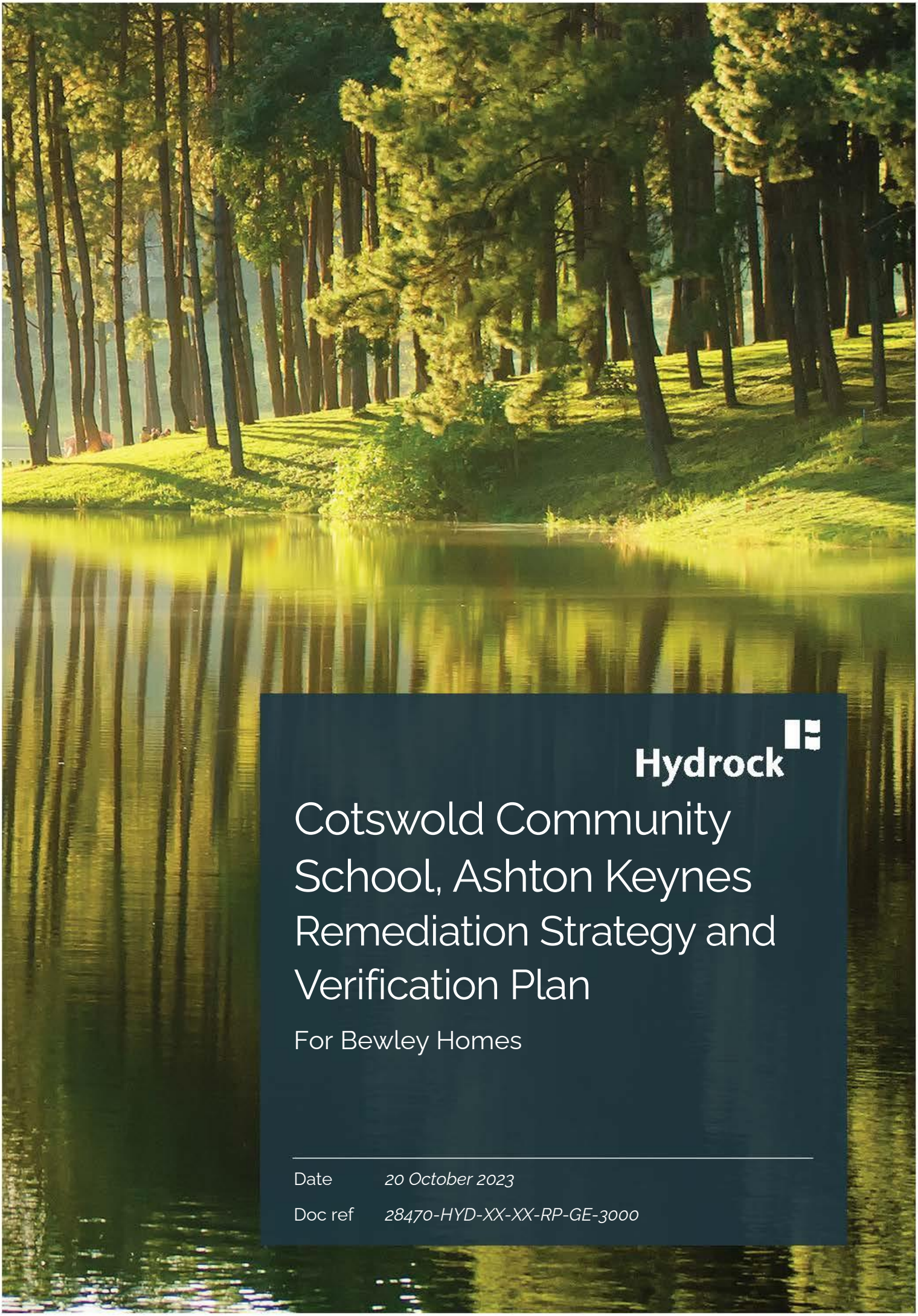

Hydrock

Cotswold Community School, Ashton Keynes Remediation Strategy and Verification Plan

For Bewley Homes

Date	*20 October 2023*
Doc ref	*28470-HYD-XX-XX-RP-GE-3000*

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1. INTRODUCTION

1.1 Terms of Reference

In August 2023, Hydrock Consultants Limited (Hydrock) received a commission from Bewley Homes (the Client) to conduct a Phase 2 supplementary ground investigation at the Cotswold Community School site in Ashton Keynes. This site is situated on the north side of Spine Road in Ashton Keynes, Swindon, Wiltshire, SN6 6QU. The scope of work also includes the development of a Remediation Strategy and Verification Plan (RSVP).

Hydrock is aware that the proposed development consists of 75 new dwellings. This development plan encompasses the replacement of 27 existing dwellings, the conversion of a listed building, and the construction of associated infrastructure, parking facilities, and soft landscaping. Additionally, it is understood that the existing open space area to the south of the site will be preserved as a key feature and central to the initial development. Furthermore, the tennis court area is slated for redevelopment into an orchard for the future residents.

A proposed engineering layout, Clarkebond Drawing (ref: D0226-CLK-XX-XX-DR-C-200-S2-T02, dated August 2023), is presented in Appendix A.

The investigation works have been undertaken in accordance with Hydrock's proposal referenced (28470-HYD-XX-XX-FP-GE-0001, dated 11 July 2023) and the Client's instructions to proceed dated 3 August 2023 and Purchase Order Number M-D0226.

1.2 Regulatory Approval

This RSVP is subject to the approval of the regulators as part of the planning application process and should to be considered as a live working document. It may need to be updated in agreement with the relevant regulatory bodies at any stage during development, dependent on the ground and other conditions encountered during construction.

1.3 Objectives

A number of ground investigations and risk assessments have been completed at the site, most notably by Hydrock in 2018 (Preliminary) and Hydock in 2023 (Comprehensive).

The Hydrock documents listed in Section 1.5 are considered to fulfil "Stage 1: Risk Assessment" of the LCRM process.

The Stage 1 works have identified a requirement to undertake remediation to mitigate the effects of the unacceptable contamination risks that have been identified.

The Stage 2 options appraisal has been undertaken and included within this RSVP.

The objective of this RSVP is to fulfil Stage 3: Remediation and Verification of LCRM, specifically the development of a remediation strategy (Step 1) to ensure that, on completion, the site can be shown to be suitable for its intended use, such that it will not pose an unacceptable contamination risk to the identified receptors.

This document ultimately seeks to agree the remediation concept for the proposed development with the relevant regulatory authorities. Therefore, allowing Contractor tender returns for the remedial works to be prepared with a greater level of confidence. Significant departures and/or variations to this strategy will require approval from the regulators.

It is recognised that prior to the implementation of this RSVP, the appointed Contractor will be required to prepare a Detailed Remediation Method Statement to address, in detail, the design and working methods by which the requirements of this RSVP will be implemented.

1.4 Scope

This RSVP details the strategy for remediation with respect to the approach, targets and verification of the remedial works required in order to mitigate future risks to human health and controlled waters in relation to the proposed redevelopment.

The remedial works will ensure that, upon completion, the ground conditions at the Site can be shown to be appropriate for its intended use and that it will not pose unacceptable contamination risks to identified receptors.

The scope of this document is as follows:

- A summary of the previous investigations;
- To highlight the identified risks;
- Presentation of the remedial measures recommended to mitigate the identified risks from contaminants at the site;
- Outline the materials management for reuse and import of materials; and
- To provide details of the appropriate verification procedures in order to demonstrate the successful implementation of the RSVP.

This RSVP provides an overview of the site development proposals and discusses remediation procedures. This document does not cover the geotechnical requirements for the development. Once the requirements for earthworks are know this document should be updated accordingly.

1.5 Sources of Information

The following reports have been completed in relation to the Site:

- Hydrock Consultants Ltd (Hydrock) September 2023. 'Cotswolds Community School, Ashton Keynes - Phase 1 review and Phase 2 Supplementary Ground Investigation Report', Ref 28470-HYD-XX-XX-GE-RP-1001. For Bewley Homes.
- Clarkebond Consultants February 2023. 'Preliminary Cut Fill Analysis Overview'. Ref D0226-CLK-XX-XX-DR-C-001-T01. For Bewley Homes.
- Clarkebond Consultants February 2023. 'Engineering layout'. Ref D0226-CLK-XX-XX-DR-C-200-T02. For Bewley Homes.
- Hydrock March 2023. 'Cotswolds Community School, Ashton Keynes - Site conditions Report' Ref 9616-HYD-XX-XX-GE-TN-001. For Bewley Homes.
- Hydrock Consultants Ltd (Hydrock) July 2018. 'Cotswolds Community School, Ashton Keynes - Desk Study and Preliminary Ground Investigation', Ref CCS-HYD-XX-GI-RP-G-1001.P1. For Acorn Property Group.

The Client has commissioned or obtained assignment of the above documents and Hydrock is entitled to full reliance upon their contents.

These reports should be read in conjunction with this document.

1.6 Limitations

This RSVP has been prepared by Hydrock on the basis of available information obtained during the study period. Although every reasonable effort has been made to gather all relevant information, all potential environmental constraints or liabilities associated with the site may not have been revealed.

The work has been carried out in general accordance with recognised best practice as detailed in guidance documents such as in the Land contamination risk management (LCRM) (EA, 2023), BS 5930:2015+A1:2020 and BS 10175:2011+A2:2017.

This RSVP has been prepared for the exclusive benefit of Bewley Homes and those parties designated by them for the purpose of providing information on the remediation and verification works to be undertaken during the enabling works and construction phases of the development. Third parties may require letters of reliance from Hydrock for the use of this report and clarification should be sought from Hydrock in this regard. This reports contents should only be used in that context. Furthermore, new information, changed practices or new legislation may necessitate revised interpretation of this report after the date of its submission.

Hydrock has used reasonable skill, care and diligence in the design of the remediation of the site. The inherent variation of ground conditions allows only definition of the actual conditions at the exploratory locations at the time of the investigation. At intermediate locations, conditions can only be inferred. Information provided by third parties has been used in good faith and is taken at face value. However, Hydrock cannot guarantee the accuracy or completeness of any information provided by others.

2. SITE DESCRIPTION AND GROUND MODEL

2.1 Context

This section presents a brief summary of the Conceptual Site Model (CSM) pertaining to the site, which has been developed from the ground investigations and assessment to date. The exploratory hole locations undertaken during each of the ground investigations are presented on the Exploratory Hole Location Plan (28470-HYD-XX-XX-DR-GE-1002, dated September 2023) in Appendix A.

It is assumed that the reader is familiar with the findings of all ground investigation undertaken at the site, which should be read in conjunction with this RSVP.

2.2 Site Location

The site is shown on the Site Location Plan (28470-HYD-XX-XX-DR-G-1000, dated September 2023) in Appendix A.

The site is located off of the north side of Spine Road, approximately 2km from the centre of Ashton Keynes and 7 km east of Cotswold Airport. The National Grid Reference for the centre of the site is SU 03444 95568.

2.3 Site description

The site covers approximately 16 ha and currently comprises a number of unoccupied former school buildings, four of which are grade listed. Other buildings/structures include a gymnasium, plant rooms, fuel tanks, swimming pool facility, derelict residential housing and agricultural barns and units. The south of the site is predominantly a grassed field, which is proposed to remain an area of Public Open Space (POS). A disused sewage treatment plant is located in the south-west corner of this grassed field, close to the southern boundary of the site.

The site setting is typically rural, with vegetation present on and around the site and the surrounding land predominantly comprising agricultural/pastoral fields and sand and gravel extraction quarries. Access to the site is from Spine Road. There is a private road network around the site. A drainage ditch and public footpath run along the main access road in an approximate north to south orientation and a second footpath truncates from the centre of the site and runs off-site to the north-east.

The site is bound to the north and north-west by active sand and gravel quarries. It is bound to the east by an area of scheduled monument which comprises agricultural fields. To the south, the site is bound by Spine Road and a restored flooded quarry. To the south-west, the site is bound by a restored quarry forming a lake.

Since the 2018 investigation significant quarrying has been and is currently being undertaken to the north-west, north and north-east around the site boundaries. Quarrying activity in to the south-west of the site has now ceased and the area has been remediated to form a lake.

At the time of writing, the quarrying activities to the north are understood to be at or nearing completion, and upon completion the quarry will also be restored to a lake.

Two stockpiles were noted to be present on site: one located in the east and one in the north of the site (see Hydrock drawing Ref: 09612-HYD-XX-GI-DR-G-1002). It is understood that these stockpiles comprise site-won topsoil.

The site is generally flat with topographic levels gently dipping towards the south. Ground levels in the north-east are approximately 93m Above Ordnance Datum (AOD) falling to approximately 89m AOD in the south.

