As-Built Remediation Strategy

Client: Lidl Great Britain Ltd

Lidl, Birstall

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REMADA GEO CONSULTANTS

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Issue No	Date	Prepared By	Technical Review	Authorised
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1. INTRODUCTION

1.1 Background

Remada Ltd was appointed by Lidl Great Britain Ltd ('the Client') to provide a response to the significant comments raised by the Environmental Health Officers (EHOs) of Kirklees Council in their correspondence reference WK202623782 dated 14th August 2026. Remada had been previously appointed by Lidl Great Britain Ltd to prepare a Remediation Strategy and a post-remediation ground gas monitoring report. Remada had been separately appointed by Stonedale Construction Ltd to prepare a Verification report for their enabling works contract but not for the construction phase of their work, at which point in time ground gas protection measures were installed.

The EHO's correspondence was a precursor to the refusal by Kirklees Council to discharge Condition 18 (Remediation Strategy) of Planning Permission 2024/9159 on 20th August 2026.

In August 2026, construction of the Lidl store and adjacent Home Bargains store were nearing completion and the previously submitted Remediation Strategy had not been approved.

In summary, Remada's Remediation Strategy presented details of the proposed earthworks and levels, extent of mine cavity treatment, details of proposed foundations and ground gas protection measures to comply with Characteristic Situation 4. The Remediation Strategy had been updated and reissued because the EHOs required building gas sensors and alarms but accepted that design details would be provided by a third-party specialist.

It is understood that Kirklees Council refused to discharge Condition 18 because:

- A separate Remediation Strategy had also been submitted that proposed to turn over landfill wastes;
- Ground gas protection measures had not been installed to meet the requirements of Characteristic Situation 4; and
- Design details for the building gas sensors and alarm system and not been submitted to accompany Remada's Remediation Strategy.

The purpose of this document is present a 'single, comprehensive and contemporaneous' report that confirms the status of the implemented remediation and groundworks activities. The document presents only as-built details of the works that have been implemented at the site. This document does not comment on the remediation of mine cavities beneath the site as the Mining Remediation (Coal) Authority has approved Remada's Verification Report 1080.08.02 in their correspondence dated 5th October 2026.

1.2 Report Structure

Section 2 of this report reproduces Remada's previous review of historical reports and background information for the site.

Section 3 reproduces Remada's Strategy with regard to the drilling and grouting of mine working as this work has been completed and approved by the Coal Authority as stated above.

Section 4 presents as-built details of the implemented earthworks/ groundworks.

Section 5 Ground Gas Protection Measures & Risk Assessment

Section 6 Landscaping

Section 7 Waste Disposal

1.3 Contractors & Consultants

A number of contractor and consultant have been appointed for the project:

- The client for the remediation & enabling works was Lidl Great Britain Ltd.
- Lidl's pre-tender Structural Engineer was SDS.
- Remada Ltd was appointed by Lidl to prepare a Remediation Strategy pre-tender and subsequently to undertake post remediation ground gas monitoring.
- Stonedale Construction Ltd were appointed as the remediation & enabling works contractor and appointed Remada as their Verification consultant.
- Stonedale were separately appointed to construct the Lidl store and the Home Bargains store. Stonedale's Structural Engineer for the Lidl store was Jameson Consulting and Adept for the Home Bargains Store.
- Soil Engineering undertook the mine drilling a grouting as a sub-contractor to Stonedale Construction.
- Vibro-Meynard design and implemented Controlled Moduls Column (CMC) ground improvement.
- PA Geo installed the ground gas membranes which were verified by Geoshield.
- Environmental Protection Group have been appointed by the Client to prepare a post-construction Ground Gas Risk Assessment

1.4 Summary of Previous Investigations

A summary of the available reports is tabulated below:

2018	*Geo-Environmental Assessment, Delta-Simons, July 2018.*
2019	*Project Completion Document: Asbestos Removal, Soft Stripping, Demolition of Building to Slab Level, Removal and Crushing of Slabs and Foundations, (by) Professional Remediation, March 2019*
2020	*Combined Phase 1 & 2 Ground Investigation Report, Curtins, December 2020.* *Supplementary Report, by G B Card & Partners, issued in December 2020*
2021	*CPT Report, Lankelma, January 2021.* *Detailed Coal Mining Risk Assessment, Sirius (ref: C8781/GH/9715/Rev B), October 2021.* *Coal Mining Risk Assessment, G B Card & Partners (ref: GB/661), October 2021.* *Ground Engineering & Contamination Mitigation Philosophy, Beam Consulting (ref: 09-148-DOC003A), October 2021.*

2022	*Supplementary Coal Mining Investigation, Sirius (ref: C8781/AW/9824 March 2022.* *Hazardous Ground Gas Risk Assessment, Sirius (ref: C8781MB9853), May 2022.* *Strategy for Remedial & Preparatory Works, Sirius, May 2022.* *Geotechnical Review, SDS Design Engineers, September 2022.* *Remediation Strategy, Remada (1080.01.01/1080.01.02) October 2022. Note: Appendices were revised in February 2023 (ref: 1080.01.03).* *Drill & Grout Specification, Remada (ref: 1080.02.01) October 2022 (superseded).* *Settlement Estimates Letter Report, Remada (ref: 1080.04.01), October 2022.*
2024	*Factual Ground Investigation Report, Remada (ref: 1080.06.01) February 2024.*
2025	*Remada Letter ref 1080.09.01 in response to Local Authority comments and regarding post remediation ground gas monitoring and risk assessment, 13th October 2025.* *Combined Remediation Strategy, Drilling and Grouting Plan Remada Remada (ref: 1080.07.04).*
2026	*Post Remediation Ground Gas Assessment, Lidl Birstall, West Yorkshire, Remada Letter 1080.11.02, dated 22nd June 2026.* *Remediation Verification Report, Stonedale, Birstall, Remada, 1080.08.02 September 2026*

1.4 Limitations

The comments given in this report and the opinions expressed are based on the information reviewed and observations during site work. However, there may be conditions pertaining to the site that have not been disclosed by this assessment and therefore could not be taken into account.

2. Background

2.1 Review of Previous Reports

A review of previous reports pertaining to the study site has been undertaken by Remada and is summarised in this section.

2.1.1 Geo-Environmental Assessment, by Delta-Simons (July 2018)

The site was found to be undeveloped until the 1960s when the southeast parts of the site comprised a landfill extending off-site to the southeast. The business park was developed in the early 1990s with the site layout generally unchanging to the present day, prior to the demolition of the business park.

The site was found to be underlain by variable thicknesses of Made Ground underlain by sandstone, siltstone, mudstone, and coal of the Lower Pennine Coal Measures. Possible voids or collapsed workings were identified. Water was rarely encountered during the course of the investigation and was considered to be perched above cohesive soils where it was.

It was recommended that Made Ground across the entire site be improved to mitigate against future unacceptable levels of settlement, for example by deep soil mixing to a specified CBR which would also enable the use of a piled foundation solution, which was recommended due to poor ground conditions. Consideration for the potential for negative skin friction associated with settlement of landfill materials was recommended.

It was recommended that all floor slabs be suspended.

It was also recommended that the extent of possible voids or collapsed workings be determined and treated prior to the redevelopment of the site.

A significant risk to controlled waters was not identified as part of the works, with the presence of buildings and hardstanding minimising infiltration and potential leaching.

The site was classified as a Characteristic Situation 2 with regards to ground gas, where basic ground gas protection measures are required.

Further ground investigation was recommended within the area of the recorded adit in the north-east of the site, to further assess the remediation cost.

However, Remada have identified that DeltaSimon's borehole log RT101 (E423789.20 N427455.68) located in the north-eastern area of the site contains evidence to suggest that the adit was encountered during their intrusive investigation. This exploratory borehole encountered MADE GROUND to 2.5m bgl, underlain by brown SANDSTONE to 3.8m bgl (145.12m AOD). The bedrock was underlain by MADE GROUND 'Loose Fill' to a depth of 5.7m bgl, with grey silt MUDSTONE thereafter. Remada considers it likely that the 1.9m thick 'loose fill' strata is actually the adit, and it would be prudent to undertake additional investigation to confirm this.

2.1.2 Project Completion Document, by Professional Remediation (March 2019)

The above document detailed the demolition of on-site buildings including asbestos removal, soft stripping, demolition, removal of slabs and foundations and crushing of all site-won material. Slabs

and foundations were removed under existing building footprints to a depth of 1m bgl, and other areas of hardstanding were removed to ground level with no turnover of underlying material.

2.1.3 Combined Phase 1 & 2 Ground Investigation, by Curtins (December 2020)

The site was found to comprise agricultural fields and woodland since the early 1850s. Coal Authority Abandonment Plans indicated historical working in the northeast of the site extending off-site to the northeast until the 1911 mapping. A highwall was shown to run north to south in the center of the site on historical maps from 1883/4, extending to the northeast of the site by 1956. Historical landfill was indicated on-site across the majority of the site area and extending off-site to the southwest in 1970. Landfill operations were considered to have continued until the mid-1980s when the highwalls were no longer mapped. In 1992 the business centre was constructed on-site.

Extensive coal and mineral mining occurred within close proximity of the site from the 1870s onwards. These wider collieries were shown to be disused by 1956. A number of landfills were mapped in close proximity to the site.

Previous investigations of the site by Delta-Simons in 2018 recorded highly variable thicknesses of Made Ground underlain by sandstone, siltstone, mudstone and coal of the Pennine Lower Coal Measures. Possible voids or collapsed workings were encountered at shallow depths within the west and northeast of the site. A ground gas characteristic situation of CS-2 was applicable to the site.

Structural surveys of two of the business centre buildings noted external and internal structural defects associated with the settlement of landfill materials.

An intrusive investigation consisting of twelve rotary boreholes and the installation of ground gas/groundwater monitoring wells encountered highly variable thicknesses of Made Ground (average depth 1.75m bgl) comprising reworked natural clay. Within the footprint of the historical landfill refuse was encountered in the southern areas of the site to a maximum depth of 12.5m bgl, and where refuse was not encountered, Made Ground comprising reworked, natural clay was encountered to a maximum depth of 14.0m bgl. Made Ground was found to vary spatially, with thicker Made Ground in the east of the site, shallowing rapidly in the northeast, and with thinner deposits of Made Ground in the west and north of the site.

Weathered and solid bedrock was encountered at depths of less than 2.0m bgl outside the footprint of the historic landfill, and at a depth of 14.5m bgl within the footprint of the landfill. Solid geology typically comprised extremely weak to medium strong thinly laminated orange-brown mottled grey mudstone and siltstone with bands of medium-strong to strong grey fine-grained sandstone. Coal associated with the Flockton Thin coal seam was encountered between 2.8 and 8.4m bgl across the northeastern, northwestern, and western areas of the site. No other coal seams were encountered within 30.0m of the existing ground surface levels. Perched water was encountered locally and bubbling was noted within one of the boreholes where perched water was encountered.

No exceedances above the appropriate GAC of the determinants tested for within soil samples analysed were identified. A ground gas characteristic situation of CS-4 was considered applicable to the site.

2.1.4 Supplementary Report, by G B Card & Partners (December 2020)

The site was found to be undeveloped since the time of the earliest available historical mapping (1852), comprising fields and a small area of woodland in the east of the site. Numerous coal pits, quarries, and other mining features were identified in the vicinity of the site at this time, as near as 70m west of the site. By 1893 excavation of the southeast of the site was evident, with further excavation indicated on the 1956 maps with an area of steeply sloping ground trending southeast to northwest across the northern margin of the site. Operations ceased between 1988 and 1990 at which time the site was infilled and the business centre was constructed by 1992. The business centre was demolished in 2018/19 as a result of ongoing settlement issues since 2001.

A Coal Mining Report obtained by Curtins Limited identified the Flockton Thin coal seam being 0.91m thick and outcropping on-site. The Top Fenton seam was recorded as being 0.60m in thickness, present on-site at a depth of 30m bgl. The seams are recorded as having last been worked in 1877 and 1911, respectively. Several further seams of present beneath the site, though these are at depths considered to be unlikely to affect the development of the site. An adit was recorded in the eastern corner of the site, apparently intercepted the Flockton Thin coal seam in a northeasterly direction. Further, unrecorded shallow workings and/or mine entries were indicated to be probable.

It was recommended that consideration be given to how the base of the columns will be installed without deflection and with sufficient penetration into competent natural material around the edge of the former opencast workings, where interacting with the highwall.

It was noted that the landfill waste was described as being within a clay matrix that would generally dominate the geotechnical engineering behaviour of the waste, though variation was predicted given the heterogeneity of the material. It was considered possible that any biodegradable putrescible materials in the waste are still degrading. Following improvement, the long-term residual degradation of landfill waste materials, resulting in potentially uneven loss of strength within the soil mass, should be considered. Where long-term settlement occurs within the waste mass, confirmation should be provided that any reduction of support and/or movement will not adversely affect the proposed solution, resulting in excessive movement or collapse of the stone columns.

It was recommended that the design considers the transition between differing foundation types (CMC's/BMC's) to minimise potential differential movements and to maintain transition gradients within acceptable tolerances. It was anticipated the use of the load transfer mat will mitigate the majority of these potential effects.

The potential for ground gas migration, particularly within the vibro stone column element of the BMC columns, should also be considered when designing the system. It may not be feasible to locate the base of the stone columns within the landfill waste material, encountered from depths as shallow as 0.8m bgl, which may mean varying the depth of the stone columns across the site.

It was understood that the identified shallow mine workings are to be treated by injection grouting prior to ground improvement works taking place. The interaction between the treated mine workings, including the adit recorded in the northeast of the site, but not identified, and the ground improvement works should be considered to ensure the performance of the ground treatment is not adversely affected.

It was recommended that excessive heave should be mitigated during the ground improvement works, as this will reduce the effectiveness of the improvement of soils surrounding the columns. It was assumed the surcharge loading from the addition of the load distribution mat will be minimal and supported by the columns and will therefore not significantly increase consolidation settlements.

GB Card and Partners were commissioned to undertake a geotechnical assessment of the proposed ground improvements at the site.

Based on the information provided by the previous ground investigations, controlled modulus columns (CMC) beneath the building footprints and service yard and bi modulus columns (BMC) comprising vibro stone columns (VSC) to depths between 1 and 2m and underlain by CMC, beneath pavement areas were recommended. It was recommended that all CMC were advanced into the underlying bedrock.

Potential issues with the ground improvement method included further deterioration of landfill materials resulting in reduced lateral support to columns, the potential for differential settlement (to be mitigated via a load transfer platform), and the potential for ground gas migration.

2.1.5 CPT Report, by Lankelma (January 2021)

Lankelma undertook a ground investigation comprising cone penetrations tests (CPT) across the site; eight were advanced in car park and landscaped areas, and fourteen were advanced under the building footprints.

2.1.6 Detailed Coal Mining Risk Assessment, by Sirius (October 2021)

The table below summarized the potential risks associated with coal mining legacy for the site.

Coal Mining Issue	Requires Further Consideration?		Comments
	Yes	No	
Underground Coal Mining	✓		The CA Mining Report notes that a number of seams are recorded to have been mined below the site, including the Flockton Thin at a depth of 10m bgl and an extraction thickness of 0.91m (last worked in 1877). The Top Fenton (or First Brown Metal) is recorded to have been mined at a depth of 30m bgl with an extraction thickness of 0.60m (last worked in 1911). The Middleton Main is recorded to have been mined at a depth of 74m bgl with an extraction thickness of 1.22m (last worked in 1875). The Top Beeston, Whinmoor and Black Bed coals are recorded to have been mined at depths of between 165m and 242m bgl. Mine abandonment plans have been obtained for the three shallowest recorded seams, copies of which are included within Attachment B. The site falls within the CA defined Development High Risk Area.
Unrecorded Shallow Coal Mining	✓		The CA Mining Report notes that there are probable unrecorded shallow workings below the site.
Mine Entries (shafts and adits)	✓		An adit is recorded to be located within the northeast of the site (CA ref. 423427-054), with a recorded bearing of 24°. The CA hold no details of any past treatment of the adit. The CA records five mine entries off-site, the closest located 50m to the west. The locations of the recorded mine entries are shown within the CA report, included within Attachment B.
Coal Mining Geology		✓	The CA's Mining Report states there are no faults, fissures or breaklines recorded.
Record of Past Mine Gas Emissions	✓		No mine gas emissions recorded by the CA within 500m of the site. It is acknowledged, however that where coal resources or coal mine features exist at shallow depth, there is the potential for mine gas to exist.
Recorded Coal Mining Surface Hazard		✓	No damage notice or claim associated with coal mining subsidence for the site or any property within 50m of the site have been received by the CA since October 1994.
Surface Mining (opencast workings)		✓	The CA's Mining Report indicates that the property is not affected by historic opencast mining. However, a review of historical OS Mapping indicates the presence of potential opencast workings on site.

Three (3 No.) coal mine abandonment plans were obtained from the Coal Authority relating to the 3 No. shallowest recorded seams to have been mined.

The Flockton Thin coal was recorded in 1878 to have been worked within the northwestern and western extents of the site and an adit was mapped off-site to the northwest. The southeastern area of the site was referenced as 'output of coal' located to the east a conjectured outcrop. The coal was indicated to be around 0.8m thick.

The Top Fenton/First Brown Metal abandonment plan (1913) showed working within the First and Second Brown Metal Coal to the east and north of the site. The site was located to the south of an area referenced as 'old workings' and a drift (assumed to be related to the recording mine adit ref: 423427-054) was mapped in the northeastern portion of the site, heading off-site in a northeasterly direction.

The Brown Metal Coal foot was indicated to be encountered at a depth of around 12.0m and a section of the First and Second Brown Metal Coal indicated the seam to have a thickness of around 0.6m.

Six recorded mineral sites were identified within 250m of the site.

Previous ground investigations encountered variable thicknesses of Made Ground that was generally noted to become thicker towards the east, and was encountered to a maximum depth of 12.5m. Made Ground was found to overlie weathered and competent deposits of the Pennine Lower Coal Measures which were generally encountered as mudstone or sandstone. Coal seams and/or evidence of mine workings were identified in a number of exploratory holes, as summarised in the table below.

Borehole	Depth to Rockhead (m bgl)	Invert Depth to Intact Coal (m bgl)	Invert Depth to Suspected Workings (m bgl)	Seam / Working Thickness (m)	Inferred Seam Name	Thickness of overlying Competent Rock (m)
DS112	NR	5.8	NR	0.2	FN	0
RT101	2.5	NR	*5.7*	1.9	FN	1.3
RT105	8.2	37.3	NR	0.2	1BM	28.9
RT106	7.5	37.6	NR	0.2	1BM	29.9
RT107	1.0	NR	*4.6*	1.4	FN	2.2
		38.3	NR	0.2	1BM	37.1
RT108	0.8	NR	*5.0*	2.8	FN	1.4
		38.7	NR	0.25	1BM	37.6
RT109	3.4	38.4	NR	0.3	1BM	34.7
RH201	1.8	4.9	NR	0.2	FN	2.9
RH204	1.3	NR	2.4	0.3	FN	0.8
		NR	*3.5*	0.6	FN	
RH205	0.4	NR	*4.5*	2.7	FN	1.4
RH206	0.6	6.8	NR	0.6	FN	5.6
RH207	3.0	NR	*8.0*	LOF	FN	0.0
RH208	3.0	8.6	NR	0.2	FN	5.6
TT201A	2.0	4.0	NR	0.6	FN	1.4
TT201E	5.0	NR	*5.0*	2.5	FN	0.0
TT204B	1.0	NR	*>3.0*	>1.5	FN	0.5
TT204C	2.1	3.2	NR	0.4	FN	0.7

* Flockton Thin (FN)
Top Fenton / First Brown Metal (1BM)
LOF - Loss of Flush (thickness of workings / seam not identified)
NR – Not recorded/encountered

Recorded mine workings within the Flockton Thin Coal Seam were encountered between depths of 3.5 and 8.0m. Where intact, the Flockton Thin Coal Seam was encountered at a thickness of up to 0.60m and suspected workings were identified due to a loss of flush or encountering loose fill, collapsed workings, voids and soft/broken ground at thicknesses of between 0.60 and 2.80m.

