



SHADBOLT
ENVIRONMENTAL



EFW Facility

Howmsgill Industrial Park, Consett

Ground Investigation Interpretive Report

Dysart Developments Ltd

Issue V1

August 2020



SHADBOLT
GROUP

EFW Facility
Howns Gill Industrial Park, Consett
Ground Investigation Interpretive Report
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1.0 INTRODUCTION

Shadbolt Group (SG) were commissioned by the Client, Dysart Developments Ltd, to undertake a site investigation in relation to a proposed Energy from Waste Facility to be located within the Hownsgill Industrial Park, Consett, Co. Durham.

1.1 Aims and Objectives

The purpose of the investigation was to determine the existing ground conditions and identify possible contamination and potential pollutant linkages related to past uses of the site which may provide constraints to the proposed development and future end users.

To achieve the above stated aims and objectives the following works have been undertaken:

- Intrusive investigations comprising trial excavations and rotary openhole boreholes.
- In-situ testing.
- Chemical laboratory testing.
- Geotechnical Laboratory testing.
- Gas and water monitoring.
- Contamination risk assessment.

1.2 Proposed Development

At this stage it is understood that the final development will comprise an industrial premises comprising an energy production facility.

1.3 Scope of Works

The site investigation was undertaken by Shadbolt Group in July 2020.

The works undertaken by Shadbolt Group to date comprise:

- Intrusive investigations including trial pit excavations and rotary open-hole boreholes.
- In-situ testing.
- Chemical laboratory testing.
- Geotechnical Laboratory testing.
- Ground gas and groundwater monitoring.
- Contamination risk assessment.

1.4 Limitations

The recommendations and opinions expressed in this report are based on the strata observed in the borings and excavations; together with the results of the site and laboratory tests as detailed within the report. The Shadbolt Group take no responsibility for ground conditions which occur between the exploratory hole positions.

Every effort has been made to interpret the conditions between investigation locations; however, such information is indicative. A detailed review of the extent of limitations of this report is included in the Report Conditions included in Appendix A and the standard terms and conditions of the agreement.

2.0 SITE INFORMATION

The site is located in Consett, County Durham, approximately 1.0km south of the town centre.

The site is accessed off Hownsgill Industrial Park, the main access for which runs SW-NE to the east of the site. Further industrial and commercial premises are present on the Hownsgill Industrial Park site including a bus depot and builder merchant with surrounding land mainly comprising agricultural land to the south and west and residential and retail to the north and east.

The approximate National Grid Reference (NGR) for the centre of the site is NZ 10333 549675.

A general site location plan of the site is presented as Figure 1 and an aerial photograph as Figure 2.

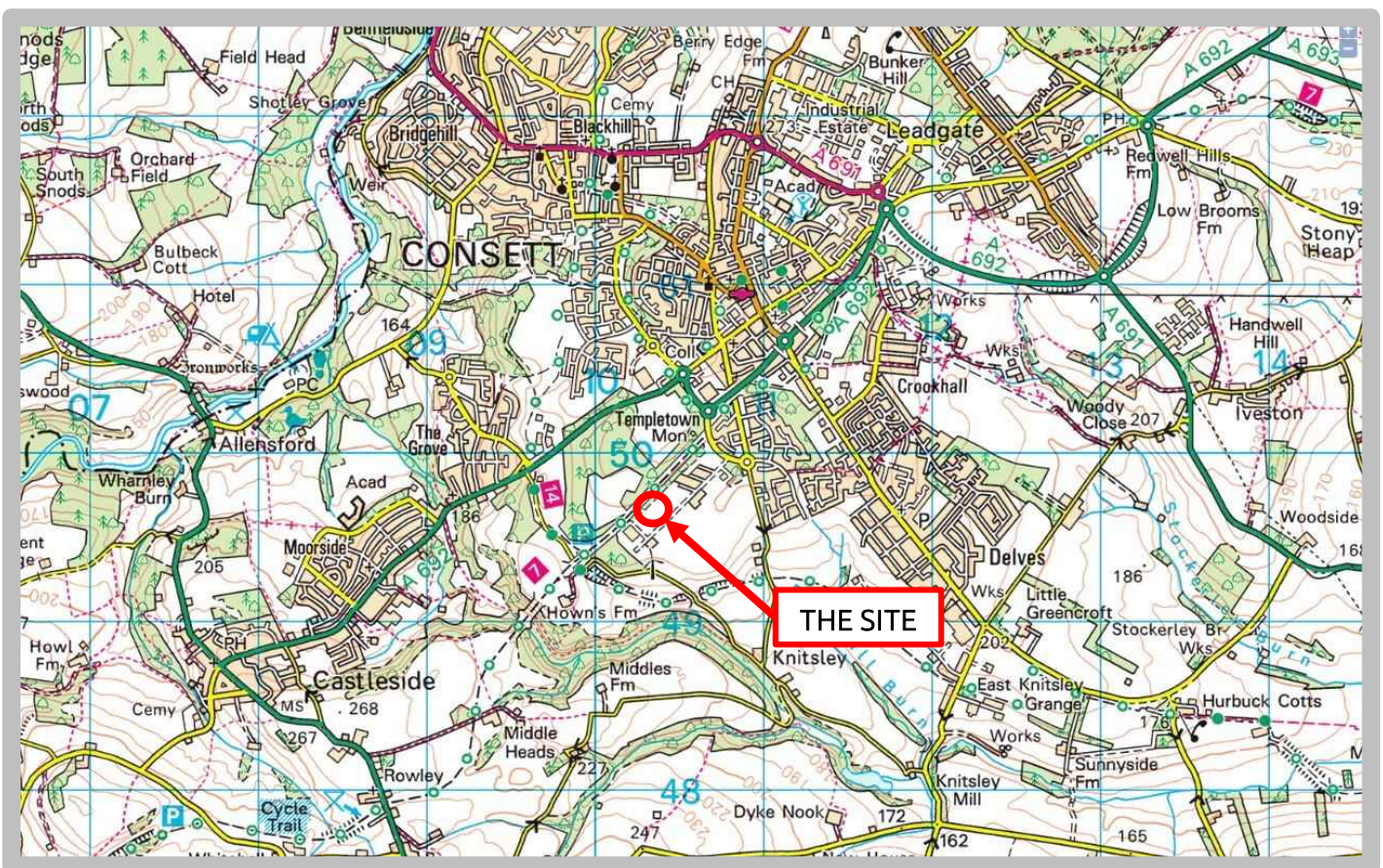


Figure 1 – General Site Location Plan

2.2 Site Description

The site comprises a generally square plot of land which is currently part of a larger area of open grassed land on the west side of Hownsgill Industrial Park. A steep grassed embankment rises to the west of the site.

The topography of the site is relatively flat with a shallow fall to the south/east.

No other plots currently border the site – the closest being Greencore which is sited some distance to the south west.

Vehicular access was available to the site from the main Hownsgill Industrial Park thoroughfare.



Figure 2 – Aerial Photograph (Approximate Plot Boundary).

3.0 HISTORICAL LAND USE

SG have not had sight of a Phase 1 desktop study for the site however SG have reviewed the history of Howngill Industrial Park sites for several neighbouring sites and have a long history with consulting on the development of the former steelworks site.

The site is located on the southern edge of the former Consett Steel works and is likely to have been impacted by reclamation works undertaken in the 1980s. The steels works plate mill constructed in the late 1950's was located on the site before demolition prior to reclamation works.

Anecdotal information relating to the area provided by the client suggest that the area was subjected to remedial / ground improvement works around 2000, however the details the works undertaken are not available.

4.0 PREVIOUS INVESTIGATIONS

SG have not had sight of any previous ground investigations undertaken at the site the site.

SG have previously obtained BGS Borehole records which indicate ground workings for the historic Howngill Plate Mill to have been undertaken to a level of 800 feet (243.8m) highlighted on the supplied record NZ14NW-95. Records indicate that to achieve this up to 30 feet (9.1m) of superficial deposits and bedrock were removed at the north end of the Plate Mill site and levels raised by 4-6m at the south end of the Plate Mill site. The nearest boreholes (records NZ14NW-91, 98, 99) located near the centre of the Plate Mill site indicate the site to have been close to the 800ft formation level of the Plate Mill site with relatively small excavations/placements required (in the order of +/- 1-2m).

Contemporary site levels remained similar at approximately 245m a.s.l. (803 ft).

BGS Historic Borehole Logs are included in **Appendix G** of this report.

5.0 SITE INVESTIGATION

The physical ground investigation work was carried out by The Shadbolt Group in July 2020.

5.1 Scope of Investigation

The SG ground investigation undertaken comprised the boring of 4 No. rotary openhole boreholes to a maximum depth of 35.0m bgl. 3 No. ground gas/groundwater monitoring installations were installed as part of the SG site works to a maximum depth of 4.00m bgl.

SG have considerable experience consulting on the former steelworks site and previous experience has shown that percussive techniques for ground investigation are not suitable for the steelworks ground conditions and boreholes/window sample holes using percussive methods tend to refuse within the Made Ground and therefore rotary techniques are used to penetrate the dense Made Ground and investigate the underlying soils / rock.

In addition to the rotary boreholes 12 No. mechanically excavated trial pits were excavated at the site to a maximum depth of 4.00m bgl.

Logs from these exploratory holes are presented, along with an Exploratory Hole Location Plan within Appendix B of this report following the main body of text.

The soils encountered during this investigation have been logged in accordance with BS5930:2015 “Code of Practice for Ground Investigation”. Representative samples were taken at regular intervals from the exploratory holes during the investigation to assist in the identification of the soils, and to allow selected geotechnical and chemical testing to be programmed.

Boreholes were placed in the position of the proposed buildings to investigate the shallow and deep soils / rocks and the trial pits were positioned beneath proposed structures and external areas to gain an understanding of the shallow ground conditions.

5.2 In-Situ Testing

Due to the ground conditions encountered no insitu testing was undertaken during the ground investigation works.

5.3 Geotechnical Laboratory Testing

Selected samples were submitted to a nominated geotechnical testing laboratory. Results of the geotechnical testing are presented within Appendix E.

5.4 Chemical Laboratory Testing

A targeted programme of chemical laboratory analysis was scheduled by Shadbolt Group and undertaken by our nominated environmental testing laboratory to determine the concentrations of potential contaminants which may be present within the soils encountered at the site. 6 No. soil samples were tested for a range of determinants including fuels, heavy and phytotoxic metals and metalloids and inorganic and organic contaminants as part of the SG investigation. 4 No. of these were also tested for the presence of asbestos.

The Shadbolt Environmental Tier 1 Screening Values, together with the results of the contamination testing are presented in Appendix C and Appendix D respectively.

5.5 Groundwater and Gas Monitoring

3 No. monitoring wells were installed by SG as part of the commissioned works. 3 No. monitoring visits have been undertaken to date – gas and groundwater monitoring is ongoing and a further 3 No. visits are anticipated. Results are reported within Appendix F.

5.6 Limitations

It should be noted that although every effort has been made to ensure the accuracy of the data obtained from the investigation, the possibility exists of variations in ground and groundwater conditions between and around the borehole locations; additionally, groundwater levels and ground gas concentrations will vary seasonally and with changes in weather conditions.

6.0 GROUND CONDITIONS

For a full description of the strata encountered and any identified groundwater strikes, reference should be made to the individual exploratory hole logs presented included in **Appendix B**.

The ground conditions encountered at the site are summarised in the following sections.

6.1 Made Ground

Made Ground was widely encountered across the site to a maximum depth of 6.70m bgl – the base of Made Ground was not established at all locations (within trial pits).

Below Topsoil stiff reworked sandy gravelly clays were noted at depths ranging from 0.15-0.80m bgl.

Gravel strata were predominant below placed cohesive material with widespread predominantly sandstone and mudstone gravel encountered from 0.50-2.80m bgl. Gravels were noted to be generally medium to coarse (including cobbles) subrounded to rounded with more limited angular concrete and brick fragments causing instability within excavations. Limited bands of dolomite gravel up to 100mm thick were noted within the upper reaches of/above this stratum.

Dark grey ashy gravel was encountered at greater depth in 6 No. trial excavations (1.20-4.00m bgl) which included more angular mudstone, brick and coal gravel as well as cinder and clinker.

More limited strata of angular coarse gravel, cobbles and boulders of sandstone and mudstone were noted at depth within TP03 and TP05 – this is considered to be reworked natural bedrock and was encountered at depths ranging from 2.00-3.40m bgl.

TP01 encountered demolition including broken concrete cobbles and boulders intermixed with clay, wood and metallic fragments from 2.20-4.00m bgl – the base of this strata could not be established.

Concrete – considered to be relict slab/foundation was encountered in 5 No. exploratory holes at depths ranging from 2.5 to 2.8m bgl. Generally concrete was noted to be reinforced but with a broken surface. The exception being TP07 which encountered a smooth concrete slab.

6.2 Topsoil

Topsoil was identified across the site and generally comprised brown sandy silty Topsoil ranging in thickness from 0.10 – 0.25m.

6.3 Superficial Deposits

Natural superficial deposits were not encountered. It is considered that these may have been excavated as part of historic groundworks for the Plate Mill building.

6.4 Solid Deposits

Bedrock was encountered immediately beneath Made Ground at depths ranging from 1.80-6.70m bgl and was noted to be highly weathered sandstone/mudstone including mudstone shale.

6.5 Groundwater

Significant groundwater was not encountered during the investigation. Wells were found to be dry upon return

monitoring visits.

6.6 Ground Obstructions

Ground obstructions have been encountered during the intrusive investigations in the form of buried concrete surfacing/foundations and cobbles and boulders of concrete and rock within Made Ground. Concrete was frequently noted to be reinforced. Similar obstructions may be reasonably expected during onward development works.

6.7 Observed Contamination

During the investigation, a slight hydrocarbon odour was noted at 1 No. location (TP11) – this may have been associated with fragments of wood within Made Ground. Ash type deposits were also noted at depth across the site. The presence of contaminants cannot be ruled out given the understanding of the sites industrial history.

6.8 In-Situ and Laboratory Geotechnical Analysis

The following in-situ and laboratory geotechnical testing has been undertaken at the site during the SG (July 2020) works;

Method	Strata	Parameter	Comments
Atterberg Limits	Made Ground Cohesive Strata 0.40 to 0.50m bgl	LL = 38 to 43% PI _(mod) = 20 to 23%	Cohesive Glacial Till is generally of Intermediate Plasticity.
Compaction (Dry Density - Moisture Content Relationship)	Made Ground Granular Strata 2.80m bgl	Moisture Content as received was 11% Optimum Moisture Content is 13%	Materials are typically a 2A (Wet Cohesive) material (SHW Series 600) and will be detrimentally affected by elevated moisture. (1 No. Slightly gravelly clayey Sand.)
CBR Testing (Lab Remoulded)	Made Ground Cohesive Strata 0.40 to 0.50m bgl	CBR Values 12.3- 18.0% Average: 15.4%	Design Value for CBR on materials recompacted by lab (2.5kg) is 5%
Particle Size Distribution	Made Ground Granular Strata 1.20 - 2.80m bgl	Cobbles: 4-9 % Gravel: 64-92% Sand: 2-15% Silt/Clay: 0-4%	Strata is confirmed as a 1A material (SHW600)

Table 6.8.1 – Summary of In-Situ and Laboratory Geotechnical Testing undertaken.

The visual appearance and grading of the materials reported indicates that the Made Ground at the site is predominantly a rounded to subrounded gravel with a very low to non-existent fines content.

7.0 GROUND CONTAMINATION ASSESSMENT

7.1 Legislation

Part IIA of the Environmental Protection Act 1990 provides for the control of specific threats to health or the environment from existing land contamination. In accordance with the Act, the statutory guidance document and The Contaminated Land (Scotland) Regulations 2005, the definition of contaminated land is intended to embody the concept of risk assessment. Therefore, land is only “contaminated land” where it appears to the regulatory authority, by reason of substances within, on, or under the land that:

Significant harm is being caused, or there is significant possibility of such harm being caused; or

Pollution of controlled waters is being, or is likely to be, caused.

The guidance defines “risk” as the combination of:

- Probability, or frequency, of occurrence of a defined hazard (for example, exposure of a property to a substance with the potential to cause harm); and
- Magnitude (including the seriousness) of the consequences.

For a risk of pollution or environmental harm to occur as a result of ground contamination, all the following elements must be present:

- Source, i.e. a substance that can cause pollution or harm;
- Receptor (or target), i.e. something which could be adversely affected by the contaminant; and
- Pathway, i.e. a route by which the contaminant can reach the receptor.

If one of these elements is missing (source, pathway or receptor) there can be no significant risk. If all are present then the magnitude of the risk is a function of the magnitude and mobility of the source, the sensitivity of the receptor and the nature of the migration pathway.

7.2 Assessment Methodology

To assess the environmental risk posed by potential contaminants within the underlying soils and groundwater Shadbolt Environmental undertook an initial screen of the laboratory results using Shadbolt Environmental Tier One Screening Values Version (TSVs). This screening was undertaken using TSVs derived for a Residential end use as this represents the end use that is likely to be developed in the area in the future (i.e. Infrastructure and residential housing).

Contaminant concentrations below the TSVs are considered not to warrant further risk assessment. Concentrations of potential contaminants above the TSVs require further consideration of the potential pollutant linkages.

It should be noted that exceedance of the TSVs does not necessarily require that the site be remediated.

7.3 Derivation of Soil TSVs

On-going research by the Environment Agency (EA) is being undertaken to produce toxicology reports (TOX series) for each of the contaminants identified within the CLR framework and then to produce published Soil Guideline Values (SGVs) using the Contaminated Land Exposure Assessment (CLEA) Model. Parallel to the work being undertaken by the EA is research being undertaken by Land Quality Management Limited and the Chartered Institute of Environmental Health (CIEH) to produce similar General Assessment Criteria (GAC) using the CLEA Model. To date, SGVs and GACs have been published for over 80 No. contaminants with SGVs / GACs derived for each contaminant for three different land use scenarios namely:

- Residential
- Allotment
- Commercial

In addition, Shadbolt Environmental have derived screening values for Parks, Playing Fields and Open Spaces based on current guidance.

Shadbolt Environmental TSV's are based on the SGVs and GACs which are scientifically based generic assessment criteria that can be used to simplify the assessment of human health risks arising from long-term and on-site exposure to chemical contamination in soil.

SGVs and GACs are a screening tool for the generic quantitative risk assessment of land contamination (Defra and Environment Agency, 2004). They are not (unless clearly stated otherwise) relevant for assessing risks to human health from short-term exposure to chemicals in soil including injury arising from direct bodily contact and do not take account of other types of risks to humans such as explosion or suffocation risks (associated with the build-up of gases such as methane and carbon dioxide) or aesthetic issues such as odour or colour. SGVs and GACs do not take account of other non-soil-based sources of contamination such as contamination in groundwater, surface waters or drinking waters. They cannot be used to evaluate risks to non-human receptors such as controlled waters, ecosystems, buildings and services, domestic pets or garden plants. Where, for example, phytotoxic effects are an important consideration in the current or future intended land use further investigation should be undertaken.

SGVs are guidelines on the level of long-term human exposure to individual chemicals in soil that, unless stated otherwise, are tolerable or pose a minimal risk to human health. They represent "trigger values" – indicators to a risk assessor that soil concentrations above this level may pose a possibility of *significant harm* to human health (Defra, 2008b). *Significance* is linked to:

- Margin of exceedance;
- Duration and frequency of exposure;
- Other site-specific factors that the enforcing authority may wish to consider.

SGVs do not of themselves represent the threshold at which there is a *significant possibility of significant harm* (SPOSH). Nor do they automatically represent an unacceptable intake in the context of Part 2A of the Environmental Protection Act 1990. However, they can be a useful starting point for such an assessment.

In order to assess the soil analyses results with regard to potential human health risks, Shadbolt Environmental TSVs have been derived in accordance with the UK framework set out in the most recent CLR (Contaminated Land Report) documents (EA/DEFRA, 2009) and LQM/CIEH Generic Assessment Criteria for Human Health Risk Assessment 2nd Edition 2015 and are "in line" with industry standards.

Assessment Framework

The CLEA model states that, 'the contamination is assumed to be at or within 1m of the surface'. It is considered that at depths greater than 1m, the probability of human exposure via the direct contact pathways are significantly reduced, leaving inhalation of volatile compounds as the dominant pathway with regard to human health risks. Typically, volatile compounds only significantly affect the indoor inhalation pathway.

Statistical Analysis

The CLEA guidelines also state that for each contaminant, the upper 95th percentile of the mean measured concentration (95%UCL) should be calculated and this value should be compared to the TSV.

The objective of maximum value tests is to decide whether the maximum concentration observed should be treated as an outlier or whether it can reasonably be considered to come from the same underlying population as the other samples.

It is known that contaminant concentrations often demonstrate lognormal or other distribution forms. Therefore, to calculate what are considered to be more representative 95%UCL values, the contaminant concentrations have first been assessed to determine if each contaminant distribution is closer to a normal or lognormal distribution.

If a dataset was found to be log normally distributed, the geometric mean was used to calculate the 95%UCL, for those that were found to be normally distributed; the arithmetic mean was used to calculate the 95%UCL. Constituent non-detects were assigned a value equal to the reported analytical laboratory limit of detection, considered reasonably conservative. Any identified outliers are excluded from the datasets used in calculation of the 95%UCL value.

7.4 Soil Contamination Assessment

In total 6 No. soil samples retrieved during site works were tested for a suite of common contaminants.

4 No. of these samples were also tested for the presence of asbestos (asbestos screen).

The laboratory testing reported no analysed chemical contaminants to be above the SE Tier One screening values for a COMMERCIAL end use.

No asbestos was detected in any tested sample.

7.4.1 Soils Statistical Assessment

No elevated concentrations of contaminants were reported – accordingly no statistical analysis was undertaken.

7.5 Leachate Contamination Assessment

No Leachate contamination assessment was undertaken as part of the site investigation works as no significantly elevated concentrations of contaminants within the shallow soils were reported.

7.6 Groundwater Contamination Assessment

No groundwater samples were tested as part of the investigation – no groundwater was encountered.

7.7 Waste Acceptance Criteria

Waste Acceptance Criteria (WAC) testing has not been undertaken as the majority of materials are expected to remain on site.

Any excess materials to be removed from site should be placed in a skip or wagon and removed by a suitably licensed waste carrier to a suitably licensed receiving facility. Testing in order to classify the material may be required prior to removal.

Based on the reported results, it is anticipated that much of clay materials on site would be classed as inert, for disposal purposes. Topsoil materials are unlikely to pass as inert classification due to the likely elevated Total Organic Carbon content.

7.8 Contamination Summary

The findings of the environmental testing indicate that the soils encountered at the site are unlikely to pose a significant risk to human health or the environment with respect to the proposed commercial development.

Made Ground is considered to pose a low risk the proposed commercial development.

Materials on site are considered suitable for reuse at the site.

8.0 GAS RISK ASSESSMENT

8.1 Gas Monitoring

Ground gas and water monitoring wells have been monitored in accordance with CIRIA C665 and BS8576:2013.

8.2 Gas Risk Assessment

CIRIA have developed a characterisation system for all buildings except for low-rise housing developments with a clear ventilated sub-floor void. Low-rise housing developments are generally covered by the NHBC's "Guidance on Evaluation of Development Proposals on Sites where Methane and Carbon Dioxide are Present".

The CIRIA system as detailed in CIRIA Report C665, is a risk-based system which compares gas emission rates to generic Characteristic Situations (CS) derived and expanded on from CIRIA 149. The NHBC guidance uses a concept of 'Traffic Lights' developed by Boyle and Witherington for the assessment of gas emission rates for a residential development.

Each methodology utilises 'Typical Maximum Concentrations' for initial screening purposes and the development of risk-based Gas Screening Values (GSVs) for consideration when the Typical Maximum Concentrations are exceeded. The GSVs are calculated by multiplying the borehole flow rate by the concentration in the air stream of the particular gas being considered.

The Traffic Light and Characteristic Situation systems have been designed for both methane and carbon dioxide, with the worst-case value adopted for assessment. The relevant assessment tables from each methodology referenced below are presented in Appendix F for clarity.

Ground Gas Monitoring Data

3 No. of the scheduled 6 No. monitoring visits have been undertaken; monitoring is ongoing. The gas monitoring results are presented in Appendix F.

The maximum Methane and Carbon Dioxide emissions, which are representative of the Typical Maximum Concentrations, were as follows:

Methane:	0.0% v/v
Carbon Dioxide:	0.2% v/v

The maximum recorded concentration of methane was 0.0% v/v, however 0.1% v/v will be used for calculations as this is the limit of detection of the instrument used.

The maximum recorded positive flow rate in the boreholes was 0.0 l/hr, however 0.1 l/hr will be used for calculations as this is the limit of detection for the instrument used.

The calculated GSVs for Methane and Carbon Dioxide are as follows:

Methane:	$(0.1/100) \times 0.1 = 0.0001$ l/hr
Carbon Dioxide:	$(0.2/100) \times 0.1 = 0.0002$ l/hr

When monitoring data to date is compared to the values in Table 8.5 in CIRIA Report C665, the site is classified as **Characteristic Situation 1**.

As the proposed development is low rise residential is it appropriate to assess the site in accordance with NHBC guidance.

When monitoring data to date is assessed in accordance with NHBC criteria the site is classified as **Green**.

Gas monitoring results are presented within Appendix F.

8.3 Gas Protection Measures

BS8485:2015, “Code of Practice for the Design of Protective Measures for Methane and Carbon Dioxide Ground Gases for New Buildings” sets out a methodology for determining an appropriate level of protection against ground gases in respect of the Characteristic Situation classification and the proposed building type.

The construction details of any proposed development are not confirmed at this stage; however, it is likely that a ground bearing floor slab will be preferred.

For any non-residential properties the methodology in BS8485 should be followed through Tables 3 to 7 inclusive which are presented in Appendix F for reference. In working through the tables, the development is categorised by Building Type; a Minimum Gas Protection Score is determined by Characteristic Situation of the site under C659 and Building Type; and Gas Protection Scores are calculated based on proposed/required structural barrier, ventilation details and gas resistant membrane.

For a Type D building (Industrial building – Lowest Risk) on a CS1 site the Minimum Gas Protection Score is 0. Therefore, specific ground gas protection should not be required when the development is assessed using BS8485:2015 with respect to Methane and Carbon Dioxide.

Similarly, no specific ground gas protection measures are required for a site classified as Green under the NHBC system.

8.4 Discussion

Using calculated GSVs for Methane and Carbon Dioxide, both of the assessment methods classify the site in the low risk classification, e.g. Green and CS1.

Ground gas protection measures are not likely to be required for residential developments at the site considering both the NHBC and BS8485:2015 methods.

This classification will be reviewed on completion of the scheduled monitoring.

