Client Ref 8511
Contract Burnt Mill Academy

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report

Certificate of Analysis

Certificate Number	23-04865	*Issued:*	07-Mar-23

Client

Earth Science Partnership
33 Cardiff Road
Taffs Well
Cardiff
CF15 7RB

Our Reference	23-04865
Client Reference	8511
Order No	11354
Contract Title	BURNT MILL ACADAMY
Description	17 Soil samples.
Date Received	28-Feb-23
Date Started	28-Feb-23
Date Completed	07-Mar-23
Test Procedures	Identified by prefix DETSn (details on request).
Notes	Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Kirk Bridgewood
General Manager

UKAS TESTING 2139

Summary of Chemical Analysis
Matrix Descriptions

Our Ref 23-04865
Client Ref 8511
Contract Title BURNT MILL ACADAMY

Sample ID	Depth	Lab No	Completed	Matrix Description
HP01	0.1	2132094	07/03/2023	Brown gravelly, sandy CLAY including some rootlets
HP01	0.2	2132095	07/03/2023	Brown gravelly, sandy CLAY including some rootlets
HP02	0.5	2132096	07/03/2023	Brown gravelly, sandy CLAY including some rootlets
HP02	0.7	2132097	07/03/2023	Brown gravelly, sandy CLAY including some rootlets
HP03	0.35	2132098	07/03/2023	Brown gravelly, sandy CLAY including some rootlets
HP03	0.45	2132099	07/03/2023	Brown gravelly, sandy CLAY including some rootlets
HP03	0.7	2132100	07/03/2023	Brown gravelly, sandy CLAY including some rootlets
HP04	0.1	2132101	07/03/2023	Brown gravelly, sandy CLAY including some rootlets
HP04	0.3	2132102	07/03/2023	Brown gravelly, sandy CLAY including some rootlets
HP04	0.35	2132103	07/03/2023	Brown gravelly, sandy CLAY including some rootlets
HP04	0.6	2132104	07/03/2023	Brown gravelly, sandy CLAY including some rootlets
HP05	0.05	2132105	07/03/2023	Brown gravelly, sandy CLAY including some rootlets
HP05	0.3	2132106	07/03/2023	Brown gravelly, sandy CLAY including some rootlets
WS107	0.6	2132107	07/03/2023	Brown gravelly, sandy CLAY including some rootlets
WS104	0.3	2132108	07/03/2023	Brown gravelly, sandy CLAY including some rootlets
TP101	0.35	2132109	07/03/2023	Brown gravelly, sandy CLAY including some rootlets
WS108	0.2	2132110	07/03/2023	Brown gravelly, sandy CLAY including some rootlets

Summary of Chemical Analysis
Soil Samples

Our Ref 23-04865
Client Ref 8511
Contract Title BURNT MILL ACADAMY

			Lab No	2132096	2132098	2132107	2132108	2132109	2132110
			.Sample ID	HP02	HP03	WS107	WS104	TP101	WS108
			Depth	0.50	0.35	0.60	0.30	0.35	0.20
			Other ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	15/02/2023	15/02/2023	16/02/2023	17/02/2023	14/02/2023	16/02/2023
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
Metals									
Arsenic	DETSC 2301#	0.2	mg/kg	17	17	9.9	4.9	11	15
Barium	DETSC 2301#	1.5	mg/kg	130	100	40	140	51	440
Beryllium	DETSC 2301#	0.2	mg/kg	0.8	0.7	0.5	0.3	0.6	0.6
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	1.1	1.2	0.4	0.2	0.7	0.7
Cadmium	DETSC 2301#	0.1	mg/kg	0.4	0.4	0.1	0.1	0.3	0.3
Chromium	DETSC 2301#	0.15	mg/kg	24	24	17	7.3	20	17
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	65	83	17	19	20	35
Lead	DETSC 2301#	0.3	mg/kg	130	100	15	25	38	340
Mercury	DETSC 2325#	0.05	mg/kg	0.18	0.15	< 0.05	0.18	< 0.05	3.3
Nickel	DETSC 2301#	1	mg/kg	19	20	17	8.1	25	16
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Vanadium	DETSC 2301#	0.8	mg/kg	43	41	34	18	37	39
Zinc	DETSC 2301#	1	mg/kg	120	110	41	61	58	350
Inorganics									
pH	DETSC 2008#		pH	8.1	8.2	8.0	11.1	8.0	8.4
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.1	0.1	< 0.1	< 0.1	< 0.1	0.7
Organic matter	DETSC 2002#	0.1	%	2.5	3.0	2.3	1.5	2.2	2.3
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01		< 0.01	
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01		< 0.01	
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01		< 0.01	
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5		< 1.5	
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2		< 1.2	
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5		< 1.5	
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4		< 3.4	
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10		< 10	
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01		< 0.01	
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01		< 0.01	
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01		< 0.01	
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9		< 0.9	
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5		< 0.5	
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6		< 0.6	
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4		< 1.4	
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10		< 10	
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10		< 10	
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01		< 0.01	
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01		< 0.01	
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01		< 0.01	
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01		< 0.01	

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 23-04865
Client Ref 8511
Contract Title BURNT MILL ACADAMY

			Lab No	2132096	2132098	2132107	2132108	2132109	2132110
			.Sample ID	HP02	HP03	WS107	WS104	TP101	WS108
			Depth	0.50	0.35	0.60	0.30	0.35	0.20
			Other ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	15/02/2023	15/02/2023	16/02/2023	17/02/2023	14/02/2023	16/02/2023
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
PAHs									
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Anthracene	DETSC 3303	0.03	mg/kg	0.11	< 0.03	< 0.03	< 0.03	< 0.03	0.03
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	0.53	0.04	< 0.03	< 0.03	< 0.03	0.09
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	0.64	0.03	< 0.03	< 0.03	< 0.03	0.08
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	0.81	0.05	0.03	< 0.03	< 0.03	0.12
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	0.36	< 0.03	< 0.03	< 0.03	< 0.03	0.06
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	0.31	< 0.03	< 0.03	< 0.03	< 0.03	0.05
Chrysene	DETSC 3303	0.03	mg/kg	0.52	0.04	< 0.03	< 0.03	< 0.03	0.12
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	0.09	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	1.0	0.10	0.07	< 0.03	0.04	0.25
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	0.31	< 0.03	< 0.03	< 0.03	< 0.03	0.05
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	0.30	0.05	0.04	< 0.03	< 0.03	0.16
Pyrene	DETSC 3303#	0.03	mg/kg	0.99	0.09	0.05	< 0.03	0.04	0.25
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	6.0	0.41	0.16	< 0.10	< 0.10	1.2
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Asbestos Analysis
Soil Samples

Our Ref 23-04865
Client Ref 8511
Contract Title BURNT MILL ACADAMY

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2132094	HP01 0.10	SOIL	NAD	none	Darryl Fletcher
2132095	HP01 0.20	SOIL	Chrysotile	Bundle of Chrysotile fibres	Darryl Fletcher
2132096	HP02 0.50	SOIL	NAD	none	Darryl Fletcher
2132097	HP02 0.70	SOIL	Chrysotile	Chrysotile fibres present in visible insulation debris & bundles of Chrysotile fibres	Darryl Fletcher
2132098	HP03 0.35	SOIL	Chrysotile	Bundles of Chrysotile fibres	Darryl Fletcher
2132099	HP03 0.45	SOIL	NAD	none	Darryl Fletcher
2132100	HP03 0.70	SOIL	Chrysotile	Bundles of Chrysotile fibres	Darryl Fletcher
2132101	HP04 0.10	SOIL	NAD	none	Darryl Fletcher
2132102	HP04 0.30	SOIL	Amosite	Bundles of Amosite fibres	Darryl Fletcher
2132103	HP04 0.35	SOIL	NAD	none	Darryl Fletcher
2132104	HP04 0.60	SOIL	NAD	none	Darryl Fletcher
2132105	HP05 0.05	SOIL	NAD	none	Darryl Fletcher
2132106	HP05 0.30	SOIL	NAD	none	Darryl Fletcher
2132107	WS107 0.60	SOIL	NAD	none	Darryl Fletcher
2132108	WS104 0.30	SOIL	Chrysotile	Chrysotile fibres present in visible & microscopic cement debris & bundles of Chrysotile fibres	Darryl Fletcher
2132109	TP101 0.35	SOIL	NAD	none	Darryl Fletcher
2132110	WS108 0.20	SOIL	NAD	none	Darryl Fletcher

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * -not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 23-04865
Client Ref 8511
Contract BURNT MILL ACADAMY