Evidence of seat earth was recorded underlying Made Ground within Curtin's trial hole TT204A.

The seam was recorded to have been worked in 1877 indicated a pillar and stall method would likely have been used. Intact coal encountered may represent areas of pillars left in-situ as support for workings.

Locally, the coal appears to have been extracted by opencast methods as identified by areas of earthworks and highwalls on historic OS maps. Excavations were backfilled with Made Ground soils.

It was noted that instability of bedrock resulting from the collapse of pillar and stall mine workings may exceptionally extent to 10 times the height of the original extraction. All boreholes where evidence

of mine workings was encountered within the Flockton Thin seam were found to have insufficient cover.

Sufficient competent cover was identified over the deeper Top Fenton/First Brown Metal seam to mitigate any risk from surface stability within any mine workings present below the site. No definitive evidence of mine workings within the seam were recorded on-site on the mine abandonment plan.

It was recommended that areas of the site underlain by the Flockton Thin and/or associated coal/seat earth workings be stabilised by drilling and pressure grouting to mitigate the risk of surface instability. The stabilisation works are proposed to allow historic workings within the Flockton Thin coal seam to be substantially filled as well as any voids or broken ground to prevent the development of crown holes at surface or formation level.

The adit in the northeast of the site had a recorded angle of 24° and a departure of 8m with an assumed diameter of 2m. Evidence of a drift was indicated on the abandonment plans for the Top Fenton seam.

Further investigations to determine the presence/absence of the adit and its dimensions, depth, and locality were strongly recommended as well as confirmatory probe holes to confirm the depth and dimensions of any backfill.

The adit is located within a proposed car parking area and any identified adits with the potential to affect the proposed development should be stabilised, e.g., by the drilling, grouting, and capping where necessary.

The possibility of encountering unrecorded mine entries on-site cannot be discounted, therefore it was recommended that areas beneath proposed buildings have overlying Made Ground removed where feasible to expose the natural ground to enable the inspection of the formation for any disturbed ground, which if encountered would require treatment.

The foundation designs should consider the presence of shallow treated/consolidated mine workings. As an alternative to a piled foundation solution, ground improvement utilising controlled modulus columns beneath building footprints and the service yard, and bi-modulus columns beneath the pavement areas is being considered, with the base of the columns at least 0.5m within the Pennine Lower Coal Measures.

2.1.7 Coal Mining Risk Assessment, by G B Card & Partners (October 2021)

A letter report was produced by G B Card & Partners in response to the above Detailed Coal Mining Risk Assessment produced by Sirius. G B Card & Partners largely agrees with the site characterization and setting as described but made the following comments:

It was recommended that the proposed building development be founded on soil cement columns penetrating a minimum of 0.5m into the underlying Pennine Lower Coal Measures Formation (below the Flockton Thin and First Brown Metal coal seams). G B Card & Partners stated that there was no need to pressure grout loose or fissured round as the process of installing soil cement columns would fill any loose or voided ground. The same process would be undertaken beneath roads and drainage infrastructure, and a reinforced granular mattress should be placed beneath buildings, roads, and hardstanding to further spread load from the structure or pavement onto the improved, treated ground as well as to span any loose or voided ground that may migrate to shallow depths.

It was considered that the previous application of a ground gas characteristic situation of CS4 to the site was conservative. It was considered that the age of the Made Ground and waste deposits (30 to 50 years) would mean the majority of the degradable waste within the fill will have reduced, reducing the potential for significant ground gas generation, therefore it was not considered that further ground gas monitoring would be necessary unless intended to reduce the characteristic situation applicable to the site and the scope of ground gas protection measures.

2.1.8 Ground Engineering & Contamination Mitigation Philosophy, by Beam Consulting (October 2021)

Beam Consulting produced this document to enable the successful remediation of the site. Beam identified contamination, coal mining legacy, ground gas and the essential requirement to improve the bearing capacity of the existing ground as the key issues affecting the site.

A holistic ground engineering approach was recommended to establish the extent of coal mining legacy on-site, grout up the appropriate extent of coal mining workings, retain a significant portion of Made Ground in-situ, improve the ground without the use of traditional piling by adopting controlled and/or bi-modulus columns with a load transfer mat above to eliminate the risk up any upwardly migrating voids. The culvert in the east of the site was noted, and it was stated that the proposed ground treatment would be designed not to negatively impact the culvert.

Organic contamination was considered to be low risk due to the age of the organic fill. Inorganic contamination was considered to be adequately encapsulated by the 15m or so of proposed ground improvement measures. The previous ground gas characteristic situation of CS4 was considered to be a conservative evaluation which could be revised with additional ground gas monitoring, however the cost of additional monitoring was estimated to exceed the potential cost reduction of reducing the site from CS4 to CS3, therefore the application of a CS4 characteristic situation to the site was recommended.

It was recommended that the ground engineering scheme specified by G B Card & Partners in their December 2020 letter report (detailed above) should be adopted.

2.1.9 Supplementary Coal Mining Investigation, by Sirius (March 2022)

In February 2022, Sirius drilled forty rotary probe holes along 3 No perpendicular transects of the recorded adit to a maximum depth of 25m bgl. Additionally, 3 No trial pits/trenches were excavated to a maximum depth of 5.5mbgl to determine the nature of the underlying coal seam and associated mine workings, and 5 No rotary probe holes and 2 No cable percussion boreholes were drilled to install ground gas/groundwater monitoring wells (detailed in subsequent hazardous ground gas risk assessment).

No evidence of the adit was identified along its conjectured length and allowing for an 8m departure from its recorded location. Should the adit exist at a depth greater than 25m, it was considered that significant cover exists within the eastern part of the site to mitigate against any risk from surface stability of the adit which has a conjectured height of 2m.

Soft ground was identified within several probe holes with confirmatory trial pitting identifying extremely weak intact coal at depths of 3.7 and 4.0m bgl, with a thickness of around 1.1m, indicated that the Flockton Thin Coal seam does not appear to have been subjected to pillar and stall working

within this area. The presence of deep Made Ground associated within historic earthworks has resulted in the local extraction of coal by opencast methods.

The risk posed by pillar and stall workings within the eastern part of the site was considered to be low, removing the requirement for remedial works in the form of drill and pressure grouting within the northeastern area of the site.

Risks to surface stability do exist in the northern and western portions of the site which were recommended to by stabilised by drilling and pressure grouting to mitigate the risk of surface instability.

2.1.10 Hazardous Ground Gas Risk Assessment, by Sirius (May 2022)

The site was a registered landfill from March 1982, and was authorized to accept household, commercial, and industrial waste from 1989. The was detailed as dormant in 1996. Two other historical landfills are located within 250m of the site.

The site is located within a lower probability radon area.

Organic matter contents of the on-site Made Ground were found to vary from 0.5 to 4.6%, though one sample did exhibit an organic matter content of 20%. Laboratory analysis of the landfill material noted organic matter contents to range from 4.4 to 9.9%.

Elevated concentrations of PAHs were identified within one sample recovered from the landfill material.

Ambisense Gasflux real-time data monitors were installed within 3 No selected gas wells and continuous monitoring was undertaken from 11th March to 4th April 2022. Spot monitoring of ground gases was also carried out on 5 No occasions between 24th February and 14th April 2022.

During continuous monitoring within the landfill material, methane concentrations ranged from non-detectable to 82.79% v/v, although typically remained high (69.5 to 82.8% v/v). Carbon dioxide concentrations ranged between 0.03 and 27.86% v/v though typically ranged from 19.4 to 27.9%. Oxygen levels were generally <1% v/v. A relationship between flow rates and atmospheric pressure was noted, with flow rates generally between -3.57 and -13.2l/hr. Carbon monoxide concentrations were generally <10ppm though maximum concentrations of 62.2ppm were noted. Hydrogen sulphide and VOC concentrations were non-detectable to <3ppm.

Within the lower coal measures, methane levels ranged from non-detectable to <1% v/v, with flow rates not exceeding 0.09 l/hr. Oxygen levels were recorded to range from 18.22 to 20.41% v/v, and carbon monoxide and hydrogen sulphide concentrations were <3ppm and <1ppm, respectively. VOC concentrations were noted to <3ppm during the monitoring period.

Spot sampling data was generally consistent with the findings of the continuous monitoring.

Worst case values indicated a GSV of 11.2 l/hr for methane, 3.7 l/hr for carbon dioxide, indicative of a high hazard potential for methane and carbon dioxide, classifying the site as Characteristic Situation 4 (CS4). It was considered that gas protection measures designed for a CS4 site would be adequate to mitigate the migration of carbon monoxide at the recorded concentrations. Low oxygen concentrations were detected on several occasions which may present a significant risk to construction and maintenance workers operating in excavations and in below ground confined spaces. Appropriate

risk assessment and mitigation measures will be required during construction of below-ground structures.

It was recommended that all existing monitoring wells should be fully decommissioned prior to development commencing.

2.1.11 Strategy for Remedial & Preparatory Works, by Sirius (May 2022)

A previously obtained Coal Authority (CA) Mining Report states that the site is located within a "High Risk Development Area" with the shallowest recorded worked coal seams underlying the site being the Flockton Thin and the Top Fenton (or First Brown Metal) coal seams, recorded to have been mined at depths of 10.0 and 30.0m bgl, respectively. An adit was recorded with a bearing of 24°, located in the northeast quadrant of the site. There was no record of treatment of the adit.

Previous mining investigations identified the Flockton Thin and deeper Top Fenton coal seams and/or evidence of associated mine workings within a number of rotary boreholes and trial pits. The Flockton Thin coal seam was absent in the southern, eastern, and central parts of the site and was assumed to have been removed during historic excavations of the site.

A risk to surface stability exists in the northern and western parts of site which are underlain by the Flockton Thin and/or associated coal or seat earth workings. It was recommended that these be stabilised by drilling and pressure grouting to mitigate the risk of surface instability. Confirmatory probe holes were recommended within areas of the former opencast workings (south of the conjectured Flockton Thin outcrop) to prove the absence of the coal seam.

No evidence of the adit was identified, and it was concluded that the adit may have been removed during historical on-site earthworks.

The site was found to be underlain by variable thicknesses of Made Ground, ranging from 0.3 to 14.0m. Made Ground deposits were noted to be generally thicker in the east of the site. The Made Ground generally comprised cohesive fill and occasionally mixed granular fill. Landfill waste was encountered to a maximum depth of 12.5m bgl in the southeast of the site.

Made Ground was found to overly weathered and competent mudstone of the Pennine Lower Coal Measures.

Chemical testing of soil samples identified elevated concentrations of PAHs within one sample of landfill waste. All other determinants tested for within all other samples analysed were below the appropriate GAC for a commercial development. Testing of groundwater quality was not undertaken as the risk to controlled waters by contaminants was concluded to be very low by Curtins Limited, requiring no further consideration.

A ground gas characteristic situation of CS-4 was recommended. Radon protection measures were not required as part of the proposed development. Prior to undertaking construction on-site, the proposed design of gas protection measures and strategy for verification must be agreed with the Local Authority, and all existing monitoring wells should be fully decommissioned prior to commencement of the proposed development.

2.1.12 Geotechnical Review, by SDS (September 2022)

SDS were appointed by Lidl Great Britain Ltd to carry out a preliminary geotechnical review of the site. The report calculated estimated settlements underneath the proposed buildings based on the results of the Lankelma CPT investigation, and concluded that VSC ground improvement would be suitable under proposed buildings when combined with a raft foundation. However, it was considered overly conservative to undertake GI in car park areas; an alternative solution of 300mm of Type 1 material, underlain by 600mm of 6F2 or similar was recommended.

2.1.13 Remediation Strategy, by Remada (October 2022)

Superseded by this document.

2.1.14 Drill & Grout Specification, by Remada (October 2022)

Superseded by this document.

2.1.15 Settlement Estimates Letter Report, by Remada (October 2022)

Settlement estimates were interpreted from Lankelma's CPT Report, and the following assumptions were made:

- The first metre of material is to be excavated and recompacted;
- A 600mm thick layer of capping and 300mm layer of subbase are to be placed beneath the building footprints;
- A 600mm thick layer of capping and 300mm layer of subbase are to be placed beneath the proposed car park;
- To alllow for regrading we have assummed an additional 1m layer of fill is be placed across the site;
- Applied pressure beneath a raft downstand of 1.5m square is assumed at 125kPa from foundation plus an additional 40kPa due to self weight of fill;
- Applied pressure of the car parking area is assumed at 30kPa plus an additional 40kPa due to self weight of fill;
- Settlement was calculated to the base of the foundation zone of influence; and
- Where an exact reading was uncertain, a conservative value was estimated.

Lidl Store

The highest m_v values were recorded at CPT11, where a worse case settlement of 27mm was estimated.

Retail Unit (Disposal Land)

The highest m_v values were recorded at CPT15, where a worse case settlement of 46mm was estimated.

Car Park

The highest m_v values were recorded at CPT18, where a worse case settlement of 17mm was estimated.

2.1.16 Factual Ground Investigation Report, by Remada (February 2024)

7 No plate load tests were performed on-site, with 4 within the footprint of the proposed Lidl store and 3 No within the proposed retail unit within the disposal land. 8 No trial pits were excavated to a maximum depth of 4.0m bgl to assess the ground conditions in the plate load testing locations and to delineate the extent of the shallow landfill material.

Ground conditions encountered consisted of Made Ground comprising reworked natural clay which overlay landfill waste within exploratory holes TP04 and TP05 at depths of 1.70 and 2.40m bgl, respectively.

Plate load testing confirmed CBRs of around 21 to 52% in the footprint of the proposed Lidl store, and around 10 to 43% in the footprint of the proposed retail unit within the disposal land.

2.2 Pre-Remediation Conceptual Site Model

A Pre-Remediation Conceptual Model is tabulated below in **Table 1**.

Potential Source Areas	Potential Contaminant of Concern	Pathways	Potential Receptor	Exposure Route (Human unless otherwise stated)	Potential Identified Linkage (unmitigated)	Findings of Ground investigation	Risk (Un-mitigated)	Proposed Remediation (Mitigation) Measures	Residual Risk Estimation
<u>On-site Sources</u> **Elevated concentrations of PAHs within landfill waste** **Unidentified contaminants within landfill waste** **Hazardous ground gases generated from landfill waste and, to a lesser extent, worked coal measures** ***<u>Off-site Sources</u>*** **Migrating contaminants and ground gases from numerous landfill sites and mine workings within 250m of the site**	Asbestos / Metals As, Be, Cd, Cu, Cr (VI), Cr (III) Hg, Ni, Se, Va, Zn, *Boron, TPH /PAH/PCBs.* *Methane & Carbon Dioxide.*	Disturbance due to construction plant causing direct contact, dusts, vapours. Direct Contact with occupants of the proposed development (<u>retail & off-site residential)</u> Inhalation of fibres / vapours / gases by occupants of proposed development Permeation of water supply pipework Leachate	Occupants of the development / building fabric Ground workers during construction Adjacent residents during construction Secondary A Aquifer	Direct Soil Ingestion	Yes	PAH exceedances	Low	Hardstanding to cover retail site minimising direct contact.	Negligible
				Indoor Dust ingestion	Yes	As above	Low	As above	Negligible
				Skin Contact with Soils	Yes	As above	Low	As above	Negligible
				Skin Contact with Dust	Yes	As above	Low	As above	Negligible
				Inhalation of Outdoor Dust	Yes	As above	Low	As above	Negligible
				Inhalation of Outdoor Vapours	Yes	As above	Low	As above	Negligible
				Inhalation of Indoor Vapours	Yes	As above	Low	As above	Negligible
				Ingestion via permeated water supply pipework	Yes	As above	Low	As above	Negligible
				Inhalation of ground gas	Yes	CS4	Medium	Ground gas protection measures	Negligible
				Inhalation of radon gas	Yes	Lower Probability Radon Area	Negligible	None required	Negligible
				Leaching to Secondary A Aquifer in Bedrock	Yes	PAH exceedances	Low	Hardstanding to prevent precipitation infiltration and leaching	Negligible

Table 1: Pre-Remediation Conceptual Model *Direct contact with subsurface soil and/or groundwater during redevelopment works are not assessed as part of the CSM. It is considered that risks to workers will be managed as part of any the redevelopment works at the site through the application of health and safety procedures, where required.*

3. MINE WORKINGS

3.1 Review of Borehole Records

Information on possible mineworkings and coal seams has been reproduced from the Delta-Simons and Curtins report in Tables 2 and 3 below.

Exploratory Hole Location	Depth to top of stratum (m bgl)	Thickness (m)	Coal Description
RH201	4.7	0.2	Recovered as drilling fines within the water flush
RH206	6.2	0.6	Recovered as drilling fines within the water flush
RH208	8.4	0.2	Recovered as drilling fines within the water flush
TT201A	3.4	0.6	Intact
TT204C	2.8	0.4*	Intact - trial pit terminated within the coal
*Base not proven			

Table 2: Depths and Descriptions of Coal Recovered

Exploratory Hole Location	Depth to top of stratum (m bgl)	Void or Workings Thickness (m)	Evidence of Historical Mine Workings and Voids
RH202	4.6	*	Complete (100%) loss of flush and no drilling returns yet hard competent ground to 7.0mbgl - potential broken ground suggestive of a coal seam.
RH204	2.1	2.4	Complete (100%) loss of flush and no drilling returns - potential broken ground suggestive of historical mine workings.
	2.4	2.9	Stiff dark brown clay with frequent fragments of coal – potential coal tailings/backfill suggestive of historical mine workings.
	2.9	3.5	Complete (100%) loss of flush and no drilling returns - potential void suggestive of historical mine workings.
RH205	1.8	3.5	Partial (60%) loss of flush – potential broken ground.
	3.5	4.5	Complete (100%) loss of flush and no drilling returns – potential void/soft ground suggestive of historical mine workings.
	4.5	*	Complete (100%) loss of flush and no drilling returns yet hard competent ground to 8.0mbgl.
RH207	3.0	*	Complete (100%) loss of flush and no drilling returns yet hard competent ground to 8.0mbgl - potential broken ground suggestive of a coal seam.
TT201E	2.5	5.0	Loose black angular gravel of coal (non-intact) – potential fill / coal mine tailings.
TT204B	1.5	>3.0*	Large void encountered in the northern face of the trench.
*Base not proven			

Table 3: Depths and Descriptions of Potential Mineworkings and Voids

Based on the information collected to date and cross-sections provided by Delta-Simons, the mineworkings of the former Flockton Thin coal seam are considered to dip to the north-east at approximately 2°.

Bands of coal were also identified at depth, which were interpreted as the Top Fenton seam. No evidence of mineworkings were identified associated with this seam.

An adit (Coal Authority reference 423427-054) is recorded at an angle of 24° in the north-east of the site. The Coal Authority does not hold any record of treatment of the adit.

3.2 General Requirements of CIRIA 758

With regard to the treatment of seams CIRIA 758 states:

> *'For reasons of economy, grouting layouts have often been limited to the approximate loading footprint of a building.....For other than light loads it is recommended to treat a greater area within a load dispersal of 2V:1 H, struck from the foundation edge....*
>
> *For level or shallow-dipping workings up to 20m depth the treatment grid should extend 3.0 to 4.5m outside the foundation footprint.*
>
> *For level or shallow-dipping workings up to 50m depth the treatment grid should extend to 6m outside the foundation footprint'.*

With regard to hole spacing CIRIA 758 states general guidance on borehole spacing is a follows:

> *Large development site beneath proposed structures – primary grid 6m x 6m, secondary grid overlapping 6m x 6m (i.e. effectively a 4.24m grid) and a subsequent tertiary grid based on 3m grout takes.*
>
> *Open areas such as car parks – 12m grid breaking down to a 6m grid subject to grout takes*

Perimeter walls are generally formed by grouting through holes drilled at 1.5 to 3.0m centres.