2.4 Site History

Historically, the site has been occupied by agricultural farm buildings and agricultural fields. Further development took place between the 1940s and 1960s when the site was converted to a school, becoming known as 'Cotswold Approved School for Intermediate Boys'. The school closed in 2011. A historical gravel pit was present on site, but has been backfilled.

2.5 Geology

Geological sources indicate the site to be underlain by the Northmoor Sand and Gravel Member and, at depth, the Kellaways Clay Member. Made Ground is anticipated locally due to the current/former development of the site.

2.6 Unexploded Ordnance (UXO)

A non-specialist UXO assessment indicates low bomb risk. No further consideration of UXO is required.

2.7 Radon

The site is not in a Radon Affected Area. Hydrock note that the Radon risk maps have been updated in December 2022 and have confirmed based on up-to-date information that less than 1% of homes at or above the Action Level. Therefore, no protection measures are required.

2.8 Hydrology and Hydrogeology

The Northmoor Sand and Gravel Member is classified by the Environment Agency as a Secondary A aquifer. The underlying Kellaways Clay Member is an unproductive stratum. The site is within a Groundwater Source Protection Zone 2. (SPZ2).

There is a dry ditch (designated a watercourse by the Environment Agency) that bisects site running north to south.

The nearest surface water feature is a pond on site. There are a number of lakes relating to former gravel pits to the north, west and south of the site.

2.9 Flood risk

The site is partially in Flood Zone 2 and Zone 3. The location of the Flood Zone 3 region within the site is related to the presence of the watercourse that runs in an approximate north to south orientation through the site. The regions of Flood Zone 2 are in the south-west corner of the site and towards the north of the site along the path of the watercourse.

The Hydrock 2018 Report states that the environmental data indicates a risk of groundwater flooding of property below ground level in the central and north-eastern parts of the site. The remainder of the site is indicated to be at risk of groundwater flooding at the surface.

2.10 Ground Conditions

2.10.1 Hydrock Desk Study and Ground Investigation 2018

This investigation was undertaken as a preliminary investigation limited in locations and to undertake initial contaminated land assessment.

Ground conditions:

» Topsoil – to between 0.2m and 0.5m below ground level (bgl), comprising dark brown gravelly clay. Gravel sub-angular to sub-rounded fine to medium of limestone.

- Made Ground – to between 0.35 and 0.7m bgl (maximum proven), comprising soft brown and grey clay with frequent medium to coarse gravel and fragments of brick and concrete fragments and occasional brick and concrete cobbles.; over
- Shallow Cohesive Materials – to between 0.6m and 0.8m bgl, comprising soft brown sandy gravelly clay. Gravel sub-angular to sub-rounded fine to medium of limestone.
- Northmoor Sand and Gravel Member – to a maximum proven depth of 5.5mbgl, comprising medium dense [inferred] creamy brown sandy sub-angular to sub-rounded fine to coarse gravel of limestone. Sand is medium to coarse; over
- Kellaways Clay Member – to a maximum proven depth of 10.45mbgl, stiff blue grey slightly sandy clay with occasional fossil shell fragments.

2.10.2 *Hydrock Site Conditions Report 2023*

On the 23 March 2023, Hydrock undertook a walkover of the site in order to observe any changes to site conditions and inform the client of any new potential risks to the proposed development.

During the walkover all of the existing points of interest were checked and several new points were noted. This is summarised on the Site Walkover Plan (Ref: 09612-HYD-XX-XX-DR-G-1000, dated 27 March 2023). A summary of pertinent photographs is included in this RSVP.

The landfills recorded 210m to the east of site are now lakes; historical landfill records detail that there was waste deposited into the landfill in 1992.

2.10.3 *Hydrock Data Review and Ground Investigation 2023*

The purpose of this investigation was to provide a comprehensive investigation to inform geotechnical design parameters and assist in clearing planning conditions pertaining to contaminated land.

Ground conditions:

- Topsoil – between ground level (GL) and 0.35m bgl, comprising dark brown to brown slightly gravelly sandy silt and slightly sandy gravelly clay with varying fractions of sand and gravel; over
- Relict Topsoil – between 0.30 and 0.60m bgl, comprising firm to stiff dark brown slightly sandy to sandy slightly gravelly to gravelly silt; over
- Made Ground – between GL and 0.80m below ground level (bgl), comprising:
  - Very sandy to slightly sandy subangular fine to coarse gravel of limestone with rare subrounded cobbles of limestone. The sand fraction comprised fine to coarse sand.
  - Sandy slightly gravelly silt. The coarse fraction comprised fine to coarse sand and subangular fine to coarse gravel of limestone.
  - Gravelly silty and very gravelly fine to coarse sand. The gravel fraction comprising subangular to subrounded fine to coarse gravels of limestone, brick fragments and concrete; over
- 2 No. Topsoil Stockpiles (SP1 and SP2) comprising dark brown to brown slightly gravelly sandy silt and slightly sandy gravelly clay with varying fractions of sand and gravel.
- Made Ground Buried Construction Waste between GL and 0.30m below ground level (bgl). Anecdotal evidence during the site investigation indicated an area of buried construction waste in the paddocks in the north-east of the site behind the existing buildings. Upon investigation, a dark brown silty gravelly fine to coarse sand was encountered from the surface to a depth of 0.30m bgl. the gravel fraction comprised subangular to subrounded clasts of concrete, brick, slate, tile fragments, ceramic fragments and glass.

- Superficial Deposits – between 0.10m and 0.80m bgl, comprising soft to firm yellowish brown to brown sandy silt and slightly sandy clay with varying fractions of sand and gravel; over
- Northmoor Sand and Gravel Member – between 0.05m and 8.60m bgl, comprising soft to firm yellowish brown to brown sandy silt and slightly sandy clay with varying fractions of sand and gravel; over
- Kellaways Clay Member – between 1.50m and >10.00m bgl, comprising stiff to very stiff thinly laminated dark grey to grey slightly sandy clay with a varying silt content and occasional shell fragments.

2.11 Geo-environmental Conclusions

Geo-environmental considerations

Hydrock Site Conditions Report 2023

The following additional potential sources of contamination were identified during Hydrock's 2023 walkover survey of the site:

- Three fuel tanks;
- boiler house;
- extensive use of asbestos containing materials (ACM) in the agricultural buildings and sewage treatment works.

Human Health

Slightly elevated concentrations of benzo(a)pyrene were recorded within Made Ground encountered north of the centre of the site at TP04 (See Hydrock drawing ref: 28470-XX-XX-DR-GE-1008 for location). However, not considered an unacceptable risk (subject to regulatory approval).

Pervasive levels of lead, PAHs and asbestos fibres were recorded within the Made Ground and Made Ground Buried Construction Waste soils. The Made Ground and Made Ground Buried Construction Waste were not encountered across the whole of the site and as such the risks are localised.

Elevated levels of metals and asbestos fibres were also detected within the Made Ground Buried Construction Waste soils. These soils are localised to a paddock in the north-west of the site (See drawing 28470-HYD-XX-XX-DR-GE-1003).

Elevated concentrations of faecal coliforms (E.coli) were detected within the Northmoor Sand and Gravel Member adjacent to the disused sewage treatment plant (STP). Testing of control samples taken within the natural soils in the area of retained open space revealed no concentrations of faecal coliforms to be present above the limit of laboratory detection. The STP and soils beneath its footprint are therefore considered to pose a risk.

Furthermore, suspected asbestos containing materials were noted as part of the reduced level dig by the archaeological contractors. Visible suspected fragments were also noted during Hydrock monitoring works.

Plant Growth

Minor boron exceedance within Topsoil at TP01 in the east of the site. Not considered an unacceptable risk (Hydrock 2018).

Pervasive levels of metals within Made Ground and Made Ground Buried Construction Waste soils and slightly elevated Zinc in Stockpile 2. The mitigation requirements for the protection of human health will also serve to remove the risk to plant life (Hydrock Data Review and Ground Investigation 2023).

Controlled Waters

The site lies within a Groundwater Source Protection Zone 2 (SPZ2).

There is a dry ditch (designated as a watercourse by the Environment Agency) that runs north to south through the site. The nearest surface water feature is a pond it the north-west of the site. There are also a number of lakes which are restored gravel quarries adjacent to the north, west and south of the site.

The underlying Northmoor Sand and Gravel Member (NMS) is classified as a Secondary A aquifer. The Kellaways Clay Member is classified as an unproductive stratum.

The risk to groundwater and surface water was determined by testing 5 no. groundwater samples from across the site. Aluminium and copper concentrations were found to be in excess of the UK Drinking Water Standards (DWS) and Environmental Quality Standards (EQS) targets. Due to the wider water body (Cerney Wick Brook (source to Thames) Water Body) being noted to have high metals, and Made Ground only being encountered locally across the site (i.e. not the source of the elevated aluminium and copper), Hydrock consider that the risk to controlled waters from the site is low and therefore no further assessment was required (Hydrock Data Review and Ground Investigation 2023).

Radon

The site is not in a Radon Affected Area. Hydrock note that the Radon risk maps have been updated in December 2022 and have confirmed based on up-to-date information that less than 1% of homes at or above the Action Level. Therefore, no protection measures are required. (Hydrock 2018 and Hydrock Data Review and Ground Investigation 2023)

Water Supply Pipes

The site is partially brownfield and the investigation did not detect organic contamination in exceedance of the threshold values. Hydrock believes standard pipework is suitable for the site. However, confirmation should be sought from the water supply company at the earliest opportunity. (Hydrock 2018 & Hydrock Data Review and Ground Investigation 2023).

Gas Protection

Gas monitoring was undertaken on 3 occasions, including during periods of falling and low atmospheric pressure. Typical steady flow rate was recorded as <1 l/hr. The typical methane concentration was less than 1% and the typical carbon dioxide concentration was less than 5%. The Gas Screening Values (GSV) for methane and carbon dioxide were <0.07 l/hr. It is concluded that .CS1 Conditions apply, i.e., no protection measures required.

Remediation

Remediation measures are required to break contact with contaminated Made Ground, Made Ground Buried Construction Waste Soils and possible localised faecal coliform contamination within the Northmoor Sand and Gravel Member.

2.12 Conceptual Site Model

The full scope and detailed findings of the risk assessments completed are presented in the Hydrock documents listed in Section 1.5. Based on the risk evaluation process, the pollutant linkages that require mitigation to ensure the site is suitable for its intended use are summarised in Table 2.1 below.

Table 2.1: Residual risk following risk evaluation

Contaminant Linkage				Comments	
Pollutant Linkage	Sources	Pathways	Receptors	General	Mitigation
PL 1	Pervasive levels of Metals in Made Ground Buried Construction Waste and, metals and PAH in Made Ground. (Zone1, Zone 2 and Zone 3)	Ingestion, inhalation or direct contact.	Human health.	Significant exceedance of the GAC.	Mitigation required in the form of an engineered cover system or disposal of impacted soils in proposed private garden areas or areas of public open space.
PL 2	Possible ACM (visibly identified) and asbestos fibres in Made Ground Soils. (Zone 2, Zone 3, Zone 4 and Zone 6)	Inhalation of fugitive dust	Human health.	Possible ACM (visibly identified) and asbestos fibres.	Mitigation required in the form of an engineered cover system or disposal of impacted soils in proposed private garden areas or areas of public open space.
PL 3	Asbestos fibres from insulation or asbestos-containing materials in the buildings.	Inhalation of fugitive dust.	Human health (site neighbours).	Asbestos noted in old buildings.	Removal will be required. However, removal under controlled conditions should limit off-site emissions.

3. RECOMMENDED FURTHER WORKS.

Following the ground investigation works undertaken to date, the following further works are recommended prior to the implementation of the remedial strategy (Section 4):

- The location, extent, depth and composition of the historical back-filled gravel pit in the west of the site needs to be ascertained to deduce whether this poses a risk to human health (via contaminated soils or ground gases). During the Hydrock 2023 ground investigation the gravel pit was unable to be located and is likely to be sited east of an existing structure (Zone 6 on Hydrock drawing Ref.28470-HYD-XX-XX-DR-GE-1008) Post-demolition/during the site topsoil strip, a watching brief should be held to ascertain the location and extent of the historical gravel pit.
- The extent of the Made Ground Buried Construction Waste in the north of the site (Zone 3) is unknown and so further delineation of this is recommended. This should be undertaken during the post-demolition enabling works topsoil strip, via implementation of a watching brief.
- Made Ground was recorded as being present between 0.20m and 0.72m bgl in the centre of the site where the listed houses are to be retained (Zone 8). The proposed cut and fill model shows that this area will not be subject to earthworks. Due to the testing of one sample of Made Ground from this area, further testing of the soils is recommended to ascertain whether or not the soils are suitable for residential and Public Open Space use. If further testing is not conducted then a cover system will be required to be put into place as detailed in Section 5.7.