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2132094	HP01 0.10 SOIL	15/02/23	GJ 250ml, PT 1L		
2132095	HP01 0.20 SOIL	15/02/23	GJ 250ml, PT 1L		
2132096	HP02 0.50 SOIL	15/02/23	GJ 250ml, PT 1L	pH + Conductivity (7 days)	
2132097	HP02 0.70 SOIL	15/02/23	GJ 250ml, PT 1L		
2132098	HP03 0.35 SOIL	15/02/23	GJ 250ml, PT 1L	pH + Conductivity (7 days)	
2132099	HP03 0.45 SOIL	15/02/23	GJ 250ml, PT 1L		
2132100	HP03 0.70 SOIL	15/02/23	GJ 250ml, PT 1L		
2132101	HP04 0.10 SOIL	15/02/23	GJ 250ml, PT 1L		
2132102	HP04 0.30 SOIL	15/02/23	GJ 250ml, PT 1L		
2132103	HP04 0.35 SOIL	15/02/23	GJ 250ml, PT 1L		
2132104	HP04 0.60 SOIL	15/02/23	GJ 250ml, PT 1L		
2132105	HP05 0.05 SOIL	06/02/23	GJ 250ml, PT 1L		
2132106	HP05 0.30 SOIL	16/02/23	GJ 250ml, PT 1L		
2132107	WS107 0.60 SOIL	16/02/23	GJ 250ml, PT 1L	pH + Conductivity (7 days)	
2132108	WS104 0.30 SOIL	17/02/23	GJ 250ml, PT 1L	pH + Conductivity (7 days)	
2132109	TP101 0.35 SOIL	14/02/23	GJ 250ml, PT 1L	pH + Conductivity (7 days)	
2132110	WS108 0.20 SOIL	16/02/23	GJ 250ml, PT 1L	pH + Conductivity (7 days)	
2132111	WS103 0.30 SOIL	17/02/23	PT 1L		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 2002	Organic matter	%	0.1	Air Dried	No	Yes	Yes
DETSC 2003	Loss on ignition	%	0.01	Air Dried	No	Yes	Yes
DETSC 2008	pH	pH Units	1	Air Dried	No	Yes	Yes
DETSC 2024	Sulphide	mg/kg	10	Air Dried	No	Yes	Yes
DETSC 2076	Sulphate Aqueous Extract as SO4	mg/l	10	Air Dried	No	Yes	Yes
DETSC 2084	Total Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2084	Total Organic Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2119	Ammoniacal Nitrogen as N	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide free	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide total	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Phenol - Monohydric	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC 2130	Thiocyanate	mg/kg	0.6	Air Dried	No	Yes	Yes
DETSC 2321	Total Sulphate as SO4	%	0.01	Air Dried	No	Yes	Yes
DETSC 2325	Mercury	mg/kg	0.05	Air Dried	No	Yes	Yes
DETSC 3049	Sulphur (free)	mg/kg	0.75	Air Dried	No	Yes	Yes
DETSC2123	Boron (water soluble)	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Arsenic	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Barium	mg/kg	1.5	Air Dried	No	Yes	Yes
DETSC2301	Beryllium	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Cadmium Available	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cadmium	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cobalt	mg/kg	0.7	Air Dried	No	Yes	Yes
DETSC2301	Chromium	mg/kg	0.15	Air Dried	No	Yes	Yes
DETSC2301	Copper	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Manganese	mg/kg	20	Air Dried	No	Yes	Yes
DETSC2301	Molybdenum	mg/kg	0.4	Air Dried	No	Yes	Yes
DETSC2301	Nickel	mg/kg	1	Air Dried	No	Yes	Yes
DETSC2301	Lead	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC2301	Selenium	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC2301	Zinc	mg/kg	1	Air Dried	No	Yes	Yes
DETSC 3072	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETS 062	Benzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Ethylbenzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Toluene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	m+p Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	o Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3311	C10-C24 Diesel Range Organics (DRO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	C24-C40 Lube Oil Range Organics (LORO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	EPH (C10-C40)	mg/kg	10	As Received	No	Yes	Yes

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 3303	Acenaphthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Acenaphthylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(b)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(k)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(g,h,i)perylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Dibenzo(a,h)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Indeno(1,2,3-c,d)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Naphthalene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Phenanthrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3401	PCB 28 + PCB 31	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 52	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 101	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 118	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 153	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 138	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 180	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB Total	mg/kg	0.01	As Received	No	Yes	Yes

Method details are shown only for those determinands listed in Annex A of the MCERTS standard. Anything not included on this list falls outside the scope of MCERTS. No Recovery Factors are used in the determination of results. Results reported assume 100% recovery. Full method statements are available on request.

End of Report

Certificate of Analysis

Certificate Number	23-05907	*Issued:*	16-Mar-23

Client
Earth Science Partnership
33 Cardiff Road
Taffs Well
Cardiff
CF15 7RB

Our Reference	23-05907
Client Reference	8511
Order No	(not supplied)
Contract Title	BURNT MILL ACADAMY
Description	One Soil sample.
Date Received	10-Mar-23
Date Started	10-Mar-23
Date Completed	16-Mar-23
Test Procedures	Identified by prefix DETSn (details on request).
Notes	Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Kirk Bridgewood
General Manager

UKAS TESTING
2139

Summary of Asbestos Analysis
Soil Samples

Our Ref 23-05907
Client Ref 8511
Contract Title BURNT MILL ACADAMY

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2138799	WS103 0.30	SOIL	NAD	none	Ben Rose

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 23-05907
Client Ref 8511
Contract BURNT MILL ACADAMY

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2138799	WS103 0.30 SOIL	17/02/23	PT 1L		

Key: P-Plastic T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-
Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report

Certificate of Analysis

Certificate Number	23-05607	*Issued:*	16-Mar-23
Client	Earth Science Partnership 33 Cardiff Road Taffs Well Cardiff CF15 7RB		
Our Reference	23-05607		
Client Reference	8511		
Order No	11374		
Contract Title	BURNT MILL ACADAMY		
Description	7 Soil samples.		
Date Received	08-Mar-23		
Date Started	08-Mar-23		
Date Completed	16-Mar-23		
Test Procedures	Identified by prefix DETSn (details on request).		
Notes	Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.		

Approved By

Kirk Bridgewood
General Manager

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Summary of Asbestos Analysis

Soil Samples

Our Ref 23-05607
Client Ref 8511
Contract Title BURNT MILL ACADAMY

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2136805	TP102 0.30	SOIL	NAD	NA	SUB
2136806	TP103 0.30	SOIL	NAD	NA	SUB
2136807	WS106 0.20	SOIL	Amosite	Fibre Bundles	SUB
2136808	WS105 0.30	SOIL	NAD	NA	SUB
2136809	WS107 0.30	SOIL	NAD	NA	SUB
2136810	WS107 1.20	SOIL	NAD	NA	SUB
2136811	BH103 0.20	SOIL	NAD	NA	SUB

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * -not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 23-05607
Client Ref 8511
Contract BURNT MILL ACADAMY

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2136805	TP102 0.30 SOIL	14/02/23	No containers logged		Cannot evaluate
2136806	TP103 0.30 SOIL	14/02/23	No containers logged		Cannot evaluate
2136807	WS106 0.20 SOIL	16/02/23	No containers logged		Cannot evaluate
2136808	WS105 0.30 SOIL	16/02/23	No containers logged		Cannot evaluate
2136809	WS107 0.30 SOIL	16/02/23	No containers logged		Cannot evaluate
2136810	WS107 1.20 SOIL	16/02/23	No containers logged		Cannot evaluate
2136811	BH103 0.20 SOIL	12/02/23	No containers logged		Cannot evaluate

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report

Appendix N ESP Laboratory Asbestos Quantification Test Results

DETS

Certificate of Analysis

Certificate Number 23-05572 *Issued:* 15-Mar-23

Client Earth Science Partnership
33 Cardiff Road
Taffs Well
Cardiff
CF15 7RB

Our Reference 23-05572

Client Reference 8511

Order No 11354

Contract Title BURNT MILL ACADAMY

Description 6 Soil samples.

Date Received 28-Feb-23

Date Started 08-Mar-23

Date Completed 15-Mar-23

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Kirk Bridgewood
General Manager

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Summary of Asbestos Analysis

Samples

Our Ref 23-05572
Client Ref 8511
Contract Title BURNT MILL ACADAMY

Lab No	Sample ID	Sample Location	Material Type	Result	Comment*	Analyst

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * -not included in laboratory scope of accreditation.

Summary of Asbestos Quantification Analysis
Soil Samples

Our Ref 23-05572
Client Ref 8511
Contract Title BURNT MILL ACADAMY

		Lab No	2136566	2136567	2136568	2136569
		.Sample ID	HP01	HP02	HP03	HP03
		Depth	0.20	0.70	0.35	0.70
		Other ID				
		Sample Type				
		Sampling Date	15/02/2023	15/02/2023	15/02/2023	15/02/2023
		Sampling Time				
Test	**Method**	**Units**				
Total Mass% Asbestos (a+b+c)	DETSC 1102	Mass %	**< 0.001**	**0.140**	**0.003**	**0.004**
Gravimetric Quantification (a)	DETSC 1102	Mass %	na	0.139	na	na
Detailed Gravimetric Quantification (b)	DETSC 1102	Mass %	<0.001	0.001	0.003	0.004
Quantification by PCOM (c)	DETSC 1102	Mass %	na	na	na	na
Potentially Respirable Fibres (d)	DETSC 1102	Fibres/g	na	na	na	na
Breakdown of Gravimetric Analysis (a)						
Mass of Sample		g	1382.10	1005.46	860.48	1415.27
ACMs present*		type		Insulation		
Mass of ACM in sample		g		1.64		
% ACM by mass		%		0.16		
% asbestos in ACM		%		85		
% asbestos in sample		%		0.139		
Breakdown of Detailed Gravimetric Analysis (b)						
% Amphibole bundles in sample		Mass %	na	na	na	na
% Chrysotile bundles in sample		Mass %	<0.001	0.001	0.003	0.004
Breakdown of PCOM Analysis (c)						
% Amphibole fibres in sample		Mass %	na	na	na	na
% Chrysotile fibres in sample		Mass %	na	na	na	na
Breakdown of Potentially Respirable Fibre Analysis (d)						
Amphibole fibres		Fibres/g	na	na	na	na
Chrysotile fibres		Fibres/g	na	na	na	na

* Denotes test or material description outside of UKAS accreditation.
% asbestos in Asbestos Containing Materials (ACMs) is determined by
by reference to HSG 264.
Recommended sample size for quantification is approximately 1kg
# denotes deviating sample