CIRIA 758 defines shallow dipping seams as <25°.

3.3 Permits

The Contractor is to apply to the Coal Authority for a permit to carry out the works.

For the Coal Authority permit application, the following applies:

- The Principal Contractor will confirm landownership with their client Lidl Great Britain Ltd.
- The Client's / Principal Contractor's Consultant is Remada Ltd.

The Drilling & Grouting Contractor has not been appointed.

3.4 Drill & Grout Plan

There are two proposed building footprints within the overall site area as indicated on the attached **Figure 2.** Beneath the proposed building footprints shallow mine seams are to be grouted to a depth of 30m bgl. Grouting is to be set out on a grid measured from the centre lines of the proposed buildings (horizontal & vertical on plan).

Proposed Lidl Store

- Primary grouting of probeholes on a 6m x 6m grid to a depth of 30m bgl.
- Secondary grouting of probeholes where necessary to form a 3m x 3m grid.

Proposed B&M Store / Garden Centre

- Primary grouting of probeholes on a 6m x 6m grid to a depth of 30m.
- Secondary grouting of probeholes where necessary to form a 3m x 3m grid.

Due to the potentially lighter loading of the (B&M) garden centre area, the requirement for grouting this area is dependent on the requirements of the client.

3.5 Drill & Grout Specification

The contractor shall comply with the following guidance as appropriate to the works:

- *Coal Seams with a History of Spontaneous Combustion. www.gov.uk/government/publications*
- *Guidance on Managing the Risk of Hazardous Gases when Drilling or Piling Near Coal: The Coal Authority, Health and Safety Executive, British Drilling Association, Federation of Piling Specialists and the Association of Geotechnical and Geoenvironmental Specialists. Published 2012.*
- *Parry, D and Chiverrell, C (eds) 2019 Abandoned Mine Workings Manual, C758, CIRIA, London, UK*

3.5.1 Constituent Materials for Grouting

Water shall be from the mains supply or other source approved by the Principal Contractor, supplied by the Main Contractor. Cement shall be Portland cement complying with BS EN 197-1. PFA shall be conditioned hopper ash, or dry powder ash, or a type suitable as a constituent for grout and obtained from an approved supplier. Sand shall generally comply with BS EN 12620:2002+A1:2008 and be of a grading suitable for use in the Contractor's plant. Pea gravel shall comply with BS EN 12620 and be of a suitable grading.

Thixotropic admixtures shall be bentonite or another suitable admixture.

3.5.2 Storage and Use of Materials

Storage of materials shall be such as to prevent contamination and deterioration. Cement shall be kept in a dry location, and the sequence of deliveries recorded so that cement can be used in rotation.

PFA shall be delivered to site and stockpiled, if required it may be stored under impermeable covers which shall be weighted down to prevent dust nuisance and to retain moisture.

3.5.3 Grouting Plant

Grout will be mixed by loading hopper conditioned PFA and bagged OPC directly into a rotary paddle mixer. Water supplied from a nearby source will then be added to the mix to produce grout of the correct consistency.

The grout will be mixed and injected under hydrostatic head using a 50mm diaphragm pump operating at around 100 psi (6.9 bar) and will be pumped via 50mm reinforced grout hoses into the boreholes.

The grout mixer will be capable of producing a homogenous mix, with all particles being thoroughly wetted and without segregation occurring.

3.5.4 Grout Mixes

With consideration to the future use of the area, the filling material shall generally consist of a PFA:cement grout which should be mixed in the proportions of up to 12:1 where water is present, but which may range up to 20:1 in dry conditions.

It is anticipated that a 12:1 mix will be utilised although the exact proportion of the mix to be used at any one time shall be proposed by the grouting contractor.

Where excessive lateral flow of grout is anticipated or when voids greater than 500mm are encountered, the addition of sand or pea gravel to the mix in accordance with CIRIA 758 may be utilised. The specified grout mix shall have the minimum water content consistent with effective pumping.

The actual proportions to be used initially for the various grouts shall be agreed with the Principal Contractor paying due regard of the conditions met in drilling and the results of any trial grouting carried out before work commences.

3.5.5 Grout Properties and Testing

With water / (cement and PFA) ratios generally in the range of 0.4 to 0.45 (including the moisture in the aggregates), the mixes proposed should produce pumpable grout with flowability readings of between 300 to 600mm, when measured in a meter of the "Colcrete" type.

The sample for the flowability test shall be obtained by the grouting Contractor at the point of injection i.e. from the end of the tremie pipe. A minimum of two flowability tests per week shall be performed by the Contractor.

High-bleed grouts shall be avoided. Bleed capacity should be limited to 5% maximum unless agreed otherwise.

A minimum of two bleed capacity tests shall be performed by the Contractor per shift. The sample of grout for the test shall be taken from the point of injection, i.e. the end of the tremie pipe.

Bleed capacity shall be measured in a clear plastic or glass graduated cylinder which has an internal diameter not less than 50mm and with a volume of approximately 1000ml. After placing the grout, a cover shall be placed over the cylinder to avoid evaporation. Bleed capacity shall be read at hourly intervals for neat cement grout, and readings should continue for not less than 3 hours. For PFA:cement grouts readings should continue for not less than 6 hours.

The Contractor shall prepare two sets of test cubes of grout from one batch of grout per week.

Each cube shall be of 100mm side, and shall be taken from the grout at the point of injection i.e. the end of the tremie pipe.

At the instruction of the Principal Contractor, the Contractor shall arrange for them to be tested by crushing at 7 and 28 days in accordance with BS1881. The testing shall be carried out by an independent laboratory.

The mixes shall produce cubes with crushing strengths of not less than 0.7MN/m^2 at 28 days (Note: the 7 day test is performed to indicate that the 28 day strength is achievable i.e. a 7 day value of about 0.4MN/m^2 would probably be considered on target).

If the Principal Contractor considers the results of the test indicate that a change of mix proportions is required, the Contractor shall make such modifications as the Principal Contractor or Principal Contractor's Consultant may direct.

3.5.6 Drilling Procedures for Treatment of Shallow Mineworkings

All boreholes to be used for the injection of grout, including those which strike coal pillars, shall be drilled by rotary or rotary percussive techniques down to between 0.5m and 1.0m beyond the base of

the old workings in the seams to be treated. The drilling system and flushing medium to be used shall be as instructed on the Coal Authority permit.

The minimum diameter of the holes shall be 50mm. When it is impracticable to drill at the minimum diameter for the full depth, the diameter of the boreholes shall be increased in the upper lengths.

The boreholes shall be kept open until grout injection into the workings and rock is complete.

Where a borehole proves abortive because it becomes obstructed, it shall be re-drilled in a suitable position. Boreholes shall be formed in general accordance with the locations shown on Figure 2 (of the Remediation Strategy). The plan is provisional only, subject to change with any alterations to proposed layout. Any deviation from the final layout including the drilling of additional secondary and tertiary holes shall be recorded by the contractor and a revised borehole location plan provided to the client.

During the course of the works, an on-going review of the data generated will be undertaken to assess the potential for the treatment zone extending beyond the considered areas.

3.5.7 Grouting Procedures for Shallow Mineworkings

The Contractor shall fill all abandoned mineworkings and voids encountered in the boreholes in the manner specified. Grout shall be introduced into all boreholes drilled.

Perimeter grout walls, if required, shall be formed by filling boreholes with a viscous grout composed of appropriate proportions of cement, PFA, sand or pea gravel and water.

Unless specified otherwise, the section of the perimeter wall at the deepest part of the seam shall be constructed first. Immediately prior to grouting each borehole, the Contractor shall check that it is unobstructed to the required depth to receive the tubing or tremie pipes for grout injection. Obstructions shall be dealt with as described in 'drilling procedures' above.

Grout shall be injected into position down each hole via an approved flexible grouting tube, placed to the base of the hole or to such other depth to receive the tubing or pipes for grout.

Grouting shall proceed upwards from the base of each borehole to the base of the surface deposits. It is not intended that, as a general rule, significant quantities of grout shall be injected into the surface deposits unless specified otherwise.

The grout shall be injected at the approved rates until grout appears near the point of injection, when the borehole shall be deemed complete. If this criterion is reached quickly, the grout tubes shall be lifted to check that a local obstruction is not preventing flow of the grout into the strata.

Hydrostatic pressure shall be applied to the grout in every borehole. If grout has not appeared at the point of injection after 5 tonnes of grouting materials have been introduced, then sand and/or pea gravel (gravel which passes through a 6.33mm sieve and is retained on a 2.36mm sieve) may be added to the mix or placed down the borehole.

3.5.8 Stabilisation Procedures for the Treatment of Mine Entries (if required)

If any unrecorded mine shafts are encountered on-site, they shall be stabilised in accordance with the recommendations given in CIRIA 758. All work on or about old mine shafts must be carried out from a

safety platform of adequate dimensions that will span the potential collapse zone and support the crew and equipment should a catastrophic failure of the shaft occur.

Prior to work commencing the area will be inspected to ensure that the safe movement of heavy equipment can proceed. This will be carried out by a competent, experienced person who will be securely fastened to the surface by means of a full body harness anchored some 5.0 metres away from the shaft perimeter. If the shaft is found to be open from the surface, then it shall be backfilled with graded material.

Any such material will be introduced directly into the shaft from the surface utilising equipment such as a 360 excavator or conveyor. If the shaft is backfilled then reversed stage pressure grouting of the infill material will be undertaken. Such treatment is achieved by a combination of permeation grouting and low-pressure compaction grouting of the infill material which forms an enhanced bond between the infill and the shaft lining / bedrock. Treatment will therefore be undertaken in the following manner.

A rigid steel and wooden shaft frame will be then mounted over the shaft mouth to ensure that any slumping of the shaft infill will not jeopardise the stability of the drilling rig and the safety of the crew.

Once the safety frame is in place, the drill rig will be positioned over the shaft to allow the sinking of a centrally located borehole through fill material. Treatment will involve the drilling of a single borehole to the base of the shaft and at least three metres into natural strata. This is to ensure that no "staging" is present within the shaft and that the actual shaft base has been reached. Shaft staging would typically be encountered within the first 50m below ground within shafts, although no hard or fast rules can be applied to this. Staging can be a problem if, over time, it deteriorates to such an extent that catastrophic failure of the infill material occurs

On completion of the first borehole temporary steel casing will then be inserted into the borehole. This casing forms the basis of the reversed stage pressure grouting technique. The grouting operation will commence on completion of the borehole and will involve direct injection down the borehole under pressure through the drill rods or casing in ascending 3m stages.

The grout will possess water: solids ratio of no more than 40% giving an approximate compressive strength of 0.9N/mm^2 after 28 days.

Grout will be mixed by loading hopper conditioned PFA and bagged OPC directly into the mixer as per the grouting procedure above.

The grout will be mixed and injected using a 50mm diaphragm pump operating at around 100 psi and will be pumped via 50mm reinforced grout hoses into borehole. This will continue until either a maximum pressure is reached or refusal of grout occurs. A length of casing will then be extracted, and the process repeated until the complete length of the shaft has been treated.

Should any significant thickness of permeable / granular fill be present on site, grouting may need to be terminated at the level of the base of such material.

If any significant voids are encountered during the operation, a grout \ pea gravel mix will be introduced into the borehole to restrict excessive movement of grout. However, should any major mining feature

such as roadways running off the shaft are suspected these will require investigation and treating separately from the shaft.

If required, a reinforced concrete shaft cap (to be designed and installed by others) should be constructed at rockhead level over each treated shaft.

4. AS-BUILT REMEDIATION ACTIVITIES

4.1 Site Layout

The site layout and formation levels are presented on drawing 25289-SDS-00-SL-DR-C-3019-CN1 at **Appendix A(1)**.

4.2 Earthworks

Pre-construction site levels are recorded on Centara's topographical survey drawing 105879 at **Appendix A(2).** The survey records seven stockpiles on site with an estimated volume of 3,600m^3 which it is understood was produced from the previous demolition work. The concrete has been processed and re-used in the works as per Remada's Verification Report **1080.08.02.**

Prior to the commencement of enabling and construction works, the estimated volume of surplus Made Ground/Soils requiring disposal was estimated as circa 1,800m^3 as per drawing 22349-3015-T1 at **Appendix A(3)**.

4.2.1 Home Bargains

In the west of the site beneath the Home Bargains footprint, pre-construction ground levels (excluding stockpiles) were 150.5 +/- 0.5m mAOD and the store formation level is 150.7 mAOD. Pre-construction ground levels in the northern part zone of the car park reduced from 150.5 +/- 0.5m mAOD adjacent to the Home Bargains footprint to 148.9 mAOD at the north of the site.

4.2.2 Lidl

In the east /south-east of the site and Lidl store footprint, pre-construction ground levels (excluding stockpiles) increase from approximately 148.0 mAOD at the site boundary to 149.7 m AOD in the centre of the site.

In the car park to the north-east of the Lidl store, the pre-construction ground levels are similar to the formation level. To the south-west of the Lidl store, in the HGV turning area. The pre-construction ground levels were approximately 0.5m lower than the formation level.

Preparation of formation necessitated:

- removal of vegetation;
- processing of stockpiled crushed concrete, and
- No excavation into either natural soils or Made Ground other that at the locations indicated in the Cut/Fill drawing provided by Stonedale at **Appendix A(4)** (note this drawing includes stockpiles).

Photos of the vegetation clearance, stockpiles of crushed concrete and processed crushed concrete are presented within Remada's Verification Report 1080.08.02.

Test results for the stockpiled crushed concrete were not presented in Remada's Verification Report **1080.08.02** and the crushed concrete was used create the formation levels for the development. Grading results indicate that the crushed concrete was generally suitable for use as a either a Class 1 granular fill or 6F capping material. Asbestos was not detected in one sample. The grading and asbestos analysis are presented at **Appendix B.**

4.3 Ground Beneath Formation Level

The historical reports described in Section 2 above, record landfill waste at a number of locations and those recorded in Delta Simons report 14-0672.03 have been reproduced as **Figure 1.**

Log of probe drilling the mine grouting are presented within Remada's Verification Report 1080.08.02. None of the logs within the Home Bargains footprint recorded fill. Fill (Made Ground/Waste) was recorded in a number of logs for probes in the southern zone of the site and beneath the Lidl store footprint. The locations of fill (Made Ground/Waste) are presented on **Figure 1.**

4.4 Ground Improvement

SDS' drawing 25289-SDS-00-SL-DR-C-3019-CN1 at **Appendix A(1)** records that both the Home Bargains and Lidl store footprints received ground improvement in the form of Controlled Modulus Columns to provide a minimum specified bearing capacity beneath foundations and floor slab. The specified ground bearing capacities for the Home Bargains store were 200 kPa beneath footings and 30 kPa beneath floor slab. The specified ground bearing capacities for the Lidl store were 150 kPa beneath footings and 50 kPa beneath floor slab.

The ground improvement was designed and implemented by Vibro-Meynard and their design report is presented within Remada's Verification Report 1080.08.02.

Vibro-Meynard also produced a Completion Report for their CMC works which is presented within Remada's Verification Report 1080.08.02.

The improvement in ground bearing capacity at formation level by Controlled Modulus Columns (CMC) negates the need for either piled foundations or deep pad foundations. Therefore, no arisings were generated by either the CMC technology or the foundation construction.

4.5 Foundations

4.5.1 Lidl Store

The Lidl store has been constructed on a raft foundation as per the General Arrangement Drawing 4529 JCE S(20)01 Foundation GA - Rev E. The depth of raft down-stands and edge-beams is detailed on the Foundation Section Drawings 4529 JCE S(20)02 Foundation Sections 01 – RevC, 4529 JCE S(20)03 Foundations Sections 02 - Rev B and 4529 JCE S(20)07 Foundation Sections 03 - Rev A.

Jamesons drawings are presented in **Appendices C(1)** to **C(4)** and confirm that shallow foundations or raft down-stands were constructed a 150mm thick layer of Type 1 sub-base situated on the improved ground. The raft has minimum thicknesses of 200mm and 300mm between down-stands and/or edge-beams with two layers of A393 mesh top and bottom. Heavier rebar is detailed for the down-stands and edge-beams.

The raft construction did not necessitate excavations for foundations and Remada's Verification Report 1080.08.02 presents photos of the subbase preparation.

4.5.2 Home Bargains Store

The Home Bargains store has been constructed on slab and pad foundations as per the General Arrangement drawing 00.20321-ACE-ZZ-00-D-S-4010-C3. Sections through the slab are detailed on drawings 00.20321-ACE-ZZ-00-D-S-4011-C3 and 00.20321-ACE-ZZ-FN-D-S-4000-C3.

Adepts' drawings are presented in **Appendices D(1)** to **D(2)** and confirm that a 150mm thick slab with one bottom layer of A393 mesh was constructed on a 650mm thick load transfer platform overlying the improved ground. Pad foundations bear on the improved ground.

The depth of pad foundations is detailed on Adept drawing 00.20321-ACE-ZZ-FN-D-S-4000-C3-Foundation Plan.

4.6 Excavations for Drainage

Two as-built drainage drawings are presented in **Appendices E(1)** to **E(2)**. Surface water drainage gullies in north of the site have an invert level of 150.340 mAOD adjacent to the Home Bargains store and 149.932 mAOD in the car north-east zone the car park. Drainage flows towards the south of the site with an invert level of 149.259 between the Home Bargains and Lidl stores and 148.297 to the east of the Lidl store. Invert levels reduce further in the zone of the surface water attenuation tank at 148.00 mAOD and with its discharge to gully of invert level 147.908 mAOD between the tank and culvert.

From a comparison of the as-built drainage drawings and **Figure 1** it can be seen that drainage excavations below formation were not in locations of landfill waste except for the location of the HGV service yard and between the Lidl and Home Bargains stores.

4.7 Landfill Waste

Stonedale Construction have confirmed that no landfill waste was exposed, excavated or removed from site as per their letter at **Appendix F**.

5. GROUND GAS PROTECTION MEASURES

5.1 Lidl Store

Ground gas protection measures were installed to meet the requirements of Characteristic Situation 2. A Protech GM Super Gas Barrier was installed beneath the raft foundation by PA Geo as per the Verification Plan prepared by Geoshield at **Appendix G(1.)**

Geoshield's Verification Report is presented at **Appendix G(2).**

5.2 Home Bargains

Ground gas protection measures were installed to meet the requirements of Characteristic Situation 2. A Protech GM Super Gas Barrier was installed beneath the raft foundation by PA Geo as per the Verification Plan prepared by Geoshield at **Appendix H(1).**

Geoshield's Verification Report is presented at **Appendix H(2).**

5.3 Ground Gas Risk Assessment

Lidl appointed Environmental Protection Group (EPG) to prepare the Ground Gas Risk Assessment at **Appendix I.**

6. LANDSCAPING

Zones of soft landscaping were formed at the towards the end of the construction period as per the photos below.

Topsoil imported for landscape has been assessed to not contain concentration of contaminants greater than **Table 4** (below). Stonedale have forwarded the supplier's chemical analyses to confirm the suitability of the material for use as per the results at **Appendix J(2).** Approximately 130m^2 (13 loads) were imported as per Stonedale's email delivery dockets at **Appendices J(1) and J(3).**

For material from a brownfield, recycled or unverified source, testing should be undertaken at a rate of one sample per 100m^3, with a minimum of four tests on any individual source material and a total of five analyses have been provided.