This RSVP should be updated following the completion of these works.

4. REMEDIATION STRATEGY

4.1 Introduction

The RSVP detailed in the following sections is based on the Stage 2: Options Appraisal and Stage 3: Remediation and Verification of LCRM, specifically the development of a remediation strategy (Step 1), and is generally structured as follows:

- Setting out the remediation objectives.
- Summarising the options appraisal process (Stage 2: Options Appraisal of LCRM).
- Summarising the key remediation criteria, including the derivation of Remedial Target Values.
- Summarising the remediation stages and their implementation.
- Summarising the regulatory controls that need to be in place.
- Detailing how the remediation will be verified.
- Contingency planning and unexpected contamination.

It is recognised that prior to the implementation of this RSVP, the appointed Contractor will be required to prepare a Detailed Remediation Method Statement to address, in detail, the design and working methods by which the requirements of this strategy will be implemented.

4.2 Remediation objectives

The overall objective of the remediation is to ensure that, on completion, the site can be shown to be suitable for its intended use, such that it will not pose an unacceptable contamination risk to the identified receptors, and will not put undue constraint on the development design and implementation.

The specific remediation objectives comprise:

- Break the active pollutant linkages between the contamination in soils and identified receptors (e.g., future site users, neighbours and plant life).

4.3 Selection of the preferred remediation option(s)

A Remediation Options Appraisal has been undertaken in general accordance with Land contamination risk management (LCRM) (Environment Agency, 2021). It is designed to inform the development of the remediation strategy for the site by identifying an appropriate remediation option (or combination of options) that is capable of remedying the relevant contaminant linkages associated with the site. The Remediation Options Appraisal is presented in Appendix C.

The preferred option is considered to be:

a. Removal of contamination source (Made Ground, Made Ground Buried Construction Waste or former Sewage Treatment Works and impacted soils); or
b. The installation of a clean cover system in proposed soft landscaping areas (private gardens and public open space).

During the post-demolition site enabling works, a site wide 300mm topsoil strip will be undertaken. In many cases where Made Ground has been encountered this strip will remove the sources of Made Ground and Made Ground Buried Construction Waste.

4.4 Remediation criteria

Remediation criteria are required to demonstrate and verify the performance of the remediation. The site-specific import and reuse criteria as well as the considerations that have been used during their derivation, are detailed in Appendix B.

4.4.1 Excavation and disposal

Based on the thickness of Made Ground and Made Ground Buried Construction Waste encountered and the proposed Finished Floor Levels, the areas requiring the excavation and disposal of these soils are shown on Hydrock Remediation Zonation Plan Drawing Ref: 28470-HYD-XX-XX-DR-GE-1008.

The zones shown on 28470-HYD-XX-XX-DR-GE-1008 are subject to the proposed Finished Floor Levels and any changes in the FFL may impact the preferred remediation strategy allocated to each zone.

4.4.2 Clean cover systems

The following clean cover systems are proposed:

1. Building footprints as per the structural design (by others): the floor slab will break the linkage between the contaminated soils and potential receptors.
2. Areas of hardstanding (roads, pavements, etc.) as per the design (by others): the hardstanding will break the linkage between the contaminated soils and potential receptors.
3. Soft landscaped areas in areas of public open space and private gardens (450mm and 600mm respectively) (as shown on 28470-HYD-XX-XX-DR-GE-1008), where end users may come into contact with Made Ground and Made Ground Buried Construction Waste soils, clean cover system to reach final ground level with clean soils complying with the import criteria presented in Appendix B.

A clean cover system is required in soft landscaping areas to separate future site users from the existing contaminants in the Made Ground soils (e.g., metals and asbestos).

With reference to BRE (2004) Cover Systems for Land Regeneration: Thickness of Cover Systems for Contaminated Land (Ref: BR465), the installation of a clean cover system is required and is proposed to comprise (in order of placement):

- A suitable basal geo-fabric separation layer; and
- A combined thickness of topsoil and subsoil, comprising:
- A total combined thickness of 600mm areas of private gardens.
- A total combined thickness of 450mm in areas of public open space would be sufficient, subject to approval from the Environmental Health Officer.

For areas of proposed trees, the depth of growing medium will be deeper and tree pits will need to be excavated as per the requirements of an arboriculturist and/or landscape architect.

Where existing trees are to be retained (e.g., trees under Tree Protection Order, or retained in landscaping schedule) provisions for the clean cover system should be agreed with an arboriculturist and/or landscape architect. Proposals include the placement of a geogrid on the existing soils in the root protection area and capped with 100mm of clean topsoil. Where soft landscaped areas are adjacent, it is proposed that the geogrid should overlap with the geotextile at the base of the cover system by a minimum of 2 m.

Where areas of Made Ground have been fully excavated during the cut activities and to depths where the natural Northmoor Sand and Gravel Member has been exposed, no remediation measures would be considered necessary. However, a suitable growing medium should still be placed in garden areas.

Other considerations for clean cover systems

To protect future maintenance workers, the use of clean service corridors will be required for underground services that are to be excavated beneath the formation level (in effect below the enabling works level), and within any remaining areas of Made Ground (Zone 2).

If services are to be lain within the overlying fill or within the Remediation Zones 1, 2 and 5 where excavation and disposal is required, then clean services corridors do not need to be considered as the sources of contamination will have been removed.

4.4.3 Recovery of demolition materials

During the removal of relic underground structures, the recovery of suitable material for crushing/reuse should be undertaken in accordance with the EA/WRAP Quality Protocol for recycled aggregates and/or the site-specific Earthworks Specification to ensure potentially reusable materials are not unnecessarily classified as waste and its potential for reuse constrained. The need for recycled aggregate recovery and reuse will be dependent on the cut and fill earthworks balance for the proposed development.

4.4.4 Decommissioning and removal of the Sewage Treatment Plant

Decommissioning of the disused sewage treatment plant (STP), including demolition and removal of the structure, filter material and any connecting infrastructure should be undertaken by a suitably qualified and experienced Contractor.

Any excavated natural arisings (Northmoor Sand and Gravel Member) from the decommissioning of the STP can be reused within the same excavation but reuse of this material should be limited to only within the current footprint of the STP and not elsewhere across the site.

4.4.5 Earthworks and Reinstatement of Excavations

The reinstatement of excavations (with either treated site-won materials, or imported soils/aggregates) is to be undertaken in accordance with an Earthworks Specification (which should be produced under a separate cover) that details the methodology for placement of fill and should also detail associated geotechnical testing and earthworks specific verification requirements.

The Earthworks Specification should be based on the Specification for Highway Works Series 600 (Earthworks) tables to ensure that the construction works Contractor inherits a subgrade suitable for the proposed development.

4.4.6 Asbestos

Three detections of chrysotile asbestos have been recorded in three locations in small quantities (Zone 2 and Zone 3) within the Made Ground soils. In addition, two possible Asbestos Containing Materials (ACM) were noted to be present in Made Ground soils during archaeological excavations. ACM was also noted to be present at the disused sewage treatment plant. Laboratory quantification recorded the asbestos fibres to be at or below the limit of laboratory detection (<0.001%).

Hydrock consider it plausible that fibres could be encountered at any time during construction works, which could impact safe operating procedures, construction timescales and costs for off-site disposal.

The enabling works contractor should have trained personnel who are 'asbestos aware' and be able to discern when works are non-licensable/licensable/notifiable. Informing the requirement for a licensed Contractor under controlled conditions in line with the Control of Asbestos Regulations (2012).

5. REMEDIATION STRATEGY IMPLEMENTATION

5.1 Enabling Works: Site Clearance

The enabling works Contractor is to undertake the clearance of vegetation as well as demolish, break up and remove all remaining above and below ground structures. These may include, but are not limited to slabs, drains, hardstanding, foundations, relic structures and service ducts.

Where contamination is encountered, but not limited to, visual ACM above occasional/random fragments or significant petroleum hydrocarbon contamination not previously encountered during investigation, works should stop within this part of the site and the guidance provided in Section 6 is to be followed.

5.2 Reuse of Site Won Materials

The site-won materials can be broken down into the main types as detailed in Section 2 (i.e., Made Ground, Made Ground Buried Construction Waste, Topsoil, Relict Topsoil, Superficial Deposits, The Northmoor Sand and Gravel Member and the Kellaways Clay Member).The re-use of site-won Made Ground, and the import of clean materials (if needed) will require the preparation and implementation of a Materials Management Plan or another suitable permitted route or exemption.

Table 2: Re-use of site-won materials

Material	Details
Made Ground	**Unsuitable for re-use** (due to elevated metals and PAH) other than below areas of proposed hardstanding, if proven to be geotechnically suitable.
Made Ground Buried Construction Waste	**Unsuitable for re-use** (due to elevated metals and presence of asbestos fibres) other than below areas of proposed hardstanding, if proven to be geotechnically suitable.
Stockpiles (SP1 & SP2)	**Suitable for re-use as topsoil**
Topsoil	**Suitable for re-use as topsoil**
Relict Topsoil	**Suitable for re-use as topsoil**
Superficial Deposits	**Suitable for re-use as general fill/subsoil**
Northmoor Sand and Gravel Member (NMS)	**Suitable for re-use as general or structural fill**
NMS in vicinity of disused Sewage treatment plant	**Suitable for re-use only within the footprint of the former treatment plant and settlement ponds**
Kellaways Clay Member	**Suitable for re-use as general fill**

The primary concern with the reuse of site-won Made Ground is the presence of metals, PAH and asbestos fibres potentially harmful to human health.

This material can be reused on site provided that it is geotechnically suitable and it is placed beneath hardstanding or a clean cover system. It is not recommended that Made Ground is placed in proposed areas of soft landscaping.

Beyond this, there is also the potential to encounter unexpected finds, which may determine that the material is not suitable for reuse. These are dealt with separately in Section 7.

5.3 Off-site Disposal of Unsuitable Materials

The works should seek to reduce and control impacts upon the natural environment, therefore, the Contractor shall seek to reuse materials within the works, where appropriate.

However, where identified, any surplus (i.e., soils which cannot be reused on site due to volumes), or unsuitable soils (i.e., soils which cannot be treated and/or reused in an appropriate location), or are geotechnically unsuitable for use in the earthworks, shall be disposed of off-site by the Contractor.

If a material does not comply with the relevant criteria for its intended use (e.g., reinstatement of excavations in line with RTVs, clean cover system, etc.), then, by definition, the material is not suitable for use.

All waste materials generated during the works shall be dealt with in full compliance with the statutory Duty of Care as defined by the Environmental Protection Act (1990) and all subsequent amendments. The Contractor shall be the waste producer and is responsible for the production of all documentation required under relevant legislation, ensuring this is kept up to date and is available on-site for inspection.

5.4 Control of Asbestos

Three detections of asbestos (chrysotile) have been recorded in three locations (Zone 2 and Zone 3) within the Made Ground soils and visible asbestos containing materials (ACM) were observed to be present at the disused sewage treatment plant.

Hydrock consider it plausible that fibres could be encountered at any time during construction works within areas where Made Ground has been encountered (Zones 1-5 and 7), which could impact safe operating procedures, construction timescales and costs for off-site disposal.

All site staff are to be made aware that there is a possibility of encountering loose asbestos fibres within the Made Ground anywhere on the site (Zones 1-5 & 7), and at any stage of the development. It is advised that the Contractor should supply suitable and sufficient 'Asbestos Awareness' training (specific to asbestos in soils) to all site staff who are likely to be in contact with Made Ground at the site.

When asbestos is encountered or suspected, the enabling works Contractor must undertake a suitable and sufficient Risk Assessment in accordance with Regulation 6 of the Control of Asbestos Regulations 2012 (CAR 2012). The results of the assessment should be used to compile a methodology in accordance with Regulation 7 of CAR 2012, which limits potential exposure and spread of asbestos fibre. Appropriate training should be provided to all site staff identified within the risk assessment as having the potential to be exposed or encounter asbestos during their work in accordance with Regulation 10 of CAR 2012.

Any processing of material to remove visible asbestos fragments should be completed in accordance with CAR 2012 and CARSOIL 2016. This should include (but not be limited to):

- Method statements and risk assessments for the process and for the classification of the works (currently anticipated to be Notifiable non-licenced work but to be determined by the contractor):
- Control of the works including dust suppression and general management.
- Protection of workers.
- Protection of the public.

