QTS Project Wind

Remediation and Earthworks Strategy

QTS

Job No:	1043152
Doc ref:	GBR1-ENA1-XXX-UG-RP-B-00-11
Revision:	V02
Revision date:	23 May 2025

Project title	QTS Project Wind	**Job number**
Report title	Remediation and Earthworks Strategy	1043152
Classification	CLIENT CONFIDENTIAL	

Document revision history

Revision ref	Issue date	Purpose of issue / description of revision
V01	26 March 2025	Enabling Works – RIBA Stage 3
V02	23 May 2025	Enabling Works – RIBA Stage 4

Document validation (latest issue)

23/05/2025	23/05/2025	23/05/2025
X	X	X
Principal author	Checked by	Verified by
Signed by: g.kellett	Signed by: Chris Lazenby	Signed by: Alexander Lee

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1.0

Introduction

1.0 Introduction

1.1 Site Location

The proposed Cambois Data Centre Campus site is situated approximately 3km north of Blyth town centre in Cambois, Northumberland. The approximate centre of the site is National Grid Reference (NGR) NZ 29820 84164. The proposed development includes the construction of a data centre campus on a site immediately north of the former Blyth Power Station. The current proposed development layout is available on Corgan Drawing EX-24 titled 'Site Plan with Update to SSE Substation and connecting road to Ferguson Plot'. This report relates only to the Phase A Enabling Works area of the wider Data Centre Campus site.

Drawing GBR1-ENA1-XXX-UG-DR-B-01-10 shows the site ownership boundary delineated by the blue line and the Phase A Enabling Works boundary.

1.2 Context and Purpose

Cundall has been appointed by the Client (QTS) to complete a Remediation and Earthworks Strategy to inform the proposed enabling works on their site in Cambois, Northumberland.

The remediation strategy will provide the detailed methodology required to break residual unacceptable pollutant linkages identified for the site, in accordance with Land Contamination Risk Management (LCRM) guidance. Implementation of the remediation methodology in this document will enable the site to be considered suitable for use and allow successful delivery of the proposed scheme. The remediation strategy proposed in this document comprises both enabling works and building construction phases.

The earthworks strategy will provide a strategy for delivery of the enabling works. This will include for the formation of a suitable working platform for the proposed data centre and substation, levelling of the site to allow access, creation of a platform for a construction compound and car parking and to relocate stockpiles of material to form a processing area for material to be used in future works.

This strategy applies to Phase A Enabling Works Boundary only. This document does not intend to specify or design any required temporary works (including working platforms, temporary haul roads, temporary boundary supports etc) that may be required.

1.3 Development Proposals

The current proposals within the Phase A Enabling Works boundary include for the construction of DC01 and DC02 buildings and their associated generator yards, the substation, external hardstanding, drainage infrastructure and site access roads.

For the purposes of this strategy, it has been assumed that DC01 and DC02 shall be supported on piled foundations with a ground floor slab supported on improved ground (vibro stone columns). A piled foundation solution is also anticipated for the substation building.

1.4 Sources of Information

1. Google Earth Pro (various dates)
2. Rolton Group Limited, 07 April 2021. Phase 1 Geo-environmental Desk Study for Former Coal Stocking Yards, Cambois. Report reference: PHX-RGL-XX-XX-RP-G-000005 Rev S2-P05.
3. Rolton Group Limited, 14 May 2021. Geotechnical and Geo-Environmental Report for Former Coal Stocking Yards, Cambois. Report reference: PHX-RGL-XX-XX-RP-G-000010 Rev S2-P01.
4. Rolton Group Limited, 18 February 2021. Coal Mining Risk Assessment for Former Coal Stocking Yards, Cambois. Report reference: PHX-RGL-XX-XX-RP-G-000008 Rev S2-P04.

5. Rolton Group Limited, 2022 Rail Head Investigation (PHX-RGL-XXXX-XX-RP-G-000014)
6. Rolton Group Limited, 2022 Burnt Shale Trial Pit Investigations (PHX-RGL-XXXX-XX-RP-G-000014A)
7. Landmark Information Group, 12th October 2020. Envirocheck Report. Reference: 261662459_1_1.
8. Arcadis, 11th April 2024. Stockpile Location Plan. Drawing number: 30226657-AUK-XX-XX-DR-ZZ-0003-P1
9. Arcadis, October 2024, Project Wind, Blyth, Coal Mining Risk Assessment; 30226657-AUK-XX-XX-RP-ZZ-0010-01
10. Arcadis, November 2024, Cambois Data Centre Campus, Phase 2 Geoenvironmental Assessment; 30226657-AUK-XX-XX-RP-ZZ-0012-01
11. Arcadis, November 2024, Cambois Data Centre Campus, Outline Remediation Strategy; 30226657-AUK-XX-XX-RP-ZZ-0016-01.
12. MK Surveys, October 2024, Topographical Survey received from Arcadis on November 8th.
13. Email from Ridge Consultants @ 10.29am on 9th January 2025 titled: 'RE:Ridge Proposal and Contract'.
14. Arcadis, January 2025, Cambois Data Centre Campus Ground Investigation Report. Report reference: 30226657-AUK-XX-XX-RP-ZZ-0017-01 Rev 01.
15. Arcadis, January 2025, Ground Investigation Factual Report – Stage 1 Project Wind, Blyth. Report reference: 30226657-AUK-XX-XX-RP-ZZ-0015-01 Rev 03.
16. Arcadis, January 2025, Ground Investigation Factual Report – Stage 2 Project Wind, Blyth. Report reference: 30226657-AUK-XX-XX-RP-ZZ-0015-01 Rev 03.
17. Cundall, May 2025, Project Wind Ground Conditions Summary Report, GBR1-DCZZ-XXX-UG-RP-B-00-01 V03.
18. Cundall, May 2025, Project Wind Ground Gas Risk Assessment, GBR1-DCZZ-XXX-UG-RP-B-00-08 V03.
19. Corgan, May 2025, 'Site Plan with Update to SSE Substation and connecting road to Ferguson Plot, Drawing reference EX-24.
20. Rolton Group, February 2025, High Level PFA Feasibility Study, report ref. 250137-ROL-ZZ-XX-RP-G-0001.

1.5 Limitations

This document is based on the information referenced in Section 1.4; this information is assumed to be accurate and Cundall take no responsibility for the quality of this information. Cundall cannot be held liable for elements of the works that others have retained responsibility for.

If, during construction, ground conditions vary from those revealed by the previous information provided for the site or the proposed development layout is revised, Cundall reserves the right to carry out further assessments and revise their recommendations in line with the revised scheme details. A discovery strategy is to be implemented as part of the remediation works, the details of which can be found in Section 5.7.

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2.0

Site Setting

2.0 Site Setting

2.1 Site Details

Site details of the Phase A Enabling Works area are included within Cundall's Ground Conditions Summary Report (Reference 17, Section 1.4).

This report shall be read in conjunction with the ground conditions summary report as this provides detail on the ground conditions, hydrology, hydrogeology, coal mining risk and other pertinent items relating to the Phase A Enabling Works area.

3.0

Conceptual Site Model

3.0 Conceptual Site Model

3.1 Proposed Development

The proposed final development is a commercial end use data centre. The enabling works will comprise a bulk earthworks exercise in advance of building construction. The conceptual model considers the final development together with the construction phase. The interim stage at the completion of bulk earthworks has not been considered due to the anticipation that building construction will continue promptly.

It is anticipated that the development will largely comprise buildings with some soft landscaping areas. Existing PFA material will need to be moved and / or removed from site as part of the redevelopment and must be sealed (low dust risk) prior to the operation of the first data centre on site.

3.2 Conceptual Site Model

A comprehensive summary of ground conditions and previously undertaken assessments can be found in the Cundall Ground Conditions Report (GBR1-DCZZ-XXX-UG-RP-B-07-01). The conceptual site model was derived by Arcadis, Phase 2 Geoenvironmental Assessment (30226657-AUK-XX-XX-RP-ZZ-0012-01). The Arcadis Remediation Strategy (30226657-AUK-XX-XX-RP-ZZ-0016-01) submitted and accepted for outline planning identified a number of potential pollutant linkages that will require addressing as part of the site remediation strategy. The below provides a summary of the conceptual site model, as derived by Arcadis and amended by Cundall in subsequent additional assessments.

3.2.1 Potential Sources of Contamination

The following sources of contamination are considered to be present on site;

- Asbestos in Made Ground (concentrations between <0.001 % and 0.026%);
- Localised elevated concentrations of extractable petroleum hydrocarbons (max concentration of 17,000mg/kg);
- Elevated concentrations of metals in both groundwater and surface water.
- Sulphur bearing minerals (in relation to ground aggressivity on concrete).
- Ground gas generation from materials with elevated organic content.

3.2.2 Potential Receptors for Contamination

Human Health

- Future site users, workers and visitors
- Third party neighbours (offsite)
- Construction and maintenance workers

Controlled Waters

- Surface water courses on site (Maw Burn and Cow Gut)

Built Environment

- Below ground services (water supply pipes)
- Building structures

Plants and Vegetation

- Flora in landscaped areas

3.2.3 Relevant Contaminant Linkages

Relevant contaminant linkages (CLs) considered unacceptable and requiring remediation are presented in Table 3-1. The relevant CLs are based on the ground investigations undertaken at the site and an evaluation of the potential sources and future receptors and the current hydrogeological model as detailed in the Ground Conditions Summary Report GBR1-DCZZ-XXX-UG-RP-B-00-01.

Contaminant Linkage	Source	Pathway	Receptor	Comments
CL1	Asbestos in Made Ground	Inhalation of wind-blown dust particles	Human Health during Construction and Maintenance (on site and offsite)	Risks to anyone disturbing on site soils
CL2	Asbestos in Made Ground	Inhalation of wind-blown dust particles	Human Health during Operation (on site and offsite)	Risk specifically in areas of exposed soils (soft landscaping)
CL3	Localised elevated concentrations of extractable petroleum hydrocarbons in soils	Dermal contact, inhalation, ingestion of dust	Human Health during Construction and Maintenance (on site and offsite)	Risks to anyone disturbing on site soils
CL4	Localised elevated concentrations of extractable petroleum hydrocarbons in soils	Dermal contact, inhalation, ingestion of dust	Human Health during Operation (on site and offsite)	Risk specifically in areas of exposed soils (soft landscaping)
CL5	Localised elevated concentrations of extractable petroleum hydrocarbons in waters	Migration and base flow to surface waters	Surface Water features	Surface water courses on site are partially culverted; however condition of the culvert is unknown.
CL6	Localised elevated concentrations of extractable petroleum hydrocarbons in soils	Permeation of water supply pipes	Underground services	Particularly potable water supply pipes
CL7	Localised elevated concentrations of extractable petroleum hydrocarbons in soils	Plant uptake	Flora	Specifically in areas of soft landscaping
CL8	Metals (Arsenic, Boron and Selenium) in groundwater	Migration and base flow to surface waters	Surface Water features	Surface water courses on site are partially culverted; however condition of the culvert is unknown.
CL9	Sulphur bearing minerals and aggressive ground conditions	Direct contact causing enhanced degradation of concrete	Building Structures	Can be mitigated via selection of the appropriate concrete classification.