Photo c/o Stonedale Construction



Photo c/o Stonedale Construction



Photo c/o Stonedale Construction



Photo c/o Stonedale Construction



Photo c/o Stonedale Construction



Photo c/o Stonedale Construction

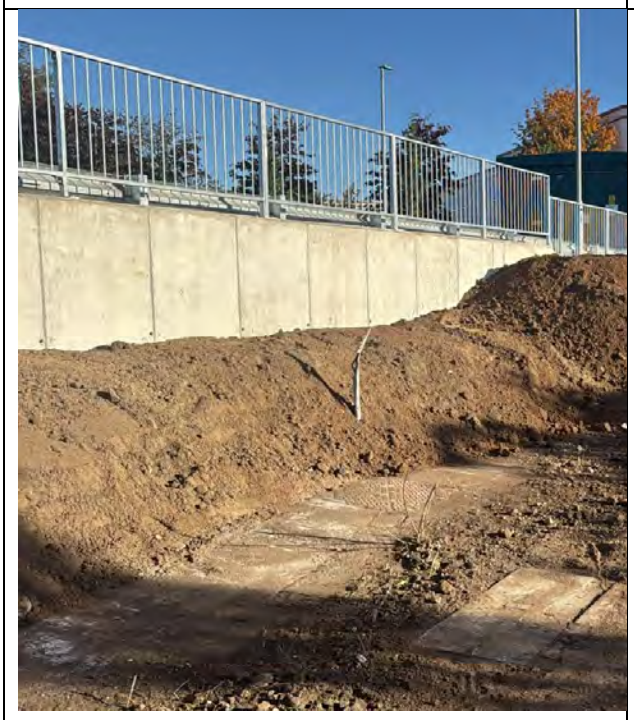


Photo c/o Stonedale Construction



Photo c/o Stonedale Construction

CLEA Category	Commercial			
	mg/kg	mg/kg	mg/kg	
Contaminant	1% SOM	2.5% SOM	6% SOM	Reference
Asbestos	<0.0001%*	<0.0001%*	<0.0001%*	JIWG CAR 2012
Antimony	7500	7500	7500	*EIC/AGS/CL:AIRE*
Arsenic	640	640	640	*LQM/CIEH S4UL*
Barium	22000	22000	22000	*EIC/AGS/CL:AIRE*
Beryllium	12	12	12	*LQM/CIEH S4UL*
Boron	240000	240000	240000	*LQM/CIEH S4UL*
Cadmium	190	190	190	*LQM/CIEH S4UL*
Chromium III	8600	8600	8600	*LQM/CIEH S4UL*
Chromium VI	33	33	33	*LQM/CIEH S4UL*
Copper	68000	68000	68000	*LQM/CIEH S4UL*
Mercury (Elemental	58[sat] (25.8)	58[sat] (25.8)	58[sat] (25.8)	*LQM/CIEH S4UL*
Mercury (Inorganic	1100	1100	1100	*LQM/CIEH S4UL*
Mercury (Methyl 4")	320	320	320	*LQM/CIEH S4UL*
Molybdenum	18000	18000	18000	*EIC/AGS/CL:AIRE*
Nickel	980	980	980	*LQM/CIEH S4UL*
Lead	NC	NC	2330	*DEFRA C4SL*
Selenium	12000	12000	12000	*LQM/CIEH S4UL*
Vanadium	9000	9000	9000	*LQM/CIEH S4UL*
Zinc	730000	730000	730000	*LQM/CIEH S4UL*
BTEX				
Benzene	27	47	90	*LQM/CIEH S4UL*
Toluene	56000[sat] (869)	110000[sat] (1920)	180000[sat] (4360)	*LQM/CIEH S4UL*
Ethylbenzene	5700[sol] (518)	13000[sol] (1220)	27000[sol] (2840)	*LQM/CIEH S4UL*
O-Xylene	6600[sol] (478)	15000[sol] (1120)	33000[sol] (2620)	*LQM/CIEH S4UL*
M-Xylene	6200[sol] (825)	14000[sol] (1470)	31000[sol] (3480)	*LQM/CIEH S4UL*
P-Xylene	5900[sol] (576)	14000[sol] (1350)	30000[sol] (3170)	*LQM/CIEH S4UL*
TPH Aliphatics				
>EC5-EC6	3200[sol] (304)	5900[sol] (558)	12000[sol] (1150)	*LQM/CIEH S4UL*
>EC6-EC8	7800[sol] (144)	17000[sol] (322)	40000[sol] (736)	*LQM/CIEH S4UL*
>EC8-EC10	2000[sol] (78)	4800[sol] (190)	11000[sol] (451)	*LQM/CIEH S4UL*
>EC10-EC12	9700[sol] (48)	23000[sol] (118)	47000[sol] (283)	*LQM/CIEH S4UL*
>EC12-EC16	59000[sol] (24)	82000[sol] (59)	90000[sol] (142)	*LQM/CIEH S4UL*
>EC16-EC35	1600000	1700000	1800000	*LQM/CIEH S4UL*
>EC35-EC44	1600000	1700000	1800000	*LQM/CIEH S4UL*
>EC44-EC70 (all+aro)	28000	28000	28000	*LQM/CIEH S4UL*
TPH Aromatics				
>EC5-EC7 (Benzene)	26000[sol] (1220)	46000[sol] (2260)	86000[sol] (4710)	*LQM/CIEH S4UL*
>EC7-EC8 (Toluene)	56000[sol] (869)	110000[sol] (1920)	180000[sol] (4360)	*LQM/CIEH S4UL*
>EC8-EC10	3500[sol] (613)	8100[sol] (1500)	17000[sol] (3580)	*LQM/CIEH S4UL*
>EC10-EC12	16000[sol] (364)	28000[sol] (899)	34000[sol] (2150)	*LQM/CIEH S4UL*
>EC12-EC16	36000[sol] (169)	37000	38000	*LQM/CIEH S4UL*
>EC16-EC21	28000	28000	28000	*LQM/CIEH S4UL*
>EC21-EC35	28000	28000	28000	*LQM/CIEH S4UL*
>EC35-EC44	28000	28000	28000	*LQM/CIEH S4UL*
>EC44-EC70 (all+aro)	28000	28000	28000	*LQM/CIEH S4UL*
PAH				*LQM/CIEH S4UL*
Naphthalene	190[vap] (78.4)	460[vap] (183)	1100[vap] (432)	*LQM/CIEH S4UL*
Acenaphthylene	83000[sat] (86.1)	97000[sol] (212)	100000	*LQM/CIEH S4UL*
Acenaphthene	84000[sat] (57)	97000[sol] (141)	100000	*LQM/CIEH S4UL*
Fluorene	63000[sat] (30.9)	68000	71000	*LQM/CIEH S4UL*
Phenanthrene	22000	22000	23000	*LQM/CIEH S4UL*
Anthracene	520000	540000	540000	*LQM/CIEH S4UL*
Fluoranthene	23000	23000	23000	*LQM/CIEH S4UL*
Pyrene	54000	54000	54000	*LQM/CIEH S4UL*
Benzo(a)anthracene	170	170	180	*LQM/CIEH S4UL*
Chrysene	350	350	350	*LQM/CIEH S4UL*
Benzo(b)fluoranthene	44	45	45	*LQM/CIEH S4UL*
Benzo(k)fluoranthene	1200	1200	1200	*LQM/CIEH S4UL*
Benzo(a)pyrene[(1)]	35	35	35	*LQM/CIEH S4UL*
Indeno(1,2,3-	500	510	510	*LQM/CIEH S4UL*
Dibenzo(a,h)anthrace	3.5	3.6	3.6	*LQM/CIEH S4UL*
Benzo(g,h,i)perylene	3900	4000	4000	*LQM/CIEH S4UL*
Coal Tar[(1)]	15	15	15	*LQM/CIEH S4UL*
Chloroalkanes &				*LQM/CIEH S4UL*
1,2-Dichloroethane	0.67	0.97	1.7	*LQM/CIEH S4UL*
1,1,1-Trichloroethane	660	1300	3000	*LQM/CIEH S4UL*
1,1,2,2-	270	550	1100	*LQM/CIEH S4UL*
1,1,1,2-	110	250	560	*LQM/CIEH S4UL*
Tetrachloroethene	19	42	95	*LQM/CIEH S4UL*
Tetrachloromethane	2.9	6.3	14	*LQM/CIEH S4UL*
Trichloroethene (TCE)	1.2	2.6	5.7	*LQM/CIEH S4UL*
Trichloromethane	99	170	350	*LQM/CIEH S4UL*
Chloroethene (Vinyl	0.059	0.077	0.12	*LQM/CIEH S4UL*
Explosives				*LQM/CIEH S4UL*
2,4,6-Trinitrotoluene	1000	1000	1000	*LQM/CIEH S4UL*
RDX	210000	210000	210000	*LQM/CIEH S4UL*
HMX	110000	110000	110000	*LQM/CIEH S4UL*
Pesticides				*LQM/CIEH S4UL*
Aldrin	170	170	170	*LQM/CIEH S4UL*
Dieldrin	170	170	170	*LQM/CIEH S4UL*
Atrazine	9300	9400	9400	*LQM/CIEH S4UL*
Dichlorvos	140	140	140	*LQM/CIEH S4UL*
alpha-Endosulfan	5600[dir] (0.003)	7400[dir] (0.007)	8400[dir] (0.016)	*LQM/CIEH S4UL*
beta-Endosulfan	6300[dir] (0.00007)	7800[dir] (0.0002)	8700	*LQM/CIEH S4UL*
alpha-	170	180	180	*LQM/CIEH S4UL*
beta-	65	65	65	*LQM/CIEH S4UL*
gamma-	67	69	70	*LQM/CIEH S4UL*
Chlorobenzenes				*LQM/CIEH S4UL*
Chlorobenzene	56	130	290	*LQM/CIEH S4UL*
1,2-Dichlorobenzene	2000[sol] (571)	4800[sol] (1370)	11000[sol] (3240)	*LQM/CIEH S4UL*
1,3-Dichlorobenzene	30	73	170	*LQM/CIEH S4UL*
1,4-Dichlorobenzene	4400[vap] (224)	10000[sol] (540)	25000[vap] (1280)	*LQM/CIEH S4UL*
1,2,3-	102	250	590	*LQM/CIEH S4UL*
1,2,4-	220	530	1300	*LQM/CIEH S4UL*
1,2,5-	23	55	130	*LQM/CIEH S4UL*
1,2,3,4-	1700[vap] (122)	3080[vap] (304)	4400[vap] (728)	*LQM/CIEH S4UL*
1,2,3,5-	49[sol] (39.4)	120[sol] (98.1)	240[sol] (235)	*LQM/CIEH S4UL*
1,2,4,5-	42[dir] (19.7)	72[dir] (49.1)	96	*LQM/CIEH S4UL*
Pentachlorobenzene	640[vap] (43.0)	770[vap] (107)	830	*LQM/CIEH S4UL*
Hexachlorobenzene	110[sol] (0.20)	120	120	*LQM/CIEH S4UL*
Phenols &				*LQM/CIEH S4UL*
Phenols	440[dir] 26000)	690[dir] (30000)	1300[dir] (34000)	*LQM/CIEH S4UL*
Chlorophenols	3500	4000	4300	*LQM/CIEH S4UL*
Pentachlorophenol	400	400	400	*LQM/CIEH S4UL*
Other				*LQM/CIEH S4UL*
Carbon Disulphide	11	22	47	*LQM/CIEH S4UL*
Hexachlorobutadiene	31	66	120	*LQM/CIEH S4UL*
dieldrin	7900	13000	24000	*EIC/AGS/CL:AIRE*

NC: No published criteria
vap: Screening criteria presented exceed the vapour saturation limit, which is presented in brackets.
sol: Screening criteria presented exceed the solubility saturation limit, which is presented in brackets.
dir: Screening criteria based on threshold protective of direct skin contact (guideline in brackets based on health effects following long term exposure provided for illustration only).
(1): For assessment based on the use of the surrogate marker approach the GAC for Coal Tar must be used instead of benzo(a)pyrene.
* Asbestos trace level

Updated with LQM/CIEH errata/erratum to March 2016.

Table 4: Imported Materials Acceptance Criteria

7 WASTE DISPOSAL

Remada's Verification Report 1080.08.02 records the quantities of wastes that were disposed from site as advised by Stonedale Construction during the enabling and remediation works. In preparing the As-Built Remediation Strategy at the end of construction Stonedale Construction have advised Remada that 200 loads of 'Muck-Away' have been removed from site. Disposal dockets are presented at **Appendix K.**

Note: 200 loads at a typical volume of 9m^3 per load equates to the estimated surplus disposal volume of 1800m^3.

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STUDY LIMITATIONS

IMPORTANT. This section should be read before reliance is placed on any of the information, opinions, advice, recommendations or conclusions contained in this report.

1. This report has been prepared by Remada, Ltd with all reasonable skill, care and diligence within the terms of the Appointment and with the resources and manpower agreed with (the 'Client'). Remada does not accept responsibility for any matters outside the agreed scope.

2. This report has been prepared for the sole benefit of the Client unless agreed otherwise in writing.

3. Unless stated otherwise, no consultations with authorities or funders or other interested third parties have been carried out. Remada is unable to give categorical assurance that the findings will be accepted by these third parties as such bodies may have published, more stringent objectives. Further work may be required by these parties.

4. All work carried out in preparing this report has used, and is based on, Remada' professional knowledge and understanding of current relevant legislation. Changes in legislation or regulatory guidance may cause the opinion or advice contained in this report to become inappropriate or incorrect. In giving opinions and advice pending changes in legislation, of which Remada is aware, have been considered. Following delivery of the report Remada has no obligation to advise the Client or any other party of such changes or their repercussions.

5. This report is only valid when used in its entirety. Any information or advice included in the report should not be relied upon until considered in the context of the whole report.

6. Whilst this report and the opinions made are to the best of Remada' belief, Remada cannot guarantee the accuracy or completeness of any information provided by third parties.

7. This report has been prepared based on the information reasonably available during the project programme. All information relevant to the scope may not have received

8. This report refers, within the limitations stated, to the condition of the site at the time of the inspections. No warranty is given as to the possibility of changes in the condition of the site since the time of the investigation.

9. The content of this report represents the professional opinion of experienced environmental consultants. Remada does not provide specialist legal or other professional advice. The advice of other professionals may be required.

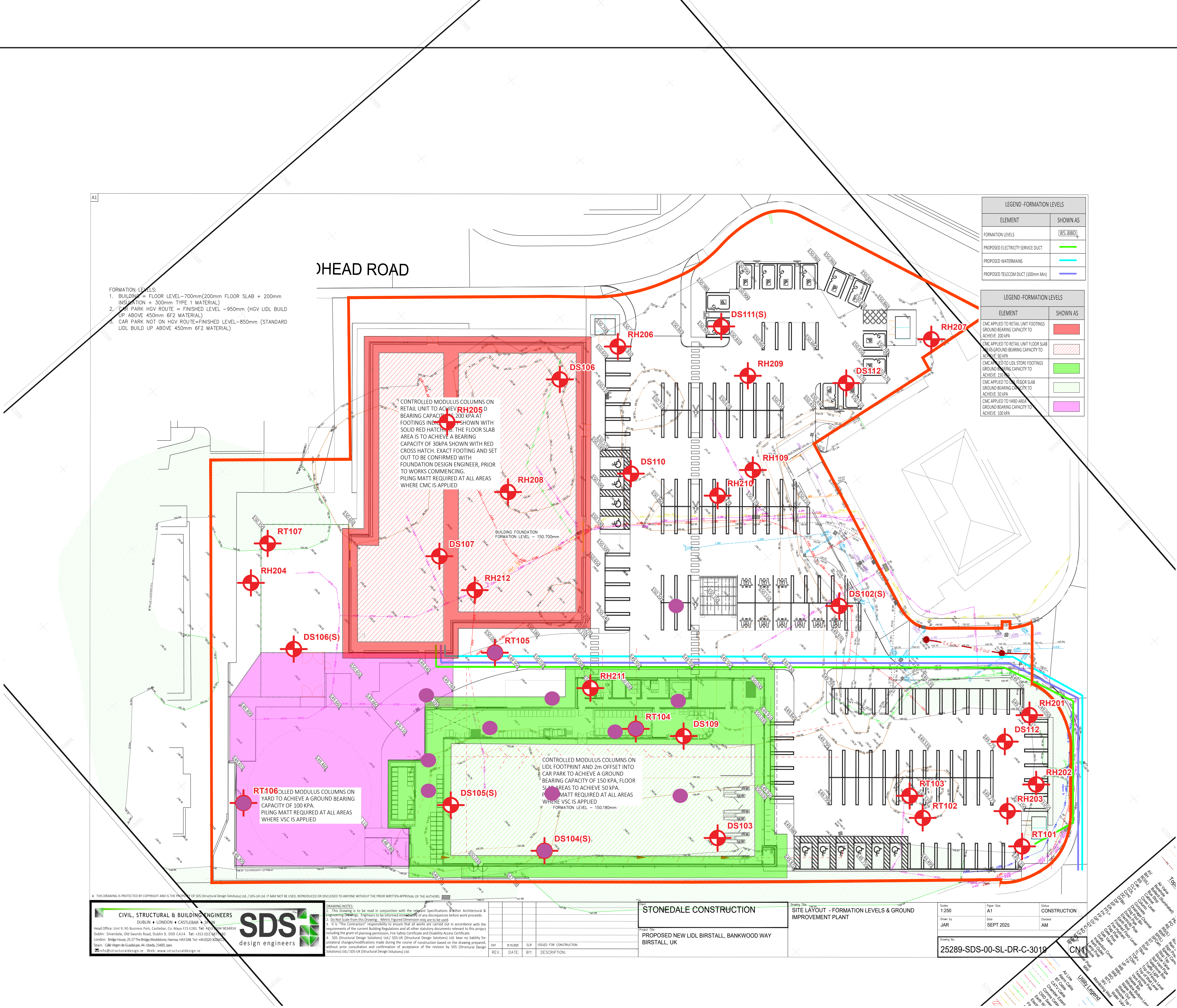
10. Where intrusive investigation techniques have been employed they have been designed to provide a reasonable level of assurance on the conditions. Given the discrete nature of sampling, no investigation technique is capable of identifying all conditions present in all areas. In some cases the investigation is further limited by site operations, underground obstructions and above ground structures. Unless otherwise stated, areas beyond the boundary of the site have not been investigated.

11. If below ground intrusive investigations have been conducted as part of the scope, service tracing for safe location of exploratory holes has been carried out. The location of underground services shown on any drawing in this report has been determined by visual observations and electromagnetic techniques. No guarantee can be given that all services have been identified. Additional services, structures or other below ground obstructions, not indicated on the drawing, may be present on site.

12. Unless otherwise stated the report provides no comment on the nature of building materials, operational integrity of the facility or on any regulatory compliance issues.

13. Unless otherwise stated, samples from the site (soil, groundwater, building fabric or other samples) have NOT been analysed or assessed for waste classification purposes.