- Protection of future site users.
- Stockpiling, storing and disposal of material.
- Monitoring the works to prove no risk has been generated.
- Processes for verification of the works such as:
- Processing method (hand pick on belt, from excavator), volumetric output and a suitable number of pickers to ensure the process will work based on the number of passes expected.
- Frequency of verification sampling and laboratory analysis (at UKAS/ MCERTS accredited laboratory) to show the process is compliant.
- Record keeping of the works including waste transfer certificates and other paperwork to allow verification of the works.
- Verification of the works:
- Providing a report outlining the works completed and evidence to corroborate its effectiveness.

Any handpicking needs to be undertaken by suitably trained and qualified staff employed by competent Contractors in accordance with HSE guidance and an Environmental Permit. It should be noted that any processing of material (such as hand picking of asbestos) is on a 'as far as is reasonably practicable' basis. As such, any material that has been handpicked (with asbestos removed) should still only be reused with caution in suitable areas below hardstanding and not at the surface or within service trenches where the risk from future human contact is higher.

5.5 Excavation and Disposal of Made Ground Buried Construction Waste and Made Ground

In the west of the site (Zone 1), Made Ground was encountered from ground level to depths of between 0.12m and 0.40m bgl. based on the proposed 300mm topsoil strip during the enabling works, it is likely that the Made Ground will be removed. Where Made Ground is slightly deeper, for example 0.40m, further excavation should be undertaken until the natural Northmoor Sand and Gravel Member is exposed.

It should be noted that within Zone 1 are situated several extant agricultural buildings. Investigation recorded concrete slabs ranging between 0.12m and 0.50m thick. These will be removed during the enabling works. It is envisaged that the structures are founded onto the Northmoor Sand and Gravel Member, and removal of Made Ground below the footprint of each structure should be undertaken until the Northmoor Sand and Gravel Member is exposed.

The Made Ground Buried Construction Waste and Made Ground soils that were encountered in the paddock in the north-east of the site (Zone 3 and Zone 5 on Hydrock Drawing Ref: 28470-HYD-XX-XX-DR-G-1008-S2-P1) had a proven thickness of 0.30m and 0.40m bgl. The proposed Earthworks Cut and Fill Drawing Ref: D0226-CLK-XX-XX-DR-C-001-T01 specifies a 300mm topsoil strip with a further 900mm minimum cut for foundations during the enabling works.

To remove the impacted soils of the Made Ground Buried Construction Waste and Made Ground from these areas, excavation should be taken down to the base of the Made Ground soils until the natural Northmoor Sand and Gravel Member is encountered.

Due to the unknown extent of the impacted soils, the excavation works should continue until the full extent of the impacted soils has been delineated and removed, and the surrounding soils that are to be left insitu (both the excavation sides and bases) are to be visually inspected to confirm that the natural soils (Northmoor Sand and Gravel Member) are encountered.

Where complete excavation and removal of impacted soils is implemented, the site should be brought to finished floor levels using materials classified as suitable in Section 5.2, including the placement of a suitable growing medium for areas of gardens and open space.

Verification should be undertaken by an experienced Geo-Environmental Engineer (working on behalf of the Contractor or the Client) and in accordance Section 6.4 and results must meet the Soil Acceptance Criteria as detailed in Appendix B.

5.6 Demolition of the disused sewage treatment plant and reuse of surrounding soils

Demolition of the disused sewage treatment plant (STP) forms part of the proposed development (Zone 4 on Hydrock Drawing Ref 28470-HYD-XX-XX-DR-GE-1008).

Demolition should be undertaken by a competent contractor and should include removal of all foundations and infrastructure, including filter materials associated with the STP. Asbestos containing materials in the form of lagging were noted to be present and should be removed by a qualified and competent contractor as set out in Section 5.4.

The reuse of materials gained via the demolition and excavation of the STP is considered to be acceptable only within the immediate vicinity of the disused STP, for example bringing the settlement ponds up to 450mm below final proposed levels.

Material derived from this area is chemically clean, however, due to the elevated count of faecal coliforms, it should not be reused across the site.

Due to the presence of ACM within the STP, and the potential for further ACM to be within the surrounding soils, as well as the elevated faecal coliform count, the installation of a clean cover system (as detailed in Section 5.7) of 450mm thickness is required to be placed over the footprint of the demolished STP.

5.7 Installation of Clean Cover System

Where site levels are reduced to the proposed formation levels, Made Ground is able to remain *in situ* in certain circumstances. These circumstances would be:

- Where hardstanding is present, as this will sever the pathway from the Made Ground to future users at the site. However, the thickness of hardstanding (concrete, asphaltic material (i.e., not loose gravel or shingle at surface) and underlying sub base should be of the required thickness for the construction build-up detailed in an agreed Specification.
- Where beneath areas of soft landscaping in public open space and private gardens, a clean cover system of 600mm (combined topsoil / subsoil) is required, comprising:
  - At least 150mm of topsoil.
  - A maximum of 450mm of subsoil.
  - A suitable basal geo-fabric separation layer.

The clean cover system installation should be undertaken in the following steps:

1. Check the elevation of the formation level to ensure that it is at the correct level and allows for the placement of the full required thickness of the clean cover system.
2. Install the basal geo-fabric separation layer.
3. Place the required thickness of topsoil and subsoil as detailed above for either private gardens or public open space (of which a minimum, 150mm is to be topsoil).

Made Ground was encountered between 0.30m and 0.80m bgl in the centre of the site (Zone 2). After the enabling works topsoil strip of 300mm there will still be up to 500mm of Made Ground left in situ. Current proposed Finished Floor Levels (FFL) show that with the proposed cut and fill model, the remaining Made Ground will be less than 600mm below the garden and POS surfaces.

Therefore, a requirement to excavate to 600mm below the FFL and placement of a clean cover system as detailed above for areas of soft landscaping and POS is needed.

Made Ground has been recorded ranging in thickness of between 0.20m and 0.72m bgl in the area of listed buildings and existing gardens (Zone 8 on Hydrock Drawing 28470-HYD-XX-XX-DR-GE-1008) that are to be retained. The proposed cut and fill model shows that this area will not be subject to earthworks. Due to the testing of one sample of Made Ground from this area, further testing of the soils is recommended to ascertain whether or not the soils are suitable for residential and Public Open Space use. If further testing is not conducted then a cover system will be required to be put into place as detailed.

Localised Made Ground was recorded to a depth of 0.70m bgl adjacent to the north end of the proposed Plot 7. There is insufficient data to determine the extent of the Made Ground, however, it is thought to be localised due to the large archaeological excavations encountering the natural Northmoor Sand and Gravel Member in the rear of the existing property gardens.

Testing of the Made Ground in Zone 7 recorded no exceedances of the Residential with home-grown produce Generic Assessment Criteria. The cut and fill plan indicates that FFL will be approximately 1m above the present ground level (level taken from BH102 at 88.85m AOD), and this along with the 300mm cut during the enabling works will lead to an effective cover system, breaking the source-pathway-receptor linkage. Any excavated Made Ground should be separated for off-site disposal.

For areas of proposed trees, the depth of growing medium will be deeper and tree pits will need to be excavated as per the requirements of an arboriculturist and / or landscape architect.

Where existing trees are to be retained, provisions for the clean cover system should be agreed with an arboriculturist / landscape architect.

Verification of thickness should be completed in any such area. In areas of hardstanding a pre-construction and post-construction isopachyte will be sufficient. Where soft landscaping occurs, verification of the thickness of clean cover system places is to be undertaken as outline in Section 8.

Chemical testing of imported material as part of the cover system is required to ensure that the clean cover is suitable for use in accordance with the Soil Acceptance Criteria set out in Appendix B. The topsoil should also comply with any criteria stipulated by a horticulturalist or other suitable expert required for plants.

The clean cover system shall give consideration to its permeability and the consequential impact upon surface runoff and ground gas regimes. This principally relates to composition (granular, cohesive or composite). The capping material will generally satisfy the requirements of NHBC Standards Chapter 4.1 and 10.2.

6. MANAGEMENT OF MATERIALS

6.1 Materials Management Strategy

Re-use of excavated materials is known to form part of the proposed development. At the time of writing, it is unknown whether products of demolition are proposed as part of the development. Offsite disposal may be required if any grossly contaminated or unexpected materials are identified during groundworks.

The reuse and import of materials on site should be managed and reused in accordance with a Materials Management Plan, prepared in accordance with 'The Definition of Waste: Development Industry Code of Practice', Version 2 (CL:AIRE), known as the DoWCoP, or another suitable permitted route or exemption.

The Materials Management Plan will need to be signed-off and declared with CL:AIRE by a Qualified Person (QP).

6.2 Sourcing of Imported Materials

There may be a requirement to import soils to the site in order for design levels to be achieved and also for the installation of the clean cover system for areas of soft landscaping.

Every effort should be made to ensure soils to be imported are accompanied by proof of provenance to demonstrate that there is no potential for the soils to have been contaminated as a result of past land uses or in the process of their creation if a manufactured material. This information should be obtained in advance of the chemical tests being commissioned.

The following protocol applies to all imported soils.

- The soil is from an identified site, which is clean and has no history of potentially contaminative uses.
- A map and site plan showing the location of the source site, with an approximate grid reference, must be provided to the relevant Local Authority. When checking the source site, accurate details of where on site the soil was derived are required, not just where they were stockpiled or screened.
- Written confirmation from the relevant Local Authority confirming that the source site has no known history of contamination.

6.3 Chemical Properties of Imported Materials

In the case of imported soil, the Soil Acceptance Criteria (SAC) presented in Appendix B shall be used. In this case, dependent on the location of the landscaped area, the following CLEA land use scenario designation should be adopted:

- Residential with plant uptake (applicable for all areas of residential garden construction).
- Public open Space (applicable for the areas of the proposed development that are to remain undeveloped).

If the proposed development changes, it may be necessary to reassess the soil acceptance criteria.

Soil organic matter is also required in order to apply the correct SAC, where applicable. In the absence of a soil organic matter value, a worst-case value of 1% should be assumed.

6.4 Physical Requirements for Imported Materials

Imported soils should be free of contamination, asbestos (non-detect), metal, plastic, wood, glass, tarmac, brick, paper, concrete or other potentially hazardous foreign material which could cause injury. In addition, all materials must be free from aggressive / invasive weeds (especially Japanese Knotweed and Giant Hogweed) and bulk vegetative growth, in order to ensure negligible risk of subsequent weed problems.

Furthermore, there shall be no visual contamination (oil staining, asphalt, etc.) as confirmed by the Contractor. Hydrock Consultants will be undertaking a watching brief to audit the absence of contamination.

6.5 Stockpiling of Materials

Any material generated from construction activities that is proposed for reuse shall be stockpiled separately by material type. Similarly, any materials being imported to site, for example clean topsoil or construction aggregates, or material awaiting disposal off site, shall be stockpiled separately. Stockpile management shall be undertaken in accordance with the following protocol:

- Separate stockpiles shall be created for each material type, whether site-won or imported materials, and shall be appropriately labelled / identified on site.
- Stockpiles shall not be cross-contaminated, double handling shall be avoided and stockpiles shall remain quarantined until ready for use.
- Topsoil shall not be placed during or after heavy or prolonged periods of rainfall.
- For imported materials, copies of the carrier's Transfer Notes shall be retained on site and made available for inspection by the supervising consultant and for inclusion within the Verification Report.
- A record of all imported materials (i.e., deliveries) shall be maintained by the Site Manager recording details of material type, source of the imported material and Transfer Note reference numbers. In addition, the Site Manager shall record the status of each stockpile, in terms of material type, source site, volume and intended use on site.
- The Contractor shall identify all stockpiles with clear signage.
- Stockpiles of significantly contaminated materials (either generated during remediation of previously identified impacts or due to encountering unexpected contamination) are to be placed in lined above-ground treatment areas comprised of impermeable membranes to prevent leaching and run off of the potential contaminant(s).

6.6 Disposal of Construction Arisings

The Waste Framework Directive (WFD) (2009/98/EC) defines waste as '*any substance which the holder discards or intends to discard.*' In a geo-environmental context, the waste is most often 'soil' and the two main scenarios are off-site disposal of the material as a waste and/or reuse of the material on site. For cost and sustainability reasons, reuse is preferred to off-site disposal.

All waste classifications outlined below assume the removal of visible asbestos – visible asbestos will generally result in materials requiring disposal as 'hazardous material'.

Based on the site history and if suitable segregation of different types of waste is put in place, for soils to be disposed of, it is considered that:

- The natural uncontaminated subsoils and rock materials (Superficial Deposits, Kellaways Clay Member and Northmoor Sand and Gravel Member) are likely to be classified as 'Non-Hazardous' waste for disposal at an inert landfill.
- The 'General' Made Ground is likely to be classified as Non-Hazardous' waste. should be able to be disposed of at an inert landfill.