Table 3-1: Plausible Contaminant Linkages

4.0

Earthworks Strategy

4.0 Earthworks Strategy

4.1 General

This strategy applies to Phase A Enabling Works Boundary only and the current earthworks proposals are summarised on Drawing GBR1-DCZZ-XXX-UG-DR-B-01-10. The objectives of this earthworks strategy is to minimise the volume of material movement (particularly offsite) and to provide a basis of design for further development.

The proposed development levels for enabling works are detailed on Drawing GBR1-ENA1-STE-XX-DR-C-01-22.

It should be noted that although the earthworks strategy below stipulates for disturbance of large areas of the site, the site currently comprises a number of sealed and unsealed roads that may be used as temporary haul roads / access roads (subject to verification by the Contractor) if required. Existing site levels are presented on Drawing GBR1-DCZZ-STE-XX-DR-C-01-03.

The chronology of the earthworks will need to be assessed by the Contractor, and they should be cognisant of the volume requirements in each individual area across the site.

The earthworks volumes calculated as part of this strategy do not include any allowance for material likely to be generated during the future construction phase activities (post enabling works), such as piling construction and drainage construction.

4.1.1 Environmental Monitoring

Noise, dust and vibration monitoring should be undertaken where earthwork operations are completed near sensitive receptors (such as residential neighbours) and / or sensitive structures (i.e. electricity pylons). The Contractor will be responsible for proposing a suitable programme of monitoring that is proportionate to the earthworks being undertaken and complies with relevant environmental and statutory regulations.

4.1.2 Zero Carbon Design

Bulk earthworks generate significant quantities of embodied carbon through direct and indirect emissions. By planning and optimising the resources available on site, the embodied carbon generated as part of an earthworks scheme can be significantly reduced. As Cundall's commitment to achieving net zero carbon on all our designs by 2030, this earthworks strategy has been developed to reduce the embodied carbon as far as reasonably practicable, predominantly by optimising material reuse and limiting offsite disposal.

4.1.3 Earthworks Principles

Based on the development proposals, the size of the site and the desire of the Client to develop the wider site in future phases, the principles of the earthworks vary over the Phase A Enabling Works. Subsequently, the earthworks have been separated into five key development areas (Area A to Area F) based on the anticipated works, rather than the spatial distribution of ground conditions. A summary of the earthworks proposed in each of these areas is provided in Section 4.1.3 and schematics of each area are provided in Drawing GBR1-DCZZ-XXX-UG-DR-B-01-10. Further information indicating the overall cut and fill requirements of the site and proposed sections are included in the following drawings:

- Enabling Works – Phase A – Site Strip Levels GBR1-ENA1-STE-XX-DR-C-01-20
- Enabling Works – Phase A – Formation Levels GBR1-ENA1-STE-XX-DR-C-01-21
- Enabling Works – Phase A – Enabling Works Finished Ground Level GBR1-ENA1-STE-XX-DR-C-01-22
- Enabling Works – Phase A – Existing Ground Level to Site Strip GBR1-ENA1-STE-XX-DR-C-01-24
- Enabling Works – Phase A – Site Strip to Formation GBR1-ENA1-STE-XX-DR-C-01-25
- Enabling Works – Phase A – Formation to Enabling Finished Ground Level GBR1-ENA1-STE-XX-DR-C-01-26
- Enabling Works – Phase A – Existing to Enabling Finished Ground Level GBR1-ENA1-STE-XX-DR-C-01-27

Further information regarding specific earthwork requirements either across the site or applicable to individual zones is included in Section 4.2.

4.1.4 Zone A

Based on the proposed foundation and floor slab solution, the primary objective of earthworks in Zone A is to break out all surface material (hard and soft) (site strip) and excavate to a depth to accommodate a granular working platform. In the absence of a final design of the working platform this has been assumed to comprise 700mm of granular material installed 150mm below finished floor level (FFL).

Obstructions are required to be removed in their entirety. Where previously unidentified piles are encountered that extend significantly beyond the base of excavation these are unlikely to be removed completely. In this scenario piles shall be cropped and broken out to an agreed depth (as defined in the earthworks specification) and any obstructions remaining in the ground shall be surveyed and their locations recorded. Backfilling will comprise placement of engineered granular fill to achieve the enabling works finished ground level.

4.1.5 Zone B

Zone B will predominantly comprise haul roads / access roads and external areas for storage / processing to be developed as part of the future construction phase. Earthworks are limited to 0.75m excavation (site strip) below existing level to recover suitable granular material. The earthworks will also remove known obstructions (as shown on GBR1-ENA1-STE-XX-DR-C-01-04 and GBR1-ENA1-XXX-UG-DR-B-01-11) and any unknown obstructions encountered during the site strip to 0.5m below invert level of deepest service corridor. Backfilling will comprise the re-engineering of suitable material to achieve a graded site level and will include 150mm of granular material as a protective surface.

4.1.6 Zone C

Based on the anticipated foundation design of the substation requiring piles and the likely presence of obstructions and potentially hydrocarbon impacted soils, a full made ground turnover (site strip including excavation and replacement) will be undertaken to prove natural ground within Zone C. This will include for removal of obstructions to full depth (if relict piles are recorded, these shall be treated as per guidance in Zone A) Backfilling will comprise the placement of engineered general fill to 700mm below the enabling works finished ground level, followed by the placement of 700mm of engineered granular fill.

4.1.7 Zone D

Zone D earthworks are proposed to be minimised as no defined end use for building or development has been specified in this part of the site. Currently, Zone D comprises large stockpiles and rough / loose surfacing and vegetation. Vegetation clearance may be required at discrete locations and will be confirmed by the Client in advance of the earthworks. Excavation of surface material should be avoided, where possible. Bulk excavation will comprise the excavation and relocation of general fill from large stockpiles in the north of Zone D (as shown on Drawing GBR1-DCZZ-XXX-UG-DR-B-01-10) and the breaking out and removal of below ground infrastructure, where specified on Drawing GBR1-ENA1-STE-XX-DR-C-01-02 and GBR1-ENA1-STE-XX-DR-C-01-04.

The low area in the south of Zone D will be used as a temporary Materials Management Area for stockpiling materials that may require treatment / screening / processing prior to reuse on other phases of the scheme. Surplus engineered granular fill generated as part of the enabling works will also be stockpiled in a predetermined location in Zone D, as specified on Drawing GBR1-ENA1-STE-XX-DR-C-01-22.

4.1.8 Zone E

The attenuation pond will be constructed within Zone E and this is predominantly in an area of excavation. Earthworks will comprise excavation to 0.5m below base of pond, followed by the placement of 300mm cohesive material (landscape fill or engineered general fill), followed by the placement of 200mm of topsoil and in accordance with Cundall Civil Engineering Specification (GBR1-ENA1-STE-UG-SP-C-00-01) and Drawing GBR1-ENA1-STE-XX-DR-C-05-05 .

Obstructions will be required to be removed to a maximum depth of 0.50m below the invert level of the pond / site drainage.

4.1.9 Zone F

Within Zone F a mound of soil is present and is heavily vegetated with semi mature and mature trees. Currently, it is understood that this part of the site will be required as a corridor for incoming services and therefore the mounds of soil should be relocated as part of the enabling works. Given the absence of any ground investigation, supplementary testing will be required during the earthworks in the form of a discovery strategy, detailed in Section 5.7, to understand the fate of this material. No placement of fill will be required within Zone F at this stage of design.

4.1.10 General

Outside of the zones detailed above limited enabling works will be required and these are shown on drawing GBR1-ENA1-STE-XX-DR-C-01-36. The works include, excavation and remediation of invasive species (where required), works to access road and service connections, relocation of small stockpiles to the east of Zone B and grubbing / cropping of piles. These stockpiles to the east of Zone B are shown on Drawing GBR1-DCZZ-XXX-UG-DR-B-01-10.

4.2 Earthworks Requirements

4.2.1 General

The detailed earthworks requirements are defined with the earthworks specification (GBR1-ENA1-XXX-UG-SP-B-00-01).

This section should be read in conjunction with the following drawings produced by Cundall:

- Preliminary Earthworks Strategy – Enabling Works Proposals (GBR1-DCZZ-XXX-UG-DR-B-01-10)
- Preliminary Earthworks Strategy - Constraints Plan (GBR1-DCZZ-XXX-UG-DR-B-01-11)
- Preliminary Earthworks Strategy – Surface Excavation Volume (GBR1-DCZZ-XXX-UG-DR-B-01-11)
- Existing Services (GBR1-ENA1-STE-XX-DR-C-01-02)
- Existing Constraints Plan (GBR1-ENA1-STE-XX-DR-C-01-02).
- Existing Levels (GBR1-ENA1-STE-XX-DR-C-01-03)
- Existing Site Drainage and Survey Schedule (GBR1-ENA1-STE-XX-DR-C-01-04)
- Site Strip Levels (GBR1-ENA1-STE-XX-DR-C-01-20)
- Formation Levels (GBR1-ENA1-STE-XX-DR-C-01-21).
- Enabling Works Finished Ground Level (GBR1-ENA1-STE-XX-DR-C-01-22)
- Existing Ground Level to Site Strip (GBR1-ENA1-STE-XX-DR-C-01-23)
- Site Strip to Formation (GBR1-ENA1-STE-XX-DR-C-01-25)
- Formation to Enabling Finished Ground Level (GBR1-ENA1-STE-XX-DR-C-01-26)

The following section details specific requirements or construction activities that are likely to be required during the earthworks and should be considered by the Contractor as part of development of this strategy.

4.2.2 Permitting

Acquiring relevant permits will be the responsibility of the Enabling Works Contractor and this may comprise a Material Management Plan or an environmental permit, or both. Further information is included in Section 5.3.

4.2.3 Supplementary Ground Investigation Testing

Once scheme design for the buildings has been developed and elements such as foundation and floor slab design, below ground service locations and depth and final earthworks strategy has been confirmed, there may be benefits in

completing further ground investigation testing and / or assessment. The testing may allow for value engineering when concluding scheme design and could include for the following elements:

- Electrical Resistivity Testing
- Thermal Conductivity Testing
- pH and sulphate testing
- lime and / or cement stabilisation trials / testing.
- Frost heave susceptibility tests (PFA only).

4.2.4 Surface Excavation

The surface material varies across the site and a summary of materials that are likely to be encountered and potential thicknesses are indicated on Drawing GBR1-DCZZ-XXX-UG-DR-B-01-02 Earthworks Strategy – Surface Excavation. Surface materials and shallow excavations are likely to include for the following:

- General soft strip which will include removal of trees and vegetation across the site (particularly in Zone D, Zone E and Zone F) along with general debris. Where tree removal is required, this must be completed in accordance with the requirements of the project ecologist and in accordance with the arboriculturist requirements.
- Excavation of topsoil, including stockpiling for future use on site in accordance with DEFRA Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (if required) or offsite disposal. Note that topsoil is predominately present across Zone D, Zone E and Zone F.
- Excavation and relocation of above ground stockpiles specifically within Zone A and Zone D. The material will be subject to further testing to determine the appropriate fate of the material. A plan of stockpiles across the site is shown on Drawing GBR1-DCZZ-XXX-UG-DR-B-01-02.
- Breaking out, segregating (or mixing), processing and crushing of hard surface material (predominately asphalt and concrete) for future reuse across site or stockpiling.