FIGURES



Legend

Mine treatment probe locations that record fill

RH201 Exploratory Holes that record waste

Notes

Overlays of:
25289-SDS-00-SL-DR-C-3019-CN1
Centara Topo' Survey 105879
Soil Engineering Probe Locations
Delta Simons 14-0672.03 Figure

Issue	Approved	Date

Project Title
Lidl Birstall

Drawing Title
Locations of Landfill Waste

Client
Lidl Great Britain Ltd

Scale	Drawn	Size
as shown	GJ	A4

Date	Job No.	Figure No.
23.10.26	1080.13	01

Drawing Reference
1080.13 Fig1

REMADA GEO CONSULTANTS

APPENDIX A
EARTHWORKS / GROUND IMPROVEMENT DRAWINGS

A1

OHEAD ROAD

FORMATION LEVELS:
1. BUILDING = FLOOR LEVEL–700mm(200mm FLOOR SLAB + 200mm INSULATION + 300mm TYPE 1 MATERIAL)
2. CAR PARK HGV ROUTE = FINISHED LEVEL –950mm (HGV LIDL BUILD UP ABOVE 450mm 6F2 MATERIAL)
3. CAR PARK NOT ON HGV ROUTE=FINISHED LEVEL–850mm (STANDARD LIDL BUILD UP ABOVE 450mm 6F2 MATERIAL)

CONTROLLED MODULUS COLUMNS ON RETAIL UNIT TO ACHIEVE A GROUND BEARING CAPACITY OF 200 kPA AT FOOTINGS INDICATIVELY SHOWN WITH SOLID RED HATCHING. THE FLOOR SLAB AREA IS TO ACHIEVE A BEARING CAPACITY OF 30kPA SHOWN WITH RED CROSS HATCH. EXACT FOOTING AND SET OUT TO BE CONFIRMED WITH FOUNDATION DESIGN ENGINEER, PRIOR TO WORKS COMMENCING.
PILING MATT REQUIRED AT ALL AREAS WHERE CMC IS APPLIED

BUILDING FOUNDATION
FORMATION LEVEL – 150.700mm

CONTROLLED MODULUS COLUMNS ON YARD TO ACHIEVE A GROUND BEARING CAPACITY OF 100 KPA.
PILING MATT REQUIRED AT ALL AREAS WHERE VSC IS APPLIED

CONTROLLED MODULUS COLUMNS ON LIDL FOOTPRINT AND 2m OFFSET INTO CAR PARK TO ACHIEVE A GROUND BEARING CAPACITY OF 150 KPA, FLOOR SLAB AREAS TO ACHIEVE 50 kPA.
PILING MATT REQUIRED AT ALL AREAS WHERE VSC IS APPLIED
FORMATION LEVEL – 150.180mm

Ex.Foul

Ex.Foul

LEGEND -FORMATION LEVELS	
ELEMENT	SHOWN AS
FORMATION LEVELS	85.880
PROPOSED ELECTRICITY SERVICE DUCT	
PROPOSED WATERMAINS	
PROPOSED TELECOM DUCT (100mm Min)	

LEGEND -FORMATION LEVELS	
ELEMENT	SHOWN AS
CMC APPLIED TO RETAIL UNIT FOOTINGS GROUND BEARING CAPACITY TO ACHIEVE 200 kPA	
CMC APPLIED TO RETAIL UNIT FLOOR SLAB AREAS GROUND BEARING CAPACITY TO ACHIEVE 30 kPA	
CMC APPLIED TO LIDL STORE FOOTINGS GROUND BEARING CAPACITY TO ACHIEVE 150 kPA	
CMC APPLIED TO LIDL FLOOR SLAB GROUND BEARING CAPACITY TO ACHIEVE 50 kPA	
CMC APPLIED TO YARD AREA GROUND BEARING CAPACITY TO ACHIEVE 100 kPA	

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SDS design engineers

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2. Do Not Scale from this Drawing; -Metric Figured Dimension only are to be used.
3. It is "The Contractors" responsibility to ensure that all works are carried out in accordance with the requirements of the current Building Regulations and all other statutory documents relevant to this project including the grant of planning permission, Fire Safety Certificate and Disability Access Certificate.
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REV.	DATE:	BY:	DESCRIPTION:
CN1	01.10.2025	ELR	ISSUED FOR CONSTRUCTION

Client: STONEDALE CONSTRUCTION

Project Title: PROPOSED NEW LIDL BIRSTALL, BANKWOOD WAY BIRSTALL, UK

Drawing Title: SITE LAYOUT - FORMATION LEVELS & GROUND IMPROVEMENT PLANT

Scales	Paper Size:	Status
1:250	A1	CONSTRUCTION
Drawn by	Date	Checked
JAR	SEPT 2025	AM

Drawing No.: 25289-SDS-00-SL-DR-C-3019

Revision: CN1



N

GRID: OS NATIONAL GRID

Using the OS GPS Network and applying OSTN15 Transformation and then removing the scale factor for true distances with a one-step transformation centered on: DH01

DATUM: OS LEVEL DATUM

Using the OS GPS Network and applying OSGM15 National Geoid Model to obtain local area corrections.

Topographic Legend

Bottom of Bank	OH Electric
Top of Banking	Railway Line
Building	Road Centre
Building Canopy	Road Markings
Concrete Base	SC Hard:Hard
Contour Major	SC Hard:Soft
Contour Minor	SC Soft:Soft
Fences	Steps
General	Tree Canopy
Kerb Bottom	Vegetation
Kerb Drop	Visible Trench
Kerb Top	Walls
OH Comms	Water Edge

Topographic Abbreviations

AV	Air Valve	PB	Pedestrian Beacon
BH	Borehole	PBox	Post Box
BO(IL)	Bollard (Illuminated)	PGR	Pedestrian Guard Rail
BS	Bus Stop	PM	Parking Meter
Cab	Cabinet	PO	Post
CL=	Cover Level	RE	Rodding Eye
COL	Column	RS(IL)	Road Sign (Illuminated)
Conc	Concrete	RWP	Rain Water Pipe
DC	Drainage Channel	SP(IL)	Sign Post (Illuminated)
DFBin	Dog Foul Bin	SPCam	Speed Camera
DP	Down Pipe	ST	Stop Tap
EP	Electricity Pole	SV	Sluice Valve
ER	Earth Rod	SVP	Soil Vent Pipe
FFL=	Finished Floor Level	TBox	Telephone Box
FH	Fire Hydrant	TL	Traffic Light
FP	Flag Pole	TOF=	Top of Fence Level
GP	Gate Post	TOW=	Top of Wall Level
GV	Gas Valve	TP	Telecoms Pole
GY	Gully	VP	Vent Pipe
IC	Inspection Cover	WB	Waste Bin
KO	Kerb Outlet	WB=	Window Bottom Level
LP	Lamp Post	WM	Water Meter
MH	Manhole	WO	Wash Out
Mkr	Marker	WT=	Window Top Level
MP	Marker Post	WV	Water Valve
		MW	Monitoring Well

Utility Legend

Air Line	SWD Sewer
Alarm Cable	Survey Extents
BT Cable	Heating Pipe
CATV Cable	HV Electric Cable
Chamber Extent	Kingston Comms
Comms Cable	Oil Pipe
CWD Sewer	Rising Main
Earth Wire/Tape	Traffic Control
Electric Cable	Unknown Utility
Fibre Optic Cable	Vent Pipe
Fuel Line	Water
FWD Sewer	GPR Detection
Gas Pipe	Assumed Route
Band of Cables	Records Route
Empty Service Duct	Drainage Backdrop /Cable Riser

Utility Abbreviations

CP	Cathodic Protection	LoS	Loss of Signal
Cut	Disconnected Utility	MDPE	Middle Density PE
DI	Ductile Iron	SI	Spun Iron
DoB	Depth of Bottom	TLC	Traffic Light Control
DoC	Depth of Cover	UDI	Unreliable Depth Info
ED	Empty Duct	uPVC	Unplasticised Polyvinyl Chloride
EoT	End of Trace	UTR	Unable to Raise
PE	Polyethylene	UTT	Unable to Trace
HDPE	High Density PE	VC	Vitrified Clay

Manufacturer Stated Depths

Detected Using Electromagnetic Location Methods e.g. Any metallic pipe/cable. Accuracy ± 2.5% of depth reading.

Detected Using Electromagnetic Location Methods eg. Using a Sonde to locate drainage pipework Accuracy ± 2.5% of depth reading.

Detected Using Ground Penetrating Radar e.g. A plastic pipe or service not located by other means. Accuracy depends on ground conditions.

CAUTION LIVE SERVICES PRESENT - EXTREME CARE SHOULD BE TAKEN WHEN EXCAVATING

Centara Ltd., and their agents or partners, are not responsible for any situation, incident or loss resulting from actions or planning resulting from total reliance upon this drawing or accompanying information. The completeness of the underground network information cannot be wholly guaranteed and as such no guarantees or warranties are provided or implied.The location and/or identification of a service will not positively indicate whether it is live or dead. A service indicated from records that has not been located or identified on site does not necessarily imply that it does not exist or is dead, however, its presence should be anticipated. The results of Electro Magnetic and GPR detection techniques are not infallible and ground proofing for the actual position and depth of services should be established.

If this drawing and any associated drawings should be used in relation to works, we advise that the users of this information follow the principles detailed by the Health and Safety Executive guidance directive HS(G) 47, "Avoiding Danger from Underground Services". Further details of this directive are available at www.hse.gov.uk <http://www.hse.gov.uk/>

Notes

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ALL HATCHING IS FOR PRESENTATIONAL PURPOSES ONLY.

Client	LIDL		
Site Location:	CENTRE 27 BUSINESS PARK, WOODHEAD RD, BIRSTALL, BATLEY, WF17 9TD.		
Purpose of Drawing	UTILITY AND TOPOGRAPHICAL SURVEY		
Surveyed:	BC GC DH	Drawn:	BM
Checked:	SH	Authorised:	KB
Date:	03/08/2020	Scale:	1:200@A0

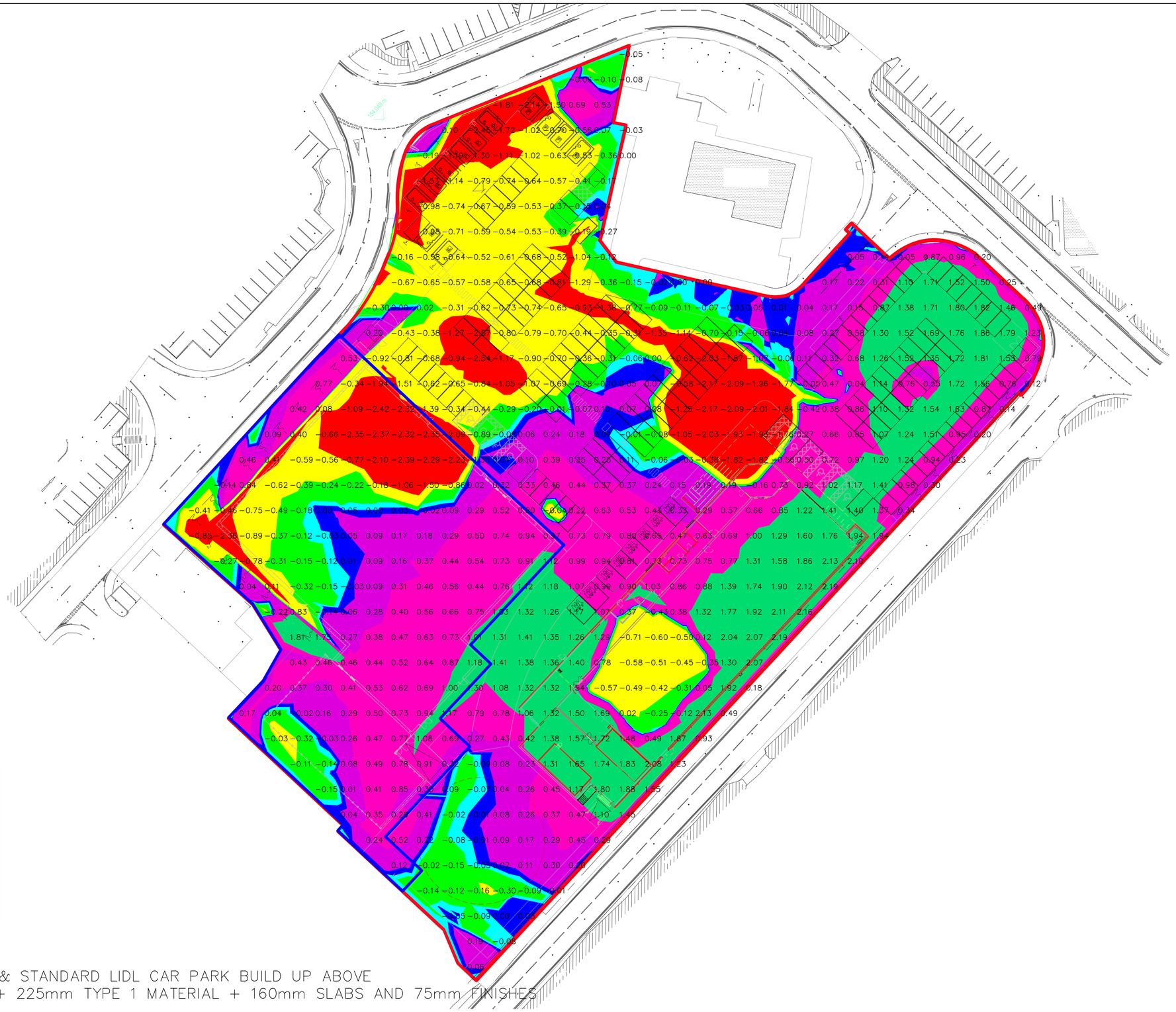
Scale 1:200

0 5 10 15

Office 10, Ripley Drive,
Normanton Business Park,
Wakefield,
WF6 1QT.
info@centara-ltd.com

Project Number:	105879
Sheet Number:	Layout 1 of 1

A1



TOTAL FILL = 7038 m3
TOTAL CUT= 4450 m3
NET FILL=2587m3

Elevations Table					
Number	Minimum Elevation	Maximum Elevation	Area	Color	VOLUME m3
1	−3.01	−0.93	1618.36		1261.68
2	−0.93	−0.28	2552.61		1817.55
3	−0.28	−0.05	1368.08		1077.25
4	−0.05	0.00	580.94		300.86
5	0.00	0.06	773.72		545.75
6	0.06	0.37	2269.41		2167.92
7	0.37	1.07	3361.11		3001.74
8	1.07	2.39	2768.01		1316.10

TABLE REFER TO FORMATION LEVELS
BUILD UPS NOT INCLUDED:
1. CAR PARK= 450mm 6F2 MATERIAL & STANDARD LIDL CAR PARK BUILD UP ABOVE
2. BUILDINGS= 225mm 6F2 MATERIAL + 225mm TYPE 1 MATERIAL + 160mm SLABS AND 75mm FINISHES

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CIVIL, STRUCTURAL & BUILDING ENGINEERS
DUBLIN • LONDON • CASTLEBAR • SPAIN
SDS design engineers
Head Office: Unit 9, N5 Business Park, Castlebar, Co. Mayo F23 E283. **Tel:** +353 (0)94 9034914
Dublin: Silverdale, Old Swords Road, Dublin 9, D09 CA24. **Tel:** +353 (0)1 6877480
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Spain: Calle Virgen de Guadalupe, 44. Ubeda, 23400, Jaen.
info@structuraldesign.ie Web: www.structuraldesign.ie

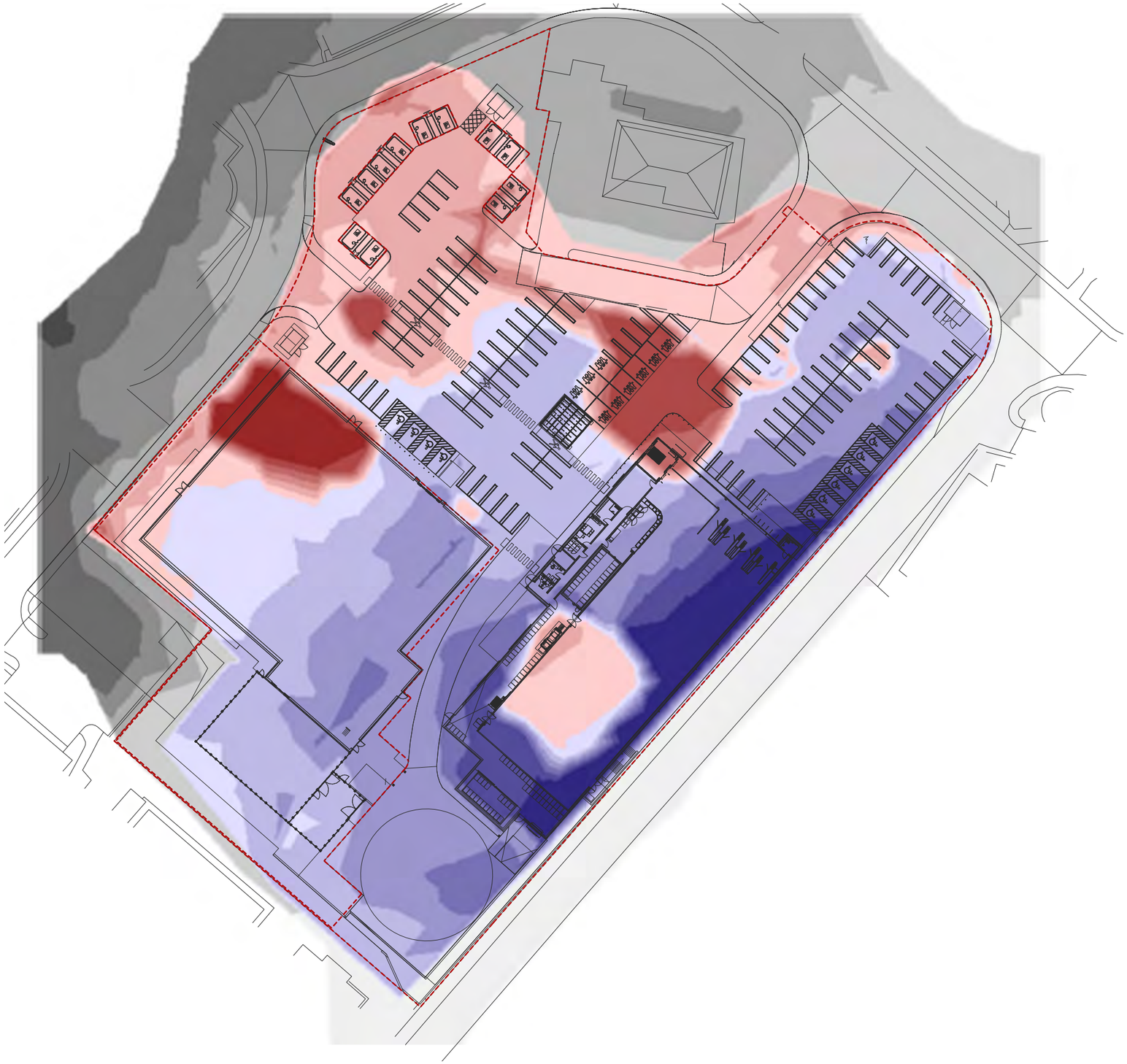
DRAWING NOTES:
1. This Drawing is to be read in conjunction with the relevant Specifications & other Architectural & Engineering Drawings. Engineers to be informed immediately of any discrepancies before work proceeds.
2. Do Not Scale from this Drawing; -Metric Figured Dimension only are to be used.
3. It is •••• ••••••••••• responsibility to ensure that all works are carried out in accordance with the requirements of the current Building Regulations and all other statutory documents relevant to this project including the grant of planning permission, Fire Safety Certificate and Disability Access Certificate.
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REV..	DATE:	BY:	DESCRIPTION:
T1	07.10.2022	AM	ISSUED FOR INFORMATION

Client: LIDL GB
Project Title: LIDL BIRSTALL, BANKWOOD WAY
BIRSTALL, UK

Drawing Title: CUT AND FILL LAYOUT

Scales	Paper Size:	Status
1:250	A1	TENDER
Drawn by: JPM	Date: OCT 2022	Checked: AM
C:\Users\Alvare\Desktop\New Folder\22349- CUT AND FILL.dwg		
Project No.: 22349	Drawing No.: 3015	Revision: T1



KEY

- Cut (darker = deeper)
- Fill (darker = deeper)
- Existing ground outside site
- Proposed site layout
- Site boundary

NOTES

1. Ground model shows cut and fill between existing ground and proposed levels.
2. Colours indicate cut (red) and fill (blue); deeper shading indicates greater depth.
3. Proposed site layout (Site Layout 18.03.2024) overlaid by matching the site boundary to the ground model extent.
4. Estimation only. Not for setting out.