- The Made Ground Buried Construction Waste is likely to be classified as 'Hazardous' waste, to be disposed of at a hazardous landfill.
- Any soils containing > 0.1% asbestos or visible asbestos containing materials would be considered as hazardous.

It should be noted that:

- The above preliminary assessment has been made on the basis of the soils tested as part of the ground investigations. Prior to disposal, the characteristics of the actual soils to be disposed of will need testing and classification in consultation with landfill sites and waste disposal Contractors. The receiving landfill will make the final decision on the classification and acceptability of the waste.
- Non-hazardous soils require pre-treatment (separation, sorting and screening) prior to disposal.
- The costs for disposal of non-hazardous and hazardous soils are significant compared to disposal of inert material.

7. PROTOCOL IF UNEXPECTED CONTAMINATION IS ENCOUNTERED

As with any site, potential exists for encountering materials that were not recorded during the original ground investigations.

Should any material, suspected of being contaminated (in addition to the expected contamination described in this document), is unexpectedly encountered during the development of any Phase of the site (by visual or olfactory means), then the following protocol should be implemented:

- Site activities in the immediate vicinity shall cease and an independent Geo-Environmental Engineer shall be contacted and provided with a summary of the observations made.
- The Geo-Environmental Engineer shall attend site and undertake appropriate investigations to establish the extent of the materials in question. Depending upon the extent and volume of material present, the materials may be removed and temporarily stockpiled (on heavy grade polythene sheeting to prevent leaching/runoff) to enable construction activities to continue.
- The Geo-Environmental Engineer shall identify an appropriate suite of chemical testing and agree this with the relevant regulator(s).
- The resultant chemical analyses shall be compared with the appropriate trigger concentrations for the land use in question. The findings and recommendations shall be discussed and agreed with the relevant regulator(s).
- Updates will be made to this RSVP, if required. In the majority of cases, it would be proposed that unexpected contaminative issues are dealt with via independent correspondence, but on occasion it may be necessary to revisit and update the RSVP.
- If necessary, the Environmental Health / Contaminated Land team shall be contacted.
- Should there be a perceived risk to Controlled Waters, the Environment Agency shall also be contacted.

Prior to implementing any amendments to the remedial strategy, as presented within this RSVP, the Environmental Health / Contaminated Land team shall be consulted and the amendments agreed in writing.

8. VERIFICATION AND REPORTING

8.1 Objectives

This RSVP has identified mitigation measures as being necessary at the subject site in order to provide a development that is fit for purpose/suitable for use.

These remedial requirements need verification such that the regulating bodies can be satisfied that the RSVP has been fully complied with, and ultimately such that any associated Planning Conditions relating to land quality can be discharged.

The verification process is also required to provide a permanent record of the remedial works undertaken at the subject site. The sections below summarise the various activities requiring verification and also comment upon the verification reporting process.

Verification visits shall be made by a suitably experienced and qualified independent geo-environmental consultant who shall undertake the necessary works outlined below.

8.2 Verification Works

In summary, the verification works will comprise:

- Verification of the quality and thickness of placed clean cover system in soft landscaping areas including gardens ensuring it meets the import criteria in Appendix B.
- Verification of Made Ground soils (contamination source) removal.

The verification should include photographic proof of activities undertaken, site inspection records and laboratory testing. A record of all material movements, imported material certifications and stockpile tracking and associated documentation shall be maintained by the Contractor(s).

8.3 Verification of Made Ground Soils Removal

Where Made Ground Soils are removed during site enabling works, Hydrock or another suitably qualified Geo-environmental Engineer should inspect and verify that no potentially contaminated soils remain. Representative photographs should be taken as evidence of complete removal of potentially contaminated soils.

Areas where Made Ground Soils removal is currently envisaged are shown on Hydrock Drawing Ref 28470-HYD-XX-XX-DR-GE-1008.

8.4 Verification of Imported Materials

Where provenance is provided relating to the source of the soil, it should be tested at a minimum rate of three samples per source, or for larger sources one sample per 250 m^3 of soil to be used on site. The sampled material shall be compared against the Soil Acceptance Criteria listed in Appendix B.

It is not advisable to rely on the quality of soil for which provenance is not known. Where this information isn't available testing frequency should be increased to a minimum of 1 sample per 100m^3.

8.5 Cover System Verification

Verification visits shall be made by a suitably experienced and qualified independent Geo-environmental Engineer who shall undertake the necessary works outlined above. Verification of the cover systems across the garden and landscaped areas shall comprise the following:

- 2 Trial pits (within Zone 2) to verify the thickness of clean cover (with photographs) based on 1 verification trial pit per 4 garden areas with collection of subsoil and topsoil samples for chemical analysis.

Testing will be completed at random locations as designated by the Geo-Environmental Engineer. This will take the form of a photograph with scale marker and accompanying photographic board detailing the measured cover system thickness. This topsoil/subsoil will be analysed for compliance with the Soil Acceptance Criteria in Appendix B and it is recommended that the Contractor samples and analyses the material prior to placement to avoid the requirement for abortive works and removal of such materials. The topsoil should also comply with any criteria stipulated by the horticulturalist/landscape architect.

8.6 Other requirements

A UKAS and MCERTS accredited laboratory should undertake all chemical testing. Samples scheduled for chemical analysis should be representative of the stockpile or source being tested.

8.7 Verification Reporting

Verification visits shall be made by a suitably experienced and qualified independent Geo-environmental Engineer who shall undertake the necessary works outlined above.

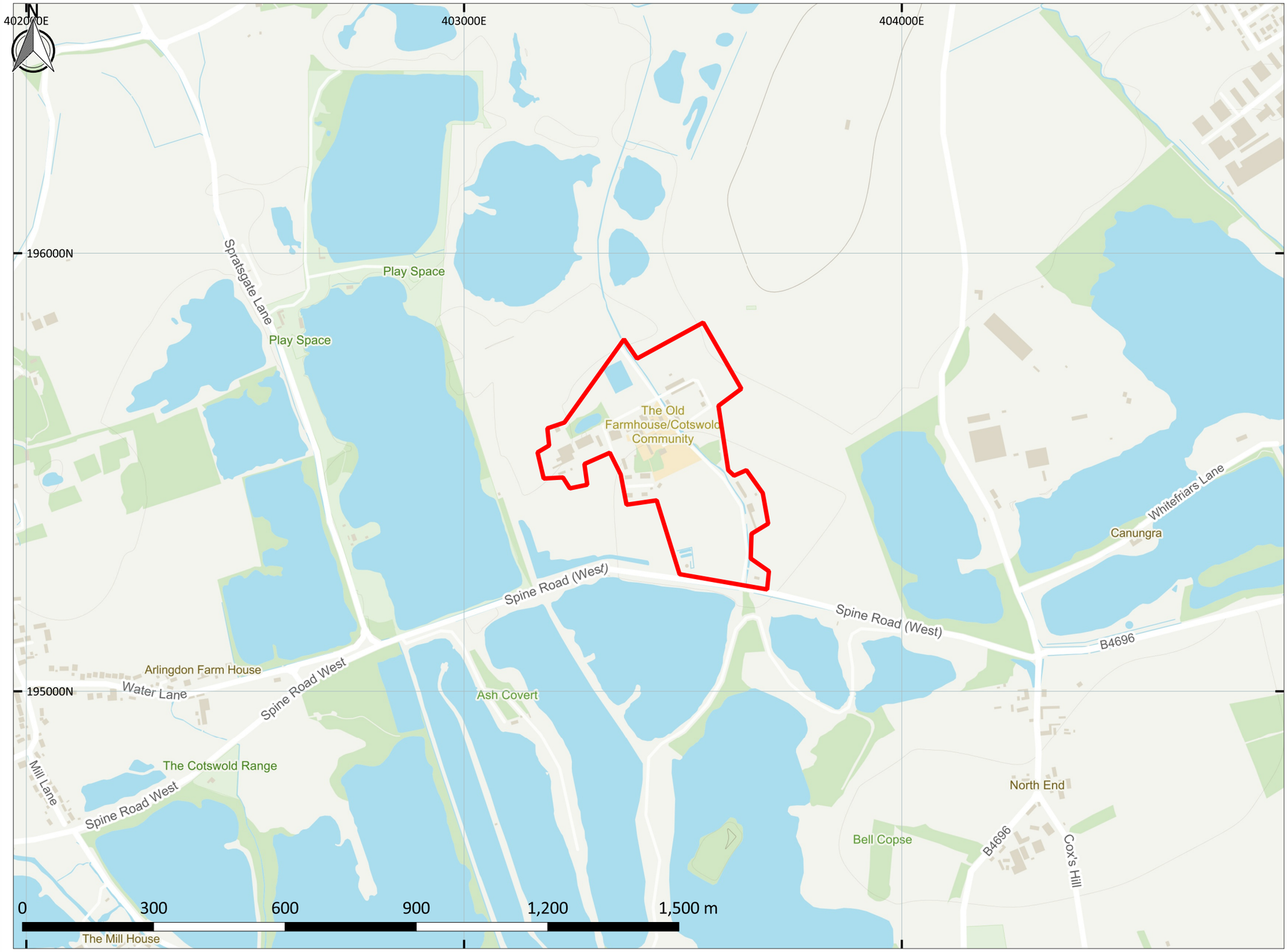
A Verification Report will need to be produced to demonstrate that the required mitigation measures have been undertaken and on completion should be issued to the local authority for approval.

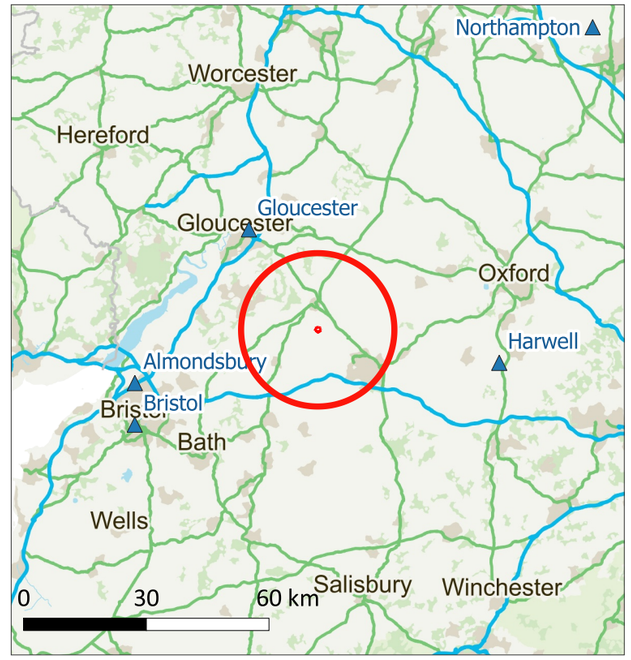
The verification report(s) shall include the following as a minimum:

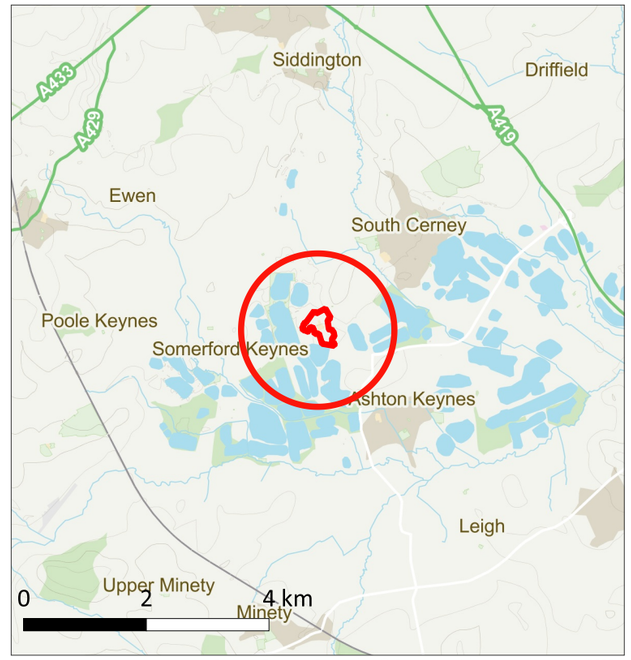
- The organisation and staff carrying out the verification;
- The remedial objectives that are being verified, including any numerical limits (such as minimum layer thicknesses and chemical testing results);
- Relevant plans, sketches and photographs as documentary evidence
- As built plans; and
- A written statement that the remediation has been undertaken in accordance with this RSVP and that the site is suitable for its intended use.

If a Materials Management Plan is used as part of the materials management strategy for the development, a separate Materials Management Verification Report (detailing volumes, suitability, etc.) is also required.