4.2.5 Compaction Trials

Based on the substantial volume of material that is likely to be re-engineered and compacted, a compaction trial will be required to be undertaken on each material type. The compaction trial will be required to be undertaken on representative samples of material on a pad at least 10m x 15m and comprise at least three layers of fill. Testing will include for density testing, stiffness testing and settlement testing via plate load testing. Refer to the Earthworks Specification for further information.

4.2.6 Obstructions and Bulk Excavation

Based on the historical development of the site, there is likely to be a number of obstructions that are within the proposed development platform. The majority of these are likely to be focused in the south and south east of the proposed enabling works boundary, although relict foundations should be expected, which are associated with the historical development (i.e. above ground conveyors, former factory, concrete settlement lagoons, former garage, etc). Reference should be made to the Below Ground Constraints Plan which presents some of the known below ground obstructions associated with the former development (GBR1-DCZZ-XXX-UG-DR-B-01-11).

In addition to the potential ground obstructions, existing services are present below the site, and these are shown on Drawing GBR1-ENA1-STE-XX-DR-C-01-01 and GBR1-ENA1-STE-XX-DR-C-01-04. The majority of the services should be removed by the Contractor (following confirmation from the Contractor that these have been abandoned / not live) where encountered within the proposed enabling works boundary. Existing site drainage should be removed where present below the footprint of proposed structures (Zone A and Zone C) and where shown on Drawing GBR1-ENA1-STE-XX-DR-C-01-04.

All areas are likely to require the breaking out of some below ground obstructions or historical features and the depth and extent of the removal of obstructions will vary in each zone. At this stage of design, the following strategy has been adopted for removal of below ground obstructions.

- Zone A and Zone C – Full depth removal of all known obstructions and those identified during the reduced level dig. Further investigation works will be required on the location and condition of a culverted watercourse (shown on drawing GBR1-ENA1-STE-XX-DR-C-01-04) and this may remain in situ and grouted up but will be dependent on proposed development requirements.
- Zone B – Below the base of excavation, known obstructions (see Drawing GBR1-ENA1-STE-XX-DR-C-01-04 and GBR1-ENA1-XXX-UG-DR-B-01-11) and those encountered during the site strip should be removed to 0.5m below proposed service corridors (as shown on Drawing GBR1-DCZZ-STE-XX-DR-C-01-40) . Where relict pile foundations are encountered, these shall be broken out and cropped to a maximum depth of 0.5m below proposed service corridors.
- Zone D – Obstructions to be removed in accordance with the Civil Engineering Specification (GBR1-ENA1-STE-UG-SP-C-00-01) and Drawing GBR1-ENA1-STE-XX-DR-C-01-33.
- Zone E – Obstructions shall be excavated and broken out to 0.5m below the base of the pond and below proposed drainage infrastructure in accordance with the Civil Engineering Specification (GBR1-ENA1-STE-UG-SP-C-00-01) as shown on Drawing GBR1-ENA1-STE-XX-DR-C-01-33.
- Zone F – Obstructions, where encountered as part of the reduced level dig, shall be broken out to 0.5m below services corridors.

An exercise has been undertaken by others to identify shallow services and existing drainage via a detailed GPR survey. Where services and drainage has been identified and is required to be removed, these are identified on drawings GBR1-ENA1-STE-XX-DR-C-01-04 and GBR1-ENA1-STE-XX-DR-C-01-01. However, existing infrastructure, such as the Cow Gut watercourse, will be required to remain in situ and maintained during any earthworks. Existing services and drainage to be maintained are also highlighted on the aforementioned drawings, as well as GBR1-ENA1-STE-XX-DR-C-01-33. Where obstructions remain in situ, these shall be recorded by survey to National Grid Co-ordinates and shall be available for review on an as built drawing upon completion of earthworks.

Bulk excavations will be required across the site to comply with this earthworks strategy and the base of the excavation is unlikely to be uniform. However, the base of excavation should be levelled to form a gradient no steeper than 1v:20h or where steeper, appropriate benching shall be implemented. The base of excavation shall be surveyed to National Grid Co-ordinates.

Where soft spots are identified during these works (i.e. where the sub grade demonstrates an undrained shear strength less than 50kN/m^2) then these areas shall be excavated and replaced with granular material.

4.2.7 Boundaries and Exclusion Zones

Earthworks undertaken adjacent to fixed boundaries, whether this includes ‘hard’ boundaries such as highways, pavements or land boundaries in the south for example, or ‘soft’ boundaries that include landscaping, should consider the temporary stability of the adjacent features.

Excavations within the vicinity of the pylons and overhead power cables shall be discussed and agreed by the Contractor with the relevant regulator.

4.2.8 General Filling and Compaction

Placement and compaction of site won or imported fill shall be undertaken in line with the approved earthworks specification.

4.3 Material Re-use

The suitability for the re-use of each material class is based on a detailed review of the findings obtained during the Rolton and Arcadis ground investigations.

The anticipated ground conditions, based on the findings of the aforementioned reports, are summarised in full in the Ground Conditions Summary report (Reference 12 in Section 1.4).

Volumes for the anticipated material ‘types’ are outlined in Section 4.3.1 and Section 4.3.2.

4.3.1 Engineered Granular Fill

Engineered granular fill has been defined as the material that is present on site that is likely to be suitable for reuse (subject to processing and / or conditioning) as a granular fill for use as capping below highways and external hardstanding and / or for pile mat construction / temporary haul roads, etc.

It may also be suitable as an engineered general fill to achieve finished levels, if required. It is likely to comprise the following materials.

4.3.1.1 Hard Material (Asphalt and Concrete)

Hard surfacing material is present across most areas but predominately across Zone A and Zone B. Asphalt and concrete will be broken out and excavated as part of the preparatory works. The approximate location of hard surfacing material is indicated on the Surface Excavation drawing GBR1-DCZZ-XXX-UG-DR-B-01-02. Significant obstructions comprising relict foundations, floor slabs and historical service runs are also likely to be present across the site (refer to Section 4.2.5).

Subject to geoenvironmental testing, it is likely that all hard surfacing material can be broken out, stockpiled and then processed (via a crushing and screening operation) to create a suitable well graded granular material. Similarly, obstructions that are encountered during works are also considered to be suitable for reuse following processing.

Some concrete, particularly that generated as a result of grubbing up old foundations and relict structures, may contain steel rebar, which will be required to be broken out and recycled appropriately.

Further geotechnical classification testing will be required on the material following processing to demonstrate it is suitable for reuse across the site.

4.3.1.2 Granular Subgrade

Granular subgrade was recorded predominantly below hard surfacing in Zone A and Zone B and within a large stockpile in Zone A. The approximate location of this stockpile is shown on Surface Excavation drawing GBR1-DCZZ-XXX-UG-DR-B-01-02.

Descriptions and particle size distribution (PSD)s of this material suggest it is likely to comprise a well graded sandy gravel. Occasionally, PSD test results indicate the material to be a uniformly graded fill. Some descriptions indicate the presence of other soils such as ash or clay, which may require screening before it can be reused as a suitable engineered structural fill.

4.3.2 Engineered General Fill

Engineered general fill has been defined as the material that is present on site that is likely to be suitable for general reuse (subject to processing and / or conditioning) to achieve the relevant formation level. It is likely to comprise the following materials.

4.3.2.1 Pulverised Fuel Ash

Approximately 17,000m^3 of PFA is anticipated to be present beneath hardstanding in Zone A and Zone B and is also present in a relatively small quantity (3,000m^3) in Zone E. A stockpile of PFA is also present to the north of Zone B, although the majority of the material is outside the enabling works area.

Moisture content tests carried out on samples of PFA suggest that the moisture contents of this material are variable and range between 13% and 35%. Although compaction testing is predominantly from material within a stockpile outside Phase A Enabling Works, they indicate optimum moisture contents of between 25% and 35%. Further testing is recommended but current testing indicates that the PFA may require conditioning via the addition of a light water spray. However, the addition of water via a spray should be considered carefully by the Contractor as PFA is highly sensitive to changes in moisture content and the addition of too much water may result in material that is not workable.

Particle size distribution (PSD) results of PFA indicate it is generally a silty sand and is likely to constitute a Class 2E fill in accordance with the SHW Series 600, if no modification via addition of lime / cement is required.

PFA demonstrates elevated concentrations of total potential sulphate, which may result in swelling of PFA that could result in cracking of sensitive structures. However, CBR swelling tests and accelerated swell tests have been undertaken on PFA and these typically demonstrate a swelling of less than 5mm, with two recording 5.1mm and 6.4mm after 28 days and 7 days respectively. As part of the earthworks specification, if PFA is to be placed below sensitive structures, a limit value of 5mm as an average swell value with a maximum value of 10mm will likely be applied and this is in general accordance with HA 74/95.

In addition to this, it may demonstrate poor thermal conductivity and electrical resistivity properties. In lieu of the absence of testing results on the PFA, it is not considered to be suitable for reuse within 500mm of buried concrete (unless sulphate resisting cement is placed). Thermal conductivity and electrical resistivity testing should be undertaken following completion of earthworks to inform scheme design. PFA may also be susceptible to frost heave so it should not be placed within the upper 450mm.

Based on anecdotal evidence of using PFA, it is generally a difficult material to manage on site as its properties and behaviour change significantly based on the weather conditions. Given it is a lightweight material and consists of fine particles size (predominantly silt sized fractions), it becomes airborne during excavation and loading and can result in dust migration. PFA is extremely sensitive to moisture and during wet weather conditions, it quickly becomes unsuitable for reuse and requires extended dry periods to reach a moisture content that is suitable for compaction. It is recommended a starter layer is placed before the placement of PFA.

Further information on the properties and risks / benefits of using PFA as general engineered fill in earthworks are included within a PFA feasibility options appraisal report (Ref 20, Section 1.4).

4.3.2.2 Burnt Shale

Burnt shale is likely to be generated in Zone C and may be present as a stockpile in Zone D (although this requires confirmation during site operations).

Moisture contents across the Phase A Enabling Works typically indicate that the material is between 12% and 18%. The results of the compaction tests indicate the optimum moisture content of the material ranges between 14.8% and 24% and these are typically wetter than the corresponding moisture content by between 2% and 9%. It is likely that following excavation and tracking the material is likely to be close to optimum moisture content and will not need significant conditioning. However, where localised wetter material is recorded, this will likely require conditioning via air drying. Given the elevated total potential sulphates of this material, it may be difficult to modify / stabilise the burnt shale using additives such as lime or cement.

PSDs suggest burnt shale is generally a well graded material and may meet the criteria or a Class 1A or Class 2C fill, although an element of screening may be required occasionally when anthropogenic materials are encountered. It may be blended with the hard surfacing material to form a Class 6F2, note that this will only be possible where concrete is designed to at least DS-3 and AC-3.

All swelling tests carried out on samples of burnt shale indicate less than 5mm of swell and so the swelling potential of burnt shale is generally not considered to be an issue at this site.