PROJECT
4115 Birstall

DRAWING
Ground model (estimation) with site layout

SCALE
NTS

DATE
27/10/2026

DRAWN
BI

SHEET
1 of 1

APPENDIX B

CRUSHED CONCRETE RETAINED ON SITE

Laboratory Report

GEOTECHNICAL SITE & TESTING LABORATORIES
A PHENNA GROUP COMPANY

Contract Number: 84476

Client Ref: **1080.01**
Client PO: **1080.01**

Client: **Remada Limited**

Contract Title: **1080.01 - Birstall**
For the attention of: **Krysia Szybut**

Date Received: **11-02-2026**
Date Completed: **16-02-2026**
Report Date: **16-02-2026**

This report has been checked and approved by:



Shaun Jones
Laboratory manager

Description	Qty
Particle Size Distribution BS EN ISO 17892-4 : 5.1 - * UKAS	6

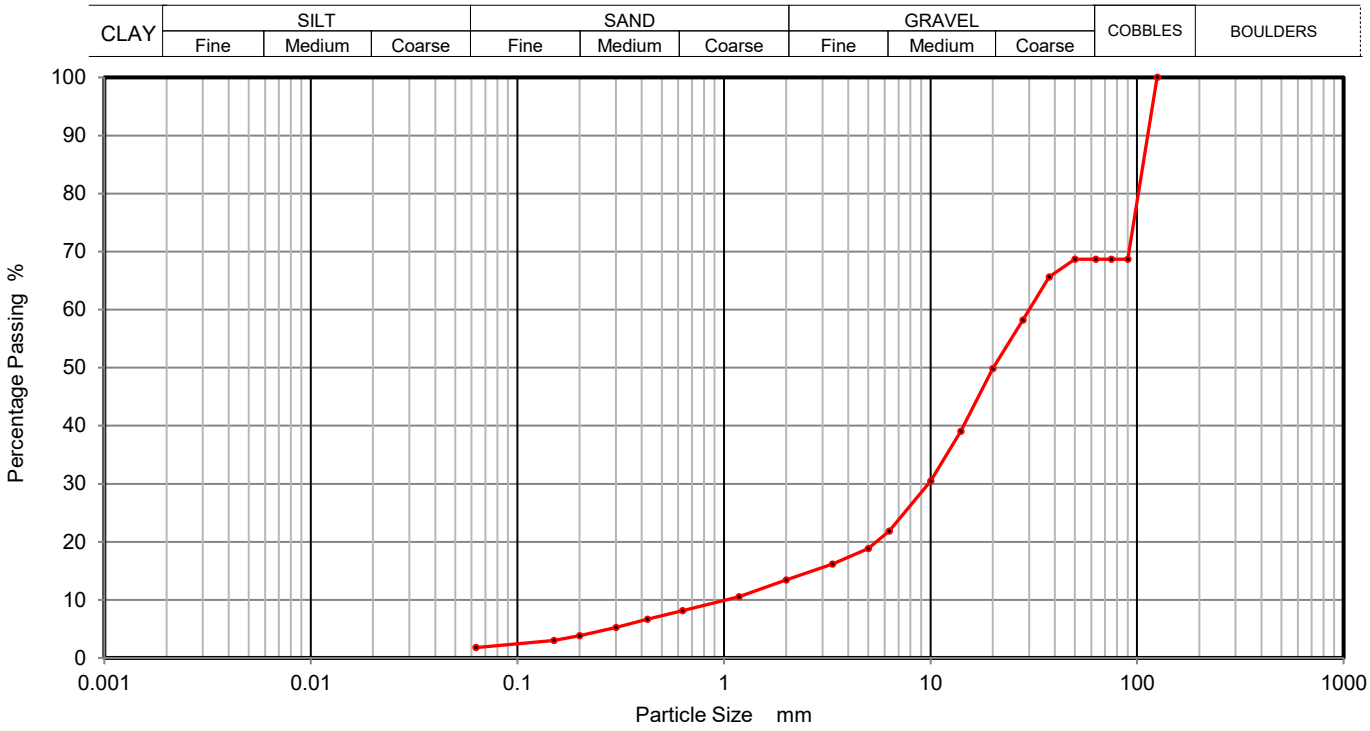
Notes: **Observations and Interpretations are outside the UKAS Accreditation**
*** - denotes test included in laboratory scope of accreditation**
 # - denotes test carried out by approved contractor
@ - denotes non accredited tests

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This test report/certificate shall not be reproduced except in full, without the approval of GEO Site & Testing Services Ltd. Any opinions or interpretations stated - within this report/certificate are excluded from the laboratories UKAS accreditation.

Approved Signatories:
Brendan Evans (Business Support Co-ordinator) - Darren Bourne (Quality Senior Technician) - Jason Jenkins (Business Development Manager)
Luke Williams (Senior Laboratory Technician) - Paul Evans (Director) - Richard John (Quality/Technical Manager)
Shaun Jones (Laboratory manager) - Shaun Thomas (Site Manager) - Vince Williams (Site Technician)
Wayne Honey (HR & HSE Manager)

GEO Site & Testing Services Ltd
Unit 3-4 Heol Aur, Dafen Ind Est, Llanelli, Carmarthenshire SA14 8QN
Tel: 01554 784 040 Fax: 01554 784 040 info@gstl.co.uk https://gstl.co.uk

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377-2:2022 Clause 10 & BS EN ISO 17892-4:2016 Wet Sieve, Clause 5.2**	Contract Number	**84476**
		Borehole/Pit No.	**SP1**
Project Name	**1080.01 - Birstall**	Sample No.	
Sample Description	Grey silty/clayey sandy fine to coarse GRAVEL with cobbles	Depth Top	
		Depth Base	
Date Tested	12/02/2026	Sample Type	**B**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	69		
75	69		
63	69		
50	69		
37.5	66		
28	58		
20	50		
14	39		
10	30		
6.3	22		
5	19		
3.35	16		
2	13		
1.18	11		
0.63	8		
0.425	7		
0.30	5		
0.20	4		
0.15	3		
0.063	2		

Sample Proportions	% dry mass
Cobbles	31
Gravel	56
Sand	11
Silt and Clay	2

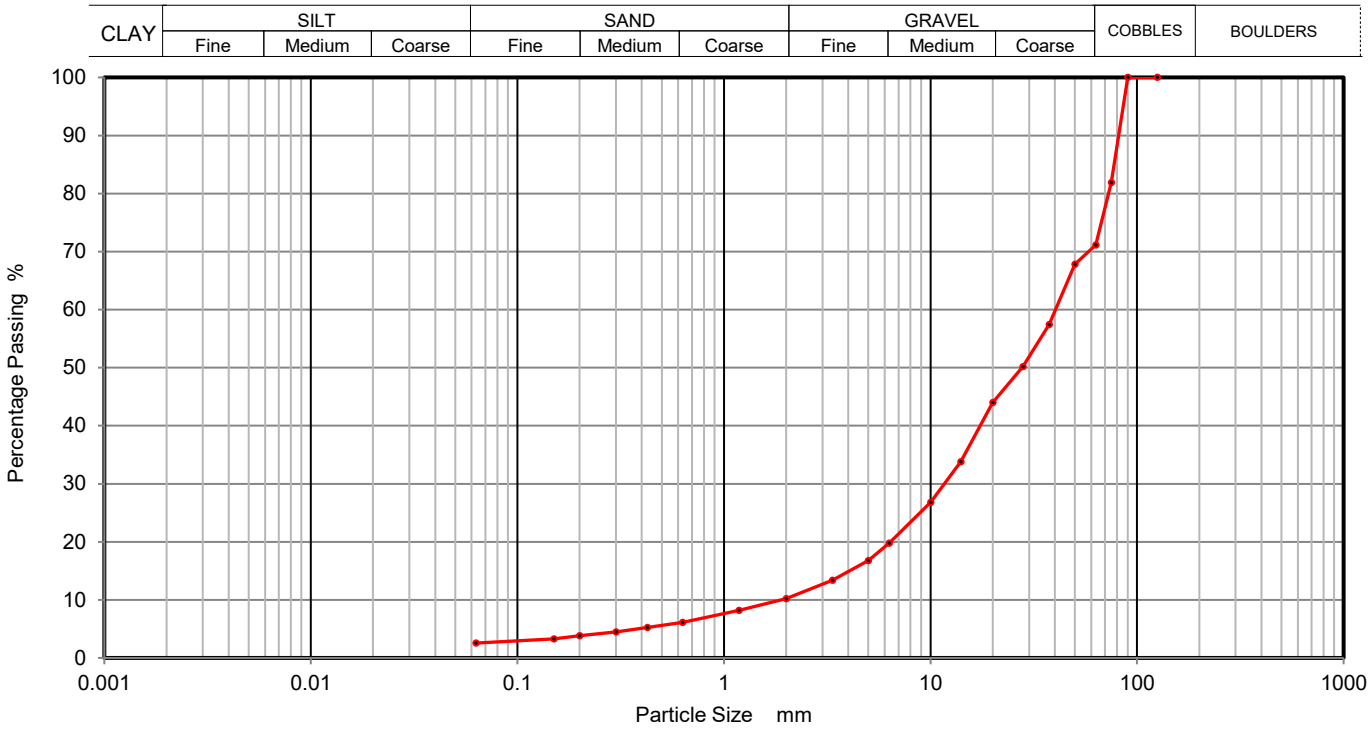
Grading Analysis	
Uniformity Coefficient	N/A

Remarks

Preparation and testing in accordance with BS17892 unless noted below

Operator
Clayton. J

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377-2:2022 Clause 10 & BS EN ISO 17892-4:2016 Wet Sieve, Clause 5.2**	Contract Number	**84476**
		Borehole/Pit No.	**SP2**
Project Name	**1080.01 - Birstall**	Sample No.	
Sample Description	Grey silty/clayey sandy fine to coarse GRAVEL with cobbles	Depth Top	
		Depth Base	
Date Tested	12/02/2026	Sample Type	**B**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	82		
63	71		
50	68		
37.5	57		
28	50		
20	44		
14	34		
10	27		
6.3	20		
5	17		
3.35	13		
2	10		
1.18	8		
0.63	6		
0.425	5		
0.30	4		
0.20	4		
0.15	3		
0.063	3		

Sample Proportions	% dry mass
Cobbles	29
Gravel	61
Sand	7
Silt and Clay	3

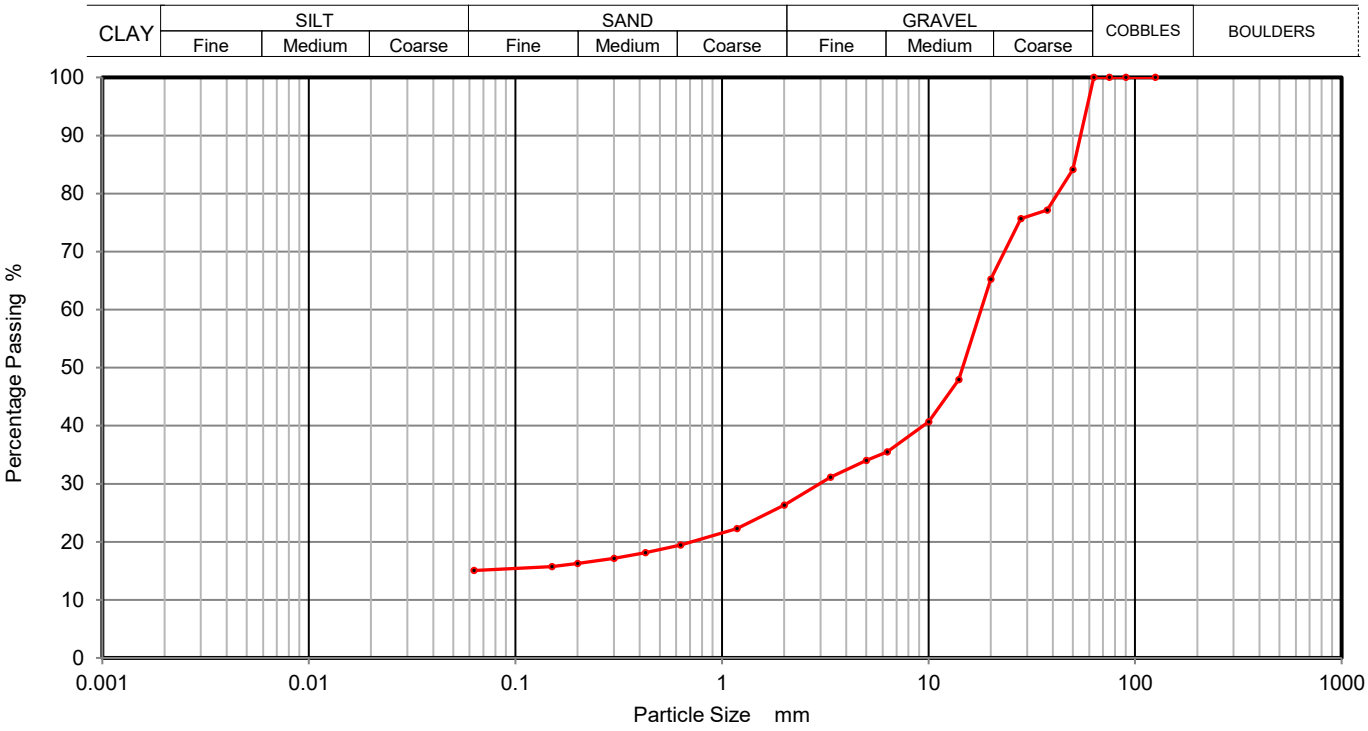
Grading Analysis	
Uniformity Coefficient	N/A

Remarks

Preparation and testing in accordance with BS17892 unless noted below

Operator
Clayton. J

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377-2:2022 Clause 10 & BS EN ISO 17892-4:2016 Wet Sieve, Clause 5.2**	Contract Number	**84476**
		Borehole/Pit No.	**SP3**
Project Name	**1080.01 - Birstall**	Sample No.	
Sample Description	Grey fine to coarse sandy silty/clayey fine to coarse GRAVEL	Depth Top	
		Depth Base	
Date Tested	12/02/2026	Sample Type	**B**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	84		
37.5	77		
28	76		
20	65		
14	48		
10	41		
6.3	35		
5	34		
3.35	31		
2	26		
1.18	22		
0.63	19		
0.425	18		
0.30	17		
0.20	16		
0.15	16		
0.063	15		

Sample Proportions	% dry mass
Cobbles	0
Gravel	74
Sand	11
Silt and Clay	15

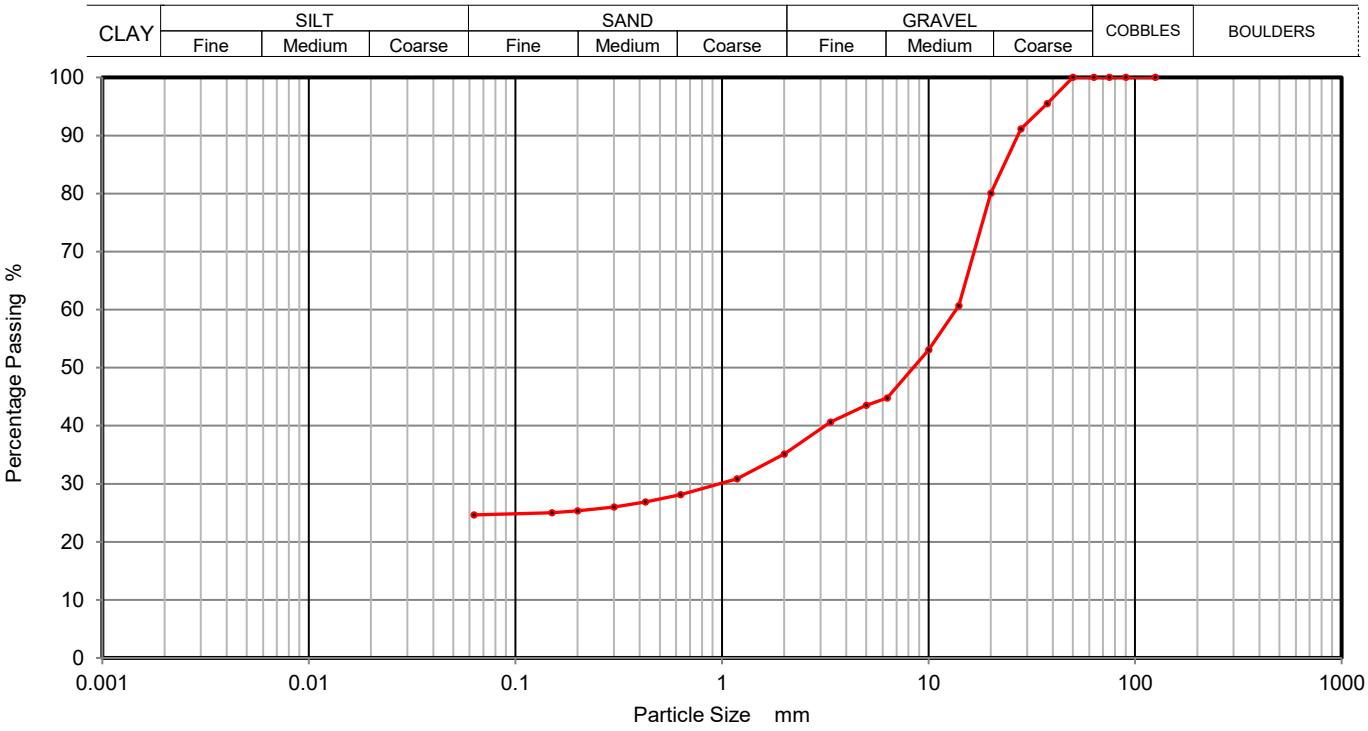
Grading Analysis	
Uniformity Coefficient	N/A

Remarks

Preparation and testing in accordance with BS17892 unless noted below

Operator
Clayton. J

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377-2:2022 Clause 10 & BS EN ISO 17892-4:2016 Wet Sieve, Clause 5.2**	Contract Number	**84476**
		Borehole/Pit No.	**SP4**
Project Name	**1080.01 - Birstall**	Sample No.	
Sample Description	Grey fine to coarse sandy silty/clayey fine to coarse GRAVEL	Depth Top	
		Depth Base	
Date Tested	12/02/2026	Sample Type	**B**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	96		
28	91		
20	80		
14	61		
10	53		
6.3	45		
5	44		
3.35	41		
2	35		
1.18	31		
0.63	28		
0.425	27		
0.30	26		
0.20	25		
0.15	25		
0.063	25		