Appendix A Drawings







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KEY PLAN

Site Boundary

NOTES

1. Contains OS data © Crown copyright and database right (2022)

REVISIONS

REV.	DRAWN BY INITIALS	CHECKED BY INITIALS	DATE	REVISION NOTES/COMMENTS
P01	KB	SW	01/09/23	First issue

Hydrock

TITLE
SITE LOCATION PLAN

HYDROCK PROJECT NO.
28470

SCALE @ A3
1:10,000

CLIENT
BEWLEY HOMES

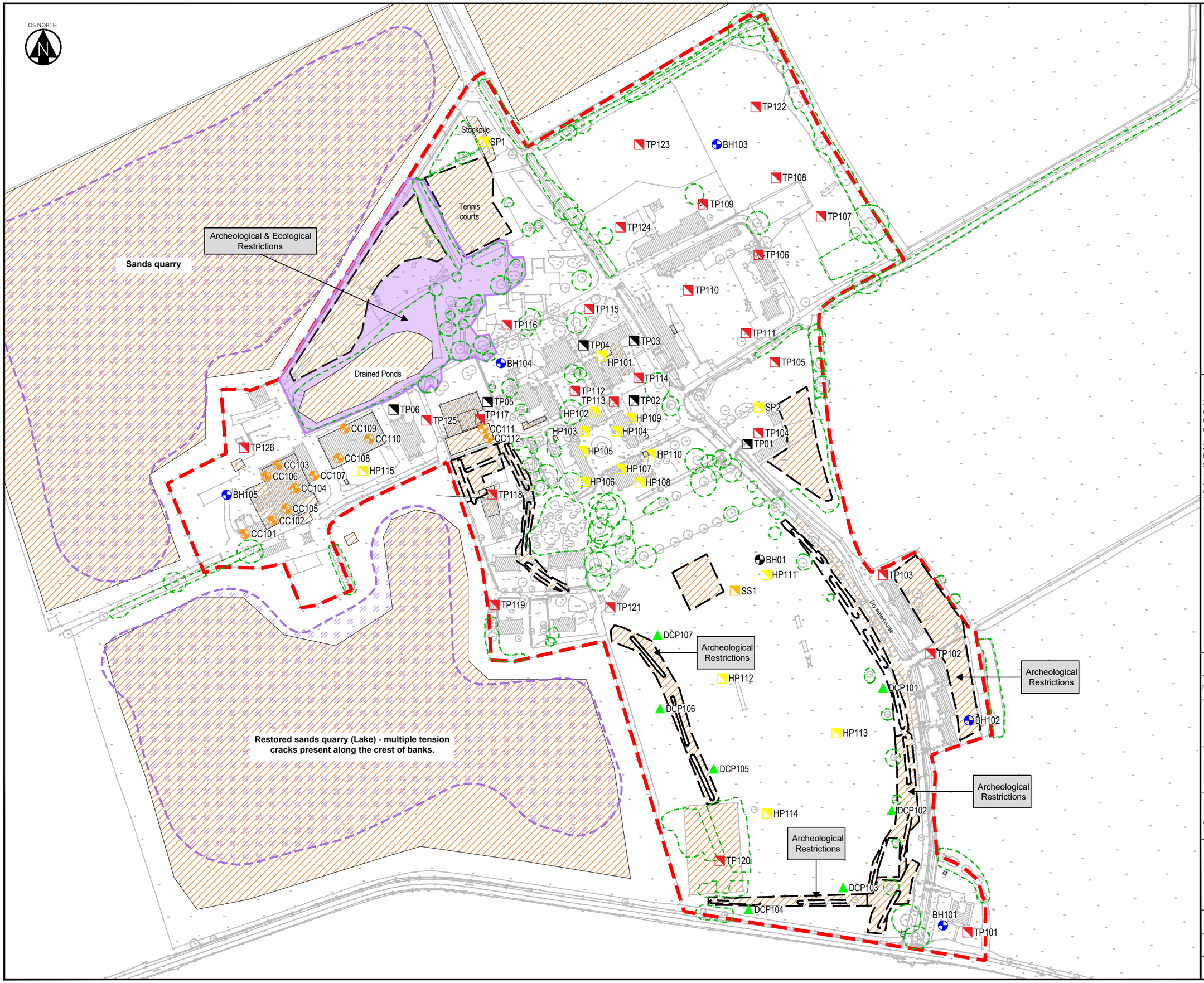
PURPOSE OF ISSUE
SUITABLE FOR INFORMATION

STATUS
S2

PROJECT
COTSWOLD COMMUNITY SCHOOL, ASHTON KEYNES

DRAWING NO.
28470-HYD-XX-XX-DR-GE-1000

REVISION
P01



KEY

- Wider Site Boundary
- BHi Borehole
- HPi Hand Pit / Stockpile
- TPi Trial Pit
- DCP TRL DCP
- CCii Concrete Core
- BHi Borehole 2018
- TPi Trial Pit 2018
- Restricted Zones
- Tree to be Retained

NOTES

1. All dimensions are to be checked on site before the commencement of works. Any discrepancies are to be reported to the Architect & Engineer for verification. Figured dimensions only are to be taken from this drawing.

2. This drawing is to be read in conjunction with all relevant Engineers' and Service Engineers' drawings and specifications.

3. This drawing has been based on the following drawings and information:
Topographic Survey
- Site Survey T_MG0377

REV.						
P1	FIRST ISSUE					
	EP	07/09/23	SW	07/09/23	SW	07/09/23
	REVISION NOTES/COMMENTS					
	DRAWN BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE

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CLIENT
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PROJECT
COTSWOLD COMMUNITY SCHOOL, ASHTON KEYNES

TITLE
EXPLORATORY HOLE LOCATION PLAN

HYDROCK PROJECT NO.	SCALE @ A3
C-28470-C	1:2000

PURPOSE OF ISSUE	STATUS
SUITABLE FOR INFORMATION	S2

DRAWING NO. (PROJECT CODE-ORGINATOR-ZONE-LEVEL-TYPE-ROLE-NUMBER) 28470- HYD-XX-GI-DR-G-1002

REVISION P2

OS NORTH

Extent implied from annecdotal evidence

Archeological & Ecological Restrictions

Sands quarry

Stockpile

Tennis courts

Drained Ponds

Restored sands quarry (Lake) - multiple tension cracks present along the crest of banks.

Made Ground and suspected ACM encountered in Archeological Restrictions

Archeological Restrictions

Archeological Restrictions

Archeological Restrictions

Archeological Restrictions

Dry watercourse

TP122 TP123 BH103 TP108 TP109 TP124 TP107 TP106 TP110 TP115 TP116 TP111 TP04 TP03 HP101 BH104 TP105 TP114 TP112 TP113 TP02 TP05 TP06 TP125 TP117 HP102 HP109 SP2 CC109 CC110 CC111 CC112 HP103 HP104 TP104 TP01 TP126 CC108 HP105 HP110 CC103 CC106 CC107 HP115 HP107 CC104 HP106 HP108 CC105 BH105 CC102 TP118 CC101 BH01 HP111 TP103 SS1 TP119 TP121 DCP107 TP102 HP112 DCP101 DCP106 BH102 HP113 DCP105 HP114 DCP102 TP120 DCP103 DCP104 BH101 TP101

KEY

- Wider Site Boundary
- BHi Borehole
- HPi Hand Pit / Stockpile
- TPi Trial Pit
- DCP TRL DCP
- CCiii Concrete Core
- BHi Borehole 2018
- TPi Trial Pit 2018
- Restricted Zones
- Tree to be Retained
- Asbestos Fibres Detected in Made Ground
- Elevated PAH Concentration in Made Ground
- Elevated Metal in Made Ground
- Elevated Faecal Coliforms

NOTES

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2. This drawing is to be read in conjunction with all relevant Engineers' and Service Engineers' drawings and specifications.

3. This drawing has been based on the following drawings and information:
Topographic Survey
- Site Survey T_MG0377

REV.						
P1	FIRST ISSUE					
	EP	07/09/23	SW	07/09/23	SW	07/09/23
	REVISION NOTES/COMMENTS					
	DRAWN BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE

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CLIENT
BEWLEY HOMES

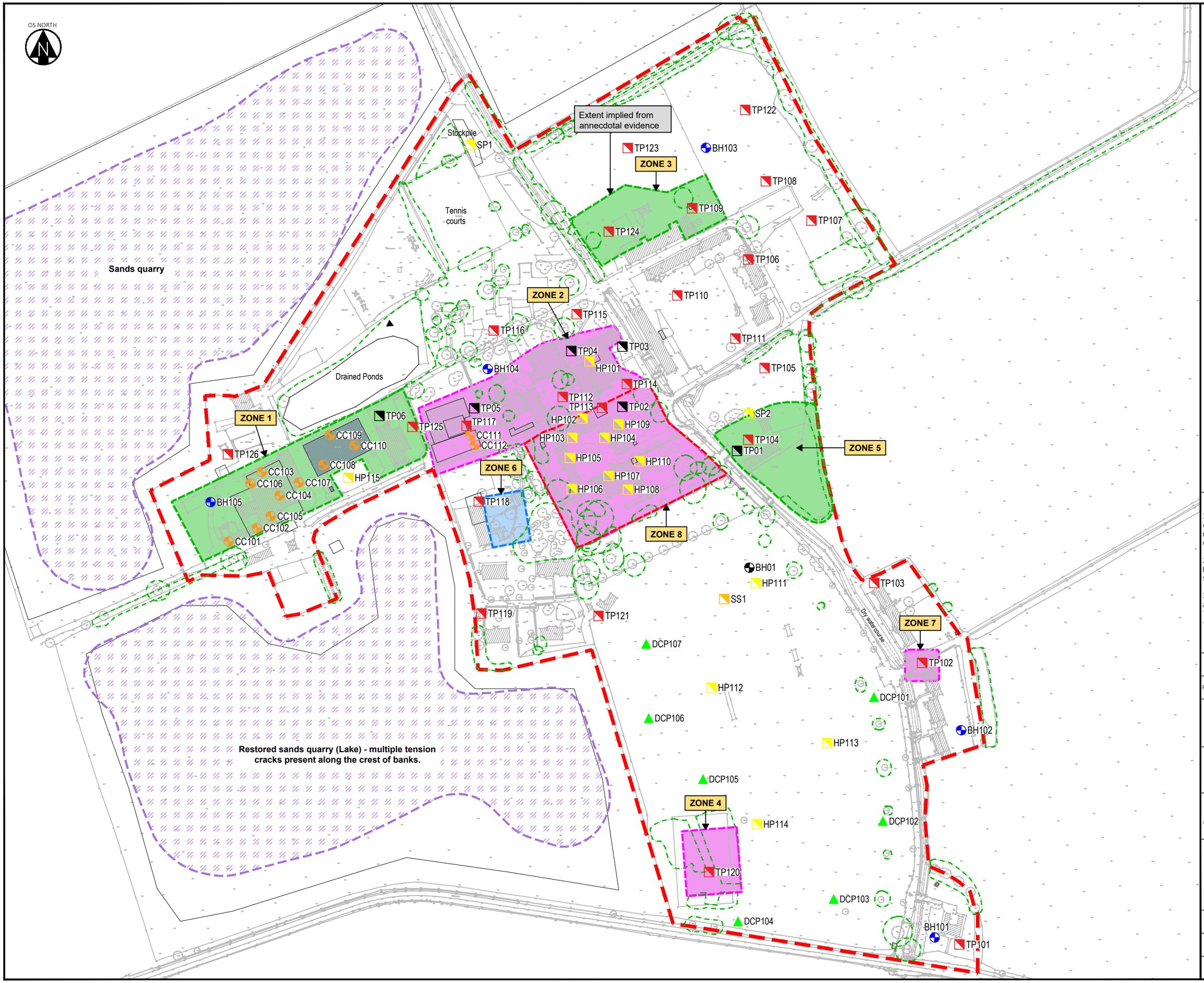
PROJECT
COTSWOLD COMMUNITY SCHOOL, ASHTON KEYNES

TITLE
SITE CONDITION PLAN

HYDROCK PROJECT NO.	SCALE @ A3
C-28470-C	1:2000

PURPOSE OF ISSUE	STATUS
SUITABLE FOR INFORMATION	S2

DRAWING NO. (PROJECT CODE-ORGINATOR-ZONE-LEVEL-TYPE-ROLE-NUMBER)	REVISION
28470-HYD-XX-XX-DR-GE-1003	P2



KEY

- Wider Site Boundary
- BHi Borehole
- HPi Hand Pit / Stockpile
- TPi Trial Pit
- DCP TRL DCP
- CCiii Concrete Core
- BHi Borehole 2018
- TPi Trial Pit 2018
- Tree to be Retained
- Implementation of a cover system
- Excavation and off-site disposal of Made Ground Soils
- Areas of recommended further work