Summary of Asbestos Quantification Analysi
Soil Samples

Our Ref 23-05572
Client Ref 8511
Contract Title BURNT MILL ACADAMY

		Lab No	2136570	2136571
		.Sample ID	HP04	WS104
		Depth	0.30	0.30
		Other ID		
		Sample Type		
		Sampling Date	15/02/2023	17/02/2023
		Sampling Time		
Test	**Method**	**Units**		
Total Mass% Asbestos (a+b+c)	DETSC 1102	Mass %	**0.003**	**0.756**
Gravimetric Quantification (a)	DETSC 1102	Mass %	na	0.753
Detailed Gravimetric Quantification (b)	DETSC 1102	Mass %	0.003	0.003
Quantification by PCOM (c)	DETSC 1102	Mass %	na	na
Potentially Respirable Fibres (d)	DETSC 1102	Fibres/g	na	na
Breakdown of Gravimetric Analysis (a)				
Mass of Sample		g	1267.78	856.44
ACMs present*		type		Cement
Mass of ACM in sample		g		42.97
% ACM by mass		%		5.02
% asbestos in ACM		%		15
% asbestos in sample		%		0.753
Breakdown of Detailed Gravimetric Analysis (b)				
% Amphibole bundles in sample		Mass %	0.003	na
% Chrysotile bundles in sample		Mass %	na	0.003
Breakdown of PCOM Analysis (c)				
% Amphibole fibres in sample		Mass %	na	na
% Chrysotile fibres in sample		Mass %	na	na
Breakdown of Potentially Respirable Fibre Analysis (d)				
Amphibole fibres		Fibres/g	na	na
Chrysotile fibres		Fibres/g	na	na

* Denotes test or material description outside of UKAS accreditation.
% asbestos in Asbestos Containing Materials (ACMs) is determined by
by reference to HSG 264.
Recommended sample size for quantification is approximately 1kg
# denotes deviating sample

Information in Support of the Analytical Results

Our Ref 23-05572
Client Ref 8511
Contract BURNT MILL ACADAMY

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2136566	HP01 0.20 SOIL	15/02/23	GJ 250ml, PT 1L		
2136567	HP02 0.70 SOIL	15/02/23	GJ 250ml, PT 1L		
2136568	HP03 0.35 SOIL	15/02/23	GJ 250ml, PT 1L		
2136569	HP03 0.70 SOIL	15/02/23	GJ 250ml, PT 1L		
2136570	HP04 0.30 SOIL	15/02/23	GJ 250ml, PT 1L		
2136571	WS104 0.30 SOIL	17/02/23	GJ 250ml, PT 1L		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report

DETS

Certificate of Analysis

Certificate Number 23-06767 *Issued:* 24-Mar-23

Client Earth Science Partnership
33 Cardiff Road
Taffs Well
Cardiff
CF15 7RB

Our Reference 23-06767

Client Reference 8511

Order No 11373

Contract Title Burnt Mill Academy

Description 2 Soil samples.

Date Received 09-Mar-23

Date Started 21-Mar-23

Date Completed 24-Mar-23

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Kirk Bridgewood
General Manager

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Summary of Asbestos Analysis

Samples

Our Ref	23-06767
Client Ref	8511
Contract Title	Burnt Mill Academy

Lab No	Sample ID	Sample Location	Material Type	Result	Comment*	Analyst

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * -not included in laboratory scope of accreditation.

Summary of Asbestos Quantification Analysis
Soil Samples

Our Ref 23-06767
Client Ref 8511
Contract Title Burnt Mill Academy

Lab No	2144107	2144108
.Sample ID	HP07	HP08
Depth	0.10	0.10
Other ID		
Sample Type		
Sampling Date	28/02/2023	28/02/2023
Sampling Time		

Test	**Method**	**Units**		
Total Mass% Asbestos (a+b+c)	DETSC 1102	Mass %	**0.002**	**< 0.001**
Gravimetric Quantification (a)	DETSC 1102	Mass %	0.002	na
Detailed Gravimetric Quantification (b)	DETSC 1102	Mass %	na	<0.001
Quantification by PCOM (c)	DETSC 1102	Mass %	na	na
Potentially Respirable Fibres (d)	DETSC 1102	Fibres/g	na	na
Breakdown of Gravimetric Analysis (a)				
Mass of Sample		g	1098.76	1004.91
ACMs present*		type	Board	
Mass of ACM in sample		g	0.04	
% ACM by mass		%	0.00	
% asbestos in ACM		%	40	
% asbestos in sample		%	0.002	
Breakdown of Detailed Gravimetric Analysis (b)				
% Amphibole bundles in sample		Mass %	na	<0.001
% Chrysotile bundles in sample		Mass %	na	na
Breakdown of PCOM Analysis (c)				
% Amphibole fibres in sample		Mass %	na	na
% Chrysotile fibres in sample		Mass %	na	na
Breakdown of Potentially Respirable Fibre Analysis (d)				
Amphibole fibres		Fibres/g	na	na
Chrysotile fibres		Fibres/g	na	na

* Denotes test or material description outside of UKAS accreditation.
% asbestos in Asbestos Containing Materials (ACMs) is determined by
by reference to HSG 264.
Recommended sample size for quantification is approximately 1kg
# denotes deviating sample

Information in Support of the Analytical Results

Our Ref 23-06767
Client Ref 8511
Contract Burnt Mill Academy

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2144107	HP07 0.10 SOIL	28/02/23	GJ 250ml, PT 1L		
2144108	HP08 0.10 SOIL	28/02/23	GJ 250ml, PT 1L		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report

DETS

Certificate of Analysis

Certificate Number 23-05607 *Issued:* 16-Mar-23

Client Earth Science Partnership
33 Cardiff Road
Taffs Well
Cardiff
CF15 7RB

Our Reference 23-05607

Client Reference 8511

Order No 11374

Contract Title BURNT MILL ACADAMY

Description 7 Soil samples.

Date Received 08-Mar-23

Date Started 08-Mar-23

Date Completed 16-Mar-23

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Kirk Bridgewood
General Manager

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Summary of Asbestos Analysis

Soil Samples

Our Ref 23-05607
Client Ref 8511
Contract Title BURNT MILL ACADAMY

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2136805	TP102 0.30	SOIL	NAD	NA	SUB
2136806	TP103 0.30	SOIL	NAD	NA	SUB
2136807	WS106 0.20	SOIL	Amosite	Fibre Bundles	SUB
2136808	WS105 0.30	SOIL	NAD	NA	SUB
2136809	WS107 0.30	SOIL	NAD	NA	SUB
2136810	WS107 1.20	SOIL	NAD	NA	SUB
2136811	BH103 0.20	SOIL	NAD	NA	SUB

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * -not included in laboratory scope of accreditation.

Summary of Asbestos Quantification Analysis
Soil Samples

Our Ref	23-05607
Client Ref	8511
Contract Title	BURNT MILL ACADAMY

Lab No	2136807
.Sample ID	WS106
Depth	0.20
Other ID	
Sample Type	SOIL
Sampling Date	16/02/2023
Sampling Time	1210

Test	**Method**	**Units**	
Total Mass% Asbestos (a+b+c)	DETSC 1102	Mass %	**0.013**
Gravimetric Quantification (a)	DETSC 1102	Mass %	na
Detailed Gravimetric Quantification (b)	DETSC 1102	Mass %	na
Quantification by PCOM (c)	DETSC 1102	Mass %	na
Potentially Respirable Fibres (d)	DETSC 1102	Fibres/g	na
Breakdown of Gravimetric Analysis (a)			
Mass of Sample		g	908.48
ACMs present*		type	na
Mass of ACM in sample		g	na
% ACM by mass		%	na
% asbestos in ACM		%	na
% asbestos in sample		%	na
Breakdown of Detailed Gravimetric Analysis (b)			
% Amphibole bundles in sample		Mass %	na
% Chrysotile bundles in sample		Mass %	0.004
Breakdown of PCOM Analysis (c)			
% Amphibole fibres in sample		Mass %	na
% Chrysotile fibres in sample		Mass %	na
Breakdown of Potentially Respirable Fibre Analysis (d)			
Amphibole fibres		Fibres/g	na
Chrysotile fibres		Fibres/g	na

* Denotes test or material description outside of UKAS accreditation.
% asbestos in Asbestos Containing Materials (ACMs) is determined by
by reference to HSG 264.
Recommended sample size for quantification is approximately 1kg
\# denotes deviating sample

Information in Support of the Analytical Results

Our Ref 23-05607
Client Ref 8511
Contract BURNT MILL ACADAMY

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2136805	TP102 0.30 SOIL	14/02/23	No containers logged		Cannot evaluate
2136806	TP103 0.30 SOIL	14/02/23	No containers logged		Cannot evaluate
2136807	WS106 0.20 SOIL	16/02/23	No containers logged		Cannot evaluate
2136808	WS105 0.30 SOIL	16/02/23	No containers logged		Cannot evaluate
2136809	WS107 0.30 SOIL	16/02/23	No containers logged		Cannot evaluate
2136810	WS107 1.20 SOIL	16/02/23	No containers logged		Cannot evaluate
2136811	BH103 0.20 SOIL	12/02/23	No containers logged		Cannot evaluate

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-
Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report

Appendix O ESP Supplementary Groundwater Sulphate Test Results

DETS

Certificate of Analysis

Certificate Number 23-09672 *Issued:* 28-Apr-23

Client
Earth Science Partnership
33 Cardiff Road
Taffs Well
Cardiff
CF15 7RB

Our Reference 23-09672

Client Reference (not supplied)

Order No 11489

Contract Title BURNT MILL ACADEMY , HARLOW

Description 3 Water samples.