Sample Proportions	% dry mass
Cobbles	0
Gravel	65
Sand	10
Silt and Clay	25

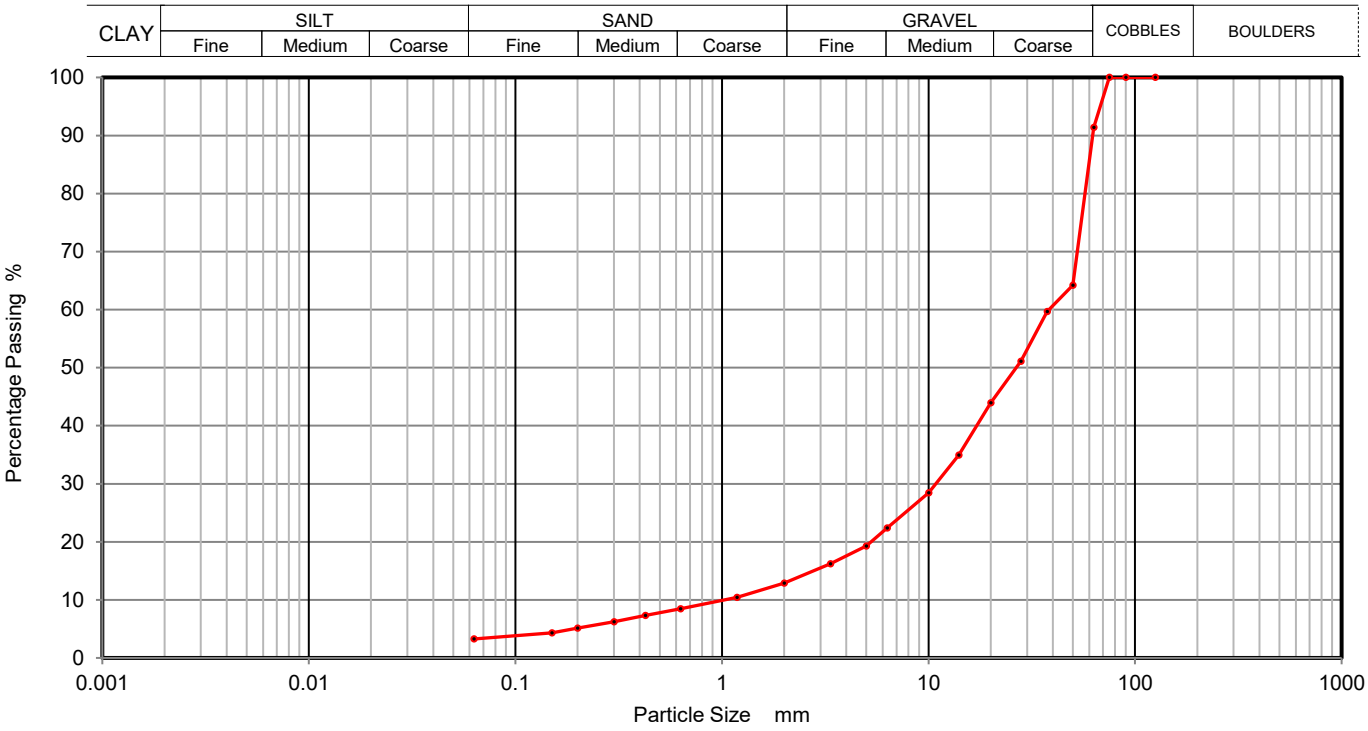
Grading Analysis	
Uniformity Coefficient	N/A

Remarks

Preparation and testing in accordance with BS17892 unless noted below

Operator
Clayton. J

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377-2:2022 Clause 10 & BS EN ISO 17892-4:2016 Wet Sieve, Clause 5.2**	Contract Number	**84476**
		Borehole/Pit No.	**SP5**
Project Name	**1080.01 - Birstall**	Sample No.	
Sample Description	Grey silty/clayey fine to coarse sandy fine to coarse GRAVEL with cobbles	Depth Top	
		Depth Base	
Date Tested	12/02/2026	Sample Type	**B**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	91		
50	64		
37.5	60		
28	51		
20	44		
14	35		
10	28		
6.3	22		
5	19		
3.35	16		
2	13		
1.18	10		
0.63	8		
0.425	7		
0.30	6		
0.20	5		
0.15	4		
0.063	3		

Sample Proportions	% dry mass
Cobbles	9
Gravel	78
Sand	10
Silt and Clay	3

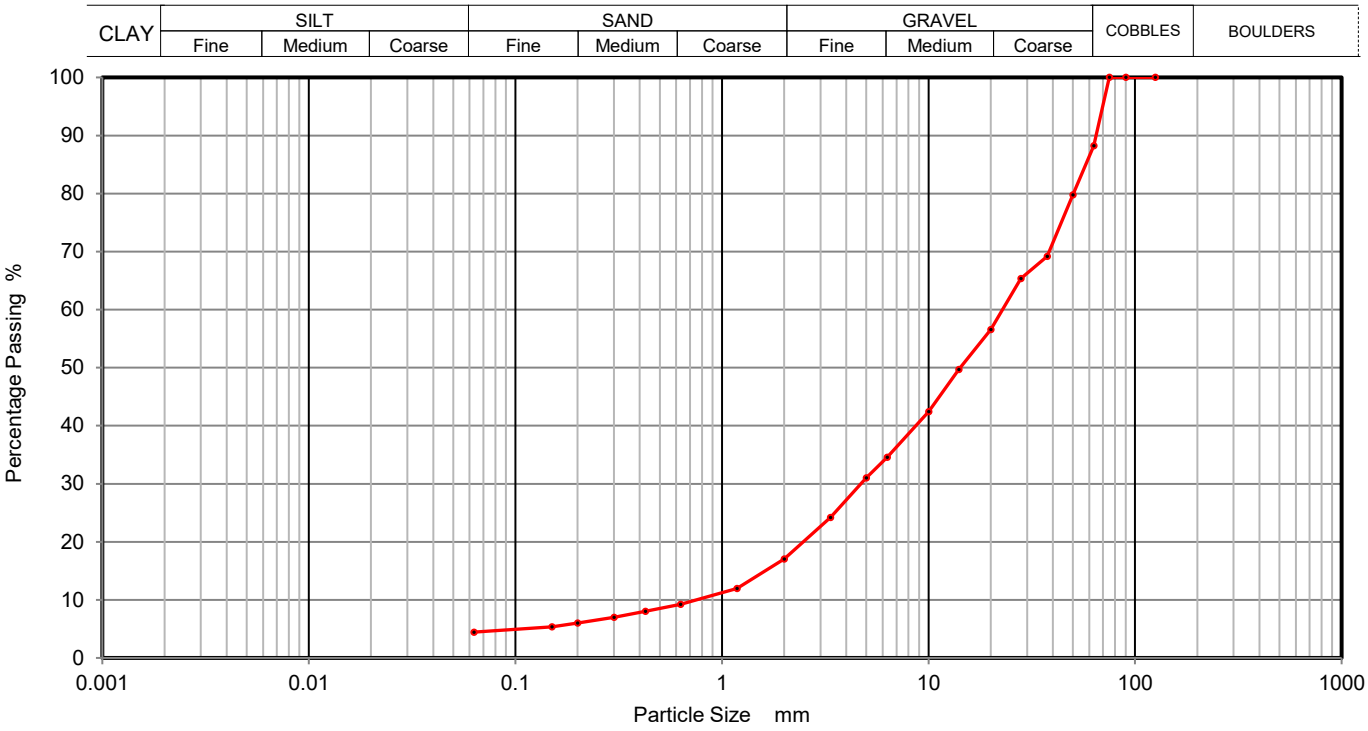
Grading Analysis	
Uniformity Coefficient	N/A

Remarks

Preparation and testing in accordance with BS17892 unless noted below

Operator
Clayton. J

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377-2:2022 Clause 10 & BS EN ISO 17892-4:2016 Wet Sieve, Clause 5.2**	Contract Number	**84476**
		Borehole/Pit No.	**SP6**
Project Name	**1080.01 - Birstall**	Sample No.	
Sample Description	Grey silty/clayey fine to coarse sandy fine to coarse GRAVEL with cobbles	Depth Top	
		Depth Base	
Date Tested	12/02/2026	Sample Type	**B**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	88		
50	80		
37.5	69		
28	65		
20	57		
14	50		
10	42		
6.3	35		
5	31		
3.35	24		
2	17		
1.18	12		
0.63	9		
0.425	8		
0.30	7		
0.20	6		
0.15	5		
0.063	4		

Sample Proportions	% dry mass
Cobbles	12
Gravel	71
Sand	13
Silt and Clay	4

Grading Analysis	
Uniformity Coefficient	N/A

Remarks

Preparation and testing in accordance with BS17892 unless noted below

Operator
Clayton. J

UKAS TESTING
4041

Normec i2 Analytical

Remada Ltd
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17 High Street
Henley-in-Arden
Warwickshire
B955AA

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e: joe.hughes@remada.co.uk
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Business Park,
Watford,
Herts,
WD18 8YS

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f: 01923 237404
e: info-i2analytical@normecgroup.com

Analytical Report Number : 26-005879

Project / Site name:	Birstall	**Samples received on:**	05/02/2026
Your job number:	1080 10	**Samples instructed on/ Analysis started on:**	05/02/2026
Your order number:	1080 10	**Analysis completed by:**	16/02/2026
Report Issue Number:	1	**Report issued on:**	16/02/2026
Samples Analysed:	6 soil samples		

Signed:

Charlotte Andrew
Key Account Manager
For & on behalf of i2 Analytical Ltd.

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

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

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

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting
air	- once the analysis is complete

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Retention period for records and reports is minimum 6 years from the date of issue of the final report.
Some records may be kept for longer according to other legal/best practice requirements.

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

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The results included within the report are representative of the samples submitted for analysis.

4041

Analytical Report Number: 26-005879
Project / Site name: Birstall
Your Order No: 1080 10

Lab Sample Number				822287	822288	822289	822290	822291
Sample Reference				SP1	SP2	SP3	SP4	SP5
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A	N/A	N/A
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				04/02/2026	04/02/2026	04/02/2026	04/02/2026	04/02/2026
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status					
Asbestos								
Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	DSA	DSA	DSA	DSA	DSA
Analysis completed	N/A	N/A	N/A	16/02/2026	16/02/2026	16/02/2026	16/02/2026	16/02/2026

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

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The results included within the report are representative of the samples submitted for analysis.

4041

Analytical Report Number: 26-005879
Project / Site name: Birstall
Your Order No: 1080 10

Lab Sample Number				822292
Sample Reference				SP6
Sample Number				None Supplied
Water Matrix				N/A
Depth (m)				None Supplied
Date Sampled				04/02/2026
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Test Limit of detection**	**Test Accreditation Status**	
Asbestos				
Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	DSA
Analysis completed	N/A	N/A	N/A	16/02/2026

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

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

4041

Analytical Report Number : 26-005879
Project / Site name: Birstall

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)
Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in Soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques	In-house method based on HSG 248, 2021	A001B	D	ISO 17025

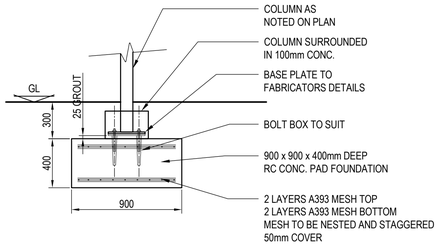
For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Quality control parameter failure associated with individual result applies to calculated sum of individuals.
The result for sum should be interpreted with caution

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

APPENDIX C

LIDL STORE FOUNDATION DRAWINGS



SECTION THROUGH PAD FOUNDATION
Scale 1:25

0m 0.5m 1m 1.5m 2m 3m 4m 5m

SCALE 1:50 - ENSURE PDF'S ARE PRINTED AT 1:1

CDM 2015 RISK NOTES

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⚠1 NO SPECIFIC ISSUES TO HIGHLIGHT. CONTRACTOR TO REVIEW SEQUENCE OF WORKS AND DISCUSS WITH THE ENGINEER.

SITE & DRAWN MEASUREMENTS

1) DRAWN DIMENSIONS ARE BASED ON ARCHITECTS DRAWINGS OR INTERPOLATED FROM ELECTRONIC FILES. THE CONTRACTOR SHOULD TAKE SITE MEASUREMENTS AS REQUIRED TO ENSURE THE SET-OUT OF THE BUILDING IS CORRECT AND STRUCTURAL ITEMS ARE PLACED IN THE CORRECT POSITION, ARE THE CORRECT LENGTH AND PROPORTIONS.

2) IF IN DOUBT ASK.

3) SITE MEASUREMENTS ARE TO BE TAKEN BY THE CONTRACTOR PRIOR TO MATERIAL ORDER. ANY DISCREPANCIES ARE TO BE REPORTED TO THE DESIGNER FOR REVIEW.

NOTES:
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THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS, NOTIFY JAMESON CONSULTING LTD, IMMEDIATELY OF ANY DISCREPANCIES. UNLESS NOTED OTHERWISE.
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DRAWING STATUS
AS BUILT STATUS

GENERAL NOTES

1. DO NOT SCALE FROM THIS DRAWING.
2. ALL DIMENSIONS ARE SHOWN FOR DESIGN AND TENDER PURPOSES ONLY. ACTUAL SURVEY OR ARCHITECTS DIMENSIONS SHOULD BE USED IN ALL CASES. BUILDER/CONTRACTOR TO SATISFY THEMSELVES THAT DIMENSIONS ARE CORRECT PRIOR TO MATERIAL ORDER.
3. REFER ARCHITECTS DRAWINGS FOR CONSTRUCTION AND FINISH REQUIREMENTS.
4. NOTIFY JAMESON CE LTD IMMEDIATELY IF ANY DISCREPANCY ARISES.

CONCRETE NOTES

1. ALL CONCRETE WORK IS TO BE IN ACCORDANCE WITH JCE-LTD NBS-SECTION E
2. RELEVANT CONCRETE MIX DESIGN :-

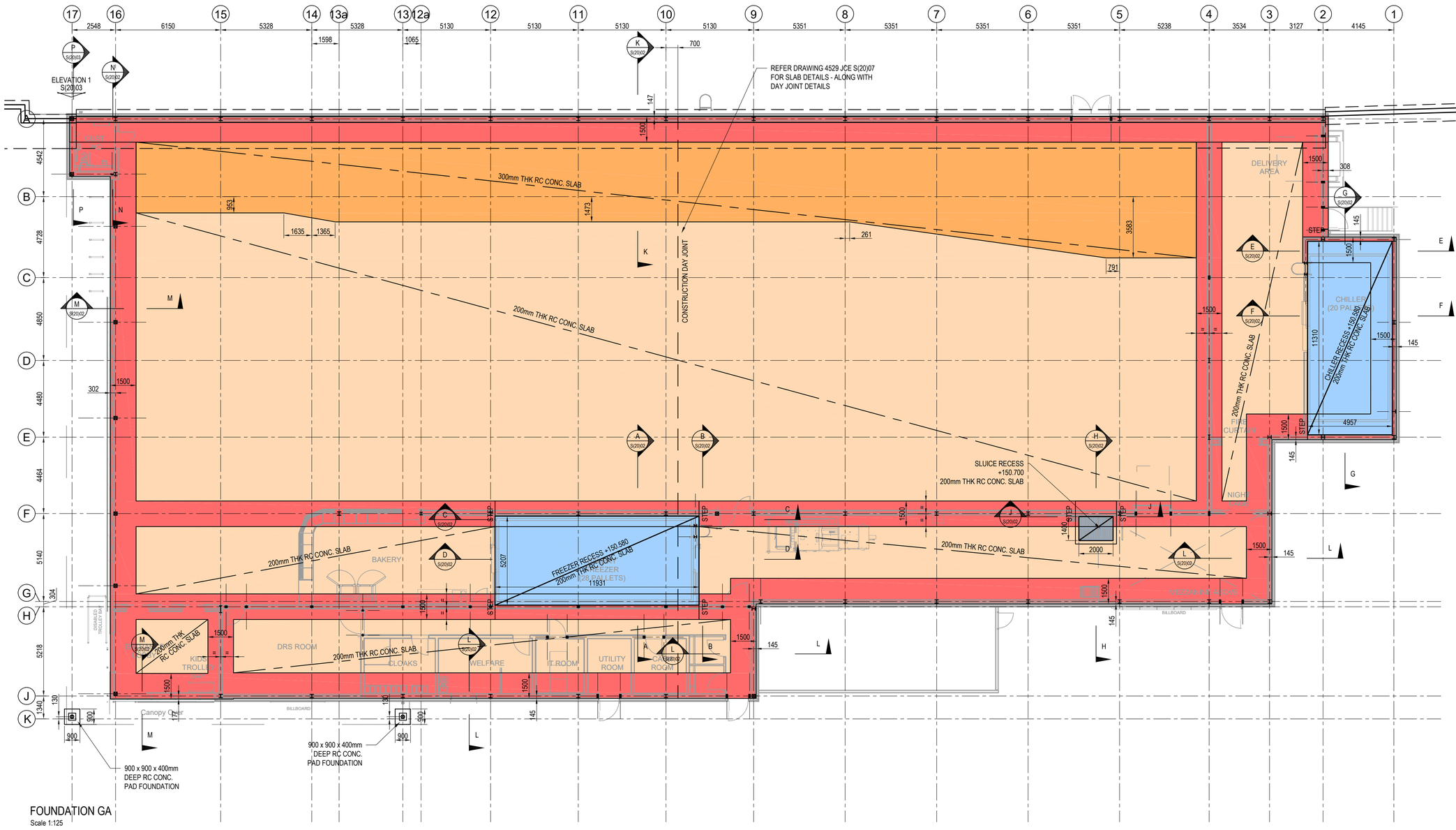
CONCRETE ELEMENT	DESIGN CHEMICAL CLASS	SPEC. CLAUSE No.
SLAB	DC-1	130 O
RETAINING WALLS	DC-1	130 O
FOUNDATIONS	DC-1	130 C

3. SURFACE FINISH TO CONCRETE TO BE IN ACCORDANCE WITH SECTION 600. ALL FACES TO BE "AS CAST" UNLESS SPECIFIED BELOW :-

CONCRETE ELEMENT	SURFACE FINISH			
	TOP	BOTTOM	SIDE	END
SLAB	FLOATED	---	SHUTTER	SHUTTER

4. ALL SERVICE ACCESSES TO BE RAISED TO NEW LEVEL.
5. ALL SURFACE MOUNTED KIT TO BE REMOVED, STORED AND REFITTED.
6. REFER JCE SPECIFICATION FOR CONCRETE CURING PROVISION. CARE TO BE TAKEN TO CURE TOPPING TO PREVENT EARLY SHRINKAGE CRACKS.
7. FORMED JOINTS AS PROPOSED ON PLAN TO BE FOLLOWED UNLESS PRIOR AGREEMENT SOUGHT FROM JCE LTD.