4.3.2.3 General Fill (Intermixed)

The remaining general fill predominately consists of reworked clay and granular general made ground. Descriptions, particularly of reworked clay, suggest the material consists of frequent anthropogenic materials including wood, ceramic, glass, brick etc, which will likely require screening and / or sorting before it can be used as an engineered general fill. Bituminous material and slag were also encountered in some locations.

Based on the spatial and lateral distribution of the general fill, it is likely that the fill is recovered as a mixed material and therefore compaction testing results available during the ground investigation may not be representative of the material. Compaction testing of the reworked clay, which is likely to be encountered in significant volumes, indicates optimum moisture contents ranging from 13% to 27%, indicating a high degree of variability. Generally, all samples were marginally wet of optimum indicating that the material may require conditioning. Moisture contents of the reworked clay are shown to vary significantly across the site between 12% and 30%. The majority of the wetter samples are recorded

at around 0.75m bgl and this may be as a result of surface water ponding on the cohesive material. A characteristic range of moisture contents of between 12% and 25% is considered to be representative and this indicates that material may require conditioning via methods such as air drying, particularly where recovered from shallow depth.

Given the likely variability of the material in terms of anthropogenic material content and potential hydrocarbon contamination (local to Zone C), it is reasonable to assume that some unsuitable material (chemical or geotechnically unsuitable) will be generated as part of any bulk excavations. Some screening, or sorting, of the general fill will be required to remove deleterious material such as timber, wood, plastics, metals etc.

It is considered prudent to assume that approximately 10% of the material may require modification or stabilisation with the addition of lime or cement to ensure it can be compacted appropriately.

4.3.3 Landscape Fill

4.3.3.1 Organic Made Ground

Organic made ground is present at depth across the site and will likely be generated within Zone C. It is considered to be a mixture of relict topsoil and reworked clay with ‘organic inclusions’ and ‘organic odour’ and is typically described as sandy clay with frequent organic inclusions and occasionally includes deleterious material including wood, brick and tile fragments.

Moisture content results within the Phase A enabling works boundary are generally between 24% and 27% optimum moisture contents were between 17% and 21%. Given the elevated moisture content and the organic context on the material, it is unlikely that this material is suitable for engineered general fill and has subsequently been considered as Class 4 Landscape Fill, in accordance with SHW Series 600. This material could be used in bunds around the site or as fill in the base of the pond, subject to acceptability by the Landscape Architect.

4.3.4 Potentially Unsuitable Soils

The subsequent sections outline the potential for the generation of soils unsuitable for reuse in Phase A of the project, prior to any processing / treatment. It is proposed that materials defined as “unsuitable” in the sections below may be suitable in future phases of the scheme. To facilitate the sustainable reuse of soils across the Project Wind development, including future phases, it is proposed that all materials deemed geotechnically unsuitable are moved to a temporary Materials Management Area prior to any processing / treatment to make them suitable for reuse in other phases of the project.

4.3.4.1 Topsoil

Topsoil is typically present in Zone D, Zone E and Zone F and although described as topsoil, it may not be of sufficient quality and condition to provide a BS3882 compliant topsoil for the proposed development. This should be reviewed by the Landscape Architect once the design has developed.

Log descriptions of topsoil consist of gravelly clayey sand and soft dark brown slightly gravelly silt with many fine rootlets. Occasional fragments of brick, concrete, clinker, tile, glass and ceramics were also recorded in this material. The thickness of topsoil varies between 0.10m bgl and 0.20m bgl although further areas are present where vegetation has self-established and thin topsoil may therefore be present.

Given the absence of any specific testing and design requirements, the topsoil has been considered as potentially unsuitable for use as a SHW Series 600 compliant Class 5 topsoil without any further treatment or processing. It may however be suitable for reuse as Class 4 Landscape Fill if required.

At this stage, it is recommended that the topsoil generated as part of the enabling works is stored on site and subject to processing or blending, along with specific environmental testing, to achieve a compliant SHW Series 600 Class 5 topsoil. Any deleterious material that is generated as part of that screening process may have to be disposed off site. However, this should be confirmed as scheme design progresses.

The volume of topsoil may reduce from the current estimate as it is likely that roots, rootlets, brash and vegetation is present within the topsoil that will be screened and disposed off site as green waste.

4.3.4.2 Invasive Species

Ridge Consultants (Ref 13, Section 1.4) has confirmed that approximately 14,250m^3 of soils previously impacted with the presence of invasive species (including Himalayan Balsam and Cotoneaster) is present within the south west corner of the site and marginally encroaches into Area B. The exact depth and extent of any historical treatment of the invasive species is unknown as no verification report is available for review.

It has been assumed as part of this strategy, the invasive species will only be excavated to execute the current strategy in Area B. Based on an excavation depth of 0.75m bgl over the anticipated footprint of invasive species, this is likely to generate approximately 1000m^3 of material that will need remediating (or relocating) at this stage. At this stage of the design and in the absence of any ecological survey, the volume of invasive species has been discounted from the earthworks reuse volume. However, once a method statement for disposal has been produced by an ecologist, the material shall be considered within the earthworks design and the relocation of soils shall be undertaken in accordance with the guidance included in the ecologists method statement. This should include, but not be limited to, methods for excavating the material and transporting it without cross contaminating adjacent soils and providing information on verification requirements.

4.3.4.3 Potentially Unsuitable Soils (U1A, U1B, U2)

Potentially unsuitable material is likely to be generated during the works given the historical development of the site. In the context of this strategy, unsuitable soils are classified in accordance with SHW Series 600 and comprise U1A, U1B and U2 unacceptable material.

Approximately 16,750m^3 of U1A and potentially U1B material may be generated across the site given the anthropogenic material and anticipated material properties. This volume is based on a conservative value of 10% of all general material generated in Area A, B, D and E. Within Area C, there is a risk that potentially hazardous material (elevated hydrocarbon concentrations in soil) may be encountered and therefore it has been assumed that 15% of U1 / U2 soils may be generated.

A significant volume (approximately 11,500m^3) of the U1A/U1B material is likely to be generated from a ‘surface excavation scrape’ prior to bulk earthworks and this may contain wet / waterlogged soils, organic soils (including roots, vegetation and brash) and soils containing significant coal fines or other organic / unsuitable material.

It is likely that the unsuitable material generated as part of any earthworks could be reduced significantly by careful management and handling of soils, implementing screening and conditioning processes relevant to the materials generated and by utilising material for specific end uses, such as landscape fill. By adopting an appropriate soil management strategy, there is potential that some ‘unsuitable’ soils can be reused to form site levels.

4.4 Earthworks Material Volumes

Material volumes likely to be generated as part of the proposed earthworks in line with Section 4.3 have been estimated based on data obtained from all relevant phases of intrusive ground investigations (completed by Arcadis and Rolton) and the 2024 Topographical Survey.

Note that these volumes do not include the future construction phase arisings (post enabling works), such as pile arisings or service arisings, but these should be considered as part of the wider ground break and enabling package for pricing purposes. The intention of the enabling works will be to reuse arisings to form finished levels as the scheme progresses.

4.4.1 Bulk Excavation Volumes

The bulk excavation is likely to comprise the excavation of shallow, surface materials (identified on Drawing GBR1-DCZZ-XXX-UG-DR-B-01-02) along with the excavation of general fill detailed in Section 4.3.2. Approximate volumes have been interpreted using Civils 3D as a computer modelling software and these are presented in Table 4-1.

Surface / Sub-surface	Material Source	Estimated Volumes (m^3) Within Each Zone					
		A	B	C	D	E	F
Engineered Granular Fill							
Surface Materials	Concrete	300	3,050	900	-	5,650	-
	Asphalt	5,450	4,850	50	-	-	-
	Granular Fill (stockpile)	11,000	1,200-	-	-	-	-
Sub-surface Materials	Granular Made Ground Subbase	17,560	26,250	100	-	-	-
Total		**34,310**	**35,350**	**1,050**	**-**	**5,650**	**-**
Engineered General Fill							
Sub-surface Materials	Pulverised Fuel Ash	7,800	8,600	-	-	3,000	-
	Burnt Shale	-	-	3,650	13,140		-
	Intermixed General Fill	1,100	8,190	8,150	4,600	18,475	-
	Total	**8,900**	**16,790**	**11,800**	**17,740**	**21,475**	**-**
Potentially Unsuitable							
Surface Materials	Surface	1000	6,150	2,600	-	-	-
	Topsoil	-	-	-	-	1,680	
Sub-surface materials	Intermixed General Fill	90	910	1,440	1,970	925	-
	Invasive Species Contaminated Soils	-	~1,000	-	-	-	-
Total		**1,090**	**7,060**	**4,040**	**1,970**	**2,605**	**-**
Potentially Suitable for Landscaping							
Surface Materials	Topsoil	-	-	-	-	840	-
Sub-surface materials	Organic Made Ground	-	-	3,300	-	-	3,300*
Total		**-**	-	**3,300**	**-**	**840**	**3,300**

Table 4-1: Summary of Material Volumes

*despite the absence of any ground investigation information (geological logs, geotechnical and / or environmental testing), it has been assumed that the mound within Area F has likely been generated from the construction of the adjacent road and may contain topsoil / subsoil, which can be utilised as landscaped fill in the development. Further sampling and testing will be required as part of the discovery strategy.

It should be noted that the above volumes are based on the following exclusions / assumptions:

- Below ground obstructions (and subsequent surrounding ground) have not been considered within the earthworks volumes (reference should be made to the Preliminary Enabling Works Strategy – Obstructions Plan).
- Excavations / filling in areas within the SSER boundary (excluding the areas of invasive species) have not been considered as part of this assessment. For example, volumes do not include for the excavation and breaking out of concrete and soils / aggregate associated with the existing site compound that straddles the SSER boundary.
- The volume of invasive species is understood to be approximately 14,250m^3 and only 1000m^3 has been considered as part of the enabling works. Confirmation of the extent and volume of the invasive species will be required to be confirmed as part of the discovery strategy. Any works undertaken on invasive species contaminated soils shall be undertaken in accordance with an Ecologist's method statement for the works, which should consider measures to prevent cross contamination of soils.
- General earthworks considerations (such as battering excavations, temporary access roads and forming of stable excavations with benching) have not been considered within the earthwork volumes.
- No allowance has been made for bulking factors.
- It has been assumed that 'potentially unsuitable' material can be stockpiled for treatment for future reuse as opposed to being disposed off site. The treatment of this material may vary from air drying, stockpiling (and turning) to adding cement or lime, but this is entirely dependent on the proposed end use. A cost for 'processing' should be allowed for.
- Soft spots / weak material may be encountered and require excavating during the earthworks, but excavations of these areas have not been accounted for.

4.5 Material Balance

Table 4-2 provides a summary of the estimated material balance based on the proposed levels as outlined in Section 4.4 the proposed development requirements and the existing materials present on site.