Date Received 24-Apr-23

Date Started 24-Apr-23

Date Completed 28-Apr-23

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Kirk Bridgewood
General Manager

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Summary of Chemical Analysis
Water Samples

Our Ref 23-09672

Client Ref

Contract Title BURNT MILL ACADEMY , HARLOW

			Lab No	2160618	2160619	2160620
			.Sample ID	BH101	WS10A	WS106
			Depth			
			Other ID			
			Sample Type	WATER	WATER	WATER
			Sampling Date	19/04/2023	19/04/2023	19/04/2023
			Sampling Time	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**			
Inorganics						
Sulphate as SO4	DETSC 2055	0.1	mg/l	54	750	120

Key: n/s -not supplied.

Information in Support of the Analytical Results

Our Ref 23-09672
Client Ref
Contract BURNT MILL ACADEMY , HARLOW

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2160618	BH101 WATER	19/04/23	PB 1L		
2160619	WS10A WATER	19/04/23	PB 1L		
2160620	WS106 WATER	19/04/23	PB 1L		

Key: P-Plastic B-Bottle

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-
Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report

DETS

Certificate of Analysis

Certificate Number 23-12691-0 *Issued:* 05-Jun-23

Client Earth Science Partnership
33 Cardiff Road
Taffs Well
Cardiff
CF15 7RB

Our Reference 23-12691-0

Client Reference 8511

Order No 11601

Contract Title Burnt Mill Campus

Description 3 Water samples.

Date Received 30-May-23

Date Started 30-May-23

Date Completed 05-Jun-23

Test Procedures Identified by prefix DETSn (details on request).

Notes **This report supersedes 23-12691, amendments made**
Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Kirk Bridgewood
General Manager

ilac-MRA

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Summary of Chemical Analysis
Water Samples

Our Ref	23-12691-0
Client Ref	8511
Contract Title	Burnt Mill Campus

			Lab No	2178497	2178498	2178499
			.Sample ID	BH101	BH102	BH105
			Depth			
			Other ID			
			Sample Type	WATER	WATER	WATER
			Sampling Date	22/05/2023	22/05/2023	22/05/2023
			Sampling Time	1715	1445	1630
Test	**Method**	**LOD**	**Units**			
Inorganics						
Sulphate as SO4	DETSC 2055	0.0001	%	0.01	0.01	0.01
Sulphate as SO4	DETSC 2055	0.1	mg/l	74	100	110

Key:

Information in Support of the Analytical Results

Our Ref 23-12691-0
Client Ref 8511
Contract Burnt Mill Campus

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2178497	BH101 WATER	22/05/23	PB 1L		
2178498	BH102 WATER	22/05/23	PB 1L		
2178499	BH105 WATER	22/05/23	PB 1L		

Key: P-Plastic B-Bottle

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-
Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report

Appendix P ESP Supplementary Geo-environmental Laboratory Test Results (July 2023)

Certificate of Analysis

Certificate Number	23-14456	*Issued:*	05-Jul-23

Client Earth Science Partnership
33 Cardiff Road
Taffs Well
Cardiff
CF15 7RB

Our Reference	23-14456
Client Reference	8511.02
Order No	11655
Contract Title	Burnt mill , Academy
Description	18 Soil samples, 9 Leachate samples.
Date Received	19-Jun-23
Date Started	19-Jun-23
Date Completed	05-Jul-23
Test Procedures	Identified by prefix DETSn (details on request).
Notes	Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Kirk Bridgewood
General Manager

UKAS TESTING 2139

Summary of Chemical Analysis
Matrix Descriptions

Our Ref 23-14456
Client Ref 8511.02
Contract Title Burnt mill , Academy

Sample ID	Depth	Lab No	Completed	Matrix Description
WS206	0.1	2189239	05/07/2023	U/S (sample matrix outside MCERTS scope of accreditation)
WS206	0.2	2189240	05/07/2023	U/S (sample matrix outside MCERTS scope of accreditation)
WS206	0.6	2189241	05/07/2023	Brown gravelly, sandy CLAY (Possible made ground - brick)
WS207	0.1	2189242	05/07/2023	U/S (sample matrix outside MCERTS scope of accreditation)
WS207	0.2	2189243	05/07/2023	Brown very gravelly, sandy CLAY
WS207	0.7	2189244	05/07/2023	Brown gravelly, sandy CLAY (Possible made ground - brick) including odd rootlets
WS208	0.1	2189245	05/07/2023	U/S (sample matrix outside MCERTS scope of accreditation)
WS208	0.2	2189246	05/07/2023	Dark brown very gravelly, sandy CLAY
WS208	0.4	2189247	05/07/2023	Brown gravelly, sandy CLAY including odd rootlets
WS210	0.3	2189248	05/07/2023	Brown gravelly, sandy CLAY including odd rootlets (Possible made ground - brick)
WS201	0.7	2189249	05/07/2023	U/S (sample matrix outside MCERTS scope of accreditation)
WS202	0.6	2189250	05/07/2023	Brown slightly gravelly, sandy CLAY including odd rootlets
WS204	0.6	2189251	05/07/2023	Brown very gravelly, sandy CLAY including odd rootlets (Made ground - brick)
WS202	1.6	2189252	05/07/2023	Brown slightly gravelly, sandy CLAY including odd rootlets (Possible made ground - brick)
WS202	3.8	2189253	05/07/2023	Brown slightly gravelly, sandy CLAY including odd rootlets (Possible made ground - brick)
WS203	2.9	2189254	05/07/2023	Brown slightly gravelly, sandy CLAY
WS205	2.5	2189255	05/07/2023	Brown slightly gravelly, sandy CLAY
WS209	1.6	2189256	05/07/2023	Brown slightly gravelly, sandy CLAY including odd rootlets

Summary of Chemical Analysis
Soil Samples

Our Ref 23-14456
Client Ref 8511.02
Contract Title Burnt mill , Academy

			Lab No	2189239	2189241	2189242	2189243	2189244	2189245
			.Sample ID	WS206	WS206	WS207	WS207	WS207	WS208
			Depth	0.10	0.60	0.10	0.20	0.70	0.10
			Other ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	14/06/2023	14/06/2023	13/06/2023	13/06/2023	13/06/2023	13/06/2023
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
Metals									
Arsenic	DETSC 2301#	0.2	mg/kg	16	12		3.4	11	11
Barium	DETSC 2301#	1.5	mg/kg	16	51		20	47	14
Beryllium	DETSC 2301#	0.2	mg/kg	< 0.2	0.7		< 0.2	0.5	< 0.2
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	< 0.2	0.7		< 0.2	0.7	< 0.2
Cadmium	DETSC 2301#	0.1	mg/kg	0.5	0.2		< 0.1	0.3	0.2
Chromium	DETSC 2301#	0.15	mg/kg	3.2	20		3.6	12	3.1
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0		< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	2.8	17		6.3	22	6.9
Lead	DETSC 2301#	0.3	mg/kg	7.8	14		11	35	7.1
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05		< 0.05	0.08	< 0.05
Nickel	DETSC 2301#	1	mg/kg	3.1	21		5.5	12	7.3
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5		< 0.5	< 0.5	< 0.5
Vanadium	DETSC 2301#	0.8	mg/kg	7.5	36		8.3	25	6.9
Zinc	DETSC 2301#	1	mg/kg	40	50		13	58	46
Inorganics									
pH	DETSC 2008#		pH	8.6	8.0		8.3	7.7	8.9
Cyanide, Total	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1		< 0.1	0.3	< 0.1
Total Organic Carbon	DETSC 2084#	0.5	%						
Organic matter	DETSC 2002#	0.1	%	5.4	1.3		1.1	2.1	4.1
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01		< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01		< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01		< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5		< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2		< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	2.3	< 1.5		< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	110	< 3.4		40	< 3.4	180
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	110	< 10		40	< 10	180
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01		< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01		< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01		< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9		2.0	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	0.6	< 0.5		1.4	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	6.4	< 0.6		3.6	3.5	6.0
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	260	< 1.4		150	4.4	820
Aromatic C5-C35	DETSC 3072*	10	mg/kg	260	< 10		160	< 10	830
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	380	< 10		200	< 10	1000
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01		< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01		< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01		< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01		< 0.01	< 0.01	< 0.01

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 23-14456
Client Ref 8511.02
Contract Title Burnt mill , Academy

			Lab No	2189239	2189241	2189242	2189243	2189244	2189245
			.Sample ID	WS206	WS206	WS207	WS207	WS207	WS208
			Depth	0.10	0.60	0.10	0.20	0.70	0.10
			Other ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	14/06/2023	14/06/2023	13/06/2023	13/06/2023	13/06/2023	13/06/2023
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
PAHs									
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		< 0.03	0.07	< 0.03
Acenaphthene	DETSC 3301	0.1	mg/kg			0.1			
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		< 0.03	0.04	< 0.03
Acenaphthylene	DETSC 3301	0.1	mg/kg			0.4			
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03		< 0.03	0.24	< 0.03
Anthracene	DETSC 3301	0.1	mg/kg			0.3			
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	0.03		< 0.03	1.2	< 0.03
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg			0.8			
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		< 0.03	1.2	0.08
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg			< 0.1			
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		0.03	1.5	0.10
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg			< 0.1			
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	0.08	< 0.03		0.03	0.51	0.14
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg			< 0.1			
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		< 0.03	0.58	< 0.03
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg			< 0.1			
Chrysene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03		< 0.03	1.3	0.15
Chrysene	DETSC 3301	0.1	mg/kg			0.2			
Coronene	DETSC 3301*	0.1	mg/kg	< 0.1		< 0.1			< 0.1
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		< 0.03	0.12	0.04
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg			< 0.1			
Fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	0.05		< 0.03	3.9	< 0.03
Fluoranthene	DETSC 3301	0.1	mg/kg			0.3			
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03		< 0.03	0.10	< 0.03
Fluorene	DETSC 3301	0.1	mg/kg			1.2			
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		< 0.03	0.47	0.05
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg			< 0.1			
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		< 0.03	< 0.03	< 0.03
Naphthalene	DETSC 3301	0.1	mg/kg			< 0.1			
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03	0.03		< 0.03	1.7	< 0.03
Phenanthrene	DETSC 3301	0.1	mg/kg			0.2			
Pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	0.04		0.04	3.5	0.05
Pyrene	DETSC 3301	0.1	mg/kg			0.9			
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	< 0.10	< 0.10		0.10	16	0.60
PAH 16 Total	DETSC 3301	1.6	mg/kg			4.4			
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