NOTES

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Topographic Survey
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REV.	REVISION NOTES/COMMENTS					
	DRAWN BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE
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PROJECT

COTSWOLD COMMUNITY SCHOOL, ASHTON KEYNES

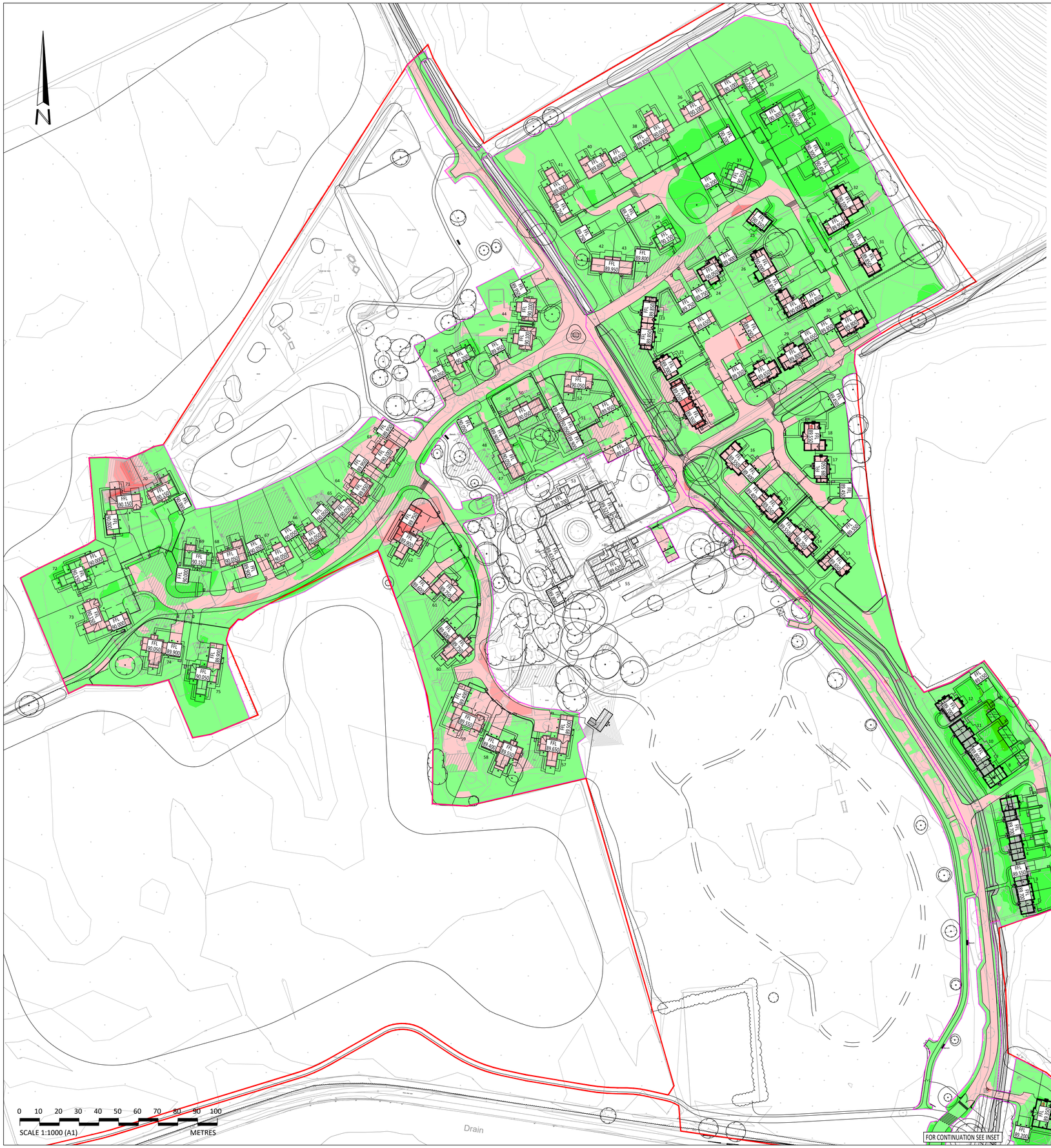
TITLE

REMEDIATON ZONATION PLAN

HYDROCK PROJECT NO.	SCALE @ A3
C-28470-C	1:2000

PURPOSE OF ISSUE	STATUS
SUITABLE FOR INFORMATION	S2

DRAWING NO. (PROJECT CODE-ORGINATOR-ZONE-LEVEL-TYPE-ROLE-NUMBER)	REVISION
28470-HYD-XX-XX-DR-GE-1008	P1



WEST

Height Bands	Cut Volume	Fill Volume
Fill 1m - 1.5m	--	0.41m³
Fill 0.5m - 1m	--	98.37m³
Fill 0m - 0.5m	--	5794.32m³
Cut 0m - 0.5m	2917.40m³	--
Cut 0.5m - 1m	215.14m³	--
Cut 1m - 1.5m	38.19m³	--
Cut 1.5m - 2m	2.47m³	--
Cut 2m - 2.5m	0.01m³	--

Total Cut: 3173.20m³
Total Fill: 5893.10m³

MODEL 1: TOPSOIL STRIP (EXISTING GROUND - 300mm)
MODEL 2: FORMATION SURFACE

EAST

Height Bands	Cut Volume	Fill Volume
Fill 1m - 1.5m	--	9.93m³
Fill 0.5m - 1m	--	866.47m³
Fill 0m - 0.5m	--	10321.07m³
Cut 0m - 0.5m	2149.78m³	--
Cut 0.5m - 1m	24.87m³	--
Cut 1m - 1.5m	0.54m³	--

Total Cut: 2175.18m³
Total Fill: 11197.47m³

MODEL 1: TOPSOIL STRIP (EXISTING GROUND - 300mm)
MODEL 2: FORMATION SURFACE

CDM RESIDUAL RISKS

The work shown on this drawing is both familiar to the designers and routinely safely built in similar circumstances by competent contractors.

Risks are not considered significant.

~~**Relevant data is included in the Pre-Construction Information Pack.**~~

Signed: D.Henson **Date: 16.08.2023**

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KEY:

SITE BOUNDARY

FFL XX.XXX PROPOSED FINISHED FLOOR LEVEL

B06163 - Ashton Keynes

Construction Depths

Landscape Depth	300 mm	
Carriageway Depth	670 mm	
Footpath Depth	230 mm	
Driveway Depth	480 mm	
Building Pad Depth	900 mm	min*

Parameters

Assumed Existing Topsoil Depth	300 mm	
Site Area	82,116 sqm	
Garden/Landscaped Areas	43,480 sqm	
Number of Plots	71 plots	#
Additional Plot Arisings Per Plot	45 cu m	

Topsoil Analysis

1st Surface	2nd Surface	Cut (cu m)	Fill (cu m)	Nett (cu m) Cut = +ve / Fill = -ve
Existing Ground	Topsoil Strip (Existing Ground - 300mm)	24,635	0	24,635
Formation Surface	Finished Surface	0	13,044	-13,044
TOTAL TOPSOIL BALANCE		**24,635**	**13,044**	**11,591**

Bulk Earthworks

1st Surface	2nd Surface	Cut (cu m)	Fill (cu m)	Nett (cu m) Cut = +ve / Fill = -ve
Topsoil Strip (Existing Ground - 300mm)	Formation Surface	5,348	17,091	-11,742
Additional Arisings				
Permeable fill required for infiltration features, Driveways = 6151 cu m (shown as cut to indicate a reduction in bulk fill requirement)				
Permeable paving in driveways		6,151	0	6,151
TOTAL BULK EARTHWORKS		**11,499**	**17,091**	**-5,591**

* 900mm minimum depth
# Existing Plots 53 to 56 omitted from volumes

Note:
1. Excavations for drainage / services / retaining walls have not been accounted for at this stage.

Rev	Detail	By	Chk	Date
T01	DRAWING REFERENCE UPDATED.	FD	DH	16.08.23
P03	FINISHED FLOOR LEVELS AND KEY ADDED.	AH	DH	02.08.23
P02	CUT AND FILL VOLUMES REVISED TO SUIT LATEST LEVELS. EARTHWORKS TABLE ADDED. HEIGHT BAND COLOURS AMENDED.	AH	DH	05.07.23
P01	PRELIMINARY FIRST ISSUE.	JB	DH	27.02.23

Revisions

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Client: BEWLEY HOMES

Project: ASHTON KEYNES

Drawing Title: PRELIMINARY CUT FILL ANALYSIS OVERVIEW

Purpose of Issue: TENDER

ClarkeBond Project No.	Status
B06163	S2

Project	Originator	Volume	Level	Type	Role	Drg No.
D0226	CLK	XX	XX	DR	C	001

Scale	Date	Revision
1:1000	Feb' 2023	T01

Drawn	Checked	Sheet Size
AH	DH	A1

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Signed: D.HENSON **Date: 25.08.2023**

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Rev	Detail	By	Chk	Date
T02	UPDATED MASTERPLAN; ENGINEERING UPDATED TO SUIT	SF	DH	25.08.23
T01	DRAWING REFERENCE UPDATED	MY	DH	16.08.23
P01	TENDER ISSUE.	AH	DH	31.07.23

Revisions

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Client: BEWLEY HOMES

Project: ASHTON KEYNES

Drawing Title: ENGINEERING LAYOUT

OVERVIEW

Purpose of Issue: TENDER

ClarkeBond Project No.	Status
B06163	S2

Project	Originator	Volume	Level	Type	Role	Drg No.
D0226	CLK	XX	XX	DR	C	200

Scale	Date	Revision
1:1250	JULY 2023	T02

Drawn	Checked	Sheet Size
AH	DH	A1

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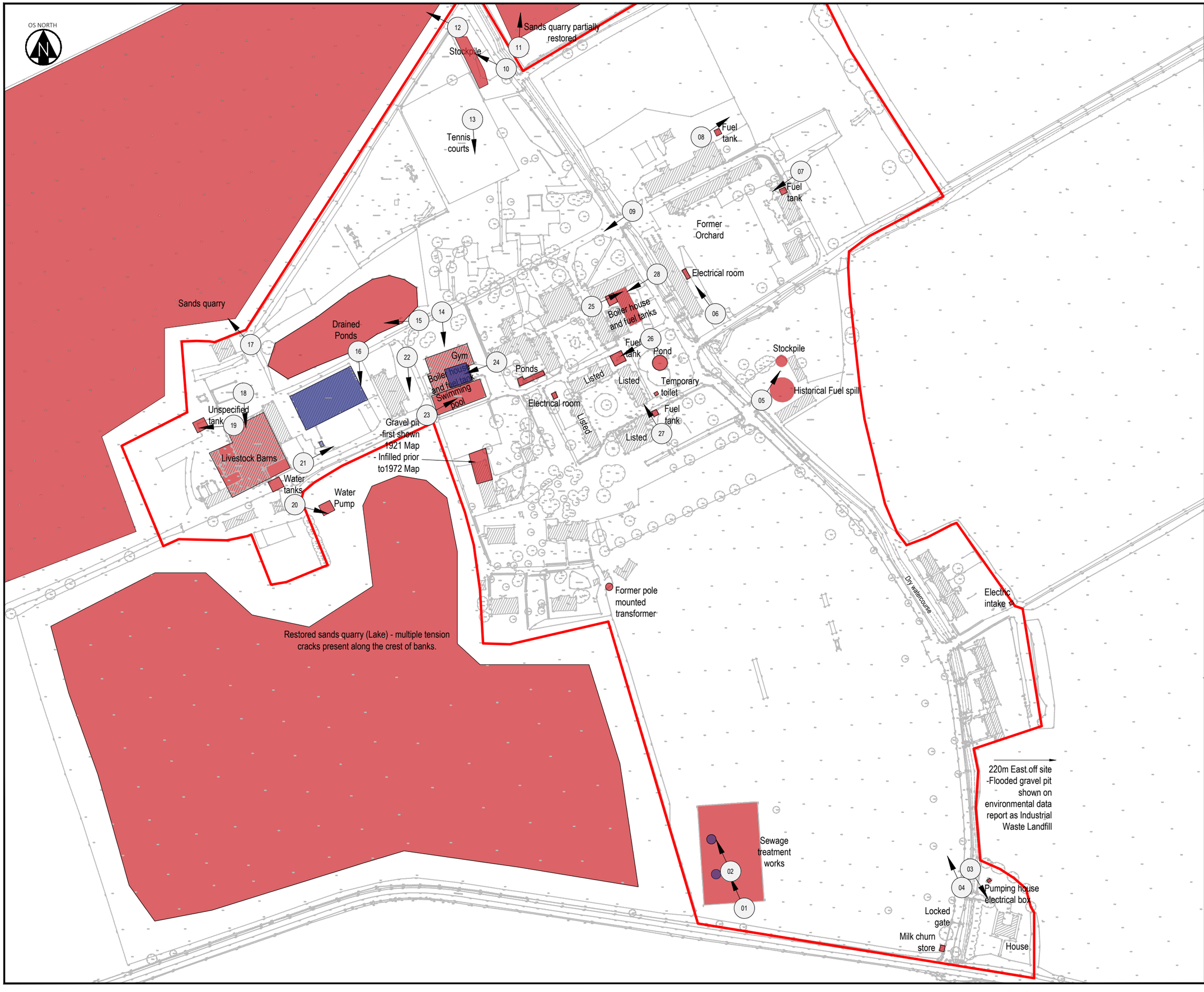