Material Type	Estimated Volumes (m^3)					
	A	B	C	D	E	F
Engineered Granular Fill						
Total on Site	34,310	35,350	1,050	0	5,650	0
Total Required	38,350	11,485	10,180	0	-	0
Balance	**-4,040**	**+23,865**	**-9,130**	**0**	**+5,650**	**0**
General Fill						
Total on Site	8,910	16,790	11,800	17,730	21,475	
Total Required	880	41,730	15,870	160	7,655	
Balance	**+8,032**	**-24,940**	**-4,070**	**+17,570**	**+13,820**	**-**
Potentially Suitable for Landscaping						
Total on Site (Topsoil)	-	-		-	840	-
Total Required (Topsoil)	-	-	-	-	5,460	0
Total on Site (Landscape Fill)			3,300	-	-	3,300
Total Required (Landscape Fill)	-	-	-	-	8,190	-
Balance (Topsoil)	**-**	**-**	**-**	**-**	**-4,600**	**-**
Balance (Landscape Fill)	**-**	**-**	**+3,300**	**-**	**-8,190**	**+3,300-**
Potentially Unsuitable						

Material Type	Estimated Volumes (m^3)					
	A	B	C	D	E	F
Total	**1,100**	**8,060 (including ~1,000m^3 invasive species)**	**4,040**	**1,970**	**2,605**	**0**

Table 4-2: Material Volume Reconciliation

A summary of the estimated material balances is included in Table 4-3.

	Total On Site	Total Required	Balance
Engineered Granular Fill	76,360	60,000	16,360
Engineered General Fill	76,700	66,290	10,410
Landscape Fill	6,600	8,190	-1,590
Potentially Unsuitable	17,765	0	-17,175 (including 1,000m^3 invasive species)

Table 4-3: Summary of Material Types

In conclusion, the preliminary volumes calculated above result in a net surplus of engineered granular fill of approximately 16,000m^3, a surplus of engineered general fill of approximately 10,500m^3, which could both be used in future phases of earthworks, where required.

Material classified as being unsuitable for reuse within Phase A should be moved to the Materials Management Area for further processing / treatment with the intention of rendering it suitable for reuse as either landscaping or general fill for future site phases. The volume of material subject to offsite disposal is likely to be minimal; however, it would be reasonable to assume that as the scheme design develops and previously unidentified material may be encountered, the volume for off site disposal may increase. Currently, only topsoil material is anticipated to be required to be imported to site.

4.6 Drainage

4.6.1 Proposed Permanent Surface Water Drainage

A drainage scheme shall be provided as part of the earthworks that prevents flooding both on and off site, provides water quality treatment and attenuation to overland stormwater flows while maintaining the existing water courses running through the site.

The proposed drainage layout for the site is included on drawing GBR1-DCZZ-STE-XX-DR-C-01-33).

4.6.2 Temporary Drainage Requirements

Previous intrusive ground investigations indicate shallow perched water within made ground units across the site. Standing water has also been noticed across the site after periods of heavy rainfall, particularly in Zone D. To facilitate the earthworks, a temporary drainage solution will be required prior to breaking ground, which may comprise the installation of pipework or open channels to manage surface water.

A temporary Surface Water Management Plan (SWMP) will be required by planning and should be produced as part of a Construction and Environmental Management Plan. The SWMP will be the responsibility of the Earthworks Contractor. As part of this SWMP, a discharge consent from Northumbrian Water Limited (NWL) may be required and this shall be the responsibility of the Earthworks Contractor to ensure this is agreed prior to mobilising to site.

4.7 Alternative Ground Engineering Solutions

As part of the early design phase, a ground improvement options appraisal report (Reference NCL1-DCZZ-XXX-UG-RP-B-00-07 V01) was produced that detailed potential alternative ground improvement options. Some of these technically feasible ground improvement options are still considered to offer a value engineered approach to executing the enabling earthworks.

5.0

Remediation Implementation

5.0 Remediation Implementation

5.1 Remediation Strategy

The existing remediation strategy for the Project Wind site included the following remedial measures.

- Clean cover system in areas of soft landscaping;
- Materials management / control of material import;
- Ground gas mitigation measures in line with a CS2 classification;
- Upgraded potable water supply pipes ; and,
- Discovery Strategy for unforeseen contamination.

The remedial measures to be implemented, as per the remediation strategy, are discussed and detailed in the following sections. Verification of the remediation implementation is outlined in Section 6.0.

5.2 Clean Cover System

5.2.1 Areas of Soft Landscaping

This Section should be read in conjunction with the Landscape Architect's specification when available.

Contaminant Linkages CL2 and CL4 outline unacceptable risks to Human Health (end users) from contaminants recorded to be present in site won soils. For the purposes of this development, there are inherent degree of protection within the masterplan, as the development will comprise the significant amount of hardstanding (pavements, roads and the buildings). The pathway from site soils to end-users is only viable in areas where soft landscaping (areas of grass or shrubs) are proposed. Soils placed in the top 300mm of soft landscaped areas, regardless of source, comprise a suitable growing medium in line with relevant landscape architect requirements and will need to adhere to the suitability criteria outlined in Table 5-1.

If the contractor wishes to reduce the testing frequency defined in Table 5-2, due to the volumes of material required, it would be appropriate for the contractor to provide a robust justification in support of an alternative testing frequency to NCC. The reduced testing frequencies would have to agreed with NCC prior to implementation and verification measures will still be required in line with those outlined in Section 6.0.

A physical geotextile membrane is required to delineate the base of the clean cover for the protection of maintenance workers, this will comprise a marker layer only and its presence should be noted in the operation and maintenance manual for the site.

Where individual determinant thresholds exceed the Class 1A carcinogenic threshold of 0.1% (generally about 1,000 mg/kg) as detailed in EA WM3, the threshold value has been defined as <1,000mg/kg. Remaining auditability criteria outlined in Table 5-1 are based on the commercial / industrial end use scenario with a 1% soil organic matter and are based on Suitable for Use Levels (S4ULs) and Category 4 Screening Levels (C4SLs) where these are not available.

Test	Threshold Value	Units	Source
Asbestos			
Asbestos	Non-detect		
Metals			
Antimony	7500	mg/kg	C4SL
Arsenic	640	mg/kg	CL:AIRE 2009
Barium	22000	mg/kg	CL:AIRE 2009
Beryllium	12	mg/kg	S4UL
Boron, Water Soluble	240000	mg/kg	S4UL
Cadmium	410	mg/kg	C4SL
Chromium III	8600	mg/kg	S4UL
Chromium, Hexavalent	49	mg/kg	C4SL
Copper	68000	mg/kg	S4UL
Lead	2330	mg/kg	C4SL
Elementary Mercury	58	mg/kg	S4UL
Inorganic Mercury	1100	mg/kg	S4UL
Methyl Mercury	320	mg/kg	S4UL
Molybdenum	17000	mg/kg	CL:AIRE 2009
Nickel	980	mg/kg	S4UL
Selenium	12000	mg/kg	S4UL
Vanadium	9000	mg/kg	S4UL
Zinc	730000	mg/kg	S4UL
TPH			
TPH Ali/Aro Total	1000	mg/kg	
BTEX and MTBE			
Benzene	98	mg/kg	C4SL
Toluene	56000	mg/kg	S4UL
Ethylbenzene	5700	mg/kg	S4UL
Phenols			
Phenol - Monohydric	440	mg/kg	S4UL
PAHs			
Naphthalene	190	mg/kg	S4UL
Benzo(a)pyrene	77	mg/kg	C4SL

Table 5-1 - Suitability Criteria for Soils (Commercial, Soil Organic Matter 1%)

5.2.2 Construction and Maintenance Workers

Based on the relatively short duration of exposure of soils to construction and maintenance workers, and the lack of significant contamination sources of site this risk is considered to be relatively low. The main risk to construction and maintenance workers is from asbestos fibres in soils (CL1 & CL3).

Asbestos is a non-threshold contaminant (no concentration is low enough to eliminate risk to human health) and although no materials encountered during site investigations were “notifiable” under Asbestos Regulations, this does not preclude the potential for notifiable asbestos to be recorded during the construction (see Section 5.7). Control of Asbestos Regulations (CAR, 2012) will apply to all construction and maintenance activities; an Asbestos Management Plan should be implemented as a part of the construction works. As general Site Management good practice, earthworks operatives should be given a tool box talk on potential contaminated land risks in particular the possibility of encountering Asbestos Containing Material (ACM) prior to excavation.

Maintenance workers are anticipated to interact with below ground soils surrounding below ground services. Backfill to below ground service trenches should therefore meet the suitability criteria outlined in Table 5-1 and, where material is site won be tested on a minimum 3 tests per source or 1 per 500 m^3 (whichever is greater). If the contractor wishes to reduce the testing frequency, due to the volumes of material required, it would be appropriate for the contractor to provide a robust justification in support of an alternative testing frequency to NCC. The reduced testing frequencies would have to agreed with NCC prior to implementation and verification measures will still be required in line with those outlined in Section 6.0. Where material is imported, these will be tested in line with the frequencies outlined in Section 5.3, dependent on source but will be required to meet the suitability criteria in Table 5-1 - Suitability Criteria for Soils (Commercial, Soil Organic Matter 1%).

5.3 Materials Management

It is anticipated that the majority of soils (including Made Ground) will be managed using a Materials Management Plan (MMP) regulated under the Department of Waste Code of Practice (DoWCOP). Some environmental permits may be required where materials have previously been deposited under a waste licence. Regardless of the regulatory regime, all soils will be required to tested for both chemical and geotechnical suitability prior to reuse for any genuine requirement for fill materials within the development. Any MMP / Environmental Permit should make reference to the chemical suitability criteria within this document and will require review and approval from a Qualified Person (QP) in the case of an MMP or the Environment Agency, in the case of an Environmental Permit.

Suitability criteria and testing in Table 5-1 apply to all general fill materials placed as part of the construction; however, it will be suitable for site won soils to include asbestos fibres in general fill material (below hardstanding and 300mm below soft landscaping, outside of utility trenches) up to a concentration of 0.1%. Soils will asbestos concentrations of 0.1% or above should be removed from site and managed in line with the Asbestos Management Plan for the works.

Asphalt material excavated from the site should be tested for the presence of Coal Tar utilising a USEPA17 suite (inclusive of coronene). An indicative Benzo(a)pyrene threshold of 50mg/kg should be utilised in accordance with WM3 guidance to determine whether the asphalt on site should be categorised as asphalt waste containing coal tar (AWCCT) which carries a hazardous waste classification (17 03 01*). If AWCCT materials are found to be present on site these will be required to be reused in accordance with the Environment Agency’s Regulatory Position Statement 75 (RPS75), notably this does not cover the treatment of AWCCT or provide end of waste criteria.

Removal of material not in compliance with the suitability criteria outlined in Table 5-1 will control the concentration of contaminants on site considered to potentially be a source of contamination for CL5 and 8. In conjunction with restricted infiltration due to the extensive hardstanding in the proposed development, adherence to the suitability criteria for general fill materials will provide a betterment to the chemical quality of surface water courses on site by way of source removal and pathway restriction to the receptor. Test frequencies and suites are applicable dependent on the material source and are outlined in Table 5-2.

Type	Number of Samples	Testing Schedule
Virgin quarried material	Minimum of 2 per source	Metals suite only.
Crushed hardcore, stone and brick (excluding asphalt)	Minimum 1 per 500m^3	Metals, PAH16, Asbestos, Total TPH.
Asphalt	Minimum 1 per 1000m^3	PAH17 Suite.
Brownfield / screened / site won material	Minimum 6 per source or 1 per 100 m^3 (whichever is greater)	All determinants in Table 5-1
Greenfield material	Minimum 3 tests per source or 1 per 250 m^3 (whichever is greater).	All determinants in Table 5-1

Table 5-2 - Material Testing suites and frequencies depending on material type

If the contractor wishes to reduce the testing frequency, due to the volumes of material required, it would be appropriate for the contractor to provide a robust justification in support of an alternative testing frequency to NCC. The reduced testing frequencies would have to be agreed with NCC prior to implementation and verification measures will still be required in line with those outlined in Section 6.0.