DETS

Summary of Chemical Analysis
Soil Samples

Our Ref 23-14456
Client Ref 8511.02
Contract Title Burnt mill , Academy

			Lab No	2189247	2189252	2189253	2189254	2189255	2189256
			.Sample ID	WS208	WS202	WS202	WS203	WS205	WS209
			Depth	0.40	1.60	3.80	2.90	2.50	1.60
			Other ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	13/06/2023	13/06/2023	13/06/2023	12/06/2023	12/06/2023	13/06/2023
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
Metals									
Arsenic	DETSC 2301#	0.2	mg/kg	12					
Barium	DETSC 2301#	1.5	mg/kg	57					
Beryllium	DETSC 2301#	0.2	mg/kg	0.8					
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	0.5					
Cadmium	DETSC 2301#	0.1	mg/kg	0.3					
Chromium	DETSC 2301#	0.15	mg/kg	24					
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0					
Copper	DETSC 2301#	0.2	mg/kg	18					
Lead	DETSC 2301#	0.3	mg/kg	39					
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05					
Nickel	DETSC 2301#	1	mg/kg	24					
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5					
Vanadium	DETSC 2301#	0.8	mg/kg	44					
Zinc	DETSC 2301#	1	mg/kg	54					
Inorganics									
pH	DETSC 2008#		pH	8.0					
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.2					
Total Organic Carbon	DETSC 2084#	0.5	%		0.7	0.9	2.4	0.9	1.1
Organic matter	DETSC 2002#	0.1	%	1.5					
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01					
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01					
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01					
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5					
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2					
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5					
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4					
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10					
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01					
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01					
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01					
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9					
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5					
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6					
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4					
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10					
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	< 10					
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01					
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01					
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01					
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01					

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Summary of Chemical Analysis
Soil Samples

Our Ref 23-14456
Client Ref 8511.02
Contract Title Burnt mill , Academy

			Lab No	2189247	2189252	2189253	2189254	2189255	2189256
			.Sample ID	WS208	WS202	WS202	WS203	WS205	WS209
			Depth	0.40	1.60	3.80	2.90	2.50	1.60
			Other ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	13/06/2023	13/06/2023	13/06/2023	12/06/2023	12/06/2023	13/06/2023
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
PAHs									
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03					
Acenaphthene	DETSC 3301	0.1	mg/kg						
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03					
Acenaphthylene	DETSC 3301	0.1	mg/kg						
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03					
Anthracene	DETSC 3301	0.1	mg/kg						
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03					
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg						
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03					
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg						
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03					
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg						
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03					
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg						
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03					
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg						
Chrysene	DETSC 3303	0.03	mg/kg	< 0.03					
Chrysene	DETSC 3301	0.1	mg/kg						
Coronene	DETSC 3301*	0.1	mg/kg						
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03					
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg						
Fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03					
Fluoranthene	DETSC 3301	0.1	mg/kg						
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03					
Fluorene	DETSC 3301	0.1	mg/kg						
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03					
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg						
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03					
Naphthalene	DETSC 3301	0.1	mg/kg						
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03					
Phenanthrene	DETSC 3301	0.1	mg/kg						
Pyrene	DETSC 3303#	0.03	mg/kg	< 0.03					
Pyrene	DETSC 3301	0.1	mg/kg						
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	< 0.10					
PAH 16 Total	DETSC 3301	1.6	mg/kg						
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	0.3					

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref	23-14456
Client Ref	8511.02
Contract Title	Burnt mill , Academy
Sample Id	WS206 0.10
Sample Numbers	2189239 2189257
Date Analysed	05/07/2023

Test Results On Waste

Determinand and Method Reference	**Units**	**Result**	**WAC Limit Values**		
			Inert Waste	**SNRHW**	**Hazardous Waste**
DETSC 2084# Total Organic Carbon	%	2.9	3	5	6
DETSC 2003# Loss On Ignition	%	5.2	n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# TPH (C10 - C40)	mg/kg	2000.0	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	< 1.6	100	n/a	n/a
DETSC 2008# pH	pH Units	8.6	n/a	>6	n/a
DETSC 2073* Acid Neutralisation Capacity (pH4)	mol/kg	< 1.0	n/a	TBE	TBE
DETSC 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1.0	n/a	TBE	TBE

Test Results On Leachate

WAC Limit Values
Limit values for LS10 Leachate

Determinand and Method Reference	**Conc in Eluate ug/l**	**Amount Leached* mg/kg**	**Inert Waste**	**SNRHW**	**Hazardous Waste**
	10:1	**LS10**			
DETSC 2306 Arsenic as As	< 0.16	< 0.01	0.5	2	25
DETSC 2306 Barium as Ba	2.3	< 0.1	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	< 0.25	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	0.48	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	< 0.010	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	< 1.1	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	< 0.50	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	0.12	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	< 0.17	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	< 0.25	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	< 1.3	< 0.01	4	50	200
DETSC 2055 Chloride as Cl	450	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	< 100	< 0.1	10	150	500
DETSC 2055 Sulphate as SO4	1600	< 100	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	21000	210	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 1	1	n/a	n/a
DETSC 2033* Dissolved Organic Carbon	3600	< 50	500	800	1000

Additional Information

DETSC 2008 pH	8.2
DETSC 2009 Conductivity uS/cm	30.6
* Temperature*	20.0

Mass of Sample Kg*	0.120
Mass of dry Sample Kg*	0.101

Stage 1

Volume of Leachant L2*	0.989
Volume of Eluate VE1*	0.93

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive Hazardous Waste

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WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 23-14456
Client Ref 8511.02
Contract Title Burnt mill , Academy
Sample Id WS206 0.60

Sample Numbers 2189241 2189258
Date Analysed 05/07/2023

Test Results On Waste			**WAC Limit Values**		
Determinand and Method Reference	**Units**	**Result**	**Inert Waste**	**SNRHW**	**Hazardous Waste**
DETSC 2084# Total Organic Carbon	%	11.0	3	5	6
DETSC 2003# Loss On Ignition	%	3.7	n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# TPH (C10 - C40)	mg/kg	< 10	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	< 1.6	100	n/a	n/a
DETSC 2008# pH	pH Units	8.0	n/a	>6	n/a
DETSC 2073* Acid Neutralisation Capacity (pH4)	mol/kg	1.6	n/a	TBE	TBE
DETSC 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1.0	n/a	TBE	TBE

Test Results On Leachate			**WAC Limit Values** Limit values for LS10 Leachate		
Determinand and Method Reference	**Conc in Eluate ug/l**	**Amount Leached* mg/kg**	**Inert Waste**	**SNRHW**	**Hazardous Waste**
	10:1	**LS10**			
DETSC 2306 Arsenic as As	1.4	0.014	0.5	2	25
DETSC 2306 Barium as Ba	8.9	< 0.1	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	< 0.25	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	0.9	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	< 0.010	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	1.5	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	< 0.50	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	0.23	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	0.51	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	0.4	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	2.6	0.026	4	50	200
DETSC 2055 Chloride as Cl	1000	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	390	3.9	10	150	500
DETSC 2055 Sulphate as SO4	13000	130	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	73000	730	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 1	1	n/a	n/a
DETSC 2033* Dissolved Organic Carbon	3200	< 50	500	800	1000

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive Hazardous Waste

Additional Information

DETSC 2008 pH	7.7
DETSC 2009 Conductivity uS/cm	104.0
* Temperature*	20.0
Mass of Sample Kg*	0.120
Mass of dry Sample Kg*	0.101

Stage 1

Volume of Leachant L2*	0.989
Volume of Eluate VE1*	0.93

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V.2.06

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WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 23-14456
Client Ref 8511.02
Contract Title Burnt mill , Academy
Sample Id WS207 0.10

Sample Numbers 2189242 2189259
Date Analysed 30/06/2023

Test Results On Waste			**WAC Limit Values**		
Determinand and Method Reference	**Units**	**Result**	**Inert Waste**	**SNRHW**	**Hazardous Waste**
DETSC 2084# Total Organic Carbon	%	0.9	3	5	6
DETSC 2003# Loss On Ignition	%	2.9	n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# TPH (C10 - C40)	mg/kg	4400.0	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	4.4	100	n/a	n/a
DETSC 2008# pH	pH Units	8.3	n/a	>6	n/a
DETSC 2073* Acid Neutralisation Capacity (pH4)	mol/kg	< 1.0	n/a	TBE	TBE
DETSC 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1.0	n/a	TBE	TBE

Test Results On Leachate			**WAC Limit Values** Limit values for LS10 Leachate		
Determinand and Method Reference	**Conc in Eluate ug/l**	**Amount Leached* mg/kg**	**Inert Waste**	**SNRHW**	**Hazardous Waste**
	10:1	**LS10**			
DETSC 2306 Arsenic as As	0.27	< 0.01	0.5	2	25
DETSC 2306 Barium as Ba	2.9	< 0.1	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	< 0.25	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	0.64	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	< 0.010	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	< 1.1	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	< 0.50	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	0.11	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	< 0.17	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	< 0.25	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	10	0.1	4	50	200
DETSC 2055 Chloride as Cl	490	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	< 100	< 0.1	10	150	500
DETSC 2055 Sulphate as SO4	3300	< 100	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	23000	230	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 1	1	n/a	n/a
DETSC 2033* Dissolved Organic Carbon	4300	< 50	500	800	1000