DRAWING KEY - PRINT IN COLOUR
- 400mm THK CONC. FOOTING
- 300mm THK CONC. SLAB
- 200mm THK CONC. SLAB
- RECESSED 200mm THK CONC. SLAB



FOUNDATION GA
Scale 1:125

E	DRAWING STATUS REVISED TO AS BUILT	RL	CM	CM	02.09.26
D	FREEZER RECESS EXTENT AMENDED IN LINE WITH SITE CHANGES.	RL	CM	CM	25.03.26
C	SLAB DETAILS MIGRATED ACROSS TO DRAWING 4529 JCE S(20)07	RL	CM	CM	19.03.26
B	SLAB CONSTRUCTION DAY JOINT SHOWN	RL	CM	CM	12.03.26
A	MINOR CHANGES	RL	CM	CM	02.03.26
REV	DESCRIPTION	BY	CHK	APP	DATE

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Client:

Project:
LIDL BIRSTALL
LEEDS

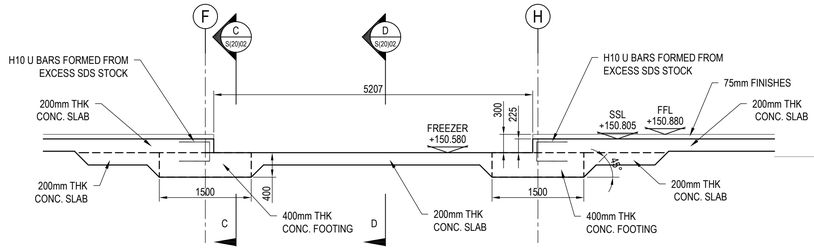
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PROPOSED NEW STORE
FOUNDATION GA

Scale	A1	Drawn	Date	Checked	Date	Approved	Date
1:125 & 25		RL	JAN 26	EJ	JAN 26	CM	JAN 26

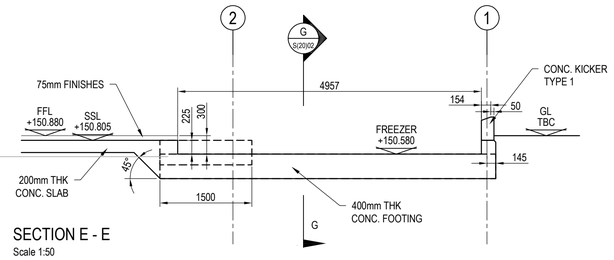
Drawing No.
4529 JCE S (20) 01

Revision
E

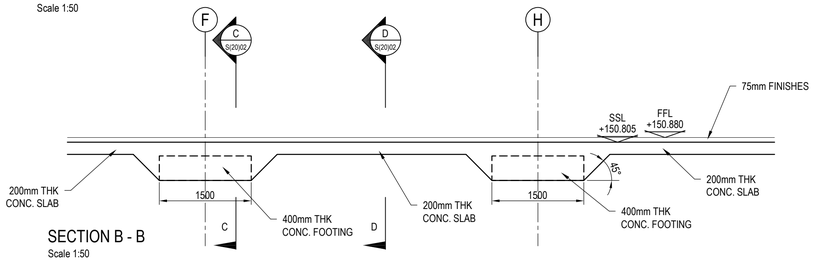
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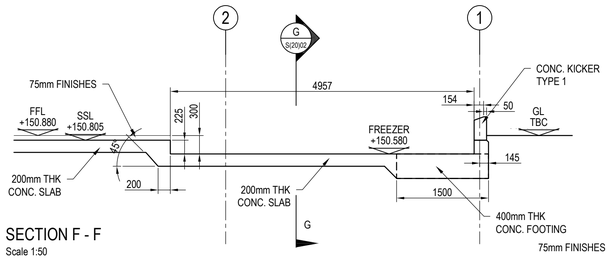
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Scale 1:50



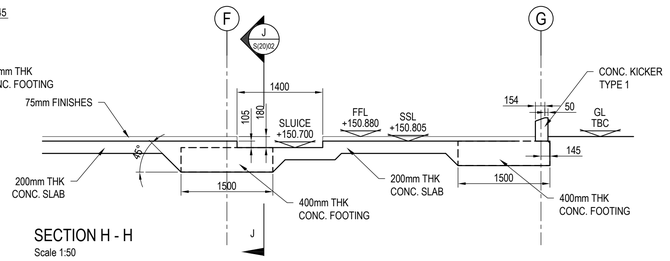
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Scale 1:50



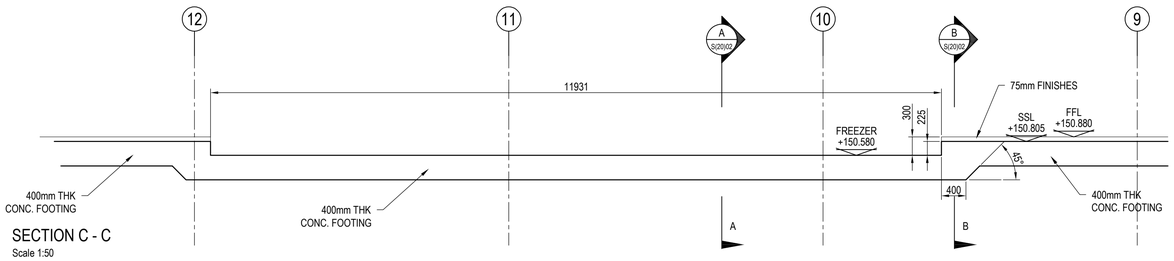
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Scale 1:50



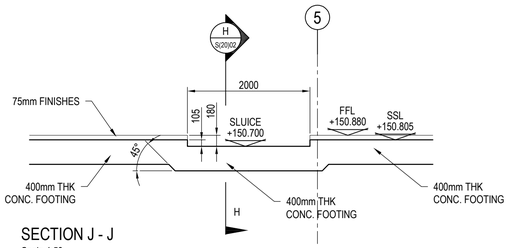
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Scale 1:50



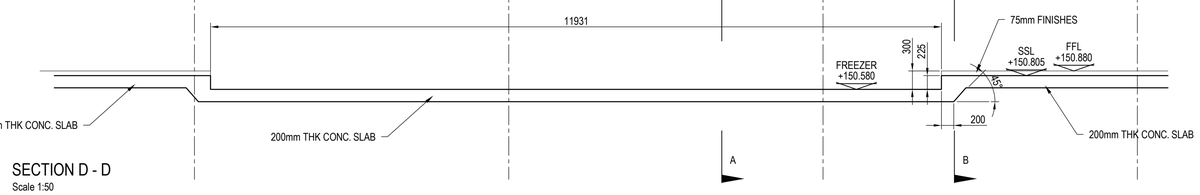
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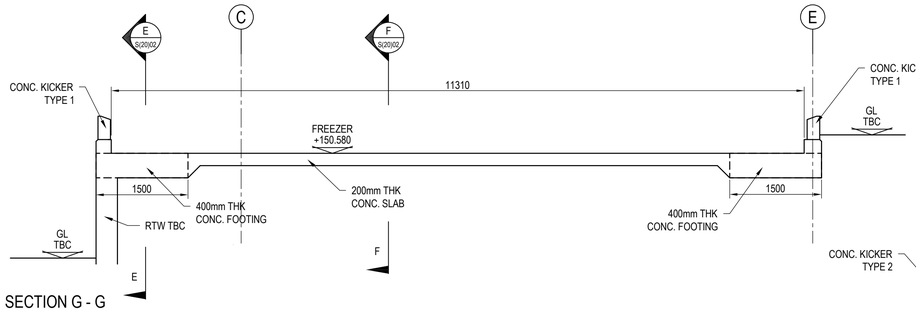
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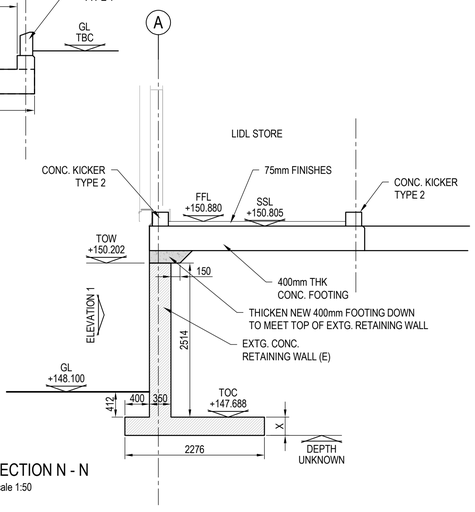
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Scale 1:50



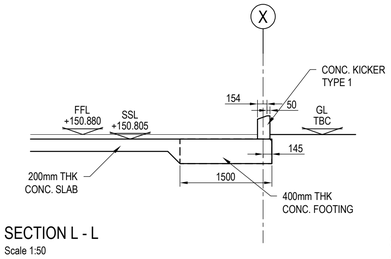
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Scale 1:50



SECTION G - G
Scale 1:50

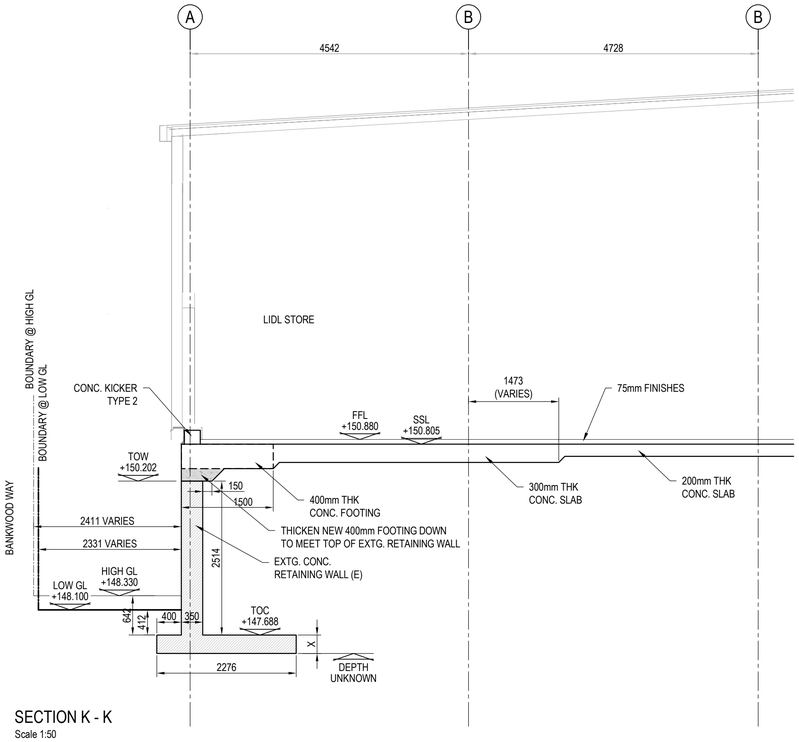


SECTION N - N
Scale 1:50



SECTION M - M
Scale 1:50

SECTION L - L
Scale 1:50



SECTION K - K
Scale 1:50

0m 0.5m 1m 1.5m 2m 3m 4m 5m

SCALE 1:50 - ENSURE PDF'S ARE PRINTED AT 1:1

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AS BUILT STATUS

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CONCRETE NOTES

1. ALL CONCRETE WORK IS TO BE IN ACCORDANCE WITH JCE-LTD NBS-SECTION E
2. RELEVANT CONCRETE MIX DESIGN :-

CONCRETE ELEMENT	DESIGN CHEMICAL CLASS	SPEC. CLAUSE No.
SLAB	DC-1	130 O
RETAINING WALLS	DC-1	130 O
FOUNDATIONS	DC-1	130 C

3. SURFACE FINISH TO CONCRETE TO BE IN ACCORDANCE WITH SECTION 600. ALL FACES TO BE "AS CAST" UNLESS SPECIFIED BELOW :-

CONCRETE ELEMENT	SURFACE FINISH			
	TOP	BOTTOM	SIDE	END
SLAB	FLOATED	---	SHUTTER	SHUTTER

4. ALL SERVICE ACCESSES TO BE RAISED TO NEW LEVEL.
5. ALL SURFACE MOUNTED KIT TO BE REMOVED, STORED AND REFITTED.
6. REFER JCE SPECIFICATION FOR CONCRETE CURING PROVISION. CARE TO BE TAKEN TO CURE TOPPING TO PREVENT EARLY SHRINKAGE CRACKS.
7. FORMED JOINTS AS PROPOSED ON PLAN TO BE FOLLOWED UNLESS PRIOR AGREEMENT SOUGHT FROM JCE LTD.

REV	DESCRIPTION	BY	CHK	APP	DATE
C	DRAWING STATUS REVISED TO AS BUILT	RL	CM	CM	02.09.26
B	FREEZER RECESS SECTION A - A AMENDED IN LINE WITH SITE CHANGES.	RL	CM	CM	25.03.26
A	MINOR CHANGES	RL	CM	CM	02.03.26

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Client: LIDL

Project:
LIDL BIRSTALL
LEEDS

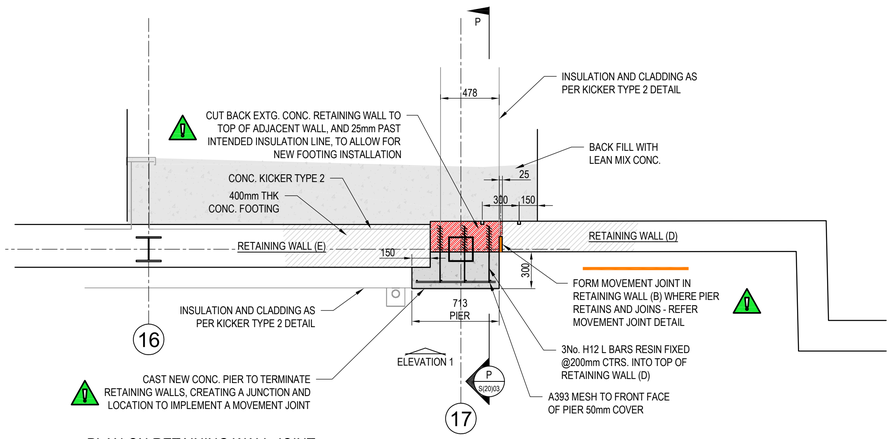
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FOUNDATION SECTIONS 01

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Drawing No. 4529 JCE S (20) 02
Revision C

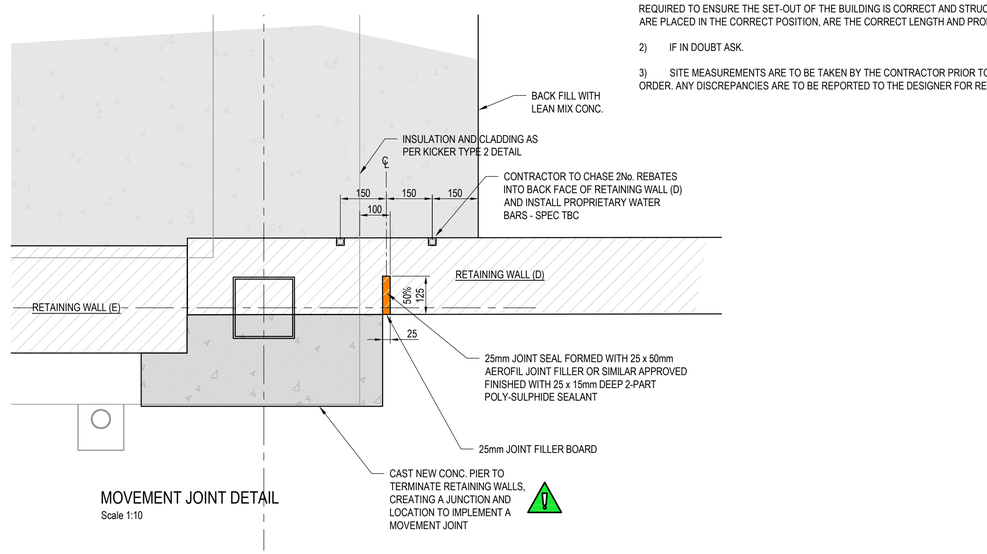
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E:\JME CJAMESON\JCE\DRAWINGS\NEW\PROJECTS\BIRSTALL\DRAWINGS\BIRSTALL 4529 JCE S(20) 02 SECTIONS.DWG | PLOTTED BY: RICHARD.WATSON | PLOTTED DATE: 25/March/2026 09:53:33



PLAN ON RETAINING WALL JOINT

Scale 1:25



MOVEMENT JOINT DETAIL

Scale 1:10

0m 0.5m 1m 1.5m 2m 3m 4m 5m

SCALE 1:50 - ENSURE PDF'S ARE PRINTED AT 1:1

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DRAWING STATUS

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CONCRETE NOTES

1. ALL CONCRETE WORK IS TO BE IN ACCORDANCE WITH JCE-LTD NBS-SECTION E

2. RELEVANT CONCRETE MIX DESIGN :-

CONCRETE ELEMENT	DESIGN CHEMICAL CLASS	SPEC. CLAUSE No.
SLAB	DC-1	130 D
RETAINING WALLS	DC-1	130 O
FOUNDATIONS	DC-1	130 C

3. SURFACE FINISH TO CONCRETE TO BE IN ACCORDANCE WITH SECTION 600. ALL FACES TO BE "AS CAST" UNLESS SPECIFIED BELOW :-

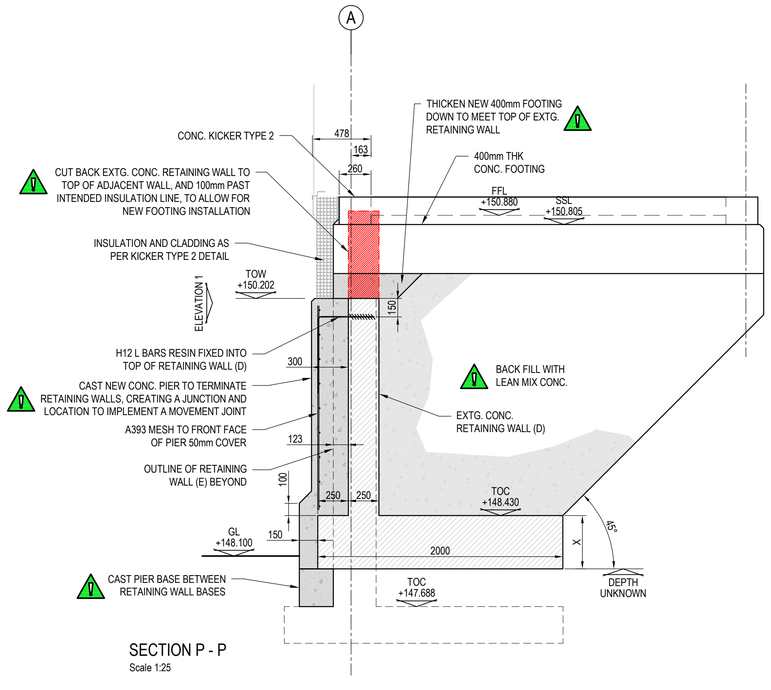
CONCRETE ELEMENT	SURFACE FINISH			
	TOP	BOTTOM	SIDE	END
-	-	-	-	-

4. ALL SERVICE ACCESSES TO BE RAISED TO NEW LEVEL.

5. ALL SURFACE MOUNTED KIT TO BE REMOVED, STORED AND REFITTED.

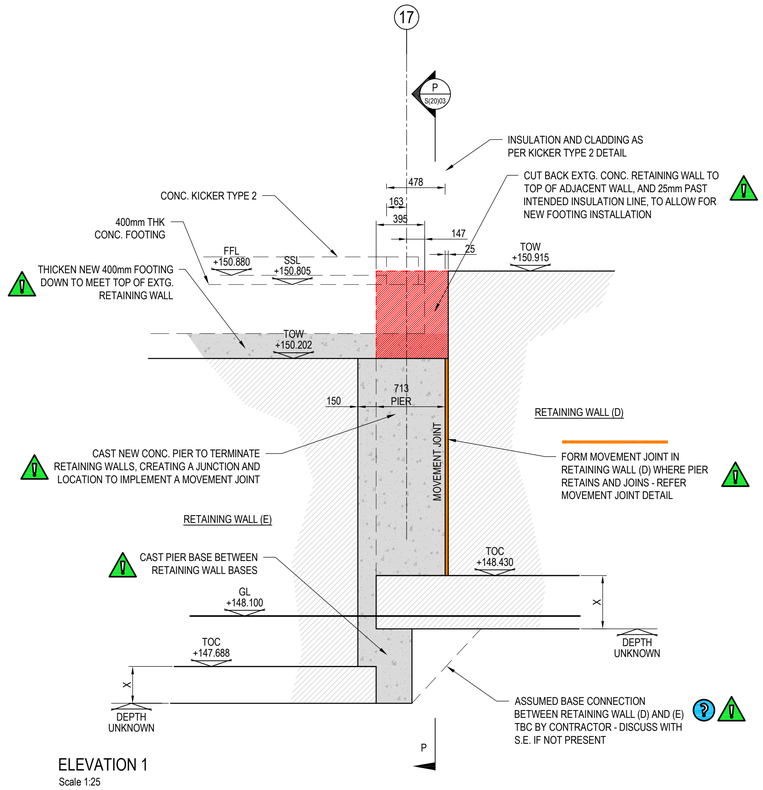
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7. FORMED JOINTS AS PROPOSED ON PLAN TO BE FOLLOWED UNLESS PRIOR AGREEMENT SOUGHT FROM JCE LTD.



SECTION P - P

Scale 1:25



ELEVATION 1

Scale 1:25

REV	DESCRIPTION	BY	CHK	APP	DATE
B	DRAWING STATUS REVISED TO AS BUILT	RL	CM	CM	02.09.26
A	PIER WIDTH REDUCED. DRAWING STATUS REVISED.	RL	CM	CM	04.03.26

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0113 8231 915 info@jamesonconsulting.co.uk

Client:

LIDL

Project:

LIDL BIRSTALL
LEEDS

Drawing Title:

PROPOSED NEW STORE
FOUNDATION SECTIONS 02

Scale	Drawn	Date	Checked	Date	Approved	Date
A1 1:50 & 25	RL	FEB 26	EJ	FEB 26	CM	FEB 26

Drawing No. 4529 JCE S (20) 03

Revision B

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