Recycled aggregates imported to site will fall under the “Concrete hardcore, stone and brick” category above and should be subject to visual screening by a competent person prior to acceptance on site. It is not suitable to import recycled materials containing either asbestos free fibres or asbestos containing materials.

5.4 Ground Gas Protection

Ground gas risk was recorded by Arcadis to be in line with Characteristic Situation 2 (CS2 - Low Risk). Following review of the ground gas data by Cundall (Cundall Ground Gas Risk Assessment GBR1-DCZZ-XXX-UG-RP-B-00-08), it is considered a Characteristic Situation 1 (CS1 -Very Low Risk) is more applicable to the site.

To provide an appropriately conservative approach, as outlying elevated ground gas concentrations were previously recorded on site (with regards to carbon dioxide), additional ground gas monitoring should be undertaken following enabling works to confirm the very low risk classification. Continuous ground gas monitoring should be undertaken for a period of 1 month from monitoring points with response zones from 1m bgl to the base of engineered general fill.

Should the continuous monitoring not support the CS1 classification, ground gas mitigation measures will be required in the buildings in accordance with a CS2.

In accordance with BS8485:2015+A1:2019, the proposed development is a ‘Type D’ building which consists of large, well-ventilated commercial buildings with central building management control of the maintenance of the building, active ventilation or good passive ventilation of all internal areas.

Therefore, gas protection equivalent to 1.5 points is required. This must comprise a minimum of two forms of protection derived from Tables 5 to 7 of BS8485:2015+A1:2019. For example, this may be a combination of

- Reinforced cast-it situ suspended slab with minimal penetrations (1.5 points)
- Gas resistant membrane (resistant to the hazardous gases/vapours identified as impacting the site, as appropriate) Independently tested and verified (2 points).

Regardless of the result of the result of the additional ground gas monitoring NCC have requested all service ducts are sealed utilising an airtight product (such as Filoform or Duct Seal HG). Product choice should include consideration of how these will interact with services, for example, some products may not be suitable for use with alkathene potable water supply pipes and proposals for products to be used alongside water supply pipes should be confirmed with Northumbrian Water prior to use.

5.5 Potable Water Supply Pipes

Localised elevated hydrocarbons recorded on site currently pose a risk to potable water supply pipes (CL6). Hydrocarbons can permeate pipes, not only introducing contaminants to the buildings water supply but also causing degradation of pipe materials. Backfill for utility trenches is required to comply with the suitability criteria in Table 5-1. Criteria in Table 5-1 are UK WIR compliant and therefore non-upgraded supply pipe materials are likely to be suitable for the site as the contaminant source will have been removed. All water supply pipe materials are subject to confirmation with Northumbrian Water, including the use of sealant products.

5.6 Concrete Classification

The concrete classification of individual material types and stratum has been assessed as part of Cundall's ground conditions summary report. Although the concrete classification of individual made ground material types varies, the proposed earthworks will include for relocation and mixing of soils so it is prudent to consider a worst case scenario to mitigate the risk of sulphate attack on buried concrete.

Utilising the appropriate concrete classification will prevent the degradation of the concrete and removes CL9.

5.7 Discovery Strategy

It is proposed that a system of appropriate inspection and assessment is implemented during the excavation of all materials. Potential unforeseen contamination should be determined via visual and olfactory evidence, such as visible asbestos materials or hydrocarbon staining / odours. This role should be performed by a suitably experienced person who is able to provide an appropriate level of specialist technical advice in relation to the presence of contamination or otherwise. The contractor undertaking the works shall ensure that all material is correctly inspected, stockpiled, tested and classified in accordance with this implementation plan.

On identification of potential contamination whilst undertaking the construction, it would be intended for this to be remediated via excavation and materials management as outlined in Section 5.3. Depending on the nature of the remediation it may be prudent to undertake local investigation to delineate impacted soils.

On removal of the impacted soils, sampling and verification testing should be undertaken on a 10m x 10m² grid on the base of the excavation and at 10m intervals on the sides of the excavation.

This role will be performed by a suitably qualified person who is able to observe any visual / olfactory evidence of contamination during the enabling works and undertake further investigation, sampling, testing and subsequent assessment on receipt of the results. Testing will include screening with a PID at a frequency of 1 / 250m³ on all excavated materials.

The findings may indicate the requirement for further mitigation measures required as a part of the proposed development. Remediation proposals should be submitted to the local authority / Environment Agency, including a verification plan prior to implementation.

6.0

Remediation Verification Plan

6.0 Remediation Verification Plan

In order to comply with pre-occupation planning conditions it is necessary to verify that the remediation outlined has been correctly implemented and therefore the site is suitable for its proposed intended use. This section outlines the records that should be kept and compiled during the construction in order to evidence remediation.

A verification report will be required to be produced by an independent geoenvironmental consultant as part of the enabling works to outline the evidence presented and, where appropriate, appending the evidence to the verification report. The enabling works contractor will be expected to include evidence of the remediation activities specific to their element of the works, which is likely to be those elements in Section 6.2 and Section 6.6 only. The verification report shall be submitted to the Client and approved before being made available to the General Contractor who will execute the build.

The General Contractor will then be responsible for producing a verification report that will verify the correct remediation mitigation measures have been applied and to address the items in Section 6.1, Section 6.3, Section 6.4 and Section 6.5.

6.1 Clean Cover System

Validation of suitable material being placed in areas of soft landscaping and utility trench backfill in accordance with Section 5.2 should comprise:

- Photographic evidence (including a survey staff or tape measure) of the thickness of material and placement of the marker layer are required on an approximately 250m grid, with a minimum of 3 spot checks per area of soft landscaping.
- Material movement records outlining, at a minimum, the volume of materials placed, the source of the material and cross-referencing relevant chemical testing.
- Chemical testing certificates (UKAS accredited, where available).
- Presentation of chemical testing data compared to the relevant suitability criteria, including samples which have not met these criteria and where material has subsequently been removed.
- If applicable, a summary of materials removed from site, including waste transfer tickets.

The above is in line with the recommended Yorkshire and Lincolnshire Pollution Advisory Group (YALPAG) guidance on the Verification Requirements for Cover Systems referenced in the Arcadis Remediation Strategy and adopted by Northumberland County Council. Further guidance can be found within the YALPAG document, publicly available online. If testing frequencies are reduced from those outlined, robust technical justification and proof of consistency of material is required to be submitted alongside validation records.

6.2 Materials Management

Validation of suitable material being placed as fill as per Section 5.3 should be evidenced via the following:

- Material movement records outlining, at a minimum, the volume of materials placed, the source of the material and cross-referencing relevant chemical testing.
- Chemical testing certificates (UKAS accredited where available).
- Presentation of chemical testing data compared to the relevant suitability criteria, including samples which have not met these criteria and where material has subsequently been removed.
- A summary of materials removed from site due to their chemical unsuitability, including waste transfer tickets.

If testing frequencies are reduced from those outlined, robust technical justification and proof of consistency of material is required to be submitted alongside validation records.

6.3 Ground Gas Protection

Continuous ground gas monitoring is required within response zones from 1m bgl to the base of engineered general fill following the completion of earthworks, as outlined in Section 5.4. If the monitoring supports the CS1 classification for the site, the monitoring data and justification will need to be presented as part of the verification report. Verification of the sealing of service ducts using a gas tight product (such as Filoform or Duct Seal HG) should be provided including justification of product choice, method statement for application, photographic evidence and inspection reports and / or competency certificates of the installers if applicable.

Should CS2 ground gas mitigation measures be required, in addition to the monitoring data and justification for CS2, the verification report should include the verification of ground gas protection measures in accordance with CIRIA C735. Verification should include photographic evidence and as-built drawings.

6.4 Potable Water Supply Pipes

Either upgraded pipe materials or suitable backfill material is required to ensure there are no residual unacceptable risks to potable water supply pipes. Validation of this remediation will be evidenced either by material tracking and testing line with Section 6.2 or evidence of the installation of upgraded pipe materials. Whichever approach is chosen, the verification should include confirmation of acceptability of this approach from Northumbrian Water.

6.5 Concrete Classification

Verification of the use of the appropriate concrete classification should be justified in the verification report and relevant import slips should be provided.

6.6 Unforeseen Contamination

Should unforeseen contamination be encountered as part of the Discovery Strategy (Section 5.7), further assessment and proposed remediation will be required to be submitted to the local authority or Environment Agency, as applicable. Proposals to the statutory bodies will need to include a verification plan specific to the remediation required. In the event unforeseen contamination is recorded during the works the following documents will need to be included within the verification report:

- Remediation plans, as submitted to the local authority;
- Confirmation of acceptance of these by the local authority / Environment Agency, as applicable
- Evidence in accordance with the verification outlined in the Remediation Plan

7.0

Earthwork Verification Requirements

7.0 Earthwork Verification Requirements

7.1 Earthworks Verification Requirements

The following earthwork verification requirements will be provided by the Contractor to the Client:

- Evidence that the Contractor (and their specialist Sub-Contractor) have produced their own Risk Assessments, Method Statements and Plan of Work (if required).
- Evidence that the correct environmental permit or materials management plan is in place prior to the execution of the earthworks.
- A photographic record of the works as they progressed.
- Base of excavation survey to National Grid Co-ordinates with measurements in mOD of the works is required. Surveys should have a tolerance of +/- 1cm
- Geotechnical testing locations surveyed to National Grid Co-ordinates with measurements in m OD of the works is required. Surveys should have a tolerance of +/- 1cm.
- An as built survey (finished formation level) to National Grid Co-ordinates with measurements in m OD of the works is required. Surveys should have a tolerance of +/- 1cm
- A constraints plan identifying any below ground obstructions that remain along with a detailed record of treatment (such as grouting) if relevant.
- A full record of all geotechnical sampling and laboratory testing undertaken during the earthworks.
- A record of all in situ geotechnical testing undertaken.
- If ground improvement works are undertaken to meet the specified performance limits, full details including basis of design and as built records of the works undertaken shall be provided.
- A comprehensive set of environmental monitoring data obtained during the works (i.e. dust, noise, etc).
- Details of any contamination or unexpected ground conditions.
- A record of any temporary works and associated design packages.
- A record of any variations from the specification.

The enabling works verification report shall be completed by an appropriately qualified geotechnical or geoenvironmental engineer working for an independent consultancy appointed by the Contractor.

7.2 Health and Safety File

Upon completion of the works, the site condition must be recorded (by way of a Verification Report) for inclusion in the site H&S File. The H&S file must include all the data included above and any other relevant information for potential occupiers of the site.

7.3 Embodied Carbon

A record of the embodied carbon associated with the construction phase earthworks should be made available to the Client by the Main Contractor and any solutions to reduce the embodied carbon through good site management / value engineered design / innovative ground improvement methods should be made available following completion of the scheme.