9.0 CONCEPTUAL SITE MODEL

All available data has been collated and evaluated to establish an initial conceptual model of the site in its current condition and post development identifying sources, pathways and receptors and pollutant linkages. The site conceptual model has been developed in accordance with BS10175: 2017.

A Tier 1 risk assessment has been undertaken using guidelines for a Residential End Use with plant uptake as an initial screening level as this best represents the end use for this area of the site.

9.1 Contamination Sources

Chemical analysis was undertaken on 6 No. samples of materials encountered during the site investigation. The reported results of the analysis show no potential contaminants to be present in concentrations exceeding their respective screening values.

It is considered that materials at the site are considered suitable for reuse at the site.

Made Ground is considered to pose a low risk the proposed commercial development.

9.2 Potential Contaminant Pathways

The following potential contaminant pathways are possible considering the proposed infrastructure development and potential future Commercial land use and accounting for pathways which may be realised during the construction phase.

- Inhalation / ingestion of dust, gases and vapour;
- Ground gas / vapour migration;
- Dermal contact;
- Ingestion of soils and / or groundwater;
- Leaching of contaminants from made ground soils to groundwater;
- Groundwater flow;
- Soil gas migration through Made Ground, granular soils, fissures and mine entries
- Migration and leakage through service conduits;

9.3 Potential Contamination Receptors

The potential receptors listed below are proposed considering the current status of the site and surrounding area, and the proposed Residential end use.

Human Health

Current site users.
Future site occupiers.
Site development workers.
Maintenance workers.

Environmental

Future establishment of flora and fauna.
Buildings and underground services.
Controlled waters and aquifers.

9.4 Qualitative Risk Assessment

By considering the sources, pathways and receptors, an assessment of the environmental risks is made with reference to the significance and degree of the risk to the development for current and future site users.

The qualitative risk assessment has been undertaken in accordance with BS10175:2017 and CIRIA Document C552: Contaminated Land Risk assessment, A Guide to Good Practice.

The risk assessment has been carried out by assessing the severity of the potential consequence, taking into account both the potential severity of the hazard and the sensitivity of the target, based on the categories given in Table 9.4.1 below.

Category	Definition
Severe	Acute risks to human health, catastrophic damage to buildings / property, major pollution of controlled waters
Medium	Chronic risk to human health, pollution of sensitive controlled waters, significant effects on sensitive ecosystems or species, significant damage to buildings or structures
Mild	Pollution of non-sensitive waters, minor damage to buildings or structures
Minor	Requirement for protective equipment during site works to mitigate health effects, damage to non-sensitive ecosystems or species

Table 9.4.1 – Definition of Risk Severity

The likelihood of an event (probability) takes into account both the presence of the hazard and target and the integrity of the pathway and has been assessed based on the categories given in Table 9.4.2 below.

Category	Definition
High Likelihood	Pollutant linkage may be present, and risk is almost certain to occur in long term, or there is evidence of harm to the receptor
Likely	Pollutant linkage may be present, and it is probable that the risk will occur over the long term
Low Likelihood	Pollutant linkage may be present, and there is a possibility of the risk occurring, although there is no certainty that it will do so
Unlikely	Pollutant linkage may be present, but the circumstances under which harm would occur are improbable

Table 9.4.2 – Definition of Risk Probability

The potential severity of the risk and the probability of the risk occurring have been combined in accordance with the following matrix to give a level of risk for each potential hazard, given in Table 9.4.3 below.

		Potential Severity			
		Severe	Medium	Mild	Minor
Probability of Risk	High Likelihood	Very high	High	Moderate	Low/Moderate
	Likely	High	Moderate	Low/Moderate	Low
	Low likelihood	Moderate	Low/Moderate	Low	Very low
	Unlikely	Low/Moderate	Low	Very low	Very low

Table 9.4.3 – Risk Matrix of Potential Hazard

The risk assessment for the site is presented in Table 9.4.4. Further discussion of the more significant pollutant linkages is provided in a discussion below for each receptor in turn.

Hazard / Pollutant	Source	Pathway	Receptor	Potential severity	Probability of risk	Level of risk
Hazardous Gas	Preliminary data indicates minimal concentrations of ground gas.	Inhalation Explosion	Future site users	Medium	Unlikely	LOW
			Site development workers / Maintenance Workers	Medium	Unlikely	LOW
Potential Contaminants in soils	Contaminants may be present in the soils <u>surrounding</u> the subject area. No samples have reported SGV exceedances when assessed for a COMMERCIAL end use. No asbestos reported from any tested sample.	Dermal Contact, Inhalation, Ingestion	Future site users	Medium	Unlikely	LOW
			Site development workers / Maintenance Workers	Medium	Unlikely	LOW

Table 9.4.4 – Risk Assessment

9.4.1 Current and Future Site Users

Potential pathways considered significant to current and future site uses are dermal contact, ingestion of contaminated soil / groundwater and inhalation of fibres, gases, vapours or dusts.

Based on the chemical analysis data it is considered that the site presents a LOW risk to current site users from the soils located at the site.

Should the site be developed in the future the risk to site users would be LOW based on the chemical analysis data.

Made Ground deposits identified in exploratory holes would be considered suitable for reuse at the site.

9.4.2 Ground Excavation / Development Workers

Earthworks will likely be undertaken as part of the proposed development. It is considered that the risk to construction and/or maintenance workers during redevelopment works and post-development maintenance works is LOW owing to the low concentrations of reported contaminants. However, site development workers should remain vigilant for the evidence of contamination.

Should any materials, including suspected Asbestos Containing Materials, suspected of being contaminated be observed during site works these works should cease and specialist environmental advice sought.

9.4.3 Future Developments including Buried Structures and Services

The risk to buried structures and services (i.e. possible migration of contamination within service corridors) is considered to be low.

Groundwater has not been reported monitoring visits undertaken.

9.4.4 Controlled Waters

Given the concentrations of potential contaminants identified on site and the lack of groundwater it is considered that there is negligible risk to controlled waters within the vicinity of the site and the underlying aquifer due to the generally low contaminants concentrations identified.

Further assessment should be carried out should any suspected contamination be identified at depth during the construction works.

9.4.5 Flora

It is considered soils encountered at the site would propose a low risk to any planting at the site – this would likely be limited to grassed verges etc within the confines of a commercial development.

10.0 GROUND ENGINEERING CONSIDERATIONS

10.1 Proposed Development – RESIDENTIAL

The area covered by this report is currently expected to be developed for an ‘energy from waste’ production plant including a furnace, chimney, water tanks, boilers and associated infrastructure.

10.2 Ground Obstructions

Ground obstructions likely to affect the proposed development were identified during the works including reinforced concrete surfacing/relict foundations of unknown (but potentially substantial) thickness associated with the site’s historic use as a steel plate mill – the encountered concrete is likely to be founded directly onto the underlying bedrock.

Cobbles and boulders of sandstone and concrete were also encountered within Made Ground. Rockhead was identified as the site at a number of exploratory locations within the trial pits where concrete was absent and encountered at depth between 3.1mbgl and 6.7mbgl within the rotary boreholes.

10.3 Coal Mining Risk Assessment

The site is located within an area where the effects of potential coal mining should be assessed as stated in the Groundsure report and verified by The Coal Authority’s Gazetteer.

A Coal Authority Report for the site has been obtained has been reviewed. In brief the Coal Authority report states the following:

- *The report contains detailed of 7 No. records of underground workings at the site with workings recorded from 1922 to 1924. These are recorded at a depth of between 27m and 29m.*
- *The report states that it is probable unrecorded shallow mine workings are **not** present on site.*
- *No records of spine roadways at shallow depth are recorded on site.*
- *1 No. shaft and 3 No. adits are recorded around the site – none of these are within 20m of the site boundary.*
- *1 No. coal outcrop is recorded on site associated with the Busty Coal Seam.*
- *The property is in an area where a notice to withdraw support was given in 1946 but is not in an area where a notice has been given under section 41 of the Coal Industry Act 1994, cancelling the entitlement to withdraw support.*

The table below summarises the risk associated with coal mining legacy for the proposed development site, identified from the sources of information available.

Coal Mining Issue	Risk Factor?	Risk Assessment
Underground Coal Mining (recorded at shallow depths)	YES	<p>Coal Authority data and geological plans indicate that shallow mine workings have been undertaken within the site boundary.</p> <p>CA records indicate extracted thickness up to 0.63m at a depth of 27-29m bgl.</p> <p>SG site works have recorded a void of 0.20m thickness at a depth of 18.1m bgl (ROBH01). ROBH02 reported a loss of flush at a similar depth of 16.5m bgl. The</p>

		<p>results of SG intrusive investigations are in-keeping with results of historical investigations for the Plate Mill which encountered old workings/backfilled workings in this area at similar depths.</p> <p>The minimum thickness of rock cover above any encountered void/loss of flush is 12.2m. Considering the maximum recorded worked thickness of 0.63m a rock cover to seam thickness ratio of 19.3:1 is calculated.</p> <p>Risk to developments at the site from recorded shallow mine workings is considered to be LOW.</p>
Underground Coal Mining (probable unrecorded shallow workings)	NO	<p>The Coal Authority do not consider the site to be within an area where unrecorded shallow mine workings may be present.</p> <p>SG exploratory boreholes to a maximum depth of 35m bgl did not encounter any voids beyond those reported by the CA report.</p> <p>Risk to developments at the site from unrecorded shallow mine workings is considered to be LOW.</p>
Spine Roadways at Shallow Depth	NO	<p>The Coal Authority have no records of spine roadways at shallow depth.</p> <p>The risk to developments at the site from recorded roadways is LOW/NEGLIGIBLE.</p>
Mine entries	YES	<p>Coal Authority Mining Report confirms that 4 No. known mine entries (1 No. shaft and 3 No. adits) exist close to the site boundary. None of these mine entries are within 20m of the site boundary.</p> <p>CA recorded report the shaft was filled to an unknown specification in 1959 likely as part of the works for the Plate Mill.</p> <p>Adit entries are considered to have been likely associated with the shallow Busty Seam. BGS records obtained indicate that workings within this seam (which outcropped close to the northern boundary of the site) were removed when site levels were reduced to achieve the '800 ft' formation level of the historic Plate Mill. Historic BGS data is included with Appendix G of this report.</p>

		The risk to developments at the site from known mine entries is considered to be LOW.
Record of past mine gas emissions	NO	There is no reported history of past mine gas emissions in the area. The risk to developments at the site from mine gas emissions is considered to be VERY LOW.
Recorded coal mining subsidence	NO	There have been no damage claims at the site/at land bordering the site. The risk to developments at the site from coal mining subsidence is considered to be LOW.
Surface Mining (opencast workings)	NO	Coal Authority data and geological plans indicate that no opencast workings are known within the site boundary. Or at land bordering the site. The risk to developments at the site from known opencast workings at the site is considered to be LOW/NEGLIGIBLE.

On review, data from the BGS, Coal Authority and SG investigations indicates that there is a **LOW** risk to proposed developments at the site from recorded or unrecorded shallow mine workings and historical mining features.

10.4 Foundations and Earthworks

The ground conditions at the site generally comprise rounded to subrounded gravel with little or no fines material overlying Mudstone at relatively shallow depth. It is understood that the gravel was imported / placed at the site as part of historical ground improvement works; however, the detail of the works undertaken has not been forthcoming.

At present the exact loadings of proposed buildings are unknown however it is considered likely that those for the furnaces/chimneys/water tanks etc may be considerable and as such foundations bearing directly

upon rockhead may be required. This could be in the form of either mass poured concrete or piled foundations into the underlying weak Mudstone were an allowable bearing capacity of 250kPa should be readily achievable.

The alternative would be to found within the rounded to subrounded gravels.

The laboratory earthworks testing undertaken on the gravel located at the site has shown that the compaction of the gravels is not affected by moisture (the laboratory could only provide the maximum and minimum dry density as the lack of fines content prevented a typical maximum dry density versus moisture content curve being produced).

Due to the nature of the gravels located at the site (rounded to subrounded with no fines) it is unlikely that traditional earthworks undertaken on the gravels would have a significant effect the gravels i.e. excavation and compaction would not necessarily improve the geotechnical properties of the gravels that are currently instu.

Raft foundations maybe a suitable solution for the structures founded within the existing gravels subject to appropriate design and earthworks and the results of trial field earthworks and an embankment surcharge field trial.

External areas/roadways are likely to require construction using suitable subbase/concrete dependent upon anticipated traffic/plant loadings. It is considered that underlying granular Made Ground will already have reached a suitable level of compaction and additional earthworks (beyond proof rolling) would be unlikely exceed this.

Once development levels and loadings are known a general Earthworks/Remediation Strategy should be developed for the site.

10.5 Chemical Attack on Buried Structures

The water-soluble sulphate test results generally recorded concentrations between 14 mg/l and 34 mg/l. The soil pH was between 7.9 and 8.6 indicating neutral to slightly alkali conditions.

The results have been assessed in accordance with the guidance given in BRE Special Digest 1:2005. Based on natural soil with mobile groundwater the Design Sulphate Class for the site is DS-1, ACEC Class AC-1.

10.6 Drainage and Infrastructure

Considering the Made Ground encountered at the site shallow soakaways are unlikely to be feasible.

Drainage is likely to utilise existing formal drainage surrounding the site.

A design CBR value of 15% has been established for Cohesive Made Ground at the site. Further information would be gained by undertaking in-situ CBR testing to assess encountered granular Made Ground (Plate Load Tests) but are anticipated to be greater than 15%.

11.0 CONCLUSIONS AND RECOMMENDATIONS

Shadbolt Group (SG) were commissioned by the Client, Dysart Developments Ltd, to undertake a site investigation in relation to a proposed Energy from Waste Facility to be located within the Hownsgill Industrial Park, Consett, Co. Durham.

The SG ground investigation undertaken comprised the boring of 4 No. rotary openhole boreholes to a maximum depth of 35.0m bgl. 3 No. ground gas/groundwater monitoring installations were installed as part of the SG site works to a maximum depth of 4.00m bgl. In addition to the rotary boreholes 12 No. mechanically excavated trial pits were excavated at the site to a maximum depth of 4.00m bgl.

The ground conditions generally comprised Made Ground to a maximum depth of 6.70m bgl – the base of Made Ground was not established at all locations (within trial pits) overlying sandstone / mudstone strata.

Concrete considered to be relict slab/foundation was encountered in 5 No. exploratory holes at depths ranging from 2.5 to 2.8m bgl. Generally concrete was noted to be reinforced but with a broken surface.

Topsoil was identified across the site and generally comprised brown sandy silty Topsoil ranging in thickness from 0.10 – 0.25m.

The findings of the environmental testing indicate that the soils encountered at the site are unlikely to pose a significant risk to human health or the environment with respect to the proposed industrial development and materials are considered suitable for reuse at the site.

On review, data from the BGS, Coal Authority and SG investigations indicates that there is a **LOW** risk to proposed developments at the site from recorded or unrecorded shallow mine workings and historical mining features.

The site has been assessed in accordance with the guidance given in BRE Special Digest 1:2005. Assuming natural soil with mobile groundwater the Design Sulphate Class for the site is DS-1, ACEC Class AC-1.

Structural loads at the site maybe taken down through the existing Made Ground and into the underlying rock or, subject to appropriate earthworks and embankment surcharge / settlement trials be founded within the Made Ground.

Shallow soakaway drainage is considered unlikely to be suitable at the site due to the encountered ground conditions. Soakaways have not been permitted across the former steelworks site as a whole due to the potential for leachate contamination to enter into local watercourses.

Ground gas and groundwater monitoring are ongoing. Based on monitoring to date specific ground gas protection measures are unlikely to be required, however, this assessment will be reviewed on completion of the scheduled monitoring.

It is recommended that a detailed earthworks strategy is produced for the site in order to allow the development to continue on a more assured basis.

The Shadbolt Group

13.0 REFERENCES

- BRE Special Digest 1, 2005 (Third Edition). Concrete in aggressive ground. Construction Research Communications Ltd, Watford.
- BS 5930: 2015. Code of practice for site investigations. BSI, UK.
- BS 10175: 2011. Investigation of potentially contaminated sites – Code of Practice. BSI, UK.
- CIRIA C665: 2006. Assessing risks posed by hazardous ground gases to buildings. London UK.
- DD ENV, 1997. Eurocode 7: Geotechnical Design. Parts 1 to 3. BSI, UK.
- Environment Agency, 2008 Onwards, Science Reports SC050021 (SGVs)
- NRPB-W26, Radon Atlas of England and Wales. NRPB, August 2002.
- TOMLINSON, M.J., 2001 Foundation design and construction. Prentice Hall, London.
- CLR11, Model Procedures for the Management of Land Contamination, Environment Agency, 2004.
- Environmental Protection Act 1990: Part IIA
- Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance April 2012.

APPENDIX A
REPORT CONDITIONS

REPORT CONDITIONS

GEO-ENVIRONMENTAL GROUND INVESTIGATION

This report is produced for the benefit of Dysart Developments Ltd in accordance with the terms of the appointment.

This report has been prepared in accordance with the terms and conditions of the appointment and relates to the condition of the site at the time of ground investigations. No warranty is provided as to the possibility of future changes in the condition of the site.

Shadbolt Environmental takes no responsibility for conditions which occur between the individual exploratory holes. Whilst every effort has been made to interpret the conditions between investigation locations, such information is only indicative.

Whilst the contamination assessment detailed within this report reflects our view, because there are no exact UK definitions of these matters, being subject to risk analysis, Shadbolt Environmental are unable to give categoric assurances that they will be accepted by authorities or funds without question. This report is prepared and written for the purposed uses stated in the report and should not be used in a different context without reference to Shadbolt Environmental. In time, improved practices or amended legislation may necessitate a re-assessment.

The report is limited to the geotechnical and environmental aspects detailed within the report and is necessarily restricted and no liability is accepted for any other aspect especially concerning gradual or sudden pollution incidents.

APPENDIX B

Exploratory Hole Logs

Drawing No. 2758-003 Exploratory Hole Location Plan



Borehole Log

Borehole No.

ROBH4

Sheet 1 of 2

Project Name: W2E Hownsgill

Project No.
2762

Co-ords: 410369E - 549734N

Hole Type
RO

Location: Hownsgill Industrial Park, Consett

Level: 246.13

Scale
1:100

Client: Project Genesis

Dates: 21/07/2020

Logged By

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.20	245.93		TOPSOIL. (Drillers Description)	
								MADE GROUND. Brown Concrete and bricks. (Drillers Description)	1
									2
									3
									4
									5
									6
					6.70	239.43		Weak grey MUDSTONE. (Drillers Description)	7
									8
									9
									10
									11
									12
									13
									14
									15
									16
									17
									18
									19
									20

Continued on Next Sheet

Remarks

Borehole commenced with hand dug pit. Groundwater not encountered. Lost flush at 20.7-21.1 but returned 100%.





Borehole Log

Borehole No.

ROBH4

Sheet 2 of 2

Project Name: W2E Hownsgill

Project No.
2762

Co-ords: 410369E - 549734N

Hole Type
RO

Location: Hownsgill Industrial Park, Consett

Level: 246.13

Scale
1:100

Client: Project Genesis

Dates: 21/07/2020

Logged By

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
							Weak grey MUDSTONE. (Drillers Description)		
							<i>Flush lost at 20.70m, returned at 21.10m.</i>	21	
								22	
								23	
								24	
								25	
								26	
								27	
								28	
								29	
								30	
								31	
								32	
								33	
								34	
				35.00	211.13		End of Borehole at 35.00m	35	
								36	
								37	
								38	
								39	
								40	

Remarks

Borehole commenced with hand dug pit. Groundwater not encountered. Lost flush at 20.7-21.1 but returned 100%.





Borehole Log

Borehole No.

ROBH3

Sheet 1 of 2

Project Name: W2E Hownsgill

Project No.
2762

Co-ords: 410351E - 549719N

Hole Type
RO

Location: Hownsgill Industrial Park, Consett

Level: 246.16

Scale
1:100

Client: Project Genesis

Dates: 21/07/2020

Logged By
Driller

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.20	245.96		TOPSOIL (Drillers Description)	1
								MADE GROUND. Brown concrete (Drillers Description)	2
					4.30	241.86		Weathered SANDSTONE (Drillers Description)	4
									5
									6
					7.10	239.06		Weak grey MUDSTONE. (Drillers Description)	7
									8
									9
									10
									11
									12
									13
									14
									15
									16
									17
									18
									19
									20

Continued on Next Sheet

Remarks

Borehole commenced with hand dug pit. Groundwater not encountered.





Borehole Log

Borehole No.

ROBH3

Sheet 2 of 2

Project Name: W2E Hownsgill

Project No.
2762

Co-ords: 410351E - 549719N

Hole Type
RO

Location: Hownsgill Industrial Park, Consett

Level: 246.16

Scale
1:100

Client: Project Genesis

Dates: 21/07/2020

Logged By
Driller

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
							Weak grey MUDSTONE. (Drillers Description)		
								21	
								22	
								23	
								24	
								25	
								26	
								27	
								28	
								29	
								30	
								31	
								32	
								33	
								34	
				35.00	211.16		End of Borehole at 35.00m	35	
								36	
								37	
								38	
								39	
								40	

Remarks

Borehole commenced with hand dug pit. Groundwater not encountered.





Borehole Log

Borehole No.

ROBH2A

Sheet 1 of 2

Project Name: W2E Hownsgill	Project No. 2762	Co-ords: 410364E - 549689N	Hole Type RO
Location: Hownsgill Industrial Park, Consett		Level: 245.86	Scale 1:100
Client: Project Genesis		Dates: 20/07/2020	Logged By Driller

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.20	245.66		TOPSOIL (Drillers Description)	
								MADE GROUND Brown concrete, plastic and wood. (Drillers Description)	1
									2
									3
									4
					4.30	241.56		Ex Weathered SANDSTONE. (Drillers Description)	5
									6
					6.30	239.56		Weak grey MUDSTONE. (Drillers Description)	7
									8
									9
									10
									11
									12
									13
									14
					14.60	231.26		Weathered SANDSTONE. (Drillers Description)	15
									16
					16.50	229.36		Lost flush, no returns.	17
									18
									19
									20

Continued on Next Sheet

Remarks
Borehole commenced with hand dug pit. Groundwater not encountered.





Borehole Log

Borehole No.

ROBH2A

Sheet 2 of 2

Project Name: W2E Hownsgill	Project No. 2762	Co-ords: 410364E - 549689N	Hole Type RO
Location: Hownsgill Industrial Park, Consett		Level: 245.86	Scale 1:100
Client: Project Genesis		Dates: 20/07/2020	Logged By Driller

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
		Depth (m)	Type	Results						
					20.30	225.56		Lost flush, no returns.		
								Weathered Sandstone (Drillers Description)	21	
									22	
									23	
									24	
									25	
									26	
									27	
									28	
									29	
						27.60	218.26		MUDSTONE. (Drillers Description)	30
									31	
									32	
									33	
									34	
									35	
									36	
									37	
									38	
									39	
						35.00	210.86		End of Borehole at 35.00m	40

Remarks
Borehole commenced with hand dug pit. Groundwater not encountered.





Borehole Log

Borehole No.

ROBH1

Sheet 1 of 2

Project Name: W2E Hownsgill	Project No. 2762	Co-ords: 410327E - 549696N	Hole Type RO
Location: Hownsgill Industrial Park, Consett		Level: 246.08	Scale 1:100
Client: Project Genesis		Dates: 20/07/2020	Logged By IDD

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
		Depth (m)	Type	Results						
							TOPSOIL. (Drillers Description)		1	
					2.00	244.08		MADE GROUND. Crushed CONCRETE with brick fragments. (Drillers Description)		2
					3.10	242.98		Weathered SANDSTONE. (Drillers Description)		3
					4.30	241.78		COAL. (Drillers Description)		4
					5.10	240.98		Weathered MUDSTONE. (Drillers Description)		5
										6
										7
										8
										9
										10
										11
										12
										13
										14
										15
										16
										17
					18.10	227.98		VOID. (Drillers Description)		18
					18.30	227.78		Weathered MUDSTONE. (Drillers Description)		19
								Lost flush at 18.1m, drilled on until 30m, solid drilling below 18.3m.		19
										20

Continued on Next Sheet

Remarks
Borehole commenced with hand dug pit. Groundwater encountered at 18.1m.





Borehole Log

Borehole No.

ROBH1

Sheet 2 of 2

Project Name: W2E Hownsgill	Project No. 2762	Co-ords: 410327E - 549696N	Hole Type RO
Location: Hownsgill Industrial Park, Consett		Level: 246.08	Scale 1:100
Client: Project Genesis		Dates: 20/07/2020	Logged By IDD

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
							Weathered MUDSTONE. (Drillers Description)		
								21	
								22	
								23	
								24	
								25	
								26	
								27	
								28	
								29	
								30	
					30.00	216.08	End of Borehole at 30.00m		
								31	
								32	
								33	
								34	
								35	
								36	
								37	
								38	
								39	
								40	

Remarks
Borehole commenced with hand dug pit. Groundwater encountered at 18.1m.





Trial Pit Log

Project Name: W2E Hownsgill	Project No. 2762	Co-ords: 410316.00 - 549688.00 Level: 246.23	Date 15/07/2020
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Location: Hownsgill Industrial Park, Consett	Dimensions (m): <input type="text"/>	Scale 1:20
Client: Project Genesis	Depth 4.00	Logged

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.10	D		0.10	246.13		Brown dry desiccated sandy silty TOPSOIL.	
	0.35	D					MADE GROUND. Stiff reworked very sandy gravelly CLAY. Gravel includes fine to coarse angular to subrounded and includes sandstone coal and brick fragments.	
				0.55	245.68		MADE GROUND. Brown and grey sandy slightly clayey GRAVEL. Gravel includes fine to coarse subrounded to rounded sandstone and mudstone with concrete and brick fragments. Cobbles noted.	
	1.00	B						1
				1.20	245.03		MADE GROUND. Dark grey ashy sandy GRAVEL. Gravel includes fine to medium angular mudstone brick, red burnt shale, and coal with cinder/clinker noted.	
	1.60	D						2
				2.20	244.03		MADE GROUND. Brown and grey slightly clayey slightly sandy GRAVEL COBBLES and BOULDERS. Gravel includes fine to coarse angular concrete and brick. Demolition waste including wood and metallic fragments noted.	
	2.60	D					<i>From 3.00m Engineer noted poorly consolidated coarse fill with voids.</i>	3
				4.00	242.23		End of Pit at 4.00m	4

Remarks: Groundwater not encountered.

Stability:
Plant:





Trial Pit Log

Project Name: W2E Hownsgill	Project No. 2762	Co-ords: 410341.00 - 549663.00 Level: 245.87	Date: 15/07/2020
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Location: Hownsgill Industrial Park, Consett	Dimensions (m): 3.00	Scale: 1:20
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Client: Project Genesis	Depth: 4.00	Logged RP
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Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.10	D		0.25	245.62		Brown dry desiccated sandy silty TOPSOIL.	
	0.40	B		0.55	245.32		MADE GROUND. Stiff reworked very sandy gravelly CLAY. Gravel includes fine to coarse angular to subrounded and includes sandstone coal and brick fragments.	
	1.60	D		1.50	244.37		MADE GROUND. Brown and grey sandy slightly clayey GRAVEL. Gravel includes fine to coarse subrounded to rounded sandstone and mudstone with concrete and brick fragments. Cobbles noted.	1
	3.00	B		2.70	243.17		MADE GROUND. Dark grey ashy sandy GRAVEL. Gravel includes fine to medium angular mudstone brick and coal with cinder/clinker noted.	2
	3.50	D					From 3.00m strata damp.	3
				4.00	241.87			4

Remarks: Groundwater not encountered.

Stability: Collapse in rounded gravel.

Plant: 20 Tonne Tracked.



Continued on Next Sheet



Trial Pit Log

Project Name: W2E Hownsgill	Project No. 2762	Co-ords: 410341.00 - 549663.00 Level: 245.87	Date 15/07/2020
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Location: Hownsgill Industrial Park, Consett	Dimensions (m): 0.90 x 3.00	Scale 1:20
Client: Project Genesis	Depth 4.00	Logged RP

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
				4.00	241.87		Hard strata - no returns or visual due to collapsing gravel. Possible bedrock. End of Pit at 4.00m

Remarks: Groundwater not encountered.

Stability: Collapse in rounded gravel.

Plant: 20 Tonne Tracked.





Trial Pit Log

Project Name: W2E Hownsgill	Project No. 2762	Co-ords: 410379.00 - 549629.00 Level: 245.24	Date: 15/07/2020
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Location: Hownsgill Industrial Park, Consett	Dimensions (m): 3.00	Scale: 1:20
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Client: Project Genesis	Depth: 3.80	Logged RP
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Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.15	D		0.15	245.09		Brown dry desiccated sandy silty TOPSOIL.
	0.45	B		0.50	244.74		MADE GROUND. Stiff reworked very sandy gravelly CLAY. Gravel includes fine to coarse angular to subrounded and includes sandstone coal and brick fragments.
	1.50	D					MADE GROUND. Brown and grey sandy slightly clayey GRAVEL. Gravel includes fine to coarse subrounded to rounded sandstone and mudstone with concrete and brick fragments. Cobbles noted.
	2.10	D		2.00	243.24		MADE GROUND. Dark grey ashy sandy GRAVEL. Gravel includes fine to medium angular mudstone brick and coal with cinder/clinker noted.
				2.30	242.94		MADE GROUND. Brown and grey angular mudstone COBBLES and GRAVEL. Possible reworked rock.
				3.40	241.84		Brown highly weathered SANDSTONE. Recovered as fine to medium angular gravel.
				3.80	241.44		End of Pit at 3.80m

Remarks: Groundwater not encountered.

Stability: Some collapse in rounded gravel strata.
Plant: 20 Tonne Tracked





Trial Pit Log

Project Name: W2E Hownsgill	Project No. 2762	Co-ords: 410346.00 - 549692.00 Level: 245.99	Date: 15/07/2020
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Location: Hownsgill Industrial Park, Consett	Dimensions (m): 3.00	Scale: 1:20
Client: Project Genesis	Depth 3.00	Logged RP

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.10	D		0.20	245.79		Brown dry desiccated sandy silty TOPSOIL.
	0.50	D		0.60	245.39		MADE GROUND. Stiff reworked very sandy gravelly CLAY. Gravel includes fine to coarse angular to subrounded and includes sandstone coal and brick fragments.
	1.20	B					MADE GROUND. Brown and grey sandy slightly clayey GRAVEL. Gravel includes fine to coarse subrounded to rounded sandstone and mudstone with concrete and brick fragments. Cobbles noted.
	2.20	D					
				2.80	243.19		MADE GROUND. CONCRETE - rough broken surface with reinforcement bar noted.
				3.00	242.99		End of Pit at 3.00m

Remarks: Groundwater not encountered.

Stability: Collapse in gravel strata

Plant: 20 Tonne Tracked





Trial Pit Log

Project Name: W2E Hownsgill	Project No. 2762	Co-ords: 410384.00 - 549666.00 Level: 245.66	Date: 15/07/2020
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Location: Hownsgill Industrial Park, Consett	Dimensions (m): 3.00	Scale: 1:20
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Client: Project Genesis	Depth: 2.90	Logged RP
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Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.15	D					Brown dry desiccated sandy silty TOPSOIL.
	0.35	D		0.25	245.41		MADE GROUND. Stiff reworked very sandy gravelly CLAY. Gravel includes fine to coarse angular to subrounded and includes sandstone coal and brick fragments.
				0.60	245.06		MADE GROUND. Brown and grey sandy slightly clayey GRAVEL. Gravel includes fine to coarse subrounded to rounded sandstone and mudstone with concrete and brick fragments. Cobbles noted.
	1.20	B					
				2.00	243.66		MADE GROUND. Brown and grey angular mudstone COBBLES and GRAVEL. Possible reworked rock.
	2.30	D					
				2.90	242.76		Brown weathered SANDSTONE. Recovered as coarse angular gravel and cobbles.
				3.00	242.66		End of Pit at 2.90m

Remarks: Groundwater not encountered.

Stability: Collapse in rounded gravel.

Plant: 20 Tonne Tracked.





Trial Pit Log

Project Name: W2E Hownsgill	Project No. 2762	Co-ords: 410408.00 - 549649.00 Level: 245.22	Date: 15/07/2020
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Location: Hownsgill Industrial Park, Consett	Dimensions (m): 3.00	Scale: 1:20
Client: Project Genesis	Depth: 2.40	Logged RP

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.10	D		0.15	245.07		Brown dry desiccated sandy silty TOPSOIL.
	0.45	D		0.65	244.57		MADE GROUND. Stiff reworked very sandy gravelly CLAY. Gravel includes fine to coarse angular to subrounded and includes sandstone coal and brick fragments. <i>Thin bands of fine to medium angular dolomite gravel noted.</i>
	1.20	B		1.70	243.52		MADE GROUND. Brown and grey sandy slightly clayey GRAVEL. Gravel includes fine to coarse subrounded to rounded sandstone and mudstone with concrete and brick fragments. Cobbles noted.
	2.10	D		2.40 2.40	242.82 242.82		MADE GROUND. CONCRETE - rough broken surface with reinforcement bar noted. Possible boulders. <i>End of Pit at 2.40m</i>

Remarks: Groundwater not encountered.

Stability: Stable
Plant: 20 Tonne Tracked





Trial Pit Log

Project Name: W2E Hownsgill	Project No. 2762	Co-ords: 410363.00 - 549716.00 Level: 246.07	Date: 15/07/2020
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Location: Hownsgill Industrial Park, Consett	Dimensions (m): 3.00	Scale: 1:20
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Client: Project Genesis	Depth: 2.40	Logged RP
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Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.15	D		0.20	245.87		Brown dry dessicated sandy silty TOPSOIL.
	0.40	B		0.55	245.52		MADE GROUND. Stiff reworked very sandy gravelly CLAY. Gravel includes fine to coarse angular to subrounded and includes sandstone coal and brick fragments.
	1.30	D					MADE GROUND. Brown and grey sandy slightly clayey GRAVEL. Gravel includes fine to coarse subrounded to rounded sandstone and mudstone with concrete and brick fragments. Cobbles noted.
	2.35	D		2.30	243.77		MADE GROUND. Dark grey ashy sandy GRAVEL. Gravel includes fine to medium angular mudstone brick and coal with cinder/clinker noted.
				2.40	243.67		MADE GROUND. CONCRETE (flat smooth slab). End of Pit at 2.40m

Remarks: Groundwater not encountered.

Stability: Collapse in rounded gravel.

Plant: 20 Tonne Tracked





Trial Pit Log

Project Name: W2E Hownsgill	Project No. 2762	Co-ords: 410384.00 - 549708.00 Level: 245.95	Date: 15/07/2020
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Location: Hownsgill Industrial Park, Consett	Dimensions (m): 3.00	Scale: 1:20
Client: Project Genesis	Depth: 2.50	Logged RP

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.10	D		0.20	245.75		Brown dry dessicated sandy silty TOPSOIL.
	0.45	B		0.75	245.20		MADE GROUND. Stiff reworked very sandy gravelly CLAY. Gravel includes fine to coarse angular to subrounded and includes sandstone coal and brick fragments.
	1.20	D					MADE GROUND. Brown and grey sandy slightly clayey GRAVEL. Gravel includes fine to coarse subrounded to rounded sandstone and mudstone with concrete and brick fragments. Cobbles noted.
	2.40	D		2.50	243.45		MADE GROUND. CONCRETE - rough broken surface with reinforcement bar noted.
				2.50	243.45		End of Pit at 2.50m

Remarks: Groundwater not encountered.

Stability: Collapse in rounded gravel.

Plant: 20 Tonne Tracked





Trial Pit Log

Project Name: W2E Hownsgill	Project No. 2762	Co-ords: 410378.00 - 549743.00 Level: 246.16	Date: 15/07/2020
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Location: Hownsgill Industrial Park, Consett	Dimensions (m): 2.50	Scale: 1:20
Client: Project Genesis	Depth: 2.50	Logged RP

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.10	D		0.20	245.96		Brown dry dessicated sandy silty TOPSOIL.
	0.50	D		0.80	245.36		MADE GROUND. Stiff reworked very sandy gravelly CLAY. Gravel includes fine to coarse angular to subrounded and includes sandstone coal and brick fragments.
	1.50	B					MADE GROUND. Brown and grey sandy slightly clayey GRAVEL. Gravel includes fine to coarse subrounded to rounded sandstone and mudstone with concrete and brick fragments. Cobbles noted.
	2.40	D		2.50	243.66		MADE GROUND. CONCRETE - rough broken surface with reinforcement bar noted.
				2.50	243.66		End of Pit at 2.50m

Remarks: Groundwater not encountered.

Stability: Collapse in rounded gravel.

Plant: 20 Tonne Tracked.





Trial Pit Log

Project Name: W2E Hownsgill	Project No. 2762	Co-ords: 410412.00 - 549704.00 Level: 245.75	Date: 15/07/2020
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Location: Hownsgill Industrial Park, Consett	Dimensions (m): 3.00	Scale: 1:20
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Client: Project Genesis	Depth: 4.00	Logged RP
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Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.15	D		0.20	245.55		Brown dry dessicated sandy silty TOPSOIL.
	0.40	D		0.60	245.15		MADE GROUND. Stiff reworked very sandy gravelly CLAY. Gravel includes fine to coarse angular to subrounded and includes sandstone coal and brick fragments.
				0.70	245.05		MADE GROUND. Light brown fine to coarse DOLOMITE GRAVEL.
	1.30	B					MADE GROUND. Brown and grey sandy slightly clayey GRAVEL. Gravel includes fine to coarse subrounded to rounded sandstone and mudstone with concrete and brick fragments. Cobbles noted.
				1.70	244.05		MADE GROUND. Dark grey ashy sandy GRAVEL. Gravel includes fine to medium angular mudstone brick and coal with cinder/clinker noted.
	2.50	B					
	3.00	D					
				4.00	241.75		End of Pit at 4.00m

Remarks: Groundwater not encountered.

Stability: Collapse in rounded gravel
Plant: 20 Tonne Tracked





Trial Pit Log

Project Name: W2E Hownsgill	Project No. 2762	Co-ords: 410428.00 - 549679.00 Level: 245.39	Date: 15/07/2020
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Location: Hownsgill Industrial Park, Consett	Dimensions (m): 3.00	Scale: 1:20
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Client: Project Genesis	Depth: 3.50	Logged RP
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Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.10	D		0.20	245.19		Brown dry desiccated sandy silty TOPSOIL.
	0.40	B		0.60	244.79		MADE GROUND. Stiff reworked very sandy gravelly CLAY. Gravel includes fine to coarse angular to subrounded and includes sandstone coal and brick fragments.
	1.50	D		2.30	243.09		MADE GROUND. Brown and grey sandy slightly clayey GRAVEL. Gravel includes fine to coarse subrounded to rounded sandstone and mudstone with concrete and brick fragments. Cobbles and timber noted. <i>Possible slight hydrocarbon odour noted.</i>
	2.50	D		3.50	241.89		Grey thinly bedded distinctly weathered grey and brown SANDSTONE AND MUDSTONE SHALE.
							End of Pit at 3.50m

Remarks: Groundwater not encountered.

Stability: Collapse in rounded gravel.

Plant: 20 Tonne Tracked.





Trial Pit Log

Project Name: W2E Hownsgill	Project No. 2762	Co-ords: 410471.00 - 549691.00 Level: 245.07	Date: 15/07/2020
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Location: Hownsgill Industrial Park, Consett	Dimensions (m): 3.00	Scale: 1:20
Client: Project Genesis	Depth: 2.00	Logged RP

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.10	D		0.20	244.87		Brown dry desiccated sandy silty TOPSOIL.
	0.50	B		0.60	244.47		MADE GROUND. Stiff reworked very sandy gravelly CLAY. Gravel includes fine to coarse angular to subrounded and includes sandstone coal and brick fragments.
	1.20	B					MADE GROUND. Brown and grey sandy slightly clayey GRAVEL. Gravel includes fine to coarse subrounded to rounded sandstone and mudstone with concrete and brick fragments. Cobbles noted.
	1.90	D		1.80	243.27		Light brown thinly bedded SANDSTONE.
				2.00	243.07		End of Pit at 2.00m

Remarks: Groundwater not encountered.

Stability: Stable
Plant: 20 Tonne Tracked.



APPENDIX C
SHADBOLT ENVIRONMENTAL TIER 1 SCREENING VALUES

SOIL - THE SHADBOLT GROUP SUITABLE FOR USE LEVELS - HUMAN HEALTH

Status		Issue No.	Date					
Issue		Version 7	16/08/2017					
Determinand	Units	Residential with Home Grown Produce	Residential without Home Grown Produce	Allotments	Commercial	Public Open Space (resi)	Public Open Space (park)	Derivation Tool
pH		<5, >9	<5, >10	<5, >9	<5, >9	<5, >9	<5, >9	Neutral Conditions
Asbestos	%	<0.001%	<0.001%	<0.001%	<0.001%	<0.001%	<0.001%	Lab Screening Level
HEAVY METALS/METALLOIDS								
Arsenic	mg/kg	37	40	43	640	79	170	CLEA MODEL LQM/CIEH 2015
Beryllium	mg/kg	1.7	1.7	35	12	2.2	63	CLEA MODEL LQM/CIEH 2015
Boron	mg/kg	290	11000	45	240000	21000	46000	CLEA MODEL LQM/CIEH 2015
Cadmium	mg/kg	11	85	1.9	190	120	532	CLEA MODEL LQM/CIEH 2015
Chromium (III)	mg/kg	910	910	18000	8600	1500	33000	CLEA MODEL LQM/CIEH 2015
Chromium (VI)	mg/kg	6	6	1.8	33	7.7	220	CLEA MODEL LQM/CIEH 2015
Copper	mg/kg	2400	7100	520	68000	12000	44000	CLEA MODEL LQM/CIEH 2015
Lead	mg/kg	200	310	80	2330	630	1300	pC4SL
Mercury (Elemental)	mg/kg	1.2	1.2	21	58 ^{pp} (25.8)	16	30 ^{pp} (25.8)	CLEA MODEL LQM/CIEH 2015
Mercury (Inorganic)	mg/kg	40	56	19	1100	120	240	CLEA MODEL LQM/CIEH 2015
Mercury (Methyl)	mg/kg	11	15	6	320	40	68	CLEA MODEL LQM/CIEH 2015
Nickel	mg/kg	180	180	230	980	230	3400	CLEA MODEL LQM/CIEH 2015
Selenium	mg/kg	250	430	88	12000	1100	1800	CLEA MODEL LQM/CIEH 2015
Vanadium	mg/kg	410	1200	91	9000	2000	5000	CLEA MODEL LQM/CIEH 2015
Zinc	mg/kg	3700	40000	620	730000	81000	170000	CLEA MODEL LQM/CIEH 2015
GENERAL INORGANICS								
Cyanide	mg/kg	2	2	2	2	2	2	LOD
US EPA PRIORITY PAHs								
Acenaphthene	mg/kg	510	4700 (141) sol	85	97000 (141sol)	15000	30000	CLEA MODEL LQM/CIEH 2015 - 2.5% SOM
Acenaphthylene	mg/kg	420	4600 (212) sol	69	97000 (212sol)	15000	30000	CLEA MODEL LQM/CIEH 2015 - 2.5% SOM
Anthracene	mg/kg	5400	35000	950	540000	74000	150000	CLEA MODEL LQM/CIEH 2015 - 2.5% SOM
Benzo(a)Anthracene	mg/kg	11	14	6.5	170	29	56	CLEA MODEL LQM/CIEH 2015 - 2.5% SOM
Benzo(a)pyrene	mg/kg	2.70	3.2	2	35	5.7	12	CLEA MODEL LQM/CIEH 2015 - 2.5% SOM
Benzo(b)fluoranthene	mg/kg	3.3	4	2.1	44	7.2	15	CLEA MODEL LQM/CIEH 2015 - 2.5% SOM
Benzo(k)fluoranthene	mg/kg	93	110	75	1200	190	410	CLEA MODEL LQM/CIEH 2015 - 2.5% SOM
Benzo(g,h,i)perylene	mg/kg	340	360	470	4000	640	1500	CLEA MODEL LQM/CIEH 2015 - 2.5% SOM
Chrysene	mg/kg	22	31	9.4	350	57	110	CLEA MODEL LQM/CIEH 2015 - 2.5% SOM
Di-benzo(a,h)anthracene	mg/kg	0.28	0.32	0.27	3.6	0.57	1.3	CLEA MODEL LQM/CIEH 2015 - 2.5% SOM
Indeno(1,2,3-cd)pyrene	mg/kg	36	46	21	510	82	170	CLEA MODEL LQM/CIEH 2015 - 2.5% SOM
Fluoranthene	mg/kg	560	1600	130	23000	3100	6300	CLEA MODEL LQM/CIEH 2015 - 2.5% SOM
Fluorene	mg/kg	400	3800 (76.5)sol	67	68000	9900	20000	CLEA MODEL LQM/CIEH 2015 - 2.5% SOM
Naphthalene	mg/kg	5.6	5.6	10	460 (183)sol	4900	1900 (183)sol	CLEA MODEL LQM/CIEH 2015 - 2.5% SOM
Phenanthrene	mg/kg	220	1500	38	22000	3100	6200	CLEA MODEL LQM/CIEH 2015 - 2.5% SOM
Pyrene	mg/kg	1200	3800	270	54000	7400	15000	CLEA MODEL LQM/CIEH 2015 - 2.5% SOM
Coal Tar (Bap as surrogate marker)	mg/kg	0.98	1.2	0.67	15	2.2	4.7	CLEA MODEL LQM/CIEH 2015 - 2.5% SOM
Chlorinated Solvents								
1,2 Dichloroethane (DCA)	mg/kg	0.011	0.013	0.0083	0.97	29	24	CLEA MODEL LQM/CIEH 2015 - 2.5% SOM
1,1,1,2 Tetrachloroethane	mg/kg	2.8	3.5	1.9	250	1400	1800	CLEA MODEL LQM/CIEH 2015 - 2.5% SOM
1,1,2,2 Tetrachloroethane	mg/kg	3.4	8	0.89	550	1400	2100	CLEA MODEL LQM/CIEH 2015 - 2.5% SOM
PCE (Tetrachloroethene)	mg/kg	0.39	0.4	1.5	42	1400	1100 sol (951)	CLEA MODEL LQM/CIEH 2015 - 2.5% SOM
1,1,1 Trichloroethane (111 TCA)	mg/kg	18	18	110	1300	140000	76000 vap (2915)	CLEA MODEL LQM/CIEH 2015 - 2.5% SOM
Chloroethene (Vinyl Chloride VC)	mg/kg	0.00087	0.001	0.001	0.077	3.5	5	CLEA MODEL LQM/CIEH 2015 - 2.5% SOM
Tetrachloromethane	mg/kg	0.056	0.056	1	6.3	920.0	270.0	CLEA MODEL LQM/CIEH 2015 - 2.5% SOM
Trichloroethene (TCE)	mg/kg	0.034	0.036	0.091	2.6	120.0	91.0	CLEA MODEL LQM/CIEH 2015 - 2.5% SOM
Trichloromethane (Chloroform)	mg/kg	1.7	2.1	0.83	170.0	2500.0	2800.0	CLEA MODEL LQM/CIEH 2015 - 2.5% SOM
Phenolics								
Phenol	mg/kg	550	1300	140	1500 dir (35000)	1500 (dir) (11000)	1500 (dir) (9700)	LQM/CIEH 2015 - 2.5% SOM
TPH (Environment Agency 16 Fractions)								
TPH Aliphatic >C5-6	mg/kg	78	78	1700	5900 (558) sol	590000	130000 (558) sol	CLEA MODEL LQM/CIEH 2015 - 2.5% SOM
TPH Aliphatic >C6-8	mg/kg	230	230	5600	17000 (332) sol	610000	220000 (332) sol	CLEA MODEL LQM/CIEH 2015 - 2.5% SOM
TPH Aliphatic >C8-10	mg/kg	65	65	770	4800 (190) vap	13000	18000 (190) vap	CLEA MODEL LQM/CIEH 2015 - 2.5% SOM
TPH Aliphatic >C10-12	mg/kg	330 (118) vap	330 (118) vap	4400	23000 (118) vap	13000	23000 (118) vap	CLEA MODEL LQM/CIEH 2015 - 2.5% SOM
TPH Aliphatic >C12-16	mg/kg	2400 (59) sol	2400 (59) sol	13000	82000 (59) sol	13000	25000 (59) sol	CLEA MODEL LQM/CIEH 2015 - 2.5% SOM
TPH Aliphatic >C16-35	mg/kg	92000 (21) sol	92000 (21) sol	270000	1700000	250000	480000	CLEA MODEL LQM/CIEH 2015 - 2.5% SOM
TPH Aliphatic > C35-44	mg/kg	92000 (21) sol	92000 (21) sol	270000	1700000	250000	480000	CLEA MODEL LQM/CIEH 2015 - 2.5% SOM
TPH Aromatic >EC5-7	mg/kg	140	690	27	46000 (2260) sol	56000	84000 (2260) sol	CLEA MODEL LQM/CIEH 2015 - 2.5% SOM
TPH Aromatic >EC7-8	mg/kg	290	1800	51	110000 (1920) sol	56000	95000 (1920) sol	CLEA MODEL LQM/CIEH 2015 - 2.5% SOM
TPH Aromatic >EC8-10	mg/kg	83	110	21	8100 (1500) vap	5000	8500 (1500) vap	CLEA MODEL LQM/CIEH 2015 - 2.5% SOM
TPH Aromatic >EC10-12	mg/kg	180	590	31	28000 (899) sol	5000	9700 (899) sol	CLEA MODEL LQM/CIEH 2015 - 2.5% SOM
TPH Aromatic >EC12-16	mg/kg	330	2300 (419)sol	57	37000	5100	10000	CLEA MODEL LQM/CIEH 2015 - 2.5% SOM
TPH Aromatic >EC16-21	mg/kg	540	1900	110	28000	3800	7700	CLEA MODEL LQM/CIEH 2015 - 2.5% SOM
TPH Aromatic >EC21-35	mg/kg	1500	1900	820	28000	3800	7800	CLEA MODEL LQM/CIEH 2015 - 2.5% SOM
TPH Aromatic >EC35-44	mg/kg	1500	1900	820	28000	3800	7800	CLEA MODEL LQM/CIEH 2015 - 2.5% SOM
Aliphatic - Aromatic EC44-70	mg/kg	1800	1900	2100	28000	3800	7800	CLEA MODEL LQM/CIEH 2015 - 2.5% SOM
Total TPH	mg/kg	1000	1000	1000	1000	1000	1000	NOT a S4U if exceeded speciation required
BTEX								
Benzene	mg/kg	0.17	0.70	0.034	47.00	72.00	100.00	LQM/CIEH 2015 - 2.5% SOM
Toluene	mg/kg	290	1900	51	110000 vap (1920)	56000	95000vap (1920)	LQM/CIEH 2015 - 2.5% SOM
Ethylbenzene	mg/kg	110	190	39	13000 vap (1220)	24000	22000vap (1220)	LQM/CIEH 2015 - 2.5% SOM
Xylenes (ortho)	mg/kg	140	210	67	15000 sol (1120)	42000	24000sol (1120)	LQM/CIEH 2015 - 2.5% SOM
Xylenes (meta)	mg/kg	140	190	74	14000 vap (1470)	42000	24000sol (1470)	LQM/CIEH 2015 - 2.5% SOM
Xylenes (para)	mg/kg	130	180	69	14000 sol (1350)	42000	23000sol (1350)	LQM/CIEH 2015 - 2.5% SOM

NOTES

- 1) Screen individual constituent values initially and if exceedences are noted consider further in relation to averaging areas and statistical analysis
- 2) These values are for initial screening for potential risk to human health only. They are not remediation thresholds. Screening for other receptors to be done separately as appropriate for the site, e.g. for water, ecology, building materials.
- 3) TSVs have been derived for common constituents only to date, pending future issues of this sheet. Research has been undertaken for numerous other constituents already.
- 4) Please note that the TSVs derived for certain compounds may be low in relation to standard laboratory detection limits.

For certain compounds not identified as a significant risk to human health (eg heavy end hydrocarbon fractions), aesthetic and other considerations may drive requirement for remediation.

APPENDIX D
CHEMICAL LABORATORY RESULTS



ANALYTICAL TEST REPORT

Contract no: 87772
Contract name: EFW Hownsgill
Client reference: -
Clients name: Shadbolt Consulting
Clients address: 18 Bewick Road
Gateshead
Tyne and Wear
NE8 4DP
Samples received: 27 July 2020
Analysis started: 27 July 2020
Analysis completed: 03 August 2020
Report issued: 03 August 2020

Notes: Opinions and interpretations expressed herein are outside the UKAS accreditation scope. Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling. All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing. Methods, procedures and performance data are available on request. Results reported herein relate only to the material supplied to the laboratory. This report shall not be reproduced except in full, without prior written approval. Samples will be disposed of 6 weeks from initial receipt unless otherwise instructed.

Key: U UKAS accredited test
M MCERTS & UKAS accredited test
\$ Test carried out by an approved subcontractor
I/S Insufficient sample to carry out test
N/S Sample not suitable for testing
NAD No Asbestos Detected

Approved by:

Dave Bowerbank
Customer Support Hero

Chemtech Environmental Limited

SAMPLE INFORMATION

MCERTS (Soils):

Soil descriptions are only intended to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions. MCERTS accreditation applies for sand, clay and loam/topsoil, or combinations of these whether these are derived from naturally occurring soils or from made ground, as long as these materials constitute the major part of the sample. Other materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

All results are reported on a dry basis. Samples dried at no more than 30°C in a drying cabinet.

Analytical results are inclusive of stones.

Lab ref	Sample id	Depth (m)	Sample description	Material removed	% Removed	% Moisture
87772-1	TP01	0.10	Clayey Sand with Gravel & Roots	-	-	23.1
87772-2	TP03	0.15	Clayey Sand with Gravel & Roots	-	-	14.9
87772-3	TP04	0.50	Clayey Sand with Gravel & Roots	-	-	9.6
87772-4	TP07	2.35	Clayey Sand with Gravel	-	-	12.5
87772-5	TP10	0.15	Clayey Sand with Gravel & Roots	-	-	14.3
87772-6	TP11	1.50	Clayey Sand with Gravel & Roots	-	-	6.2

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SOILS

Lab number			87772-1	87772-2	87772-3	87772-4	87772-5	87772-6
Sample id			TP01	TP03	TP04	TP07	TP10	TP11
Depth (m)			0.10	0.15	0.50	2.35	0.15	1.50
Date sampled			22/07/2020	22/07/2020	22/07/2020	22/07/2020	22/07/2020	22/07/2020
Test	Method	Units						
Arsenic (total)	CE127 ^M	mg/kg As	6.6	9.0	6.8	67	6.5	2.6
Boron (water soluble)	CE063 ^M	mg/kg B	0.6	<0.5	<0.5	<0.5	<0.5	<0.5
Cadmium (total)	CE127 ^M	mg/kg Cd	<0.2	0.2	<0.2	1.5	<0.2	<0.2
Chromium (total)	CE127 ^M	mg/kg Cr	30	33	27	211	18	11
Copper (total)	CE127 ^M	mg/kg Cu	21	32	23	217	16	8.2
Lead (total)	CE127 ^M	mg/kg Pb	41	71	32	230	39	14
Mercury (total)	CE127 ^M	mg/kg Hg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Nickel (total)	CE127 ^M	mg/kg Ni	23	26	25	86	11	14
Selenium (total)	CE127 ^M	mg/kg Se	1.5	1.6	1.8	3.0	1.0	0.9
Zinc (total)	CE127 ^M	mg/kg Zn	72	92	81	425	60	41
pH	CE004 ^M	units	8.0	7.9	8.4	8.5	8.0	8.6
Sulphate (2:1 water soluble)	CE061 ^M	mg/l SO ₄	30	33	16	34	25	14
Cyanide (total)	CE077	mg/kg CN	<1	<1	<1	<1	<1	<1
PAH								
Naphthalene	CE087 ^M	mg/kg	0.05	0.06	<0.02	0.20	<0.02	0.03
Acenaphthylene	CE087 ^M	mg/kg	0.14	<0.02	0.03	<0.02	<0.02	<0.02
Acenaphthene	CE087 ^M	mg/kg	0.42	0.03	0.04	0.04	<0.02	<0.02
Fluorene	CE087 ^U	mg/kg	0.82	0.03	0.05	0.07	<0.02	<0.02
Phenanthrene	CE087 ^M	mg/kg	6.65	0.37	0.62	0.74	0.06	0.16
Anthracene	CE087 ^U	mg/kg	1.95	0.07	0.35	0.12	<0.02	0.02
Fluoranthene	CE087 ^M	mg/kg	9.33	0.58	4.43	0.96	0.07	0.16
Pyrene	CE087 ^M	mg/kg	6.59	0.49	4.31	0.81	0.06	0.14
Benzo(a)anthracene	CE087 ^U	mg/kg	4.37	0.29	2.82	0.50	0.03	0.07
Chrysene	CE087 ^M	mg/kg	4.17	0.35	2.99	0.72	0.06	0.12
Benzo(b)fluoranthene	CE087 ^M	mg/kg	3.78	0.43	3.92	0.90	0.07	0.13
Benzo(k)fluoranthene	CE087 ^M	mg/kg	1.69	0.16	1.65	0.33	<0.03	0.05
Benzo(a)pyrene	CE087 ^U	mg/kg	3.08	0.31	3.11	0.54	0.04	0.08
Indeno(123cd)pyrene	CE087 ^M	mg/kg	1.90	0.25	2.44	0.61	0.03	0.07
Dibenz(ah)anthracene	CE087 ^M	mg/kg	0.55	0.07	0.53	0.17	<0.02	<0.02
Benzo(ghi)perylene	CE087 ^M	mg/kg	1.59	0.25	2.19	0.60	0.04	0.08
PAH (total of USEPA 16)	CE087	mg/kg	47.1	3.74	29.5	7.30	0.46	1.11
TPH								
EPH (>C10-C40)	CE033 ^M	mg/kg	35	60	21	59	36	23
Subcontracted analysis								
Asbestos (qualitative)	\$	-	NAD	NAD	-	-	NAD	NAD

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METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE127	Arsenic (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg As
CE063	Boron (water soluble)	Hot water extract, ICP-OES	Dry	M	0.5	mg/kg B
CE127	Cadmium (total)	Aqua regia digest, ICP-MS	Dry	M	0.2	mg/kg Cd
CE127	Chromium (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Cr
CE127	Copper (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Cu
CE127	Lead (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Pb
CE127	Mercury (total)	Aqua regia digest, ICP-MS	Dry	M	0.5	mg/kg Hg
CE127	Nickel (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Ni
CE127	Selenium (total)	Aqua regia digest, ICP-MS	Dry	M	0.3	mg/kg Se
CE127	Zinc (total)	Aqua regia digest, ICP-MS	Dry	M	5	mg/kg Zn
CE004	pH	Based on BS 1377, pH Meter	As received	M	-	units
CE061	Sulphate (2:1 water soluble)	Aqueous extraction, ICP-OES	Dry	M	10	mg/l SO ₄
CE077	Cyanide (total)	Extraction, Continuous Flow Colorimetry	As received		1	mg/kg CN
CE087	Naphthalene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Acenaphthylene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Acenaphthene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Fluorene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Phenanthrene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Anthracene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Fluoranthene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Pyrene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Benzo(a)anthracene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Chrysene	Solvent extraction, GC-MS	As received	M	0.03	mg/kg
CE087	Benzo(b)fluoranthene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Benzo(k)fluoranthene	Solvent extraction, GC-MS	As received	M	0.03	mg/kg
CE087	Benzo(a)pyrene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Indeno(123cd)pyrene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Dibenz(ah)anthracene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Benzo(ghi)perylene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	PAH (total of USEPA 16)	Solvent extraction, GC-MS	As received		0.34	mg/kg
CE033	EPH (>C10-C40)	Solvent extraction, GC-FID	As received	M	10	mg/kg
\$	Asbestos (qualitative)	HSG 248, Microscopy	Dry	U	-	-

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DEVIATING SAMPLE INFORMATION

Comments

Sample deviation is determined in accordance with the UKAS note "Guidance on Deviating Samples" and based on reference standards and laboratory trials.

For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling.

Chemtech Environmental Ltd cannot be held responsible for the integrity of sample(s) received if Chemtech Environmental Ltd did not undertake the sampling. Such samples may be deviating.

Key

N	No (not deviating sample)
Y	Yes (deviating sample)
NSD	Sampling date not provided
NST	Sampling time not provided (waters only)
EHT	Sample exceeded holding time(s)
IC	Sample not received in appropriate containers
HP	Headspace present in sample container
NCF	Sample not chemically fixed (where appropriate)
OR	Other (specify)

Lab ref	Sample id	Depth (m)	Deviating	Tests (Reason for deviation)
87772-1	TP01	0.10	N	
87772-2	TP03	0.15	N	
87772-3	TP04	0.50	N	
87772-4	TP07	2.35	N	
87772-5	TP10	0.15	N	
87772-6	TP11	1.50	N	

APPENDIX E
GEOTECHNICAL LABORATORY RESULTS



LABORATORY REPORT



4043

Contract Number: PSL20/3741

Report Date: 21 August 2020
Client's Reference: 2762
Client Name: The Shadbolt Group
18 Berwick Road
Gateshead
Tyne & Wear
NE8 4DP

For the attention of: Rob Plews

Contract Title: EFW Hownsgill
Date Received: 24/7/2020
Date Commenced: 24/7/2020
Date Completed: 21/8/2020

Notes: Opinions and Interpretations are outside the UKAS Accreditation

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced other than in full, without the prior written approval of the laboratory.

Checked and Approved Signatories:

R Gunson
(Director)

A Watkins
(Director)

R Berriman
(Quality Manager)

L Knight
(Senior Technician)

S Eyre
(Senior Technician)

S Royle
(Laboratory Manager)

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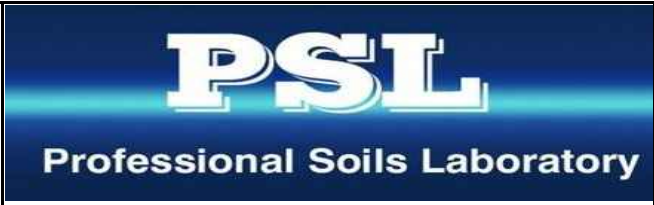
Page 1 of

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
TP02		B	0.40		Brown slightly gravelly sandy CLAY.
TP12		B	0.50		Brown slightly gravelly sandy CLAY.
TP08		B	0.45		Brown gravelly sandy CLAY.
TP07		B	0.40		Brown slightly gravelly sandy CLAY.
TP04		B	1.20		Brown sandy GRAVEL with cobbles.
TP09		B	1.50		Brown slightly sandy GRAVEL with some cobbles.
TP10		B	2.50		MADE GROUND brown very sandy slightly clayey gravel.
TP12		B	1.20		Brown slightly sandy GRAVEL with cobbles.
TP06		B	1.20		Brown sandy GRAVEL with cobbles.
TP01		B	1.00		Brown slightly sandy GRAVEL.
TP05		B	1.20		Brown slightly sandy GRAVEL.



4043



EFW Hownsgill

Contract No:

PSL20/3741

Client Ref:

2762

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % <small>Clause 3.2</small>	Linear Shrinkage % <small>Clause 6.5</small>	Particle Density Mg/m ³ <small>Clause 8.2</small>	Liquid Limit % <small>Clause 4.3/4</small>	Plastic Limit % <small>Clause 5.3</small>	Plasticity Index % <small>Clause 5.4</small>	Passing .425mm %	Remarks
TP02		B	0.40		35			40	19	21	96	Intermediate plasticity CI.
TP12		B	0.50		13			43	20	23	92	Intermediate plasticity CI.
TP08		B	0.45		16			38	18	20	87	Intermediate plasticity CI.
TP07		B	0.40		16			41	19	22	95	Intermediate plasticity CI.

SYMBOLS : NP : Non Plastic

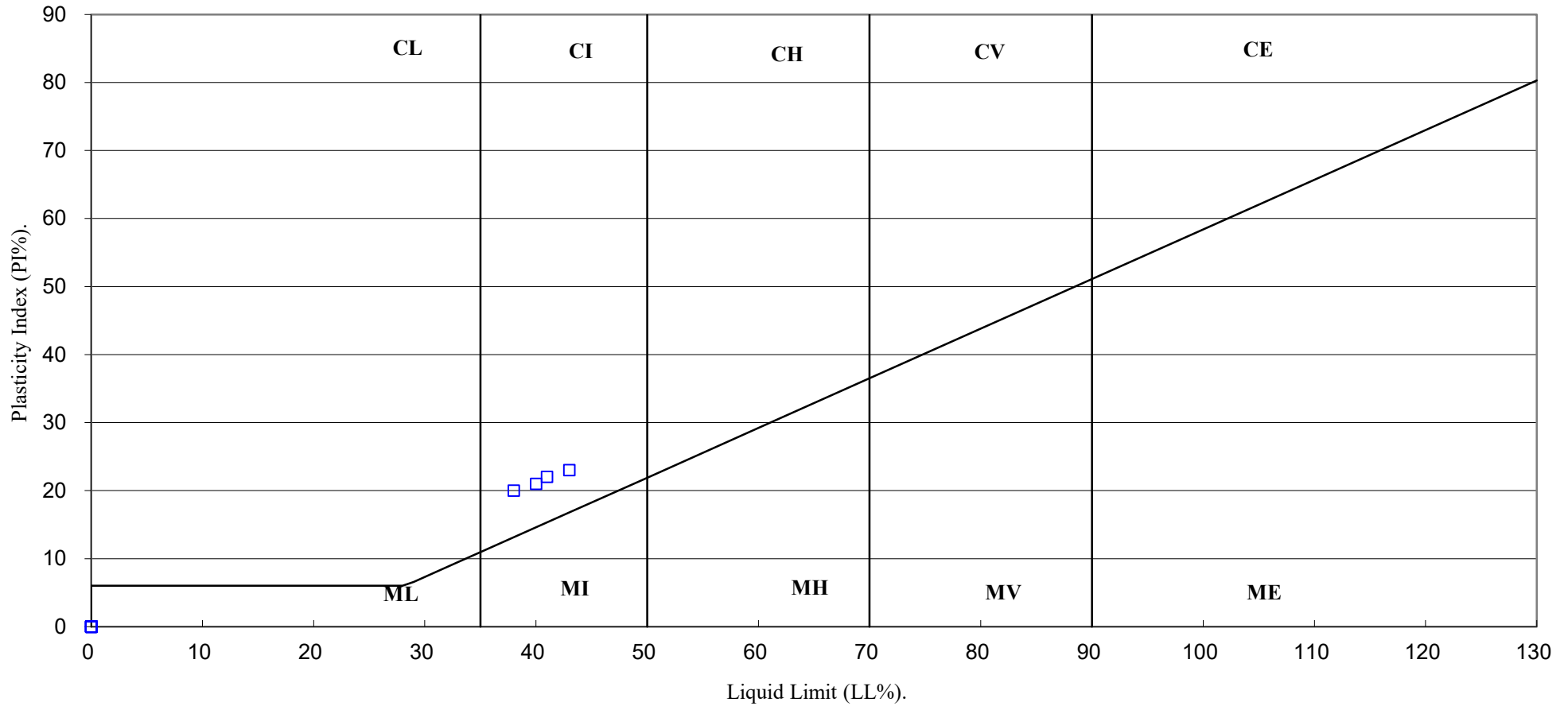
* : Liquid Limit and Plastic Limit Wet Sieved.



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Contract No:
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Client Ref:
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PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



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EFW Hownsgill

Contract No:

PSL20/3741

Client Ref:

2762

PARTICLE SIZE DISTRIBUTION TEST

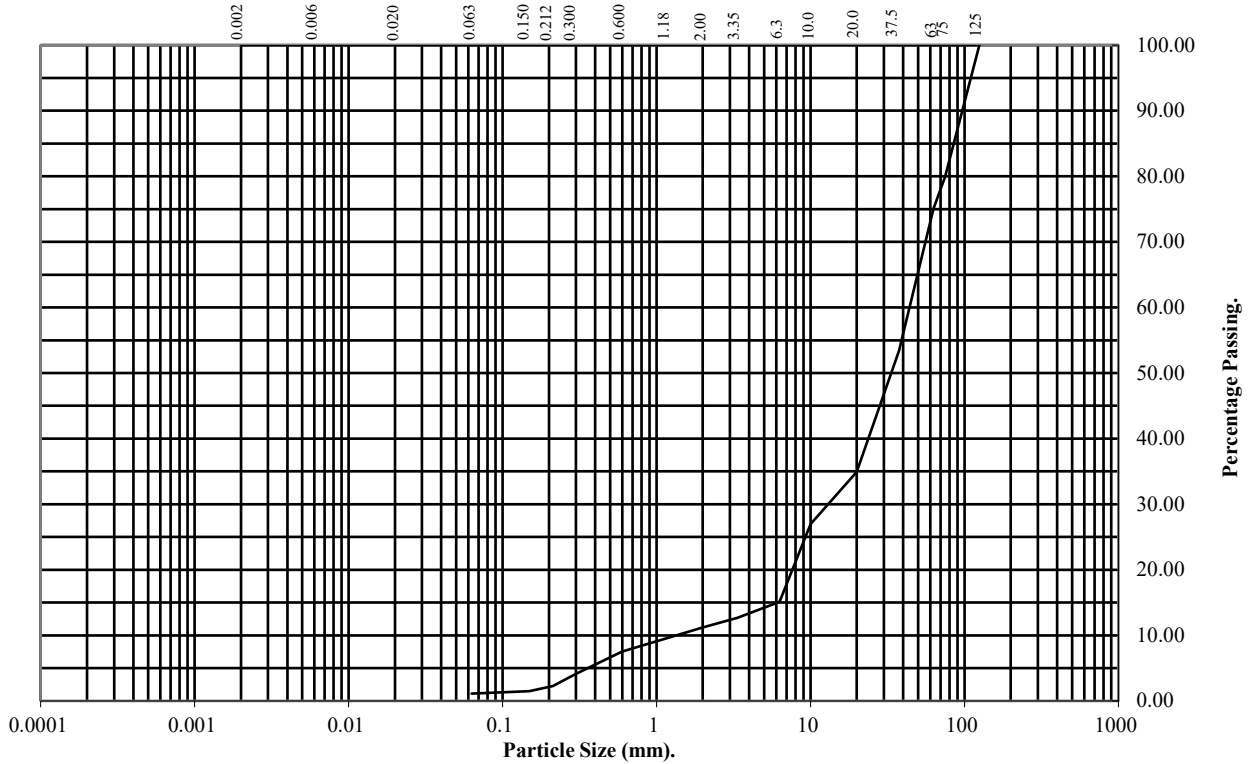
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: **TP04** Top Depth (m): **1.20**

Sample Number: Base Depth(m):

Sample Type: **B**



BS Test Sieve (mm)	Percentage Passing
125	100
75	80
63	75
37.5	53
20	35
10	27
6.3	15
3.35	13
2	11
1.18	10
0.6	8
0.3	4
0.212	2
0.15	1
0.063	1

Soil Fraction	Total Percentage
Cobbles	25
Gravel	64
Sand	10
Silt/Clay	1

Remarks:
See Summary of Soil Descriptions



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Contract No:
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Client Ref:
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PARTICLE SIZE DISTRIBUTION TEST

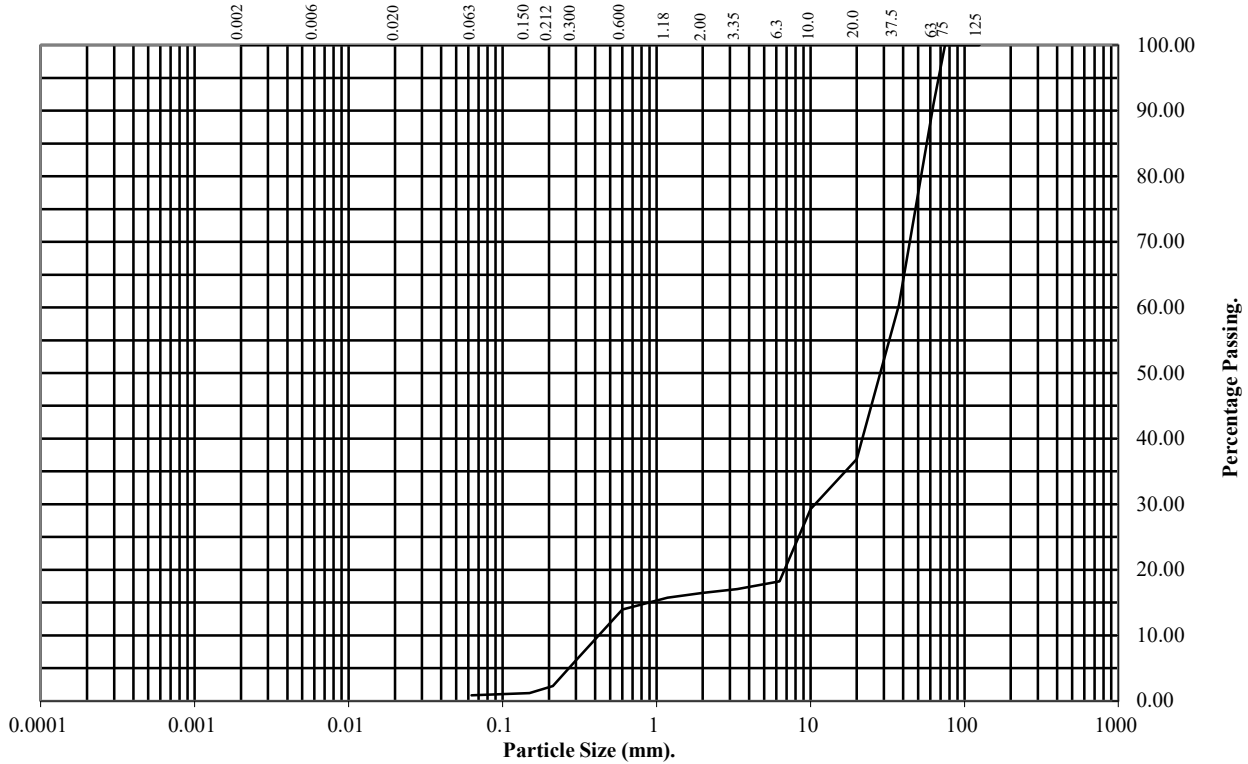
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: **TP06** Top Depth (m): **1.20**

Sample Number: Base Depth(m):

Sample Type: **B**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	91
37.5	60
20	37
10	29
6.3	18
3.35	17
2	16
1.18	16
0.6	14
0.3	6
0.212	2
0.15	1
0.063	1

Soil Fraction	Total Percentage
Cobbles	9
Gravel	75
Sand	15
Silt/Clay	1

Remarks:
See Summary of Soil Descriptions



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Contract No:
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Client Ref:
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PARTICLE SIZE DISTRIBUTION TEST

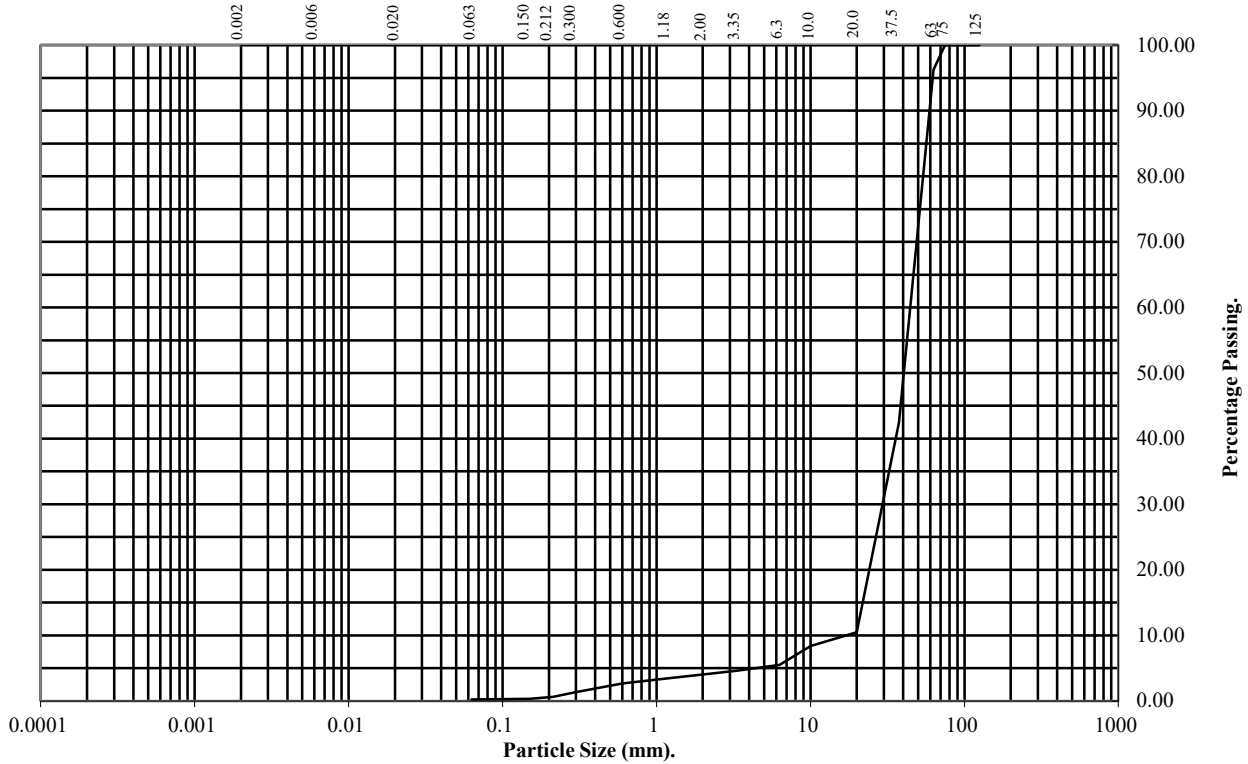
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: TP09 **Top Depth (m):** 1.50

Sample Number: **Base Depth(m):**

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	96
37.5	42
20	10
10	8
6.3	5
3.35	5
2	4
1.18	3
0.6	3
0.3	1
0.212	1
0.15	0
0.063	0

Soil Fraction	Total Percentage
Cobbles	4
Gravel	92
Sand	4
Silt/Clay	0

Remarks:
See Summary of Soil Descriptions



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Contract No:
PSL20/3741
Client Ref:
2762

PARTICLE SIZE DISTRIBUTION TEST

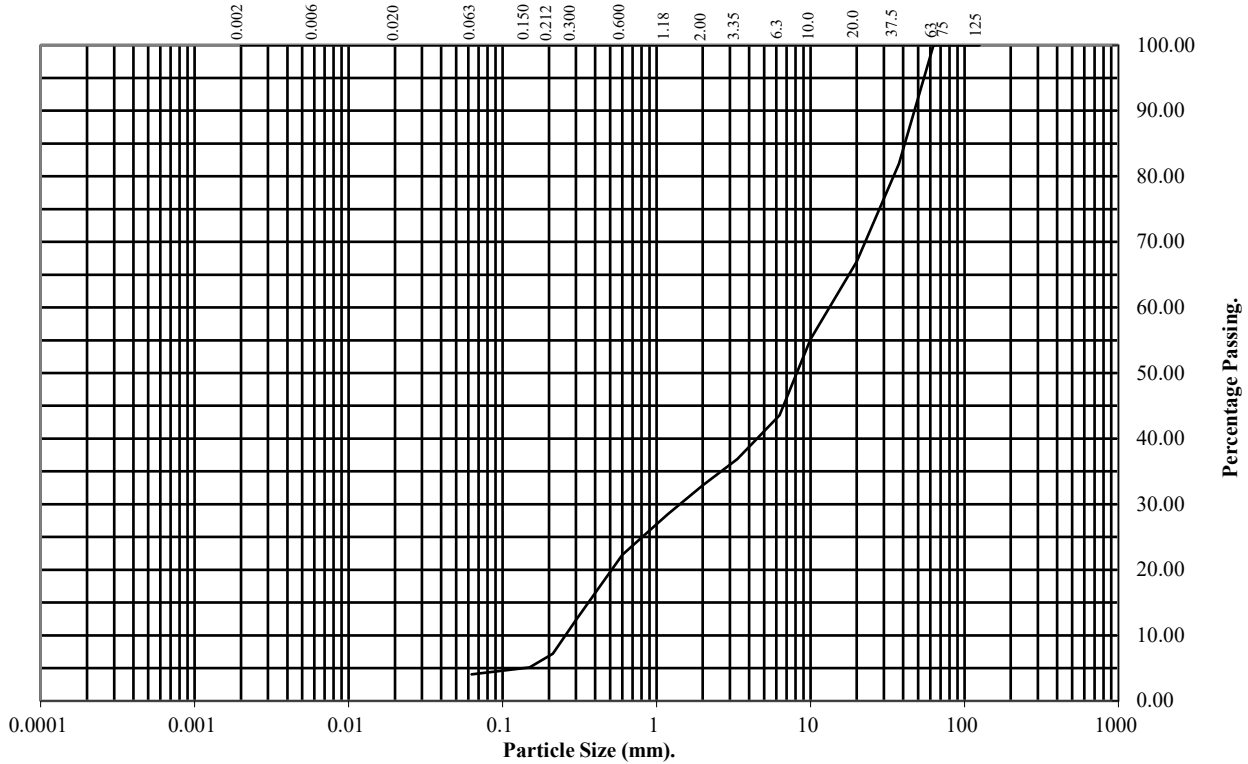
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: **TP10** Top Depth (m): **2.50**

Sample Number: Base Depth(m):

Sample Type: **B**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	82
20	67
10	55
6.3	44
3.35	37
2	33
1.18	28
0.6	22
0.3	12
0.212	7
0.15	5
0.063	4

Soil Fraction	Total Percentage
Cobbles	0
Gravel	67
Sand	29
Silt/Clay	4

Remarks:
See Summary of Soil Descriptions



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Contract No:
PSL20/3741
Client Ref:
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PARTICLE SIZE DISTRIBUTION TEST

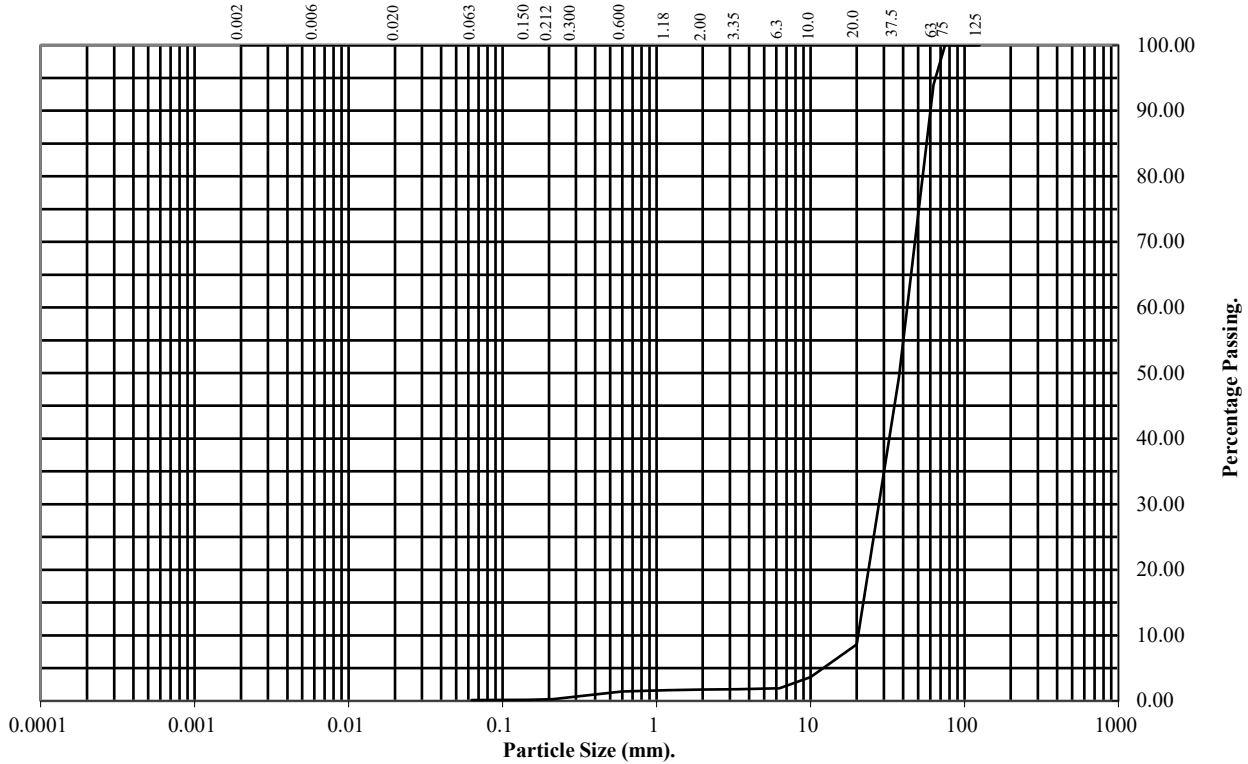
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: **TP12** Top Depth (m): **1.20**

Sample Number: Base Depth(m):

Sample Type: **B**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	94
37.5	49
20	9
10	4
6.3	2
3.35	2
2	2
1.18	2
0.6	1
0.3	1
0.212	0
0.15	0
0.063	0

Soil Fraction	Total Percentage
Cobbles	6
Gravel	92
Sand	2
Silt/Clay	0

Remarks:
See Summary of Soil Descriptions



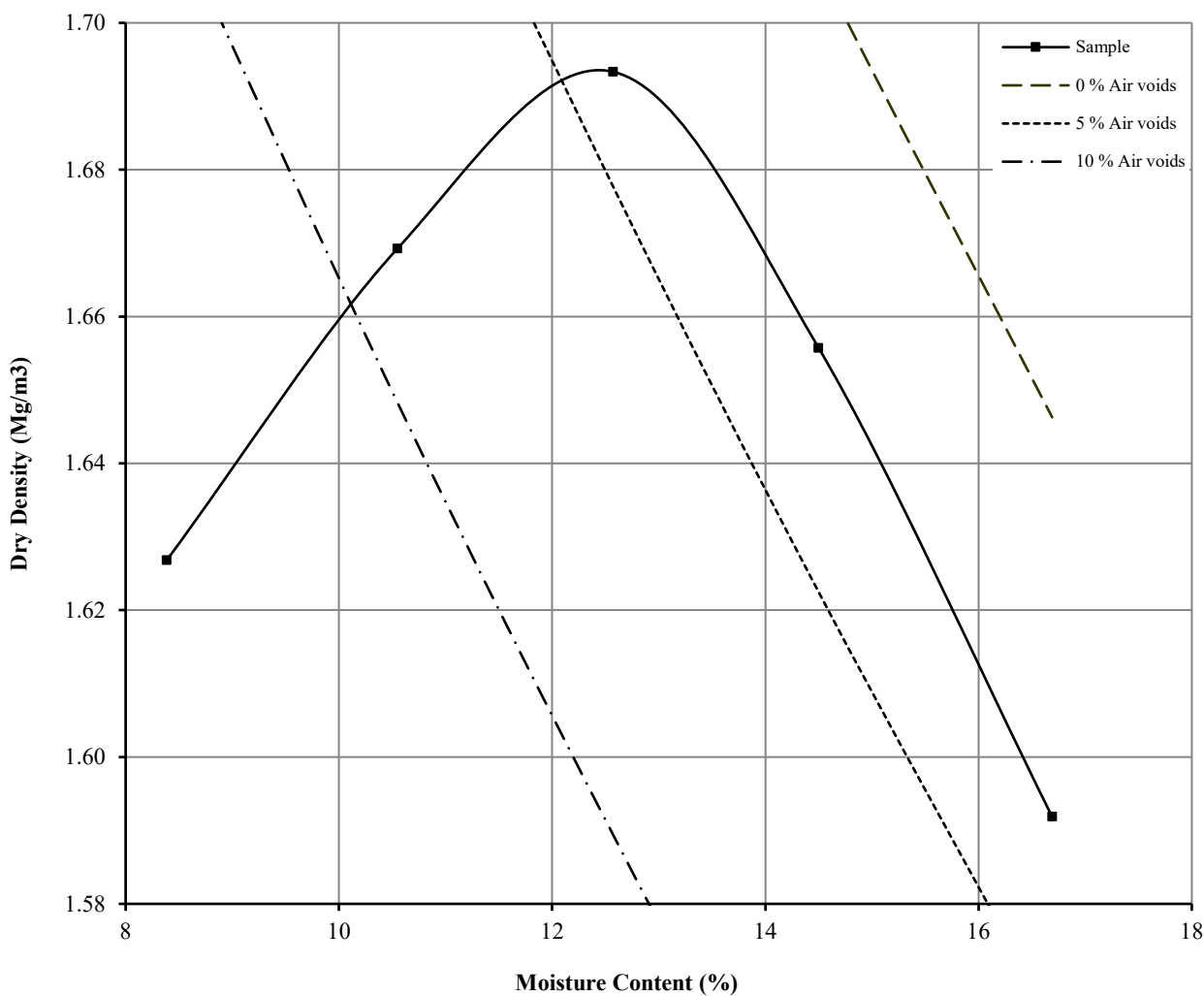
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PSL20/3741
Client Ref:
2762

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

Non compliance with BS 1377 : Part 4 : Clause 3.7 : 1990

Hole Number: TP10 Top Depth (m) : 2.50
 Sample Number: Base Depth (m) :
 Sample Type: B



Initial Moisture Content:	11	Method of Compaction:	Vibro	Separate Samples
Particle Density (Mg/m ³):	2.27	Assumed	Material Retained on 37.5 mm Test Sieve (%):	18
Maximum Dry Density (Mg/m ³):	1.69		Material Retained on 20.0 mm Test Sieve (%):	15
Optimum Moisture Content (%):	13			
Remarks				
See summary of soil descriptions.				



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Client Ref
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CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

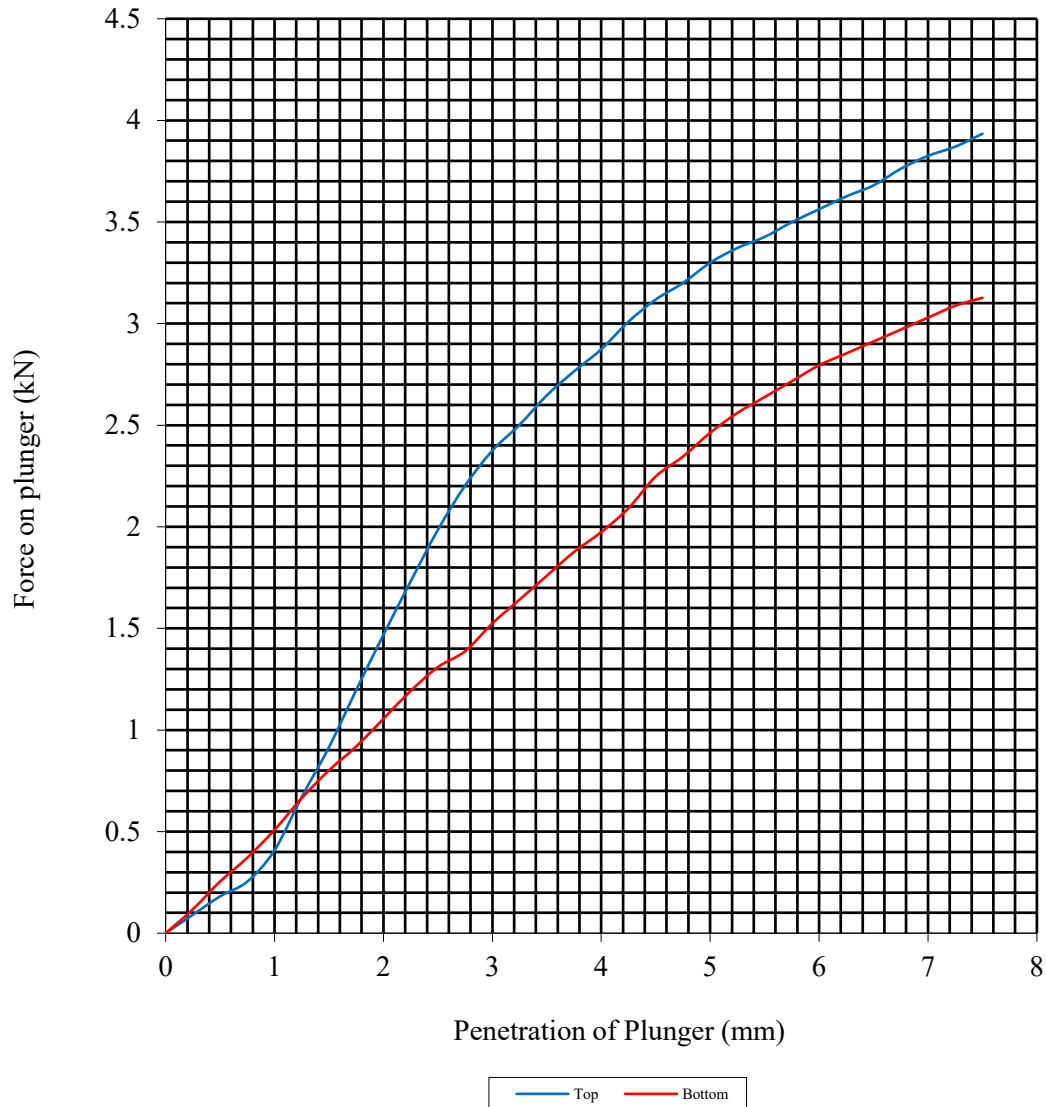
Hole Number: TP07

Top Depth (m): 0.40

Sample Number:

Base Depth (m):

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	16	Surcharge Kg:	4.20	Sample Top	16	Sample Top	16.5
Bulk Density Mg/m ³ :	2.01	Soaking Time hrs	0	Sample Bottom	16	Sample Bottom	12.3
Dry Density Mg/m ³ :	1.74	Swelling mm:	0	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			0				
Compaction Conditions	2.5kg						



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Client Ref:
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CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

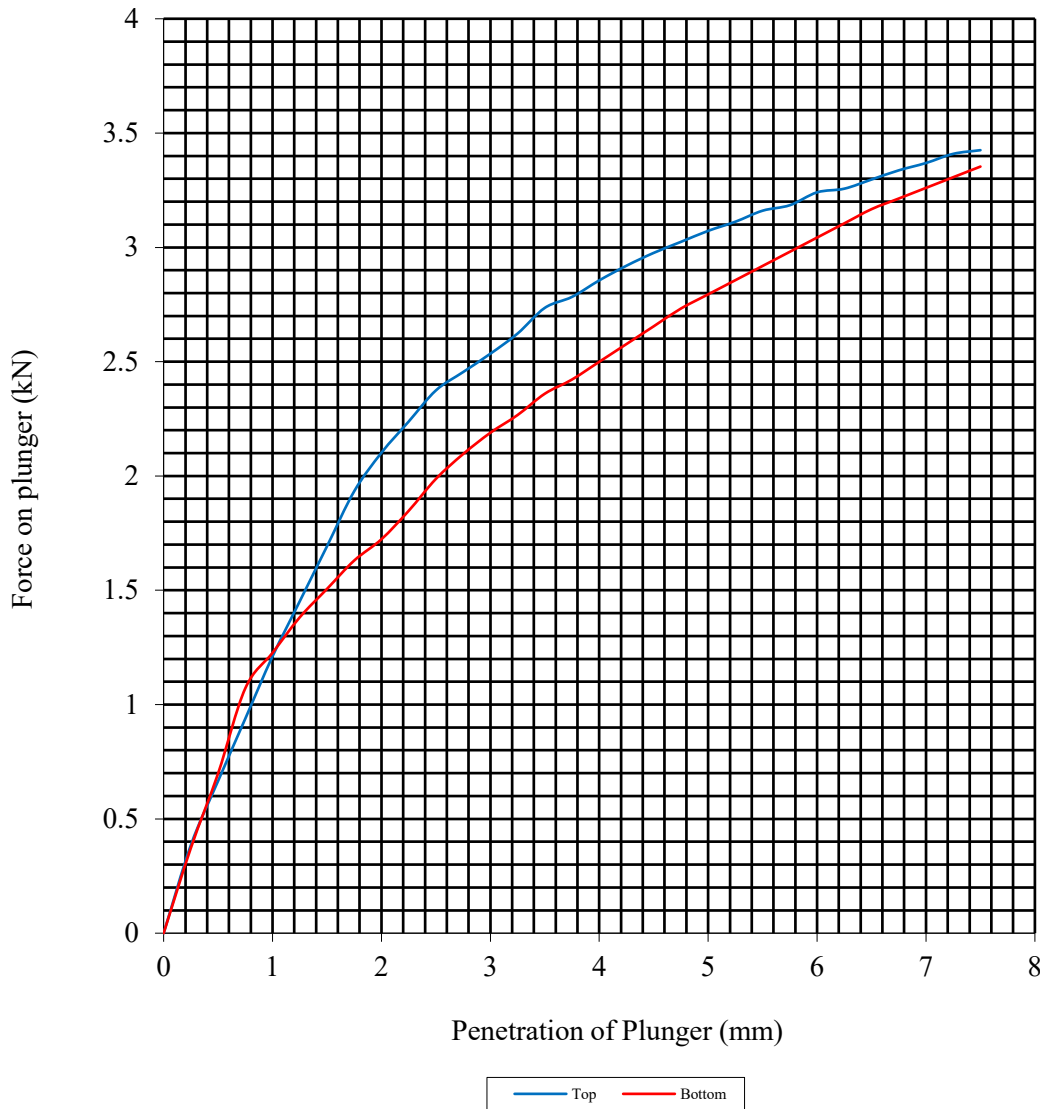
Hole Number: TP12

Top Depth (m): 0.50

Sample Number:

Base Depth (m):

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	13	Surcharge Kg:	4.20	Sample Top	13	Sample Top	18.0
Bulk Density Mg/m ³ :	1.98	Soaking Time hrs	0	Sample Bottom	13	Sample Bottom	15.1
Dry Density Mg/m ³ :	1.75	Swelling mm:	0	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			0				
Compaction Conditions	2.5kg						



EFW Hownsgill

Contract No:
PSL20/3741
Client Ref:
2762

SUMMARY OF SOIL DENSITY RELATED TESTS

(BS1377 : PART 2 & 4 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content %	Bulk Density Mg/m ³	Dry Density Mg/m ³	Retained 20mm %	Retained 37.5mm %	Method of compaction kg	Maximum Dry Density Mg/m ³	Minimum Dry Density Mg/m ³	Remarks
TP01		B	1.00		2.5						1.96	1.39	
TP05		B	1.20		4.3						2.09	1.28	



EFW Hownsgill

Contract No:
PSL20/3741
Client Ref:
2762

APPENDIX F

GAS AND GROUNDWATER MONITORING RESULTS
GAS RISK ASSESSMENT TABLES (NHBC, CIRIA C665)
GAS PROTECTION MEASURES TABLES (BS8485:2015)

CIRIA C665

Characteristic Situation

Characteristic Situation (CIRIA 149)	Comparable Classification In DETER <i>et al</i> (1999)	Risk Classification	Gas Screening Value (GSV) (CH ₄ or CO ₂) (l/hr) ¹	Additional Factors	Typical source of generation
1	A	Very Low Risk	<0.07	Typically, methane 1 % and/or carbon dioxide 5 %. Otherwise consider increase to Situation 2.	Natural soils with low organic content. "Typical" made ground
2	B	Low. Risk	<0.7	Borehole air flow rate not to exceed 70 l/hr. Otherwise consider increase to characteristic Situation 3	Natural soil, high peat/ organic content "Typical" made ground
3	C	Moderate Risk	<3.5		Old landfill, inert waste, mineworkings flooded
4	D	Moderate to high risk	<15	Quantitative risk assessment required to evaluate scope of protective measures	Mineworkings – susceptible to flooding, completed landfill (WMP 26B criteria)
5	E	High risk	<70		Mineworkings Unflooded inactive with shallow workings near surface
6	F	Very high risk	>70		Recent landfill site

Notes:

Gas screening value: (Litres of gas/hour) is calculated by multiplying the maximum gas concentration (%) by the maximum measured borehole flow rate (l.hr) – See Glossary.

Site Characterisation should be based on gas monitoring of concentrations and borehole flow rates for the minimum period defined in Table 5.5, CIRIA 659.

Source of gas and generation potential/performance should be identified.

Soil gas investigation should be in accordance with guidance provided in Chapters 4 to 6.

If there is no detectable flow, use the limit of detection of the instrument.

The boundaries between the Partners in Technology classifications do not fit exactly with the boundaries for the CIRIA classification.

Gas Risk Assessment – Characteristic Situations with Typical Maximum concentrations and Gas Screening Values (Reproduced from Table 8.5, CIRIA Report C659 – Assessing risk posed by hazardous ground gases to buildings).

NHBC Guidance

Traffic Light Classification System – Table 14.1

Traffic light Classification	Methane ¹		Carbon Dioxide ²	
	Typical Maximum Concentration ³ (% v/v)	Gas Screening Value (l/hr)	Typical Maximum Concentration ³ (% v/v)	Gas Screening Value ^{2,4} (l/hr)
Green	1	0.13	5	0.78
Amber 1	5	0.63	10	1.60
Amber 2	20	1.60	30	3.10
Red				

Notes:

1. The worst-case ground gas regime identified on the site, either methane or carbon dioxide, at the worst-case temporal conditions that the site may be expected to encounter will be the decider as to what Traffic light is allocated;
2. Borehole Gas Volume Flow Rates, in litres per hour as defined in Wilson and Card (1999), is the borehole flow rate multiplied by the concentration in the air stream of the particular gas being considered;
3. The typical Maximum Concentrations can be exceeded in certain circumstances should the Conceptual Site Model indicate it is safe to do so;
4. The Gas Screening Value thresholds should not generally be exceeded without the completion of a detailed ground gas risk assessment taking into account site-specific conditions.

*Gas Risk Assessment - Traffic Lights with Typical Maximum Concentrations and Gas Screening Values
Reproduced from NHBC Guidance*

NHBC Guidance

Gas Protection Measures Required for Traffic Light Classification – Table 14.2

Traffic Light Classification	Ground Gas Protection Measures Required
Green	Ground gas protection measures are not required.
Amber 1	Low-level ground gas protection measures are required, using a membrane and ventilated sub-floor void that creates a permeability contrast to limit the ingress of gas into buildings. Gas protection measures are to be installed as prescribed in BRE 414. Ventilation of the sub-floor void should be designed to provide a minimum of one complete volume change per 24 hours.
Amber 2	High-level ground gas protection measures are required, creating a permeability contrast to prevent ingress of gas into buildings. Gas protection measures are to be installed as prescribed in BRE 414. Membranes used should always be fitted by a specialist contractor and should be fully certified (see Appendix E). As with Amber 1, ventilation of the sub-floor void should be designed to provide a minimum of one complete volume change per 24 hours.
Red	Standard residential housing is not normally acceptable without further Ground Gas Risk Assessment and/or possible remedial mitigation measures to reduce/remove the source of the ground gases. In certain circumstances, active protection methods could be applied, but only when there is a legal agreement assuring the management and maintenance of the system for the life of the property.

Table 14.2 - Reproduced from NHBC Guidance

BS8485:2015

Code of Practice for the Design of Gas Protective Measures for Methane and Carbon Dioxide for New Buildings

Table 3

<u>BRITISH STANDARD</u>		<u>BS 8485:2015</u>			
Table 3 Building types					
	Type A	Type B	Type C	Type D	
Ownership	Private	Private or commercial/public, possible multiple	Commercial/public	Commercial/industrial	
Control (change of use, structural alterations, ventilation)	None	Some but not all	Full	Full	
Room sizes	Small	Small/medium	Small to large	Large industrial/retail park style	
<ul style="list-style-type: none"> • Type A building: private ownership with no building management controls on alterations to the internal structure, the use of rooms, the ventilation of rooms or the structural fabric of the building. Some small rooms present. Probably conventional building construction (rather than civil engineering). Examples include private housing and some retail premises. • Type B building: private or commercial property with central building management control of any alterations to the building or its uses but limited or no central building management control of the maintenance of the building, including the gas protection measures. Multiple occupancy. Small to medium size rooms with passive ventilation of rooms and other internal spaces throughout ground floor and basement areas. May be conventional building or civil engineering construction. Examples include managed apartments, multiple occupancy offices, some retail premises and parts of some public buildings (such as schools, hospitals, leisure centres) and parts of hotels. • Type C building: commercial building with central building management control of any alterations to the building or its uses and central building management control of the maintenance of the building, including the gas protection measures. Single occupancy of ground floor and basement areas. Small to large size rooms with active ventilation or good passive ventilation of all rooms and other internal spaces throughout ground floor and basement areas. Probably civil engineering construction. Examples include offices, some retail premises, and parts of some public buildings (such as schools, hospitals, leisure centres and parts of hotels). • Type D building: industrial style building having large volume internal space(s) that are well ventilated. Corporate ownership with building management controls on alterations to the ground floor and basement areas of the building and on maintenance of ground gas protective measures. Probably civil engineering construction. Examples are retail park sales buildings, factory shop floor areas, warehouses. (Small rooms within these style buildings should be separately categorized as Type B or Type C). <p><i>NOTE 2</i> Type A buildings are those where the risk of failure of the gas protection measures is likely to be most significant to the safety of the occupants and Type D buildings are those where this same risk is likely to be least significant.</p> <p>From the design CS and the type of building (A, B, C or D) the minimum level of gas protection (score) in the range 0 to 7.5 should be determined in accordance with Table 4.</p>					

BS8485:2015

Code of Practice for the Design of Gas Protective Measures for Methane and Carbon Dioxide for New Buildings

Table 4

BS 8485:2015		BRITISH STANDARD		
Table 4 Gas protection score by CS and type of building				
CS	Minimum gas protection score (points)			
	High risk	Medium risk		Low risk
	Type A building	Type B building	Type C building	Type D building
1	0	0	0	0
2	3.5	3.5	2.5	1.5
3	4.5	4	3	2.5
4	6.5 ^{A)}	5.5 ^{A)}	4.5	3.5
5	— ^{B)}	6.5 ^{A)}	5.5	4.5
6	— ^{B)}	— ^{B)}	7.5	6.5

^{A)} Residential buildings should not be built on CS4 or higher sites unless the type of construction or site circumstances allow additional levels of protection to be incorporated, e.g. high-performance ventilation or pathway intervention measures, and an associated sustainable system of management of maintenance of the gas control system, e.g. in institutional and/or fully serviced contractual situations.

^{B)} The gas hazard is too high for this empirical method to be used to define the gas protection measures.

NOTE 3 The NHBC has published guidance [8] for use on residential developments, which utilizes an alternative classification ("traffic light") system. This guidance typically applies to Type A buildings utilizing beam and block floor constructions with clear void ventilation. The design choice variables are limited to decisions relating to the membrane specification and verification recommendations (see Table 7). Designers utilizing this system would therefore need to refer to the NHBC [8] to assess compliance for specific recommendations.

When the minimum gas protection score has been determined for the building as a whole, or for each part of the building, then a combination of two or more of the following three types of protection measures should be used to achieve that score:

- the structural barrier of the floor slab, or of the basement slab and walls if a basement is present;
- ventilation measures; and
- gas resistant membrane.

NOTE 4 The method of selecting the combination of these types of protection measures for a particular building is given in 7.2.

Once the types of protection measures have been decided, the detailed design and specification of the measures should be undertaken (see 7.3).

NOTE 5 In some cases, the designer might be of the opinion at this stage that the extent of the protection measures is potentially more than is needed, because of limitations in the scope of the site investigation [these limitations having led to a more conservative GSV and CS than is likely from the conceptual site model (see 6.3.7.2 and 6.3.7.3)]. In this case, further site investigation could be carried out to check the GSV. Only if there is sufficient time to carry out additional site investigation and gas monitoring would this step be useful.

The detailed design and specification of the protection measures should be recorded in a design report (see 8.3).

BS8485:2015

Code of Practice for the Design of Gas Protective Measures for Methane and Carbon Dioxide for New Buildings

Table 5

Table 5 Gas protection scores for the structural barrier	
Floor and substructure design (see Annex A)	Score ^{A)}
Precast suspended segmental subfloor (i.e. beam and block)	0
Cast in situ ground-bearing floor slab (with only nominal mesh reinforcement)	0.5
Cast in situ monolithic reinforced ground bearing raft or reinforced cast in situ suspended floor slab with minimal penetrations	1 or 1.5 ^{B)}
Basement floor and walls conforming to BS 8102:2009, Grade 2 waterproofing ^{C)}	2
Basement floor and walls conforming to BS 8102:2009, Grade 3 waterproofing ^{C)}	2.5

^{A)} The scores are conditional on breaches of floor slabs, etc., being effectively sealed.
^{B)} To achieve a score of 1.5 the raft or suspended slab should be well reinforced to control cracking and have minimal penetrations cast in (see A.2.2.2).
^{C)} The score is conditional on the waterproofing not being based on the use of a geosynthetic clay liner waterproofing product (see C.3, Note 4).

BS8485:2015

Code of Practice for the Design of Gas Protective Measures for Methane and Carbon Dioxide for New Buildings

Table 6

<u>BRITISH STANDARD</u>	<u>BS 8485:2015</u>	
Table 6 Gas protection scores for ventilation protection measures		
Protection element/system	Score	Comments
(a) Pressure relief pathway (usually formed of low fines gravel or with a thin geocomposite blanket or strips terminating in a gravel trench external to the building)	0.5	Whenever possible a pressure relief pathway (as a minimum) should be installed in all gas protection measures systems. If the layer has a low permeability and/or is not terminated in a venting trench (or similar), then the score is zero.
(b) Passive sub floor dispersal layer: Very good performance: Good performance: Media used to provide the dispersal layer are: <ul style="list-style-type: none"> • Clear void • Polystyrene void former blanket • Geocomposite void former blanket • No-fines gravel layer with gas drains <ul style="list-style-type: none"> • No-fines gravel layer 	2.5 1.5	Performance criteria for methane and carbon dioxide are shown in Figure B.6 and Figure B.7, respectively. The ventilation effectiveness of different media depends on a number of different factors including the transmissivity of the medium, the width of the building, the side ventilation spacing and type and the thickness of the layer. The selected score should be assigned taking into account the recommendations in Annex B. Passive ventilation should be designed to meet at least "good performance", see Annex B.
(c) Active dispersal layer, usually comprising fans with active abstraction (suction) from a subfloor dilution layer, with roof level vents. The dilution layer may comprise a clear void or be formed of geocomposite or polystyrene void formers	1.5 to 2.5	This system relies on continued serviceability of the pumps, therefore alarm and response systems should be in place. There should be robust management systems in place to ensure the continued maintenance of the system, including pumps and vents. Active ventilation should always be designed to meet at least "good performance", as described in Annex B.
(d) Active positive pressurization by the creation of a blanket of external fresh air beneath the building floor slab by pumps supplying air to points across the central footprint of the building into a permeable layer, usually formed of a thin geocomposite blanket	1.5 to 2.5	This system relies on continued operation of the pumps, therefore alarm and response systems should be in place. The score assigned should be based on the efficient "coverage" of the building footprint and the redundancy of the system. Active ventilation should always be designed to meet at least "good performance".
(e) Ventilated car park (floor slab of occupied part of the building under consideration is underlain by a basement or undercroft car park)	4	Assumes that the car park is vented to deal with car exhaust fumes, designed to <i>Buildings Regulations 2000, Approved Document F</i> [9].

BS8485:2015

Code of Practice for the Design of Gas Protective Measures for Methane and Carbon Dioxide for New Buildings

Table 7

<u>BRITISH STANDARD</u>	<u>BS 8485:2015</u>	
Table 7 Gas protection score for the gas resistant membrane		
Protection element/system	Score	Comments
<p>Gas resistant membrane meeting all of the following criteria:</p> <ul style="list-style-type: none"> • sufficiently impervious to the gases with a methane gas transmission rate <40.0 ml/day/m²/atm (average) for sheet and joints (tested in accordance with BS ISO 15105-1 manometric method); • sufficiently durable to remain serviceable for the anticipated life of the building and duration of gas emissions; • sufficiently strong to withstand in-service stresses (e.g. settlement if placed below a floor slab); • sufficiently strong to withstand the installation process and following trades until covered (e.g. penetration from steel fibres in fibre reinforced concrete, penetration of reinforcement ties, tearing due to working above it, dropping tools, etc); • capable, after installation, of providing a complete barrier to the entry of the relevant gas; and • verified in accordance with CIRIA C735 [N1] 	2	<p>The performance of membranes is heavily dependent on the quality and design of the installation, resistance to damage after installation and integrity of joints.</p> <p>For example, a minimum 0.4 mm thickness (equivalent to 370 g/m² for polyethelene) reinforced membrane (virgin polymer) meets the performance criteria in Table 7 (see C.3).</p> <p>If a membrane is installed that does not meet all the criteria in column 1 then the score is zero.</p>

APPENDIX G
HISTORIC BGS DATA/ COAL AUTHORITY DATA



The Coal
Authority

Consultants Coal Mining Report

Proposed Efw Facility
Hownsgill Industrial Estate
Consett
Durham

Date of enquiry: 10 July 2020
Date enquiry received: 10 July 2020
Issue date: 10 July 2020

Our reference: 51002289111001
Your reference: EFW



Consultants

Coal Mining Report

This report is based on and limited to the records held by the Coal Authority at the time the report was produced.

Client name

Shadbolt Environmental

Enquiry address

Proposed Efw Facility
Howngill Industrial Estate
Consett
Durham

How to contact us

0345 762 6848 (UK)
+44 (0)1623 637 000 (International)

200 Lichfield Lane
Mansfield
Nottinghamshire
NG18 4RG

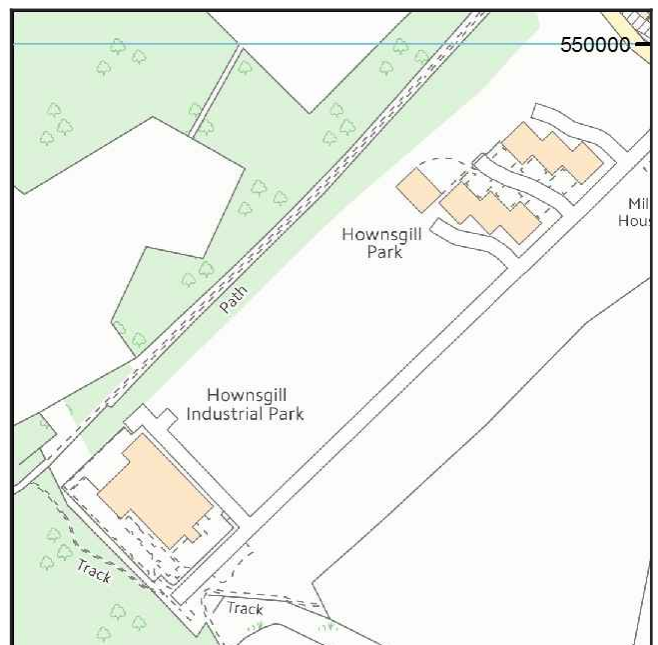
www.groundstability.com

 @coalauthority

 /company/the-coal-authority

 /thecoalauthority

 /thecoalauthority



Approximate position of property



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Section 1 – Mining activity and geology

Past underground mining

Colliery	Seam	Mineral	Coal Authority reference	Depth (m)	Direction to working	Dipping rate of seam worked (degrees)	Dipped direction of seam worked	Extraction thickness (cm)	Year last mined
CROOKHALL	BROCKWEL L	Coal	5UME	27	Beneath Property	1.5	East	63	1923
CROOKHALL	BROCKWEL L	Coal	5UMK	27	Beneath Property	1.5	East	63	1923
CROOKHALL	BROCKWEL L	Coal	5UMJ	27	Beneath Property	1.5	East	63	1922
CROOKHALL	BROCKWEL L	Coal	5UMT	28	Beneath Property	1.5	East	63	1924
CROOKHALL	BROCKWEL L	Coal	5UMP	28	South-West	1.5	East	63	1924
CROOKHALL	BROCKWEL L	Coal	5UMN	29	Beneath Property	1.5	East	63	1924
CROOKHALL	BROCKWEL L	Coal	5UMO	29	South-West	1.5	East	63	1924

Probable unrecorded shallow workings

None.

Spine roadways at shallow depth

No spine roadway recorded at shallow depth.

Mine entries

Entry type	Reference	Grid reference	Treatment description	Mineral	Conveyancing details
Adit	410549-004	410425 549855		Coal	
Shaft	410549-005	410427 549840	Reported as filled to an unknown specification in 1959.	Coal	
Adit	410549-006	410398 549825		Coal	
Adit	410549-007	410519 549788		Coal	

Abandoned mine plan catalogue numbers

The following abandoned mine plan catalogue numbers intersect with some, or all, of the enquiry boundary:

D123	D1593	0
D999	D718	

Please contact us on 0345 762 6848 to determine the exact abandoned mine plans you require based on your needs.

Outcrops

Seam name	Mineral	Seam workable	Distance to outcrop (m)	Direction to outcrop	Bearing of outcrop
BUSTY	Coal	Yes	Within	N/A	294

Geological faults, fissures and breaklines

No faults, fissures or breaklines recorded.

Opencast mines

Please refer to the "Summary of findings" map (on separate sheet) for details of any opencast areas within 500 metres of the enquiry boundary.

Coal Authority managed tips

None recorded within 500 metres of the enquiry boundary.

Section 2 – Investigative or remedial activity

Please refer to the 'Summary of findings' map (on separate sheet) for details of any activity within the area of the site boundary.

Site investigations

None recorded within 50 metres of the enquiry boundary.

Remediated sites

None recorded within 50 metres of the enquiry boundary.

Coal mining subsidence

The Coal Authority has not received a damage notice or claim for the subject property, or any property within 50 metres of the enquiry boundary, since 31 October 1994.

There is no current Stop Notice delaying the start of remedial works or repairs to the property.

The Coal Authority is not aware of any request having been made to carry out preventive works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991.

Mine gas

None recorded within 500 metres of the enquiry boundary.

Mine water treatment schemes

None recorded within 500 metres of the enquiry boundary.

Section 3 – Licensing and future mining activity

Future underground mining

None recorded.

Coal mining licensing

None recorded within 200 metres of the enquiry boundary.

Court orders

None recorded.

Section 46 notices

No notices have been given, under section 46 of the Coal Mining Subsidence Act 1991, stating that the land is at risk of subsidence.

Withdrawal of support notices

The property is in an area where a notice to withdraw support was given in 1946.

The property is not in an area where a notice has been given under section 41 of the Coal Industry Act 1994, cancelling the entitlement to withdraw support.

Payments to owners of former copyhold land

The property is not in an area where a relevant notice has been published under the Coal Industry Act 1975/Coal Industry Act 1994.

Section 4 – Further information

The following potential risks have been identified and as part of your risk assessment should be investigated further.

Development advice

The site is within an area of historical coal mining activity. Should you require advice and/or support on understanding the mining legacy, its risks to your development or what next steps you need to take, please contact us.

For further information on specific site or ground investigations in relation to any issues raised in Section 4, please call us on 0345 762 6848 or email us at groundstability@coal.gov.uk.

Section 5 – Data definitions

The datasets used in this report have limitations and assumptions within their results. For more guidance on the data and the results specific to the enquiry boundary, please **call us on 0345 762 6848** or **email us at groundstability@coal.gov.uk**.

Past underground coal mining

Details of all recorded underground mining relative to the enquiry boundary. Only past underground workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination, will be included.

Probable unrecorded shallow workings

Areas where the Coal Authority believes there to be unrecorded coal workings that exist at or close to the surface (less than 30 metres deep).

Spine roadways at shallow depth

Connecting roadways either, working to working, or, surface to working, both in-seam and cross measures that exist at or close to the surface (less than 30 metres deep), either within or within 10 metres of the enquiry boundary.

Mine entries

Details of any shaft or adit either within, or within 100 metres of the enquiry boundary including approximate location, brief treatment details where known, the mineral worked from the mine entry and conveyance details where the mine entry has previously been sold by the Authority or its predecessors British Coal or the National Coal Board.

Abandoned mine plan catalogue numbers

Plan numbers extracted from the abandoned mines catalogue containing details of coal and other mineral abandonment plans deposited via the Mines Inspectorate in accordance with the Coal Mines Regulation Act and Metalliferous Mines Regulation Act 1872. A maximum of 9 plan extents that intersect with the enquiry boundary will be included. This does not infer that the workings and/or mine entries shown on the abandonment plan will be relevant to the site/property boundary.

Outcrops

Details of seam outcrops will be included where the enquiry boundary intersects with a conjectured or actual seam outcrop location (derived by either the British Geological Survey or the Coal Authority) or intersects with a defined 50 metres buffer on the coal (dip) side of the outcrop. An indication of whether the Coal Authority believes the seam to be of sufficient thickness and/or quality to have been worked will also be included.

Geological faults, fissures and breaklines

Geological disturbances or fractures in the bedrock. Surface fault lines (British Geological Survey derived data) and fissures and breaklines (Coal Authority derived data) intersecting with the enquiry boundary will be included. In some circumstances faults, fissures or breaklines have been known to contribute to surface subsidence damage as a consequence of underground coal mining.

Opencast mines

Opencast coal sites from which coal has been removed in the past by opencast (surface) methods and where the enquiry boundary is within 500 metres of either the licence area, site boundary, excavation area (high wall) or coaling area.

Coal Authority managed tips

Locations of disused colliery tip sites owned and managed by the Coal Authority, located within 500 metres of the enquiry boundary.

Site investigations

Details of site investigations within 50 metres of the enquiry boundary where the Coal Authority has received information relating to coal mining risk investigation and/or remediation by third parties.

Remediated sites

Sites where the Coal Authority has undertaken remedial works either within or within 50 metres of the enquiry boundary following report of a hazard relating to coal mining under the Coal Authority's Emergency Surface Hazard Call Out procedures.

Coal mining subsidence

Details of alleged coal mining subsidence claims made since 31 October 1994 either within or within 50 metres of the enquiry boundary. Where the claim relates to the enquiry boundary confirmation of whether the claim was accepted, rejected or whether liability is still being determined will be given. Where the claim has been discharged, whether this was by repair, payment of compensation or a combination of both, the value of the claim, where known, will also be given.

Details of any current 'Stop Notice' deferring remedial works or repairs affecting the property/site, and if so the date of the notice.

Details of any request made to execute preventative works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991. If yes, whether any person withheld consent or failed to comply with any request to execute preventative works.

Mine gas

Reports of alleged mine gas emissions received by the Coal Authority, either within or within 500 metres of the enquiry boundary that subsequently required investigation and action by the Coal Authority to mitigate the effects of the mine gas emission.

Mine water treatment schemes

Locations where the Coal Authority has constructed or operates assets that remove pollutants from mine water prior to the treated mine water being discharged into the receiving water body.

These schemes are part of the UK's strategy to meet the requirements of the Water Framework Directive. Schemes fall into 2 basic categories: Remedial – mitigating the impact of existing pollution or Preventative – preventing a future pollution incident.

Mine water treatment schemes generally consist of one or more primary settlement lagoons and one or more reed beds for secondary treatment. A small number are more specialised process treatment plants.

Future underground mining

Details of all planned underground mining relative to the enquiry boundary. Only those future workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination will be included.

Coal mining licensing

Details of all licenses issued by the Coal Authority either within or within 200 metres of the enquiry boundary in relation to the under taking of surface coal mining, underground coal mining or underground coal gasification.

Court orders

Orders in respect of the working of coal under the Mines (Working Facilities and Support) Acts of 1923 and 1966 or any statutory modification or amendment thereof.

Section 46 notices

Notice of proposals relating to underground coal mining operations that have been given under section 46 of the Coal Mining Subsidence Act 1991.

Withdrawal of support notices

Published notices of entitlement to withdraw support and the date of the notice. Details of any revocation notice withdrawing the entitlement to withdraw support given under Section 41 of the Coal Industry Act 1994.

Payment to owners of former copyhold land

Relevant notices which may affect the property and any subsequent notice of retained interests in coal and coal mines, acceptance or rejection notices and whether any compensation has been paid to a claimant.






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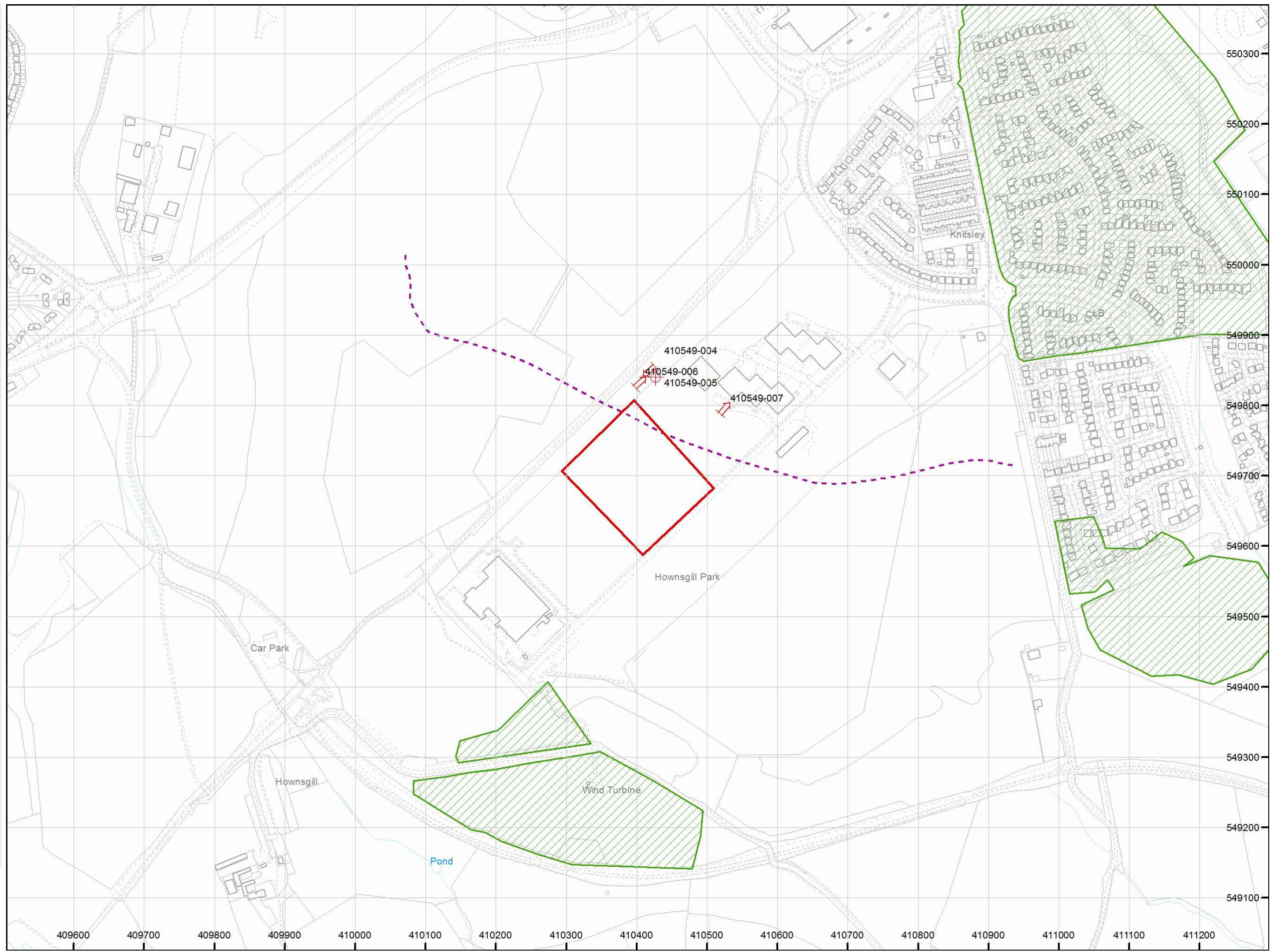
VAT receipt

Issued by	The Coal Authority 200 Lichfield Lane Mansfield Nottinghamshire NG18 4RG
Tax point date	10 July 2020
Issued to	SHADBOLT ENVIRONMENTAL 18 BEWICK ROAD GATESHEAD TYNE AND WEAR NE8 4DP
Property search for	PROPOSED EFW FACILITY HOWNSGILL INDUSTRIAL ESTATE CONSETT DURHAM
Reference number	51002289111001
Date of issue	10 July 2020
Cost	£112.13
VAT @ 20%	£22.43
Total received	£134.56
VAT registration	598 5850 68

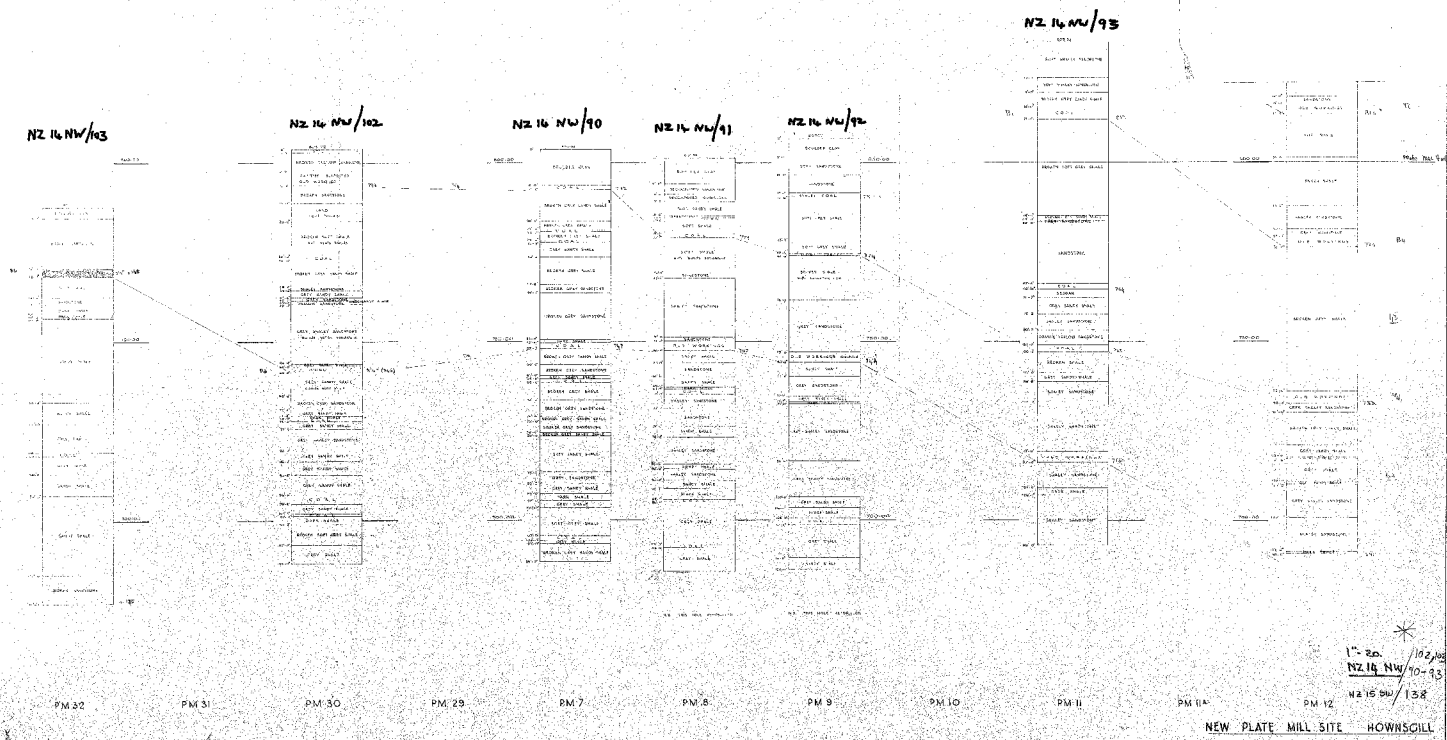
The map highlights any specific surface or subsurface features within or near to the boundary of the site.

Key

- Approximate position of the enquiry boundary shown 
- Disused mine shaft 
- Disused adit 
- Outcrop (Conjectured) 
- Unlicensed opencast site 



How to contact us
 0345 762 6848 (UK)
 +44 (0)1623 637 000 (International)
www.groundstability.com



1" = 20'
 NZ 14 NW / 102-93
 NZ 14 NW / 90-93
 NEW PLATE MILL SITE HOWNSGILL
 DETAILS OF BOREHOLES

THE CONSETT IRON CO. LTD.
 CO. DURHAM

VERTICAL SCALE 10 FEET TO INCH

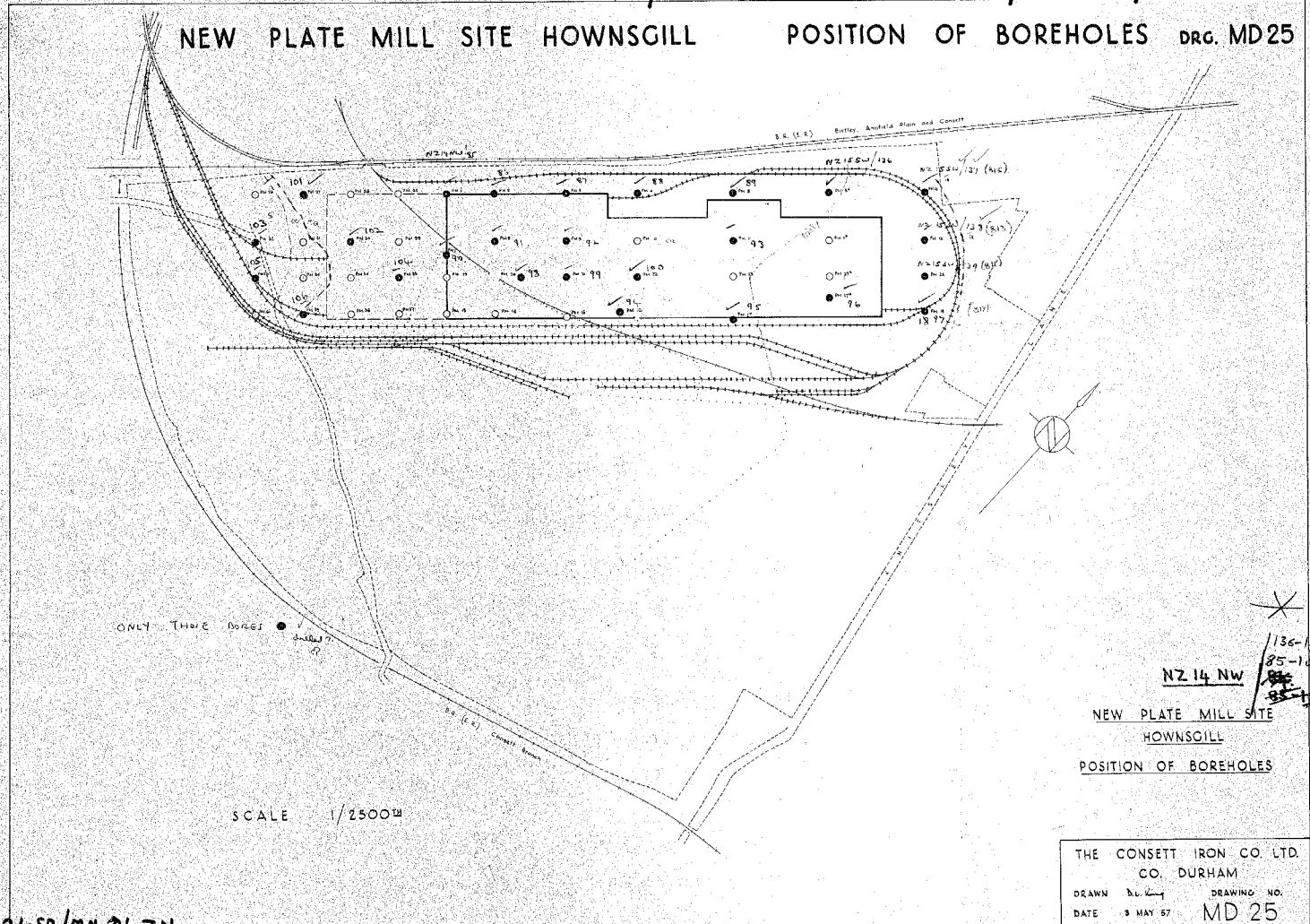


NZ 14 NW / 85 - 106

NZ 15 SW / 136 - 139

NEW PLATE MILL SITE HOWNSGILL

POSITION OF BOREHOLES DRG. MD25



ONLY THESE BORES

SCALE 1/2500²³

✕
 136-139
 85-106
 NZ 14 NW
 85-106
 136-139

NEW PLATE MILL SITE
 HOWNSGILL
 POSITION OF BOREHOLES

THE CONSETT IRON CO. LTD.	
CO. DURHAM	
DRAWN BY <i>[Signature]</i>	DRAWING NO.
DATE 9 MAY 57	MD 25

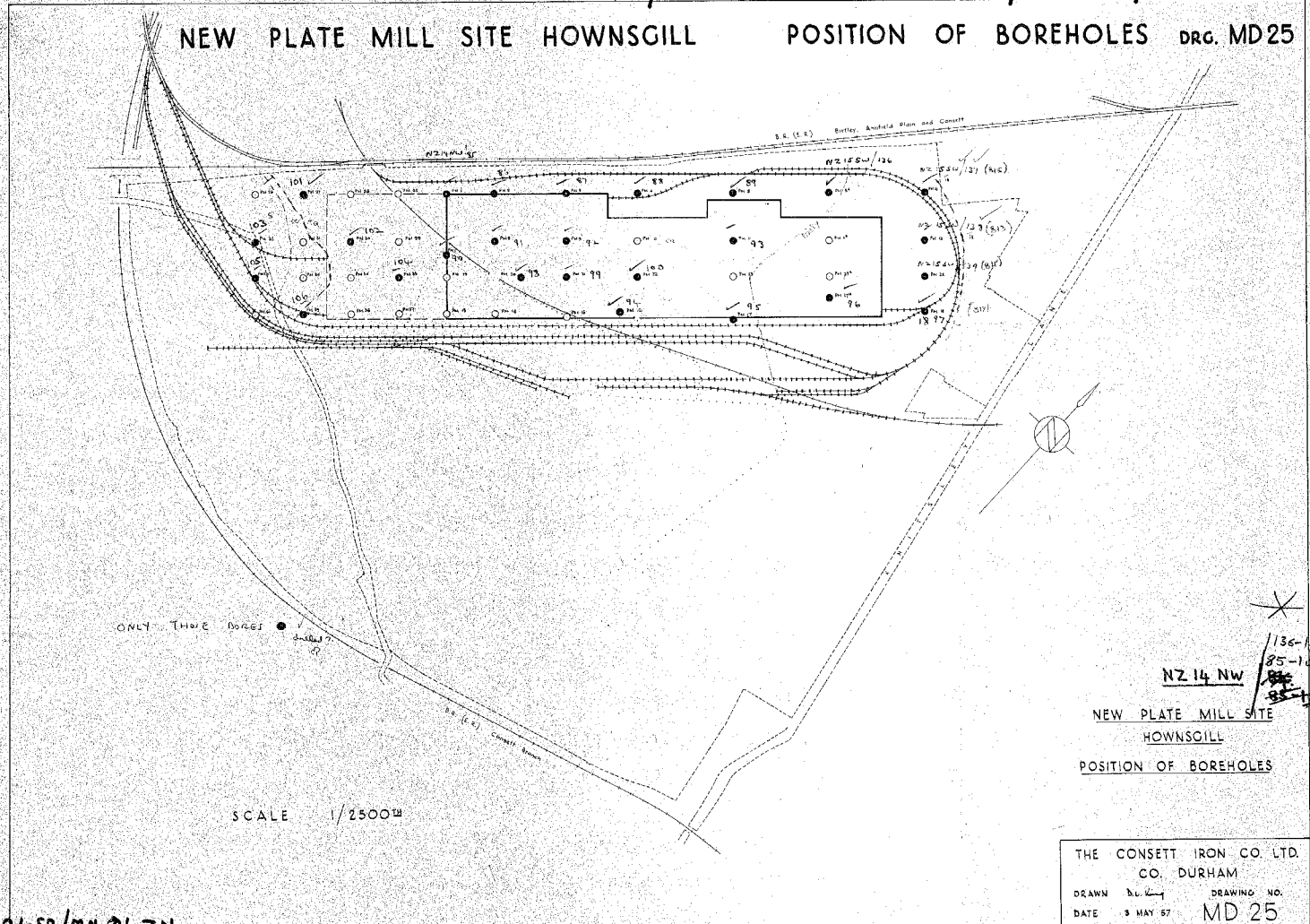
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NEW PLATE MILL SITE HOWNSGILL

POSITION OF BOREHOLES DRG. MD25

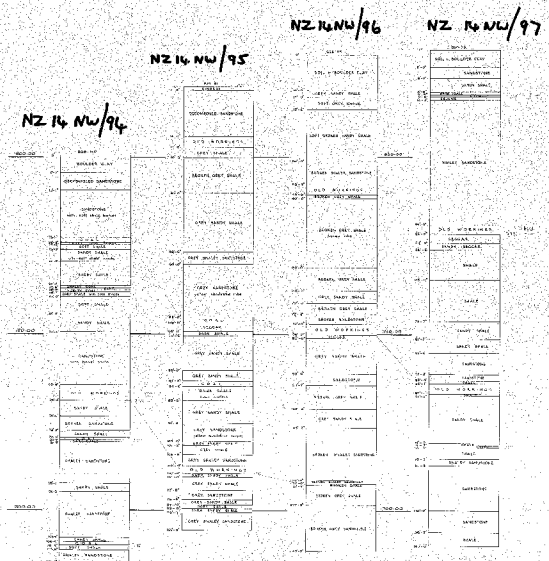
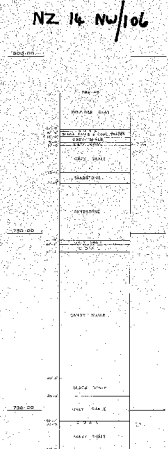


NZ 14 NW / 85-106
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NEW PLATE MILL SITE
 HOWNSGILL
 POSITION OF BOREHOLES

THE CONSETT IRON CO. LTD.
 CO. DURHAM
 DRAWN BY [signature]
 DATE 9 MAY 57
 DRAWING NO. MD 25

901-58/MN 71 ZN



PM 40 PM 39 PM 38 PM 37 PM 13 PM 14 PM 15 PM 16 PM 17 PM 17A PM 18



1" = 20'
 NZ14 NW/94-97
 106

NEW PLATE MILL SITE HOWNSGILL
 DETAILS OF BOREHOLES

VERTICAL SCALE 0 FEET TO 1 INCH

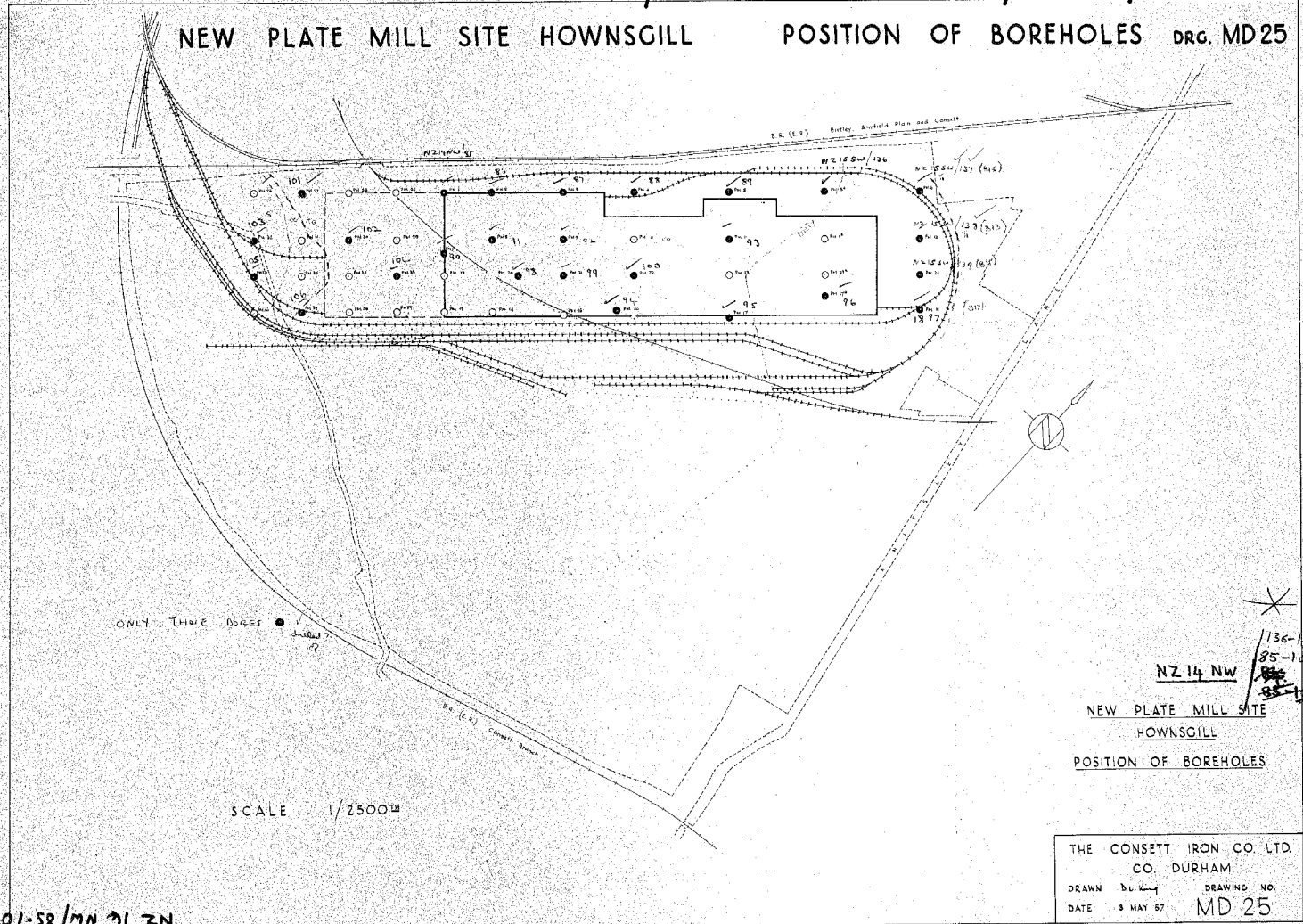
THE GONSETT ROM CO. LTD.
 CO. DURHAM
 DRAWN BY: J. G. G.
 CHECKED BY: J. G. G.
 DATE: 1. 10. 67
 DRAWING NO. MD 29

NZ 14 NW / 85 - 106

NZ 15 SW / 136 - 139

NEW PLATE MILL SITE HOWNSGILL

POSITION OF BOREHOLES DRG. MD25



ONLY THESE BORES

SCALE 1/2500TH

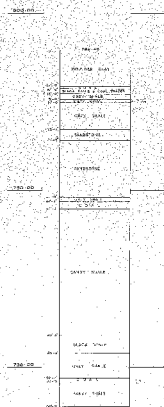
NZ 14 NW
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NEW PLATE MILL SITE
 HOWNSGILL
 POSITION OF BOREHOLES

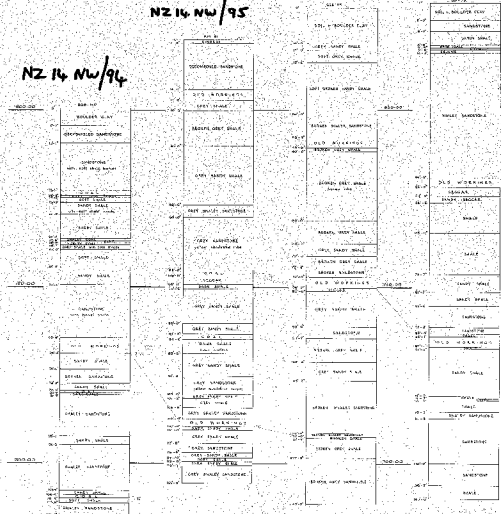
THE CONSETT IRON CO. LTD.
 CO. DURHAM
 DRAWN BY B. J. 2 DRAWING NO.
 DATE 3 MAY 57 MD 25

901-58/MN 71 ZN

NZ 14 NW/106



NZ 14 NW/94



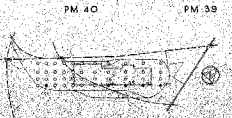
READS "PM LEVEL" (I.E. PLATE MILL LEVEL)

1" = 20'
NZ14 NW/94-97
106

NEW PLATE MILL SITE HOWNSGILL
DETAILS OF BOREHOLES

THE GONSETT ROM CO. LTD.
CO. DURHAM
DRAWN BY S. G. G.
DATE 1.10.57
EXHIBIT NO.
MD 29

VERTICAL SCALE 0 FEET TO 100



PM 40

PM 39

PM 38

PM 37

PM 36

PM 35

PM 34

PM 33

PM 32

PM 31

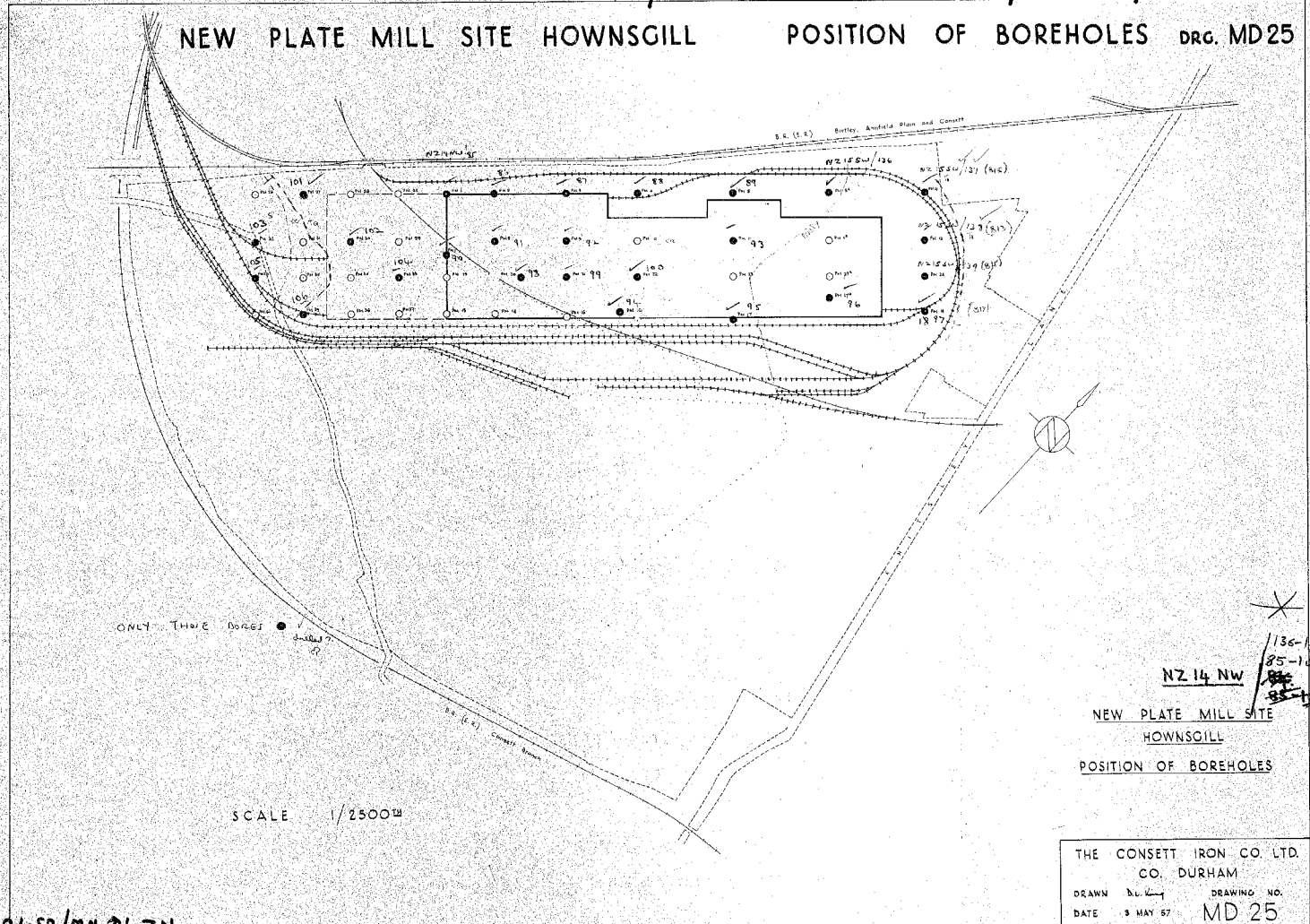
PM 30

NZ 14 NW / 85 - 106

NZ 15 SW / 136 - 139

NEW PLATE MILL SITE HOWNSGILL

POSITION OF BOREHOLES DRG. MD25

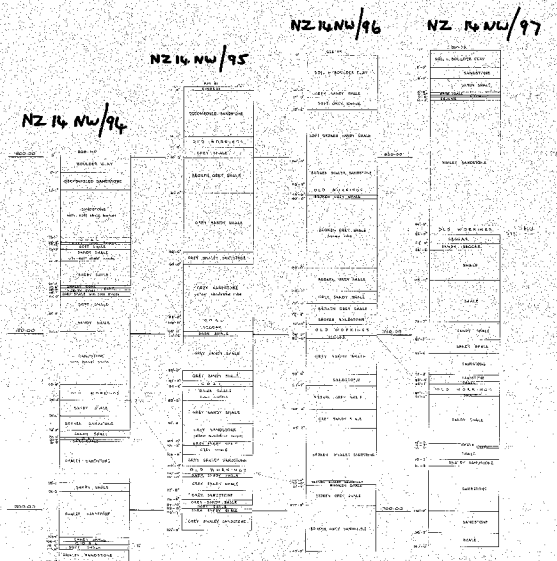
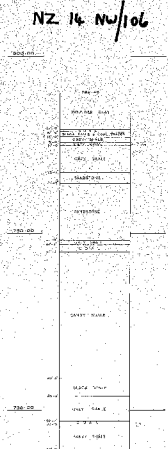


~~NZ 14 NW / 85-106~~
 NZ 14 NW / 136-139

NEW PLATE MILL SITE
 HOWNSGILL
 POSITION OF BOREHOLES

THE CONSETT IRON CO. LTD.
 CO. DURHAM
 DRAWN BY [Signature]
 DATE 3 MAY 57
 DRAWING NO. MD 25

901-58/MN 71 ZN



1" = 20'
 NZ14 NW/94-97
 106

PM 40 PM 39 PM 38 PM 37 PM 13 PM 14 PM 15 PM 16 PM 17 PM 17A PM 18



NEW PLATE MILL SITE HOWNSGILL
 DETAILS OF BOREHOLES

VERTICAL SCALE 0 FEET TO 1 INCH

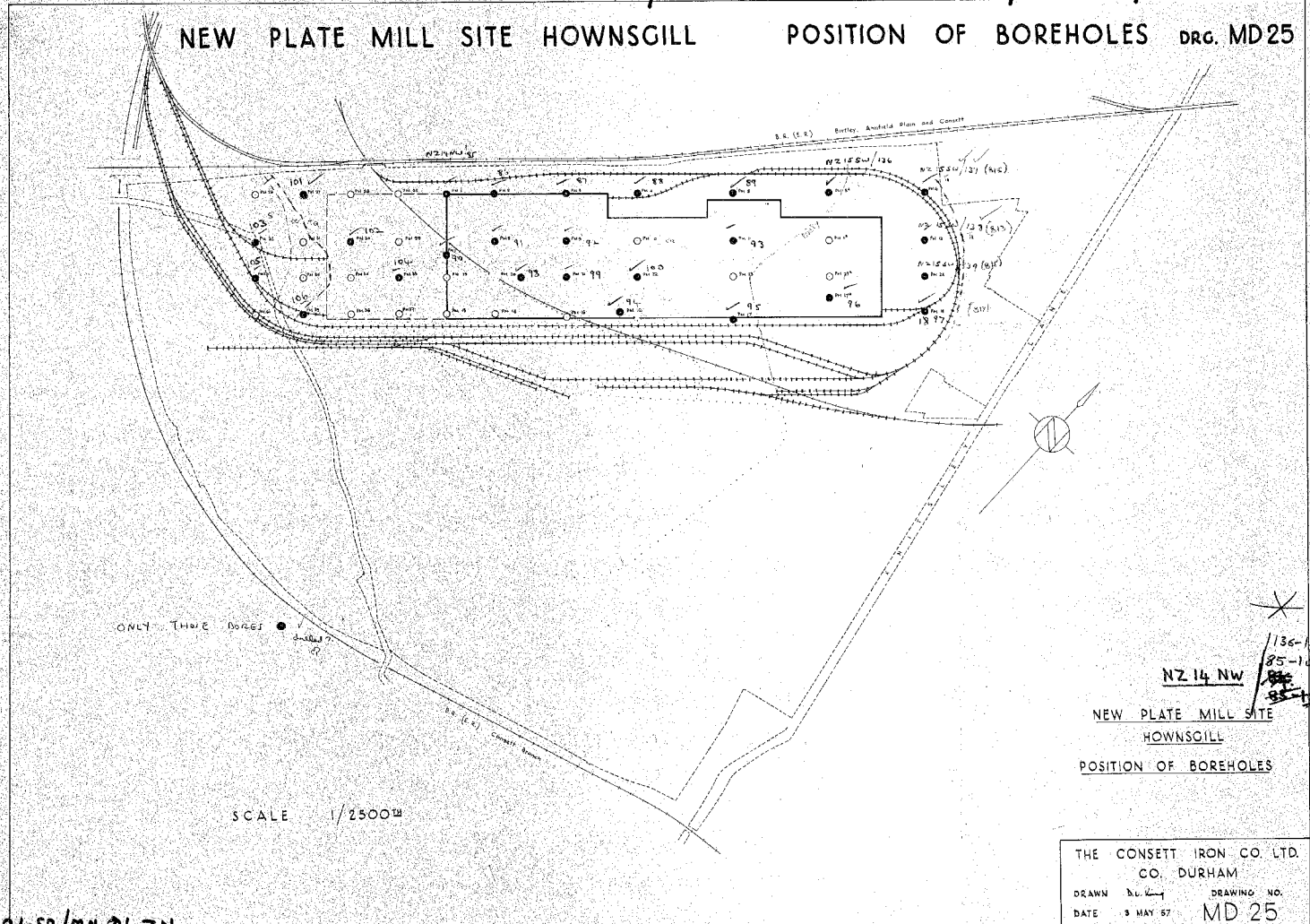
THE GONSETT ROM CO. LTD.
 CO. DURHAM
 DRAWN BY S. G. S.
 CHECKED BY S. G. S.
 DATE 1.10.66
 DRAWING NO. MD 29

NZ 14 NW / 85 - 106

NZ 15 SW / 136 - 139

NEW PLATE MILL SITE HOWNSGILL

POSITION OF BOREHOLES DRG. MD25



ONLY THOSE BORES

SCALE 1/2500

NZ 14 NW / 136-139
 85-106
~~85-106~~

NEW PLATE MILL SITE
 HOWNSGILL
 POSITION OF BOREHOLES

THE CONSETT IRON CO. LTD.
 CO. DURHAM
 DRAWN BY [Signature]
 DATE 9 MAY 57
 DRAWING NO. MD 25

901-58/MN 71 ZN

NZ 15 SW/139

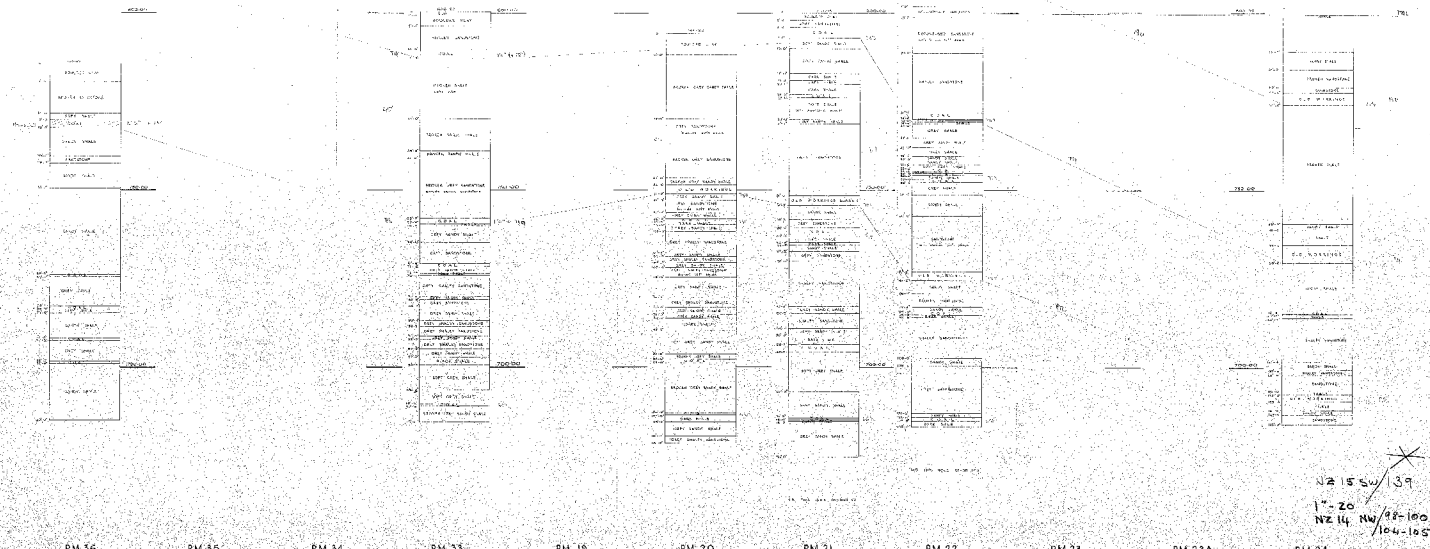
NZ 14 NW/105

NZ 14 NW/104

NZ 14 NW/98

NZ 14 NW/99

NZ 14 NW/100



NZ 15 SW/139
 1" = 20'
 NZ 14 NW/98-100
 NZ 14 NW/104-105



NEW PLATE MILL SITE HOWNSGILL
 DETAILS OF BOREHOLES

THE CONSETT IRON CO. LTD.
 CO. DURHAM

VERTICAL SCALE 10 FEET TO 1 INCH

N2 14NW / 154

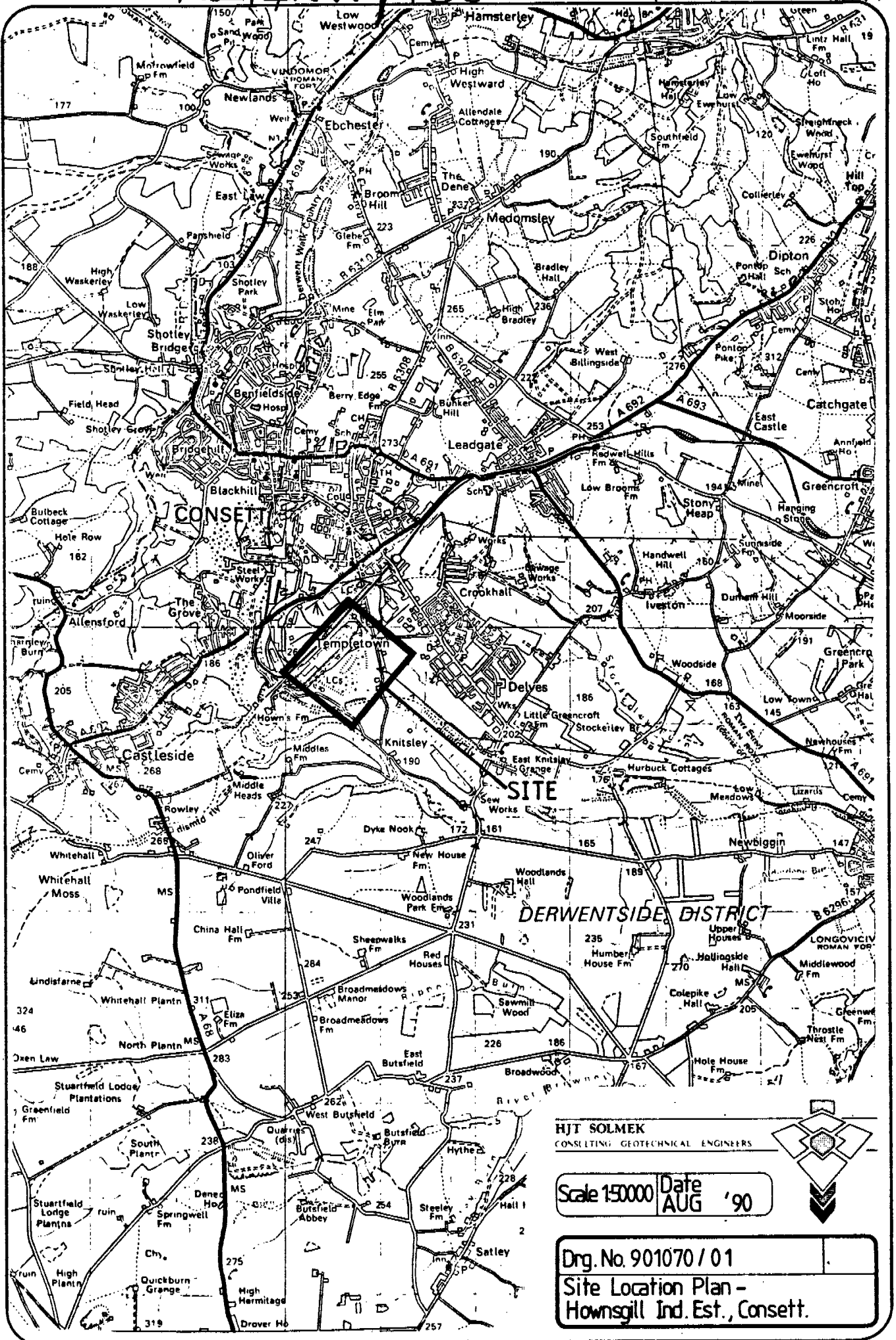
(see N21049)

HJT SOLMEK					Sheet of 1 1	Borehole No. RH 3	
Boring Method ROTARY OPEN HOLE VERTICAL AT 100mm DIAMETER					Site HOWNSGILL INDUSTRIAL ESTATE		
Drilling Commenced 27.4.90			Ground Level 243.80m A.O.D.				
Scale	Samples/Tests		Standing Water Level (m)	Reduced Level (m)	Description of Strata	Depth (m)	Legend
	Sample Type	In situ Test					
2.0					Concrete		
4.0							
6.0				238.80		5.00	
8.0					Shale		
10.0							
12.0				232.80 232.60	Coal/shaley coal (0.20m)	11.00 11.20	
					Shale		
14.0				230.80 230.60	Coal/shaley coal (0.20m)	13.00 13.20	
16.0					Shale		
18.0				226.80		17.00	
					White Sandstone		
20.0					Hole Terminated	20.00	

Remarks No groundwater encountered during drilling.

See sheets A & B for key to symbols

N214NW/138 - 171 (see N21049)

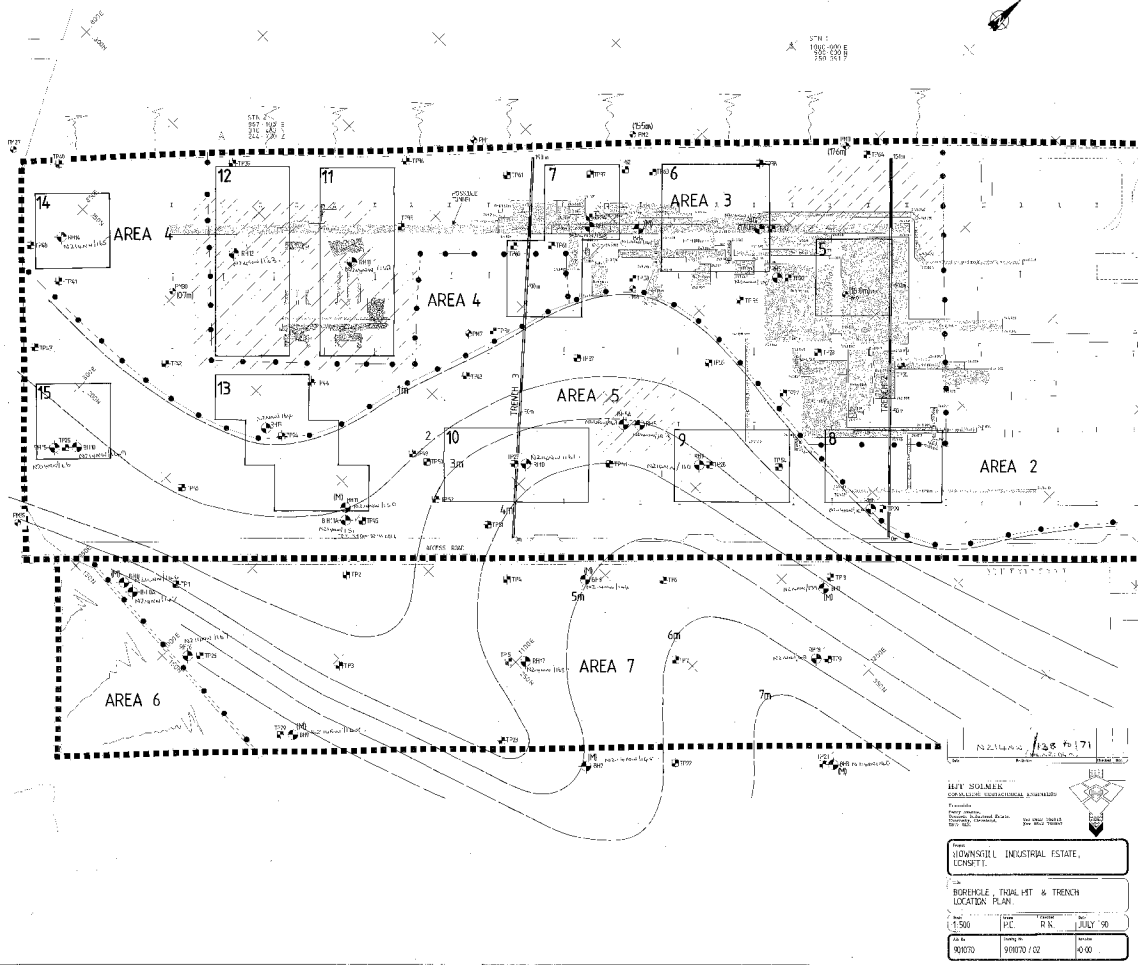


HJT SOLMEK
CONSULTING GEOTECHNICAL ENGINEERS















Scale 1:50000 Date AUG '90

Drng. No. 901070 / 01
Site Location Plan -
Hownsgill Ind. Est., Consett.

C.D.S Ltd. 3438

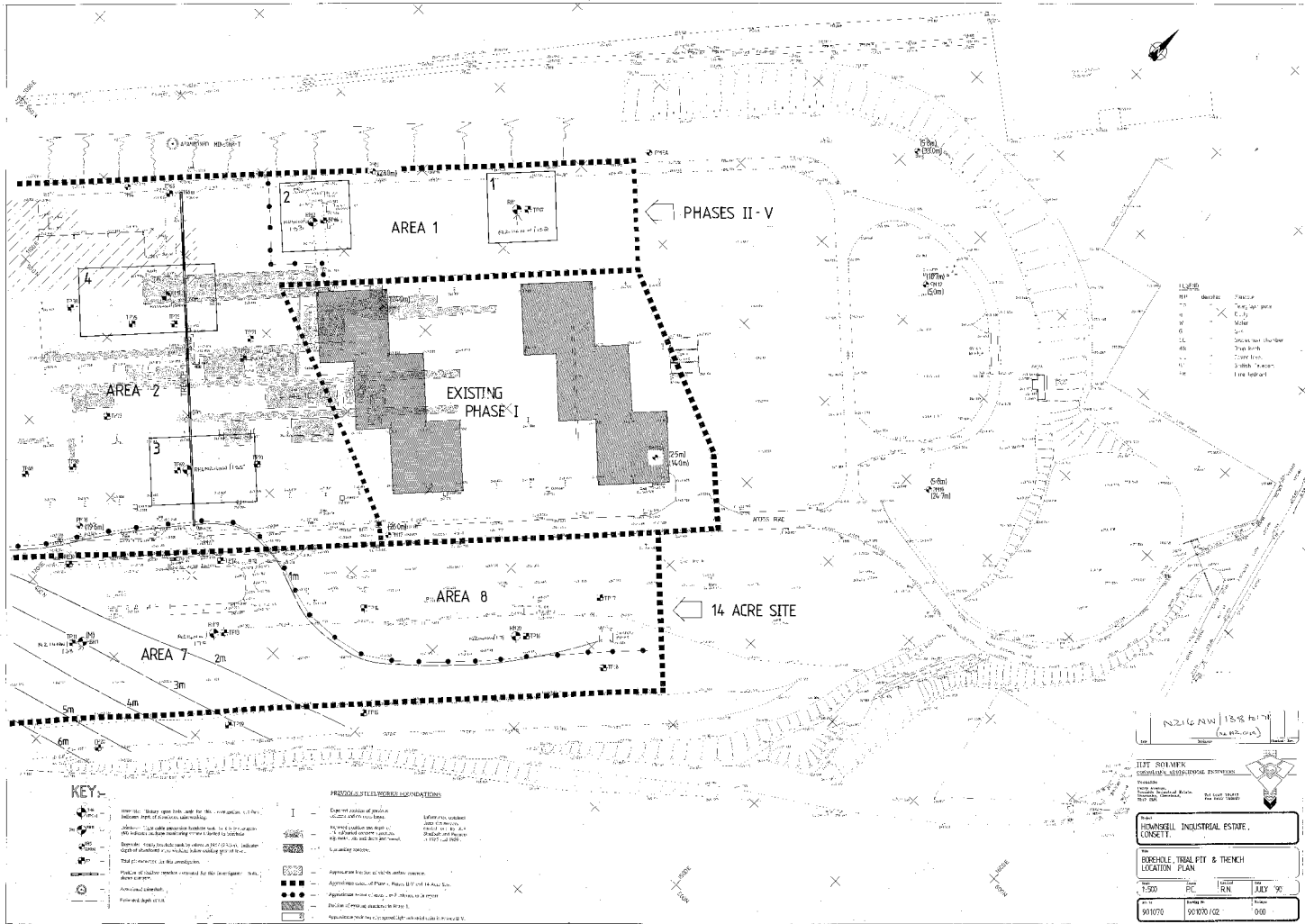


KEY-

-  Borehole - Shows the location of the borehole and the depth of the borehole.
-  Trench - Shows the location and depth of the trench.
-  Proposed trench - Shows the location of a proposed trench.
-  Proposed borehole - Shows the location of a proposed borehole.
-  Proposed trench and borehole - Shows the location of a proposed trench and borehole.
-  Proposed trench and borehole with depth - Shows the location of a proposed trench and borehole with depth.
-  Proposed trench and borehole with depth and diameter - Shows the location of a proposed trench and borehole with depth and diameter.
-  Proposed trench and borehole with depth, diameter and length - Shows the location of a proposed trench and borehole with depth, diameter and length.
-  Proposed trench and borehole with depth, diameter, length and diameter - Shows the location of a proposed trench and borehole with depth, diameter, length and diameter.
-  Proposed trench and borehole with depth, diameter, length, diameter and length - Shows the location of a proposed trench and borehole with depth, diameter, length, diameter and length.
-  Proposed trench and borehole with depth, diameter, length, diameter and length - Shows the location of a proposed trench and borehole with depth, diameter, length, diameter and length.
-  Proposed trench and borehole with depth, diameter, length, diameter and length - Shows the location of a proposed trench and borehole with depth, diameter, length, diameter and length.
-  Proposed trench and borehole with depth, diameter, length, diameter and length - Shows the location of a proposed trench and borehole with depth, diameter, length, diameter and length.
-  Proposed trench and borehole with depth, diameter, length, diameter and length - Shows the location of a proposed trench and borehole with depth, diameter, length, diameter and length.

REF: 100/100/100
 BORNEOLE TRENCH LOCATOR PLAN
 SCALE: 1:500
 DATE: JULY 90
 DRAWN BY: J. R. H.
 CHECKED BY: J. R. H.
 APPROVED BY: J. R. H.

TOWNSHILL INDUSTRIAL ESTATE, COVENTRY
BORNEOLE TRENCH & TRENCH LOCATOR PLAN
 SCALE: 1:500
 DATE: JULY 90
 DRAWN BY: J. R. H.
 CHECKED BY: J. R. H.
 APPROVED BY: J. R. H.



NZ14NW
 1:500
 1898
 1979

SITE SYMBOLS
 (continued) - SEE PREVIOUS DRAWINGS

BORSHELL INDUSTRIAL ESTATE, LODGE 11

BORSHELL TRAIL PTY & THEMCH LOCATION PLAN

1:500 PC RN JULY '90

901070 901070/02 000

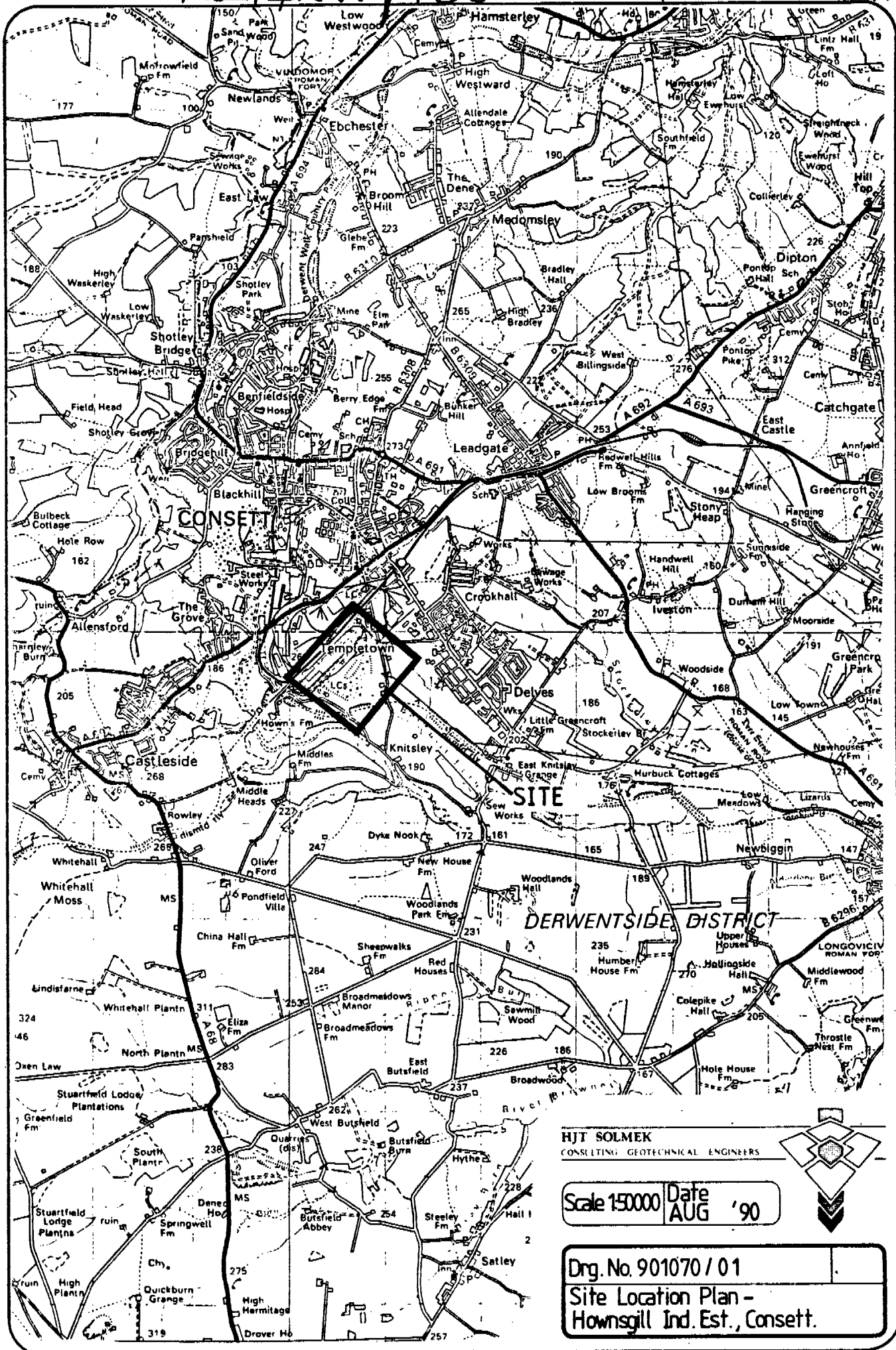
N2 14NW / 155 N210523 49736
 (see N21049)

HJT SOLMEK					Sheet of 1	Borehole No. RH4	
Boring Method ROTARY OPEN HOLE VERTICAL AT 100mm DIAMETER					Site HOWNSGILL INDUSTRIAL ESTATE		
Drilling Commenced 26.4.90			Ground Level 244.00m A.O.D.				
Scale	Samples/Tests		Standing Water Level (m)	Reduced Level (m)	Description of Strata	Depth (m)	Legend
	Sample Type	In situ Test					
2.0				243.50	MADE GROUND	0.50	
				242.70	Gravelly sandy Clay	1.30	
4.0					Hard Sandstone with softer bands of shale		
6.0							
8.0							
10.0							
12.0				234.10		9.90	
				233.50	Coal (0.60m)	10.50	
				233.00	Grey Shale	11.00	
14.0					White sandy shale		
				231.00		13.00	
16.0					Grey Shale		
				227.00		17.00	
18.0					Hole Terminated		
20.0							

Remarks No groundwater encountered.

See sheets A & B for key to symbols

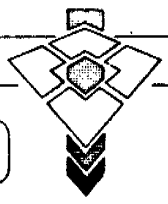
N214NW/138 - 171 (see N21049)



HJT SOLMEK
CONSULTING GEOTECHNICAL ENGINEERS

Scale 1:50000 Date AUG '90

Drng. No. 901070 / 01
Site Location Plan -
Hownsgill Ind. Est., Consett.



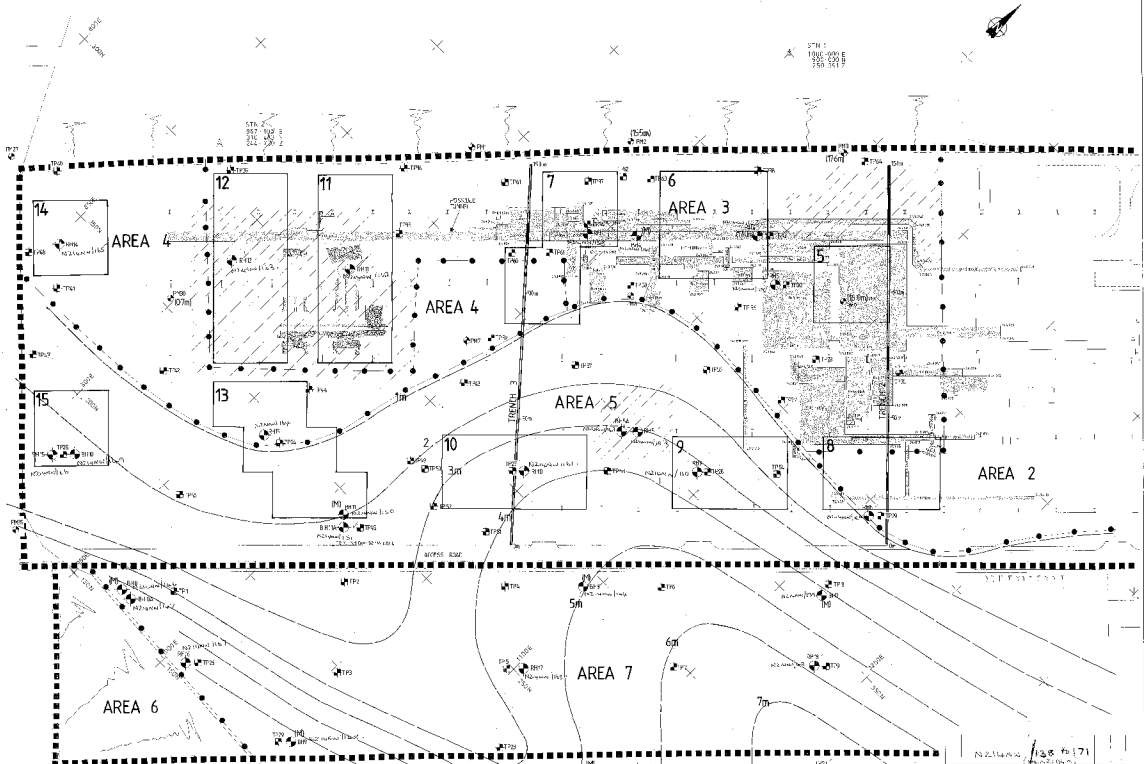
C.D.S Ltd. 3438



British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

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[N214NW BJ 155.]



KEY-

Boundary - shown with the 'X's for the boundary, if 20m or less, the 'X's are spaced every 20m.
 Fence - shown with the 'X's for the fence, if 20m or less, the 'X's are spaced every 20m.
 Road - shown with the 'X's for the road, if 20m or less, the 'X's are spaced every 20m.
 Ditch - shown with the 'X's for the ditch, if 20m or less, the 'X's are spaced every 20m.
 Stream - shown with the 'X's for the stream, if 20m or less, the 'X's are spaced every 20m.
 Boundary - shown with the 'X's for the boundary, if 20m or less, the 'X's are spaced every 20m.

PERMANENT STRUCTURES FOUNDATIONS

Foundation - shown with the 'X's for the foundation, if 20m or less, the 'X's are spaced every 20m.
 Foundation - shown with the 'X's for the foundation, if 20m or less, the 'X's are spaced every 20m.
 Foundation - shown with the 'X's for the foundation, if 20m or less, the 'X's are spaced every 20m.

NS 2115 1/2
 1:8 R. 1/1

BEEF SOLUTIONS
 CONSULTING ENGINEERS
 1000
 1000
 1000

YOUNGHEIL INDUSTRIAL ESTATE, CORSTI.
 BOREHOLE, TRENCH & TRENCH