KEY

01 Photo location and reference

Notable site feature

Asbetos Containing Materials Present

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- Site Survey T_MG0377

REV.						
P1	FIRST ISSUE					
	SW	23/03/23	AJ	27/03/23	AJ	27/03/23
REV.	REVISION NOTES/COMMENTS					
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CLIENT
BEWLEY HOMES

PROJECT
COTSWOLD COMMUNITY SCHOOL, ASHTON KEYNES

TITLE
SITE WALKOVER PLAN

HYDROCK PROJECT NO.	SCALE @ A3
C-09612-C	1:1750

PURPOSE OF ISSUE	STATUS
SUITABLE FOR INFORMATION	S2

DRAWING NO. (PROJECT CODE-ORGINATOR-ZONE-LEVEL-TYPE-ROLE-NUMBER)	REVISION
09612- HYD-XX-GI-DR-G-1002	P1

Appendix B Soil Acceptance Criteria

Chemical Requirements for the Import and Re-use of Topsoil and Subsoil for areas of gardens and POS

Contaminant	Proposed Import Criteria (mg/kg)	Justification
Arsenic	21.5	Highest Regional Background Level.
Beryllium	0.80	Concentrations within natural soils on site.
Boron	1	Highest Concentrations within natural soils on site.
Cadmium	0.60	Highest Concentrations within natural soils on site.
Chromium (III)	20.00	Highest Concentrations within natural soils on site.
Chromium (VI)	2.0	Level of detection.
Copper	27.00	Highest Concentrations within natural soils on site.
Lead	27.00	Highest Concentrations within natural soils on site.
Mercury, inorganic	<1.0	Level of detection.
Nickel	25.59	Highest Regional Background Level.
Selenium	2.00	Highest Concentrations within natural soils on site.
Vanadium	98.95	Highest Regional Background Level.
Zinc	92.00	Highest Regional Background Level.
Cyanide (free)	<1	Below laboratory limit of detection (not detected on site)
Total Phenols (Monohydric)	<2	Below laboratory limit of detection (not detected on site)
Acenaphthene	0.10	Below laboratory limit of detection (not detected on site)
Acenaphthylene	0.10	Below laboratory limit of detection (not detected on site)
Anthracene	0.10	Below laboratory limit of detection (not detected on site)
Benz(a)anthracene	0.10	Below laboratory limit of detection (not detected on site)
Benzo(a)pyrene	0.10	Below laboratory limit of detection (not detected on site)
Benzo(b)fluoranthene	0.10	Below laboratory limit of detection (not detected on site)
Benzo(ghi)perylene	0.10	Below laboratory limit of detection (not detected on site)
Benzo(k)fluoranthene	0.10	Below laboratory limit of detection (not detected on site)
Chrysene	0.10	Below laboratory limit of detection (not detected on site)
Dibenz(ah)anthracene	0.10	Below laboratory limit of detection (not detected on site)
Fluoranthene	0.10	Below laboratory limit of detection (not detected on site)
Fluorene	0.10	Below laboratory limit of detection (not detected on site)
Indeno(123cd)pyrene	0.10	Below laboratory limit of detection (not detected on site)
Naphthalene	0.10	Below laboratory limit of detection (not detected on site)

Contaminant	Proposed Import Criteria (mg/kg)	Justification
Phenanthrene	0.10	Below laboratory limit of detection (not detected on site).
Pyrene	0.10	Below laboratory limit of detection (not detected on site)
(Total) Petroleum Hydrocarbons	<100	To prevent import of odorous or visually oily material.
Asbestos	<0.001%	Below laboratory limit of detection

In addition, all imported soils must also comply with the following wider suitability criteria:

- No visible anthropogenic materials (e.g., asbestos containing materials, brick, concrete, etc.).
- No visible or olfactory evidence of organic contamination, including free phase liquids.
- No visible evidence of invasive plant specifies (e.g., Japanese Knotweed or Giant Hogweed).
- No visible organic or putrescible material that could constitute a source of ground gas (e.g., wood).
- Meet any additional requirements set by the arboriculturist and/or landscape architect.

The import criteria above have been developed based on the understanding that imported material will be required as part of the clean cover systems that are required within landscaped areas.

The lowest concentration for each contaminant has typically been selected from the following sources:

- Regional and/or local background concentrations (where available):
- Range and mean of concentrations detected on-site;
- GAC protective of the relevant end use (e.g., POS resi) based on 1% SOM).
- GAC protective of plant life (e.g., pH 7).

The use of the above values will ensure that soils imported will not significantly increase contaminant loading to the site. In addition, petroleum hydrocarbons are limited to a proposed 100 mg/kg to prevent import of odorous or visually oily material.

Appendix C Remediation Options Appraisal

This Remediation Options Appraisal has been undertaken in general accordance with Land contamination risk management (LCRM) (Environment Agency, 2021). It is designed to inform the development of the remediation strategy for the site by identifying an appropriate remediation option (or combination of options) that is capable of remedying the relevant contaminant linkages associated with the site.

The scope of the Remediation Options Appraisal comprises:

- Selection of feasible remediation options (for each relevant pollutant linkage).
- A detailed evaluation of options.
- Selection of the final remediation options.

Remediation Objectives and Criteria

The remediation at the site must mitigate the following:

- Deliver site betterment by removing identified sources of contamination as far as reasonably practicable;
- Provide a remediation solution that can be validated in the short-term and avoids the requirement for long-term monitoring and regulatory engagement; and
- Deliver a remediation solution that is compatible with the requirement for the creation of geotechnically suitable development platform.

Constraints

Where possible, all materials suitable to be crushed and used as 6F2/similar such as concrete hardstanding, will be re-used under an appropriate waste protocol/exemption; however, this will not impact any proposed remediation options.

Any remediation works will (as much as possible) need to:

- Reduce impact to any adjacent site users with regards to noise, dust, odour and vibration.
- Minimise road traffic by reducing the amount of disposal and maximising re-use of excavated materials.

Regulatory constraints will also need to be addressed. The proposed scheme will be submitted for approval but is unlikely to have an effect on the final remediation strategy.

Selection of feasible remediation options (Options Assessment Tier 1)

In accordance with LCRM (2021), the first stage of an options assessment is to select feasible remediation techniques that are capable of achieving the remediation objectives and criteria set out above.

The initial screening process considers the available remedial techniques based on following key criteria:

- Effectiveness. Will the remediation treatment successfully reduce, or control unacceptable risks to a defined (and appropriate) level? The strategy must work within the context of the site and be effective in the removal of contamination linkages.
- Durability. Can the remediation treatment continue to reduce, or control unacceptable risks to a defined level over a period of time?
- Environmental impact. Will the remediation treatment affect the quality of the environment during or following remediation?
- The (relative) cost. Is the strategy reasonable and affordable, given the available resources?
- Sustainability. Is the option sustainable? More sustainable options are preferred.
- Relative Operational Time. The strategy should work in a feasible and realistic time scale.
- Practicality. The strategy has to have been successfully used in similar situations on other sites and readily available within the UK market. Novel solutions or those still in the research stage would require additional consideration.

- How the strategy meets other environmental objectives. For example, on the use of energy and other material resources.
- Are there any indirect benefits that the remediation would bring? For example, will it enhance the amenity or ecological value of an area, remove blight or encourage regeneration?
- The legal, financial and commercial context of the site.

Table C.1 below summarises the accepted remedial techniques readily available in the UK and assesses each against the ten parameters listed above.

- Initially the effectiveness at treating the contamination is assessed. This is broken down into: effective (Y), partially effective (P) or ineffective (N).
- The durability of each of the remediation options is assessed as either: durable (D) i.e., providing a long-term solution; durable with maintenance requirements (D-M) e.g., gas venting trenches or permeable reactive groundwater barrier, which may require inspections and maintaining; or temporary (T) i.e., providing a short-term solution, but not necessarily effective in the long term e.g., groundwater pump and treat without source removal
- The environmental impact is then assessed as: Low (L), Moderate (M) or High (H).
- The listed techniques are then assessed in terms of relative cost ranging from: low cost (£), moderately expensive (££), expensive (£££), to prohibitively expensive for the site under consideration (£££+).
- Sustainability is assessed based on a relative comparison of: Sustainable (S) or Unsustainable (U).
- The timescale over which the remediation technique is operational has been broadly assessed in units of weeks, months, years and decades (W, M, Y, D). If for example a given technique is only effective over a period of years to decades then its overall feasibility is diminished.
- Previous site experience, technical literature and Hydrock's in house knowledge have been used to reject impractical and or unsuitable remediation options. The primary reasons for rejection of an option are due to the ongoing operational constraints, the cost and the inability to treat all the required contaminants. If an option is deemed impractical, it is noted in the comments.

Additional comments are provided as necessary and if other environmental objectives, indirect benefits or legal implications are identified, these are noted in the comments.

In some instances, there may be a number of treatment options identified and it may not be possible to determine the best practicable option at this stage. In these instances, all potential remedial options are carried forward.

Table C.1: Applicability of Remediation Options and Initial Assessment

Method	Remediation options	Effectiveness	Durability	Environmental	Relative Cost	Sustainability	Relative Time	Applicability to Soil and/or Groundwater	Comments and Feasibility
Civil Engineering	Excavation and disposal of contaminated Made Ground soils	Y	D	L	£££	U	W	S	Made Ground is present in localised pockets and extensive earthworks are proposed as part of the enabling works. The Made Ground is recorded to be at most 0.80m bgl, with an average thickness of 0.36m. The volume of material to dispose of is anticipated to be moderate, and the cost of off-site disposal is likely to be high. This option effectively removes the source of contamination, with no further post-enablement works remediation required at the site. It is considered that the majority of the Made Ground soils may be removed as part of the enabling works. In areas that Made Ground remains a clean cover system would be required, which would be of 0.60m thickness. This could either be implemented as part of the level raising or by continuing excavation and complete removal of Made Ground soils. Viable option.
	Containment - Cover System	Y	D	L	£	S	D - W	S	Will prevent contact between future site users and contaminated Made Ground and break the S-P-R linkage. Remediation and discharge of conditions delayed until close to end of construction programme. Site levels are to be raised as part of the development. Viable option.

Detailed evaluation of options (Options Assessment Tier 2)

The short-list of options presented below represents those technologies taken forward to the Step 2 Options Assessment:

- Excavation of contaminated soils and off-site disposal; and
- Installation of an engineered cover system in areas of proposed soft landscaping.

The above remediation techniques are discussed in more detail below.

Excavation and off-site disposal

Disposal involves the removal of contaminated material from site and disposal at an appropriately licensed waste management facility.

Excavation and off-site disposal of Made Ground is considered to be a feasible option, as it is anticipated that this will not cost more than the off-site disposal of other site-won soils.

The advantages with regards to excavation and disposal are:

- it represents a relatively rapid remediation strategy; and
- provides a high degree of certainty in the suitability of the site for its intended end use.

The main disadvantages with excavation and disposal are:

- cost of disposal; and
- it does not represent a sustainable remediation strategy as significant vehicle movement will be required to and from the site and the contamination is not destroyed but simply relocated to a waste management facility, thus taking up valuable landfill space.

Installation of an engineered cover system

Cover systems have been widely used in the UK for managing risks associated with brownfield land. The technology involves the placement of a cover to form a barrier between the contaminant and site users thus breaking the pathway in the source-pathway-receptor linkage.

Subject to site levels available for the installation of the cover, this option is technically simple and represents a low-cost strategy that can be implemented rapidly.

The timescale for installing a barrier is relatively quick allowing for rapid completion of the remediation objectives and this remediation solution could be designed and implemented within a matter of months.

However, due to the timescale upon which the clean cover system is typically placed (near end of construction), regulatory sign-off cannot be completed until close to the end of the construction programme.