The embodied carbon generated by the earthworks should be tracked and recorded during the earthworks by using in line with SBTi (Science Based Target Initiatives) guidance.

Appendices

Appendices

Appendix A Drawings

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CUNDALL
One Carter Lane
London
EC4V 5ER
United Kingdom
www.cundall.com

ARCHITECT

CORGAN
185 Park St
Trinity Buoy Wharf
London
E14 0AF
United Kingdom
www.corgan.com

LANDSCAPE

ARCADIS
80 Fenchurch Street,
City of London,
London
EC3M 4BY
United Kingdom
www.arcadis.com

SHEET NOTES

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LEGEND

- Site Boundary
- Enabling Works Phase A Boundary
- SSER Cable Route Exclusion Zone / Working Zone
- Asphalt (Hard material)
- Concrete (Hard material)
- Potentially Class U1A / U1B / U2
- Approximate Area of Invasive Species Impacted Soils
- Topsoil
- Stockpiled Materials
- Enabling Works Zone A
- Enabling Works Zone B
- Enabling Works Zone C
- Enabling works Zone D
- Enabling Works Zone E
- Enabling Works Zone F

NOTES

The suitability of materials are based on review of the available ground investigation information.

This drawing should be read in conjunction with the following reports:

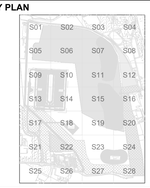
- Cundall Ground Conditions Report (GBR1-DCZZ-XXX-UG-RP-B-00-01 Rev V02).
- Cundall Remediation and Earthworks Strategy report (GBR1-DCZZ-XXX-UG-RP-B-00-11 Rev V02).

This drawing was previously issued as 'Preliminary Earthworks Strategy - Surface Excavation Volume' (Rev V01) and has now been changed to 'Earthworks Strategy - Surface Excavation Materials'.

Rev	Description	Date	Chk'd	Apr'd
V03	ENABLING WORKS - RIBA STAGE 4	23/05/25	[Checker]	[Approver]
V02	ENABLING WORKS - RIBA STAGE 3	26/03/25	AL	GK
V01	ISSUED FOR RIBA STAGE 2	22/11/24	CL	KM

DRAWING ISSUES

KEY PLAN



PROJECT

QTS PROJECT WIND

Former Blyth Power Station
Coal Stocking Yard, Cambois,
Northumberland

DWG. TITLE

ENABLING WORKS - PHASE A
EARTHWORKS STRATEGY - SURFACE EXCAVATION MATERIALS

PROJECT NO:

1043152

DWG. NO:

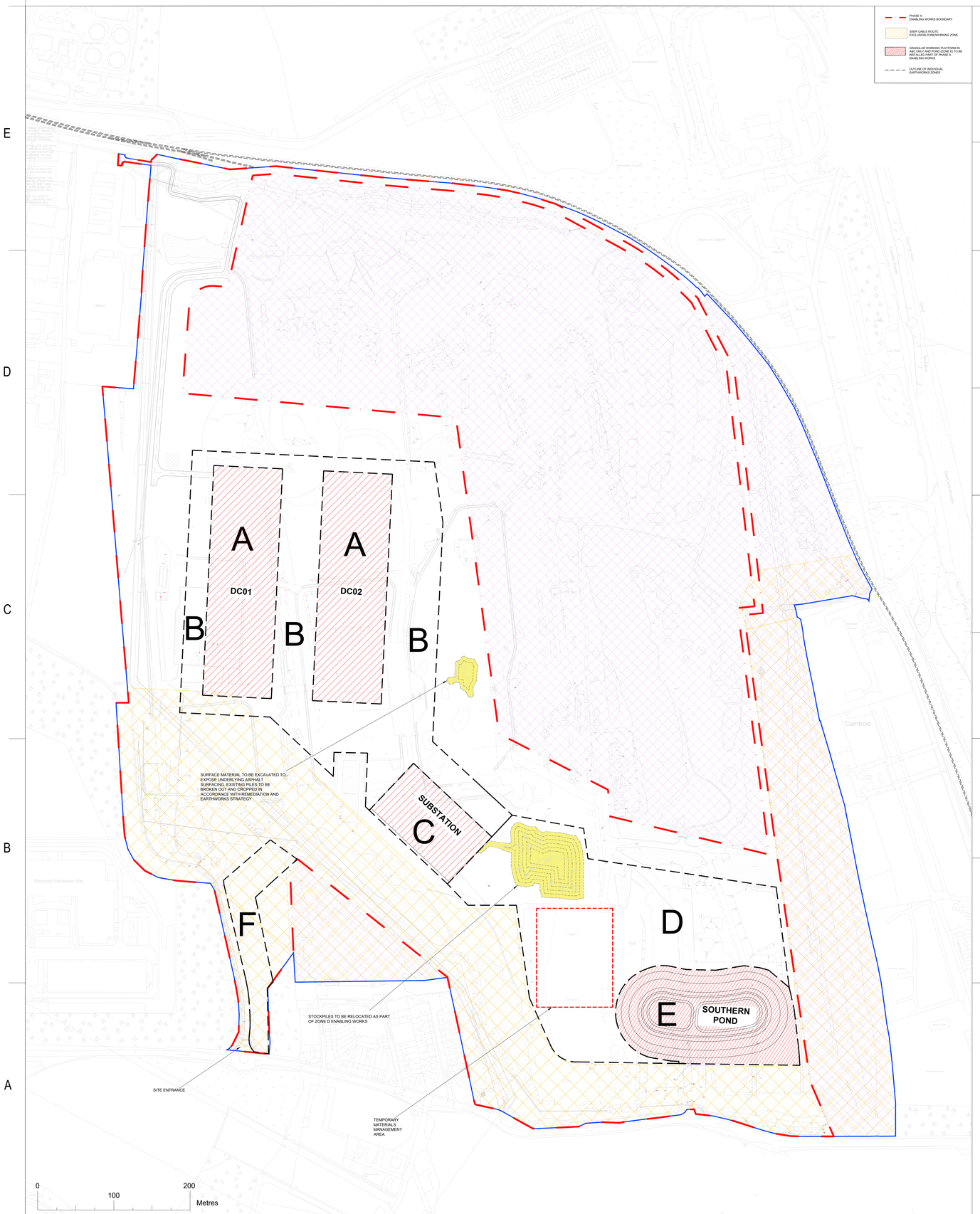
GBR1-DCZZ-XXX-UG-DR-B-01-02

STATUS:

ISSUED FOR REVIEW

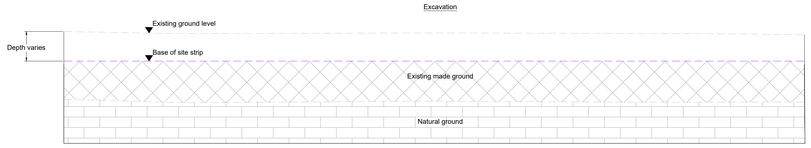
SCALE @ A0:

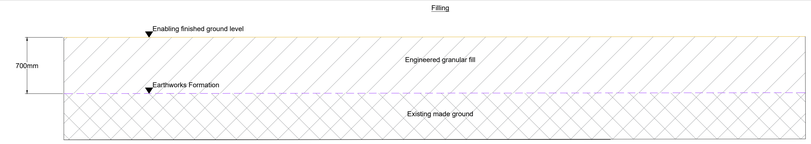
1:2000



Zone A - Typical Cross Section View

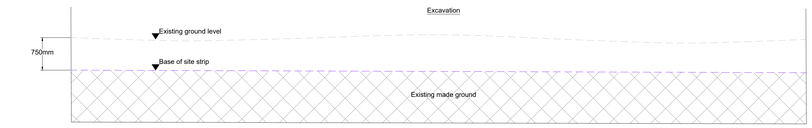
NTS
Not orientated

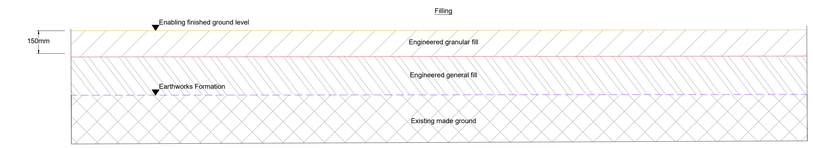




Zone B - Typical Cross Section View

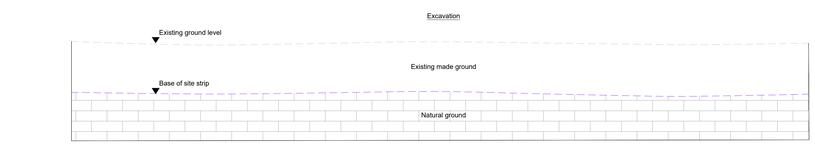
NTS
Not orientated

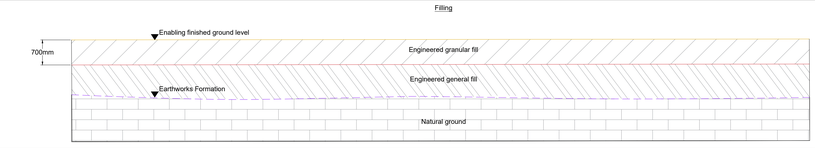




Zone C - Typical Cross Section View

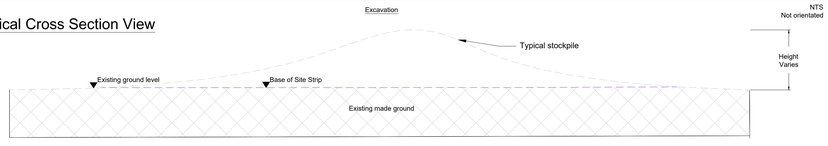
NTS
Not orientated

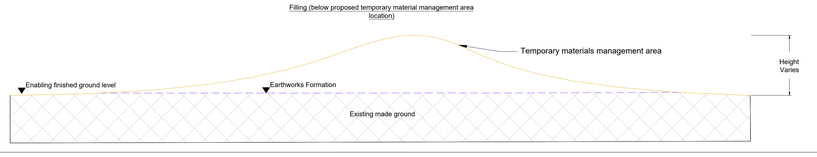




Zone D - Typical Cross Section View

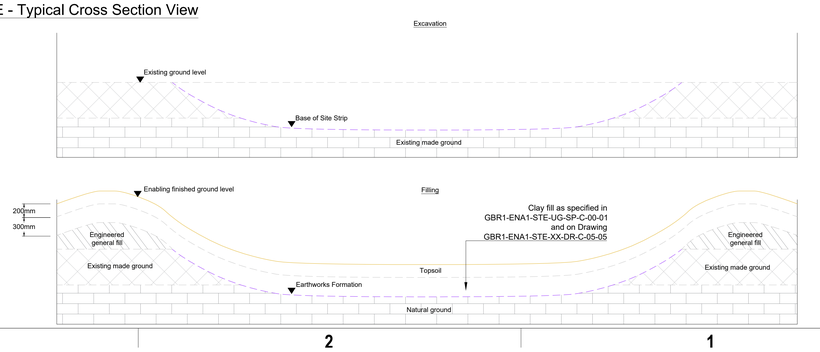
NTS
Not orientated





Zone E - Typical Cross Section View

NTS
Not orientated



OWNER

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CUNDALL
One Carter Lane
London
EC4V 5ER
United Kingdom
www.cundall.com

ARCHITECT

CORGAN
185 Park St
Triptych Barkside
London
SE1 9BH
United Kingdom
www.corgan.com

LANDSCAPE

ARCADIS
80 Fenchurch Street,
City of London,
London
EC3M 4BY
United Kingdom
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NOTES

For further detail on the Remedial and Earthworks Strategy, this drawing should be read in conjunction with the following Cundall reports:

- Ground Conditions Summary Report NCL1-DCZZ-XXX-UG-RP-B-00-01 Rev V03)
- Remediation and Earthworks Strategy (NCL1-DCZZ-XXX-UG-RP-B-00-011 Rev V02).