Additional Information

DETSC 2008 pH	7.7
DETSC 2009 Conductivity uS/cm	32.2
* Temperature*	20.0

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive Hazardous Waste

Mass of Sample Kg*	0.120
Mass of dry Sample Kg*	0.101

Stage 1

Volume of Leachant L2*	0.989
Volume of Eluate VE1*	0.93

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WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref	23-14456
Client Ref	8511.02
Contract Title	Burnt mill , Academy
Sample Id	WS207 0.20
Sample Numbers	2189243 2189260
Date Analysed	05/07/2023

Test Results On Waste

Determinand and Method Reference	**Units**	**Result**	**WAC Limit Values** **Inert Waste**	**SNRHW**	**Hazardous Waste**
DETSC 2084# Total Organic Carbon	%	14.0	3	5	6
DETSC 2003# Loss On Ignition	%	1.3	n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# TPH (C10 - C40)	mg/kg	< 10	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	< 1.6	100	n/a	n/a
DETSC 2008# pH	pH Units	8.3	n/a	>6	n/a
DETSC 2073* Acid Neutralisation Capacity (pH4)	mol/kg	< 1.0	n/a	TBE	TBE
DETSC 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1.0	n/a	TBE	TBE

Test Results On Leachate

WAC Limit Values
Limit values for LS10 Leachate

Determinand and Method Reference	**Conc in Eluate ug/l** **10:1**	**Amount Leached* mg/kg** **LS10**	**Inert Waste**	**SNRHW**	**Hazardous Waste**
DETSC 2306 Arsenic as As	1.4	0.014	0.5	2	25
DETSC 2306 Barium as Ba	3.4	< 0.1	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	< 0.25	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	0.61	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	< 0.010	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	< 1.1	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	< 0.50	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	0.13	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	< 0.17	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	< 0.25	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	< 1.3	< 0.01	4	50	200
DETSC 2055 Chloride as Cl	730	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	< 100	< 0.1	10	150	500
DETSC 2055 Sulphate as SO4	1500	< 100	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	40000	400	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 1	1	n/a	n/a
DETSC 2033* Dissolved Organic Carbon	2900	< 50	500	800	1000

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive Hazardous Waste

Additional Information

DETSC 2008 pH	6.8
DETSC 2009 Conductivity uS/cm	56.7
* Temperature*	20.0

Mass of Sample Kg*	0.120
Mass of dry Sample Kg*	0.101

Stage 1

Volume of Leachant L2*	0.989
Volume of Eluate VE1*	0.93

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WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 23-14456
Client Ref 8511.02
Contract Title Burnt mill , Academy
Sample Id WS208 0.10

Sample Numbers 2189245 2189261
Date Analysed 05/07/2023

Test Results On Waste

			WAC Limit Values		
Determinand and Method Reference	**Units**	**Result**	**Inert Waste**	**SNRHW**	**Hazardous Waste**
DETSC 2084# Total Organic Carbon	%	1.1	3	5	6
DETSC 2003# Loss On Ignition	%	7.5	n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# TPH (C10 - C40)	mg/kg	1800.0	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	< 1.6	100	n/a	n/a
DETSC 2008# pH	pH Units	8.9	n/a	>6	n/a
DETSC 2073* Acid Neutralisation Capacity (pH4)	mol/kg	< 1.0	n/a	TBE	TBE
DETSC 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1.0	n/a	TBE	TBE

Test Results On Leachate

			WAC Limit Values Limit values for LS10 Leachate		
Determinand and Method Reference	**Conc in Eluate ug/l** **10:1**	**Amount Leached* mg/kg** **LS10**	**Inert Waste**	**SNRHW**	**Hazardous Waste**
DETSC 2306 Arsenic as As	0.3	< 0.01	0.5	2	25
DETSC 2306 Barium as Ba	2.8	< 0.1	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	< 0.25	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	0.44	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	< 0.010	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	< 1.1	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	< 0.50	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	0.095	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	< 0.17	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	< 0.25	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	1.8	0.018	4	50	200
DETSC 2055 Chloride as Cl	580	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	< 100	< 0.1	10	150	500
DETSC 2055 Sulphate as SO4	1400	< 100	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	15000	150	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 1	1	n/a	n/a
DETSC 2033* Dissolved Organic Carbon	4500	< 50	500	800	1000

Additional Information

DETSC 2008 pH	6.7
DETSC 2009 Conductivity uS/cm	21.9
* Temperature*	20.0

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive Hazardous Waste

Mass of Sample Kg*	0.120
Mass of dry Sample Kg*	0.101

Stage 1

Volume of Leachant L2*	0.989
Volume of Eluate VE1*	0.93

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WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 23-14456
Client Ref 8511.02
Contract Title Burnt mill , Academy
Sample Id WS208 0.20
Sample Numbers 2189246 2189262
Date Analysed 05/07/2023

Test Results On Waste			**WAC Limit Values**		
Determinand and Method Reference	**Units**	**Result**	**Inert Waste**	**SNRHW**	**Hazardous Waste**
DETSC 2084# Total Organic Carbon	%	15.0	3	5	6
DETSC 2003# Loss On Ignition	%	2.4	n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# TPH (C10 - C40)	mg/kg	1600.0	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	< 1.6	100	n/a	n/a
DETSC 2008# pH	pH Units	9.0	n/a	>6	n/a
DETSC 2073* Acid Neutralisation Capacity (pH4)	mol/kg	< 1.0	n/a	TBE	TBE
DETSC 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1.0	n/a	TBE	TBE

Test Results On Leachate			**WAC Limit Values** Limit values for LS10 Leachate		
Determinand and Method Reference	**Conc in Eluate ug/l** **10:1**	**Amount Leached* mg/kg** **LS10**	**Inert Waste**	**SNRHW**	**Hazardous Waste**
DETSC 2306 Arsenic as As	1.5	0.015	0.5	2	25
DETSC 2306 Barium as Ba	3.7	< 0.1	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	< 0.25	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	1.2	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	< 0.010	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	< 1.1	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	< 0.50	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	0.25	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	< 0.17	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	< 0.25	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	2.9	0.029	4	50	200
DETSC 2055 Chloride as Cl	860	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	< 100	< 0.1	10	150	500
DETSC 2055 Sulphate as SO4	1700	< 100	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	28000	280	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 1	1	n/a	n/a
DETSC 2033* Dissolved Organic Carbon	4700	< 50	500	800	1000

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive Hazardous Waste

Additional Information

DETSC 2008 pH	6.8
DETSC 2009 Conductivity uS/cm	40.5
* Temperature*	20.0

Mass of Sample Kg*	0.120
Mass of dry Sample Kg*	0.101

Stage 1

Volume of Leachant L2*	0.989
Volume of Eluate VE1*	0.93

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WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 23-14456
Client Ref 8511.02
Contract Title Burnt mill , Academy
Sample Id WS210 0.30
Sample Numbers 2189248 2189263
Date Analysed 05/07/2023

Test Results On Waste			**WAC Limit Values**		
Determinand and Method Reference	**Units**	**Result**	**Inert Waste**	**SNRHW**	**Hazardous Waste**
DETSC 2084# Total Organic Carbon	%	2.2	3	5	6
DETSC 2003# Loss On Ignition	%	4.3	n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# TPH (C10 - C40)	mg/kg	46.0	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	< 1.6	100	n/a	n/a
DETSC 2008# pH	pH Units	9.9	n/a	>6	n/a
DETSC 2073* Acid Neutralisation Capacity (pH4)	mol/kg	< 1.0	n/a	TBE	TBE
DETSC 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1.0	n/a	TBE	TBE

Test Results On Leachate			**WAC Limit Values** Limit values for LS10 Leachate		
Determinand and Method Reference	**Conc in Eluate ug/l** **10:1**	**Amount Leached* mg/kg** **LS10**	**Inert Waste**	**SNRHW**	**Hazardous Waste**
DETSC 2306 Arsenic as As	1.2	0.012	0.5	2	25
DETSC 2306 Barium as Ba	6.2	< 0.1	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	< 0.25	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	2.6	0.026	2	50	100
DETSC 2306 Mercury as Hg	< 0.010	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	< 1.1	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	< 0.50	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	1.3	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	< 0.17	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	0.26	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	3.2	0.032	4	50	200
DETSC 2055 Chloride as Cl	830	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	320	3.2	10	150	500
DETSC 2055 Sulphate as SO4	3600	< 100	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	45000	450	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 1	1	n/a	n/a
DETSC 2033* Dissolved Organic Carbon	5000	50	500	800	1000

Additional Information

DETSC 2008 pH	6.8
DETSC 2009 Conductivity uS/cm	64.3
* Temperature*	20.0

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive Hazardous Waste

Mass of Sample Kg*	0.120
Mass of dry Sample Kg*	0.101

Stage 1

Volume of Leachant L2*	0.989
Volume of Eluate VE1*	0.93

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V.2.06 ** DETS are accredited for the testing of leachates and not the leachate preparation stage which is unaccredited.*

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref	23-14456		
Client Ref	8511.02		
Contract Title	Burnt mill , Academy	*Sample Numbers*	2189250 2189264
Sample Id	WS202 0.60	*Date Analysed*	05/07/2023

Test Results On Waste

Determinand and Method Reference	Units	Result	WAC Limit Values Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	3.2	3	5	6
DETSC 2003# Loss On Ignition	%	4.4	n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# TPH (C10 - C40)	mg/kg	< 10	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	< 1.6	100	n/a	n/a
DETSC 2008# pH	pH Units	8.2	n/a	>6	n/a
DETSC 2073* Acid Neutralisation Capacity (pH4)	mol/kg	< 1.0	n/a	TBE	TBE
DETSC 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1.0	n/a	TBE	TBE

Test Results On Leachate

WAC Limit Values
Limit values for LS10 Leachate

Determinand and Method Reference	Conc in Eluate ug/l 10:1	Amount Leached* mg/kg LS10	Inert Waste	SNRHW	Hazardous Waste
DETSC 2306 Arsenic as As	0.48	< 0.01	0.5	2	25
DETSC 2306 Barium as Ba	5.3	< 0.1	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	< 0.25	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	1.1	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	< 0.010	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	< 1.1	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	< 0.50	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	0.7	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	< 0.17	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	< 0.25	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	3.1	0.031	4	50	200
DETSC 2055 Chloride as Cl	1000	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	180	1.8	10	150	500
DETSC 2055 Sulphate as SO4	2700	< 100	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	44000	440	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 1	1	n/a	n/a
DETSC 2033* Dissolved Organic Carbon	4600	< 50	500	800	1000

Additional Information

DETSC 2008 pH	6.8
DETSC 2009 Conductivity uS/cm	63.2
* Temperature*	20.0

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive Hazardous Waste

Mass of Sample Kg*	0.120
Mass of dry Sample Kg*	0.101

Stage 1

Volume of Leachant L2*	0.989
Volume of Eluate VE1*	0.93

Disclaimer: *The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.*

V.2.06 ** DETS are accredited for the testing of leachates and not the leachate preparation stage which is unaccredited.*

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref	23-14456
Client Ref	8511.02
Contract Title	Burnt mill , Academy
Sample Id	WS204 0.60
Sample Numbers	2189251 2189265
Date Analysed	05/07/2023

Test Results On Waste			**WAC Limit Values**		
Determinand and Method Reference	**Units**	**Result**	**Inert Waste**	**SNRHW**	**Hazardous Waste**
DETSC 2084# Total Organic Carbon	%	< 0.5	3	5	6
DETSC 2003# Loss On Ignition	%	3.0	n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# TPH (C10 - C40)	mg/kg	< 10	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	< 1.6	100	n/a	n/a
DETSC 2008# pH	pH Units	8.3	n/a	>6	n/a
DETSC 2073* Acid Neutralisation Capacity (pH4)	mol/kg	< 1.0	n/a	TBE	TBE
DETSC 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1.0	n/a	TBE	TBE

Test Results On Leachate			**WAC Limit Values** Limit values for LS10 Leachate		
Determinand and Method Reference	**Conc in Eluate ug/l** **10:1**	**Amount Leached* mg/kg** **LS10**	**Inert Waste**	**SNRHW**	**Hazardous Waste**
DETSC 2306 Arsenic as As	1.1	0.011	0.5	2	25
DETSC 2306 Barium as Ba	4.2	< 0.1	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	< 0.25	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	1.8	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	< 0.010	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	< 1.1	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	< 0.50	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	0.84	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	< 0.17	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	< 0.25	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	2.1	0.021	4	50	200
DETSC 2055 Chloride as Cl	610	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	290	2.9	10	150	500
DETSC 2055 Sulphate as SO4	2200	< 100	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	46000	460	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 1	1	n/a	n/a
DETSC 2033* Dissolved Organic Carbon	7300	73	500	800	1000

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive Hazardous Waste

Additional Information

DETSC 2008 pH	6.8
DETSC 2009 Conductivity uS/cm	65.0
* Temperature*	20.0

Mass of Sample Kg*	0.120
Mass of dry Sample Kg*	0.101

Stage 1

Volume of Leachant L2*	0.989
Volume of Eluate VE1*	0.93

Disclaimer: *The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.*

V.2.06 ** DETS are accredited for the testing of leachates and not the leachate preparation stage which is unaccredited.*

Summary of Asbestos Analysis

Soil Samples

Our Ref 23-14456
Client Ref 8511.02
Contract Title Burnt mill , Academy

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2189239	WS206 0.10	SOIL	NAD	none	Barry Kelly
2189240	WS206 0.20	SOIL	NAD	none	Barry Kelly
2189241	WS206 0.60	SOIL	NAD	none	Barry Kelly
2189243	WS207 0.20	SOIL	NAD	none	Barry Kelly
2189244	WS207 0.70	SOIL	NAD	none	Barry Kelly
2189245	WS208 0.10	SOIL	NAD	none	Barry Kelly
2189246	WS208 0.20	SOIL	NAD	none	Barry Kelly
2189247	WS208 0.40	SOIL	NAD	none	Barry Kelly
2189248	WS210 0.30	SOIL	NAD	none	Barry Kelly
2189249	WS201 0.70	SOIL	NAD	none	Barry Kelly
2189250	WS202 0.60	SOIL	NAD	none	Barry Kelly
2189251	WS204 0.60	SOIL	NAD	none	Barry Kelly

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 23-14456
Client Ref 8511.02
Contract Burnt mill , Academy

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2189239	WS206 0.10 SOIL	14/06/23	GJ 250ml x2, GV x2, PT 1L x2		
2189240	WS206 0.20 SOIL	14/06/23	GJ 250ml x2, GV x2, PT 1L x2		
2189241	WS206 0.60 SOIL	14/06/23	GJ 250ml x2, GV x2, PT 1L x2		
2189242	WS207 0.10 SOIL	13/06/23	GJ 250ml x2, GV x2, PT 1L x2		
2189243	WS207 0.20 SOIL	13/06/23	GJ 250ml x2, GV x2, PT 1L x2		
2189244	WS207 0.70 SOIL	13/06/23	GJ 250ml x2, GV x2, PT 1L x2		
2189245	WS208 0.10 SOIL	13/06/23	GJ 250ml x2, GV x2, PT 1L x2		
2189246	WS208 0.20 SOIL	13/06/23	GJ 250ml x2, GV x2, PT 1L x2		
2189247	WS208 0.40 SOIL	13/06/23	GJ 250ml x2, GV x2, PT 1L x2		
2189248	WS210 0.30 SOIL	12/06/23	GJ 250ml x2, GV x2, PT 1L x2		
2189249	WS201 0.70 SOIL	12/06/23	GJ 250ml x2, GV x2, PT 1L x2		
2189250	WS202 0.60 SOIL	13/06/23	GJ 250ml x2, GV x2, PT 1L x2		
2189251	WS204 0.60 SOIL	13/06/23	GJ 250ml x2, GV x2, PT 1L x2		
2189252	WS202 1.60 SOIL	13/06/23	PT 1L		
2189253	WS202 3.80 SOIL	13/06/23	GJ 250ml, PT 1L		
2189254	WS203 2.90 SOIL	12/06/23	PT 1L		
2189255	WS205 2.50 SOIL	12/06/23	PT 1L		
2189256	WS209 1.60 SOIL	13/06/23	PT 1L		
2189257	WS206 0.10 LEACHATE	14/06/23	GJ 250ml x2, GV x2, PT 1L x2		
2189258	WS206 0.60 LEACHATE	14/06/23	GJ 250ml x2, GV x2, PT 1L x2		
2189259	WS207 0.10 LEACHATE	13/06/23	GJ 250ml x2, GV x2, PT 1L x2		
2189260	WS207 0.20 LEACHATE	13/06/23	GJ 250ml x2, GV x2, PT 1L x2		
2189261	WS208 0.10 LEACHATE	13/06/23	GJ 250ml x2, GV x2, PT 1L x2		
2189262	WS208 0.20 LEACHATE	13/06/23	GJ 250ml x2, GV x2, PT 1L x2		
2189263	WS210 0.30 LEACHATE	12/06/23	GJ 250ml x2, GV x2, PT 1L x2		
2189264	WS202 0.60 LEACHATE	13/06/23	GJ 250ml x2, GV x2, PT 1L x2		
2189265	WS204 0.60 LEACHATE	13/06/23	GJ 250ml x2, GV x2, PT 1L x2		

Key: G-Glass P-Plastic J-Jar V-Vial T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 2002	Organic matter	%	0.1	Air Dried	No	Yes	Yes
DETSC 2003	Loss on ignition	%	0.01	Air Dried	No	Yes	Yes
DETSC 2008	pH	pH Units	1	Air Dried	No	Yes	Yes
DETSC 2076	Sulphate Aqueous Extract as SO4	mg/l	10	Air Dried	No	Yes	Yes
DETSC 2084	Total Organic Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2119	Ammoniacal Nitrogen as N	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide free	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide total	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Phenol - Monohydric	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC 2130	Thiocyanate	mg/kg	0.6	Air Dried	No	Yes	Yes
DETSC 2301	Arsenic	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC 2301	Barium	mg/kg	1.5	Air Dried	No	Yes	Yes
DETSC 2301	Beryllium	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC 2301	Cadmium Available	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2301	Cadmium	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2301	Cobalt	mg/kg	0.7	Air Dried	No	Yes	Yes
DETSC 2301	Chromium	mg/kg	0.15	Air Dried	No	Yes	Yes
DETSC 2301	Copper	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC 2301	Manganese	mg/kg	20	Air Dried	No	Yes	Yes
DETSC 2301	Molybdenum	mg/kg	0.4	Air Dried	No	Yes	Yes
DETSC 2301	Nickel	mg/kg	1	Air Dried	No	Yes	Yes
DETSC 2301	Lead	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC 2301	Selenium	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC 2301	Zinc	mg/kg	1	Air Dried	No	Yes	Yes
DETSC 2311	Boron (water soluble)	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC 2321	Total Sulphate as SO4	%	0.01	Air Dried	No	Yes	Yes
DETSC 2325	Mercury	mg/kg	0.05	Air Dried	No	Yes	Yes
DETSC 3049	Sulphur (free)	mg/kg	0.75	As Received	No	Yes	Yes
DETSC 3072	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETSC 3303	Acenaphthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Acenaphthylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(b)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(k)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(g,h,i)perylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Dibenzo(a,h)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 3303	Indeno(1,2,3-c,d)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Naphthalene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Phenanthrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3311	C10-C24 Diesel Range Organics (DRO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	C24-C40 Lube Oil Range Organics (LORO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	EPH (C10-C40)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3321	Benzene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3321	Ethylbenzene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3321	Toluene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3321	Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3321	m+p Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3321	o Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 28 + PCB 31	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 52	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 101	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 118	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 153	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 138	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 180	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB Total	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3521	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3521	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3521	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3521	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETSC 3521	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3521	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3521	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETSC 3521	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3521	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETSC 3521	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETSC 3521	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes

Method details are shown only for those determinands listed in Annex A of the MCERTS standard. Anything not included on this list falls outside the scope of MCERTS. No Recovery Factors are used in the determination of results. Results reported assume 100% recovery. Full method statements are available on request.

End of Report

DETS

Certificate of Analysis

Certificate Number 23-16046

Issued: 12-Jul-23

Client Earth Science Partnership
33 Cardiff Road
Taffs Well
Cardiff
CF15 7RB

Our Reference 23-16046

Client Reference 8511.02

Order No 11655

Contract Title Burnt mill , Academy

Description 3 Leachate samples.

Date Received 19-Jun-23

Date Started 05-Jul-23

Date Completed 12-Jul-23

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Kirk Bridgewood
General Manager

UKAS TESTING
2139

Summary of Chemical Analysis
Leachate Samples

Our Ref 23-16046
Client Ref 8511.02
Contract Title Burnt mill , Academy

			Lab No	2198114	2198115	2198116
			.Sample ID	WS206	WS207	WS208
			Depth	0.10	0.10	0.10
			Other ID			
			Sample Type	LEACHATE	LEACHATE	LEACHATE
			Sampling Date	14/06/2023	13/06/2023	13/06/2023
			Sampling Time	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**			
Preparation						
NRA Leachate Preparation	DETSC 1009*			Y	Y	Y
Phenols						
Phenol - Monohydric	DETSC 2130	100	ug/l	< 100	< 100	< 100

Key: * -not accredited. n/s -not supplied.

Information in Support of the Analytical Results

Our Ref 23-16046
Client Ref 8511.02
Contract Burnt mill , Academy

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2198114	WS206 0.10 LEACHATE	14/06/23	GJ 250ml x2, GV x2, PT 1L x2		
2198115	WS207 0.10 LEACHATE	13/06/23	GJ 250ml x2, GV x2, PT 1L x2		
2198116	WS208 0.10 LEACHATE	13/06/23	GJ 250ml x2, GV x2, PT 1L x2		

Key: G-Glass P-Plastic J-Jar V-Vial T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report

DETS

Certificate of Analysis

Certificate Number	23-13528	*Issued:*	16-Jun-23
Client	Earth Science Partnership 33 Cardiff Road Taffs Well Cardiff CF15 7RB		
Our Reference	23-13528		
Client Reference	8511		
Order No	11626		
Contract Title	BURNT MILL ACADEMY		
Description	2 Soil samples.		
Date Received	08-Jun-23		
Date Started	08-Jun-23		
Date Completed	16-Jun-23		
Test Procedures	Identified by prefix DETSn (details on request).		
Notes	Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.		

Approved By

Kirk Bridgewood
General Manager

ilac-MRA

UKAS
TESTING
2139

Summary of Asbestos Analysis
Soil Samples

Our Ref 23-13528
Client Ref 8511
Contract Title BURNT MILL ACADEMY

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2183398	BH201 0.50	SOIL	NAD	none	Vicky Convery
2183399	BH201 1.00	SOIL	NAD	none	Vicky Convery

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 23-13528
Client Ref 8511
Contract BURNT MILL ACADEMY

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2183398	BH201 0.50 SOIL	05/06/23	GJ 250ml, PT 1L		
2183399	BH201 1.00 SOIL	05/06/23	GJ 250ml, PT 1L		

Key: G-Glass P-Plastic J-Jar T-Tub

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Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report

GENERAL NOTES

1. Earth Science Partnership (ESP) believes that providing information about limitations is essential to help clients identify and therefore manage their risks. These risks can be mitigated through further investigation or research, but they cannot be eliminated. This report may not be used for any purpose other than that for which it was commissioned.

2. This report includes available factual data for the site as obtained only from the sources described in the text. The data are related to the site on the basis of the site location and boundary information provided by the client. The findings and opinions conveyed in this assessment are based on the information obtained from a variety of sources as detailed in the report, which ESP believe are reliable. Nevertheless, ESP cannot and does not guarantee the authenticity or reliability of the information it has relied on. It is possible that the assessment failed to indicate the existence of further sources of information on the site. Assuming such sources do exist, their information could not have been considered in the formulation of the opinions and findings in this report. It should be recognised that different conditions on site may have existed between and subsequent to the various map surveys.

3. In preparing this report it has been assumed that all past and present occupants of the site have provided all relevant and other information, especially relating to known or potential hazards. This report is not required to identify insufficiencies or mistakes in the information provided by the user/owner or from any other source, but has sought to compensate for these where obvious in the light of other information.

4. Reports are normally prepared and written in the context of a stated purpose, and should not, therefore be used in a different context. Furthermore, new information, improved practices and legislation may necessitate an alteration to the report in whole or in part after its submission.

5. The opinions presented in this report are based on the findings derived from a site inspection, investigations and a review of historical and other records. The report details any indicators that may suggest that hazardous substances exist at the site at levels likely to warrant mitigation. Not finding such indicators does not mean that hazardous substances do not exist at the site. The most recent site inspection was undertaken as detailed within the report. Circumstances on sites are subject to change and certain indicators of the presence of hazardous substances that may have been latent at the time of this inspection may subsequently have become observable.

6. The work carried out for the assessment can only investigate a small portion of the subsurface conditions. Certain indicators or evidence of hazardous substances may have been outside the limited portion of the subsurface investigated, latent at the time of the work or only partially intercepted by the works, and thus their full significance could not be appreciated. In this regard, groundwater levels are particularly susceptible to variation and it should be noted that groundwater levels are subject to diurnal, seasonal, and climatic changes and are solely dependent on the time the ground investigation was carried out and the weather before and during the investigation.

7. Accordingly, it is possible that the assessment failed to indicate the presence or significance of hazardous substances. Assuming such substances exist, their presence could not have been considered in the formulation of the report's findings and opinions. The conclusions resulting from this study and contained in this report are not necessarily indicative of future conditions or operating practices at or adjacent to the site. Where differing ground conditions or suspect materials are encountered during future site works, additional specialist advice should be sought to assess whether the new information will materially affect the recommendations currently provided herein and whether further consideration is required. Any limiting factors should be assessed by an appropriately qualified specialist.

8. The assessment was prepared for the sole internal use and reliance of the Client. The report shall not be relied upon by or transferred to other parties without the express written authorisation of the Earth Science Partnership. If an unauthorised party comes into possession of the report, they rely on it at their peril and the authors owe them no duty of care and skill.

9. The copyright in this report and other plans and documents prepared by the ESP is owned by them and no such report, plan or document may be reproduced, published or adapted without their consent. Complete copies of this report may, however, be made and distributed by the Client as an expedient in dealing with matters related to its commission.

GENERAL GEOTECHNICAL CONSTRUCTION ADVICE

1. The locations of all buried services should be accurately determined prior to detailed design in order that zones of influence, easements, diversions etc. can be considered. Care should be undertaken that any field drains encountered are carefully and satisfactorily blocked to prevent water seeping through the drains and into any excavations.

2. A site strip should be undertaken with all surface vegetation and topsoil either stockpiled for future re-use or disposed at a suitable licensed facility. In particular, all areas of Japanese Knotweed should be excavated and disposed in accordance with published guidelines.

3. All areas of hardstandings or old foundations, basements or other substructures should be broken out and either processed for re-use on site or disposed of at a suitable licensed landfill facility.

4. For all spread foundation options, formations should be cleaned, and subsequently inspected by a suitably qualified engineer prior to placing concrete. Should any soft, compressible or otherwise unsuitable materials be encountered they should be removed and replaced by lean mix concrete or suitable compacted granular material. A blinding layer of concrete should be placed after excavation and inspection in order to protect the formation against softening and disturbance.

5. Generally, all foundations should be placed wholly within the same material type, unless specific geotechnical inspection and assessment has been undertaken.

6. The location of the exploratory holes undertaken as part of this report should be accurately surveyed in order that their precise location is known and that appropriate precautions can be taken when building over or near to these locations.

7. Appropriate precautions should be adopted to prevent the disturbance of foundations or services by roots associated with trees or hedges where shallow foundations are considered within the influence zone of such trees and hedges. Any such roots should be removed from foundation excavations and the foundations located below such disturbance strata. Where the natural soil bounded by the foundations could increase in volume greater than that outside the foundations (e.g. where a shallow foundation is sited over a previous tree or severed major roots) a compressible material / loose backfill should be placed on the faces of the footing.

8. Where the distance from foundations to existing trees/hedgerows is less than twice the foundation depth, as determined by NHBC Practice Note 3 (1985), a compressible material or loose backfill shall be placed on the outside of the foundation to absorb potential forces.