This drawing shall be read in conjuction with the following Cundall Civil Engineering Drawings:

- Enabling Works - Phase 1 - Site Strip Levels GBR1-ENA1-STE-XX-DR-C-01-20
- Enabling Works - Phase 1 - Formation Levels GBR1-ENA1-STE-XX-DR-C-01-21
- Enabling Works - Phase 1 - Enabling Works Finished Ground Level GBR1-ENA1-STE-XX-DR-C-01-22
- Enabling Works - Phase 1 - Existing Ground Level to Site Strip GBR1-ENA1-STE-XX-DR-C-01-24
- Enabling Works - Phase 1 - Site Strip to Formation GBR1-ENA1-STE-XX-DR-C-01-25
- Enabling Works - Phase 1 - Formation to Enabling Finished Ground Level GBR1-ENA1-STE-XX-DR-C-01-26
- Enabling Works - Phase 1 - Existing to Enabling Finished Ground Level GBR1-ENA1-STE-XX-DR-C-01-27

1. Zone F - A typical cross section view has not been provided for Zone F. Enabling works will comprise the removal of vegetation, excavation of the soil mounds and no filling will be required.

Refer to drawing GBR1-ENA1-STE-XX-DR-C-01-36 for works that will be undertaken within SSER corridor and shall be discussed and agreed with SSER.

Rev	Description	Date	Chk'd	Apr'd
V02	ENABLING WORKS - RIBA STAGE 4	23/05/25	[C]Checked	[C]Approved
V01	ENABLING WORKS - RIBA STAGE 3	26/03/25	MG	KM

DRAWING ISSUES

KEY PLAN

PROJECT

QTS PROJECT WIND

Former Blyth Power Station
Coal Stocking Yard, Cambois,
Northumberland

DWG. TITLE

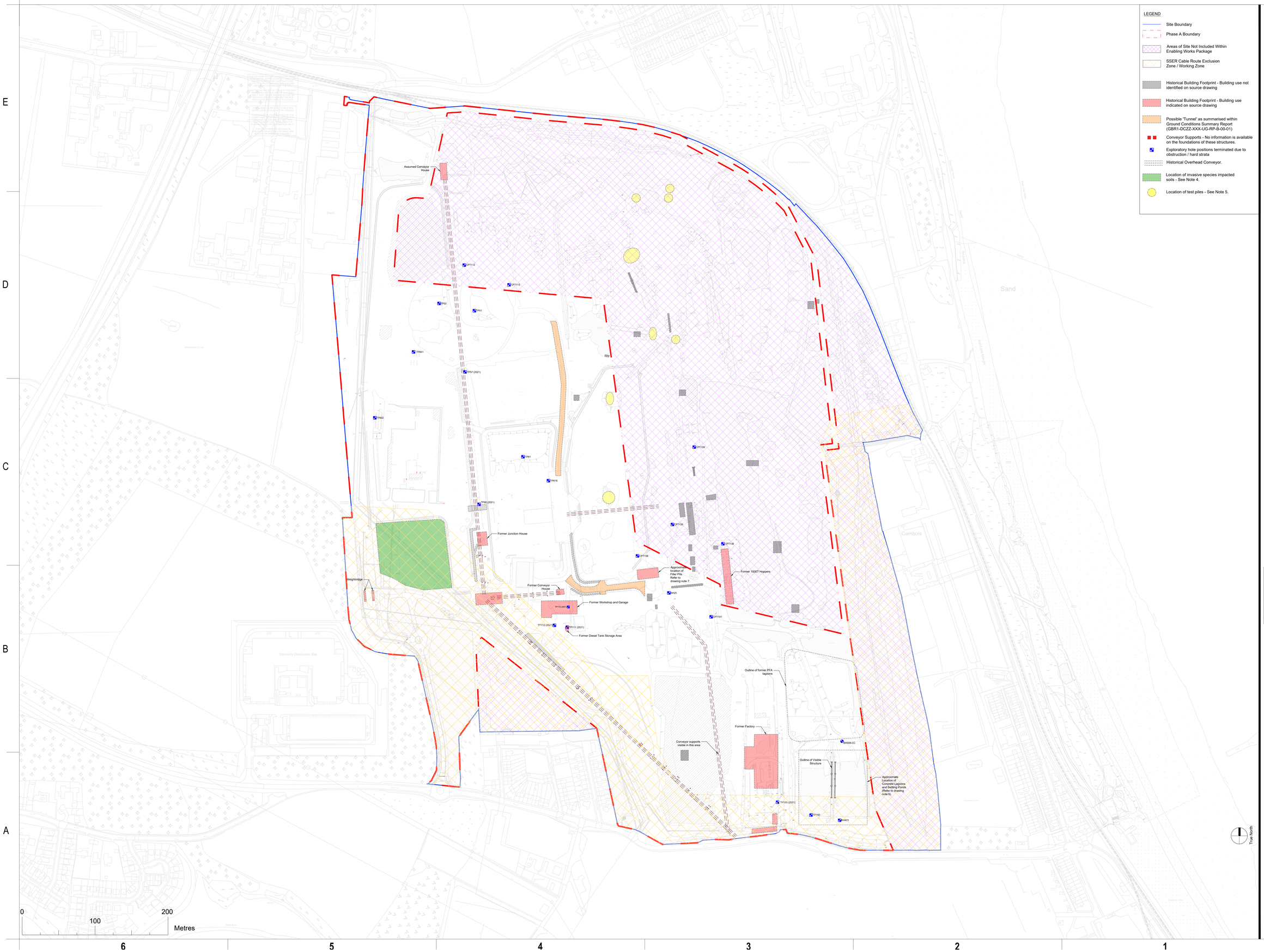
ENABLING WORKS - PHASE A
REMEDIATION AND EARTHWORKS STRATEGY - ENABLING WORKS PROPOSALS

PROJECT NO: 1043152

DWG. NO: GBR1-ENA1-XXX-UG-DR-B-01-10

STATUS: ISSUED FOR REVIEW

SCALE @ A0: AS SHOWN



LEGEND

- Site Boundary
- Phase A Boundary
- Areas of Site Not Included Within Enabling Works Package
- SSER Cable Route Exclusion Zone / Working Zone
- Historical Building Footprint - Building use not identified on source drawing
- Historical Building Footprint - Building use indicated on source drawing
- Possible 'Tunnel' as summarised within Ground Conditions Summary Report (GBR1-DCZZ-XXX-UG-RP-B-00-01)
- Conveyor Supports - No information is available on the foundations of these structures.
- Exploratory hole positions terminated due to obstruction / hard strata
- Historical Overhead Conveyor.
- Location of invasive species impacted soils - See Note 4.
- Location of test piles - See Note 5.

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One Carter Lane
London
EC4V 5ER
United Kingdom
www.cundall.com

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CORGAN
185 Park St
Trinity Buoy Wharf
London
E14 0AF
United Kingdom
www.corgan.com

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80 Fenchurch Street,
City of London,
London
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United Kingdom
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NOTES

1. Features shown on this plan are not exhaustive and are based on the references listed on this drawing.
2. The locations of features shown on this plan are approximate.
3. Relict foundations and floor slabs are anticipated to be present associated with former building / structure footprints.
4. The location of soils contaminated due to the relocation and remediation of invasive species was confirmed via email correspondence between the Client and Ridge and Partners LLP (Ridge) on 9th January 2025.
5. Co-ordinates of as-built test piles can be found within the Arcadis Ground Investigation Report (Arcadis (January 2025). Cambois Data Centre Campus Ground Investigation Report. Report reference: 30226657-AUK-XX-XX-RP-ZZ-0017-01 Rev 01).
6. Approximate location of concrete lagoons and settling ponds based on historical mapping (GBR1-DCZZ-XXX-UG-RP-B-00-01) and site walkover.
7. No as-built information available on the depth of the filler pits shown on this drawing, although it is noted that these are outside the area of ground break during phase 1 enabling works.

The information in this drawing has been derived from:

- Cundall 2025, Ground Conditions Summary Report, Report reference GBR1-DCZZ-XXX-UG-RP-B-00-01.
- Rolton Group 2020, Phase 1 Geo-Environmental Desk Study.
- Rolton Group 2021, Site Enabling - Preparation Works GA For Existing Constraints - Full Site, ISG. Drawing reference: PHX-RGL-STEN-ST-DR-S-050001
- Arcadis 2020, Site Layout and Constraints. Drawing reference: 401-12510874-DWG-C-011
- Ordnance Survey Plan 1971, 1:10,000, Russian Map - Slice A
- Ordnance Survey Plan 1978, 1:10,000, Historical Map - Slice A
- Northumberland Map 1924, 1:10,560, Historical Map - Slice A
- 10k Raster Mapping 2000, 1:10,000, Historical Map - Slice A

This drawing should be read in conjunction with the following Cundall drawings:

- GBR1-DCZZ-XXX-UG-DR-B-01-02 Earthworks Strategy - Surface Excavation Materials
- GBR1-ENA1-STE-XX-DR-C-01-04 Existing Site Drainage and Survey Schedule
- GBR1-ENA1-STE-XX-DR-C-01-01 Existing Services
- GBR1-ENA1-STE-XX-DR-C-01-02 Existing Site Constraints

Services identified as part of previous GPR survey are shown on Drawing GBR1-ENA1-STE-XX-DR-C-01-01 Existing Services.

Contractor will be responsible for ensuring that services are.....

Rev	Description	Date	Chk'd	Apr'd
V02	ENABLING WORKS - RIBA STAGE 4	23/05/25	[Checked]	[Approved]
V01	ENABLING WORKS - RIBA STAGE 3	26/03/25	MG	KM

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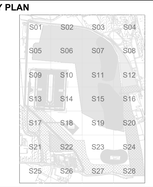

PROJECT

QTS PROJECT WIND

Former Blyth Power Station
Coal Stocking Yard, Cambois,
Northumberland

DWG. TITLE

ENABLING WORKS - PHASE A
REMEDIATION AND EARTHWORKS STRATEGY - BELOW GROUND FEATURES PLAN

PROJECT NO: 1043152

DWG. NO: GBR1-ENA1-XXX-UG-DR-B-01-11

STATUS: ISSUED FOR REVIEW

SCALE @ A0: 1:2000

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Cundall Johnston & Partners LLP
One Carter Lane London EC4V 5ER
Tel:+44 (0)20 7438 1600
Asia Australia Europe MENA UK and Ireland
www.cundall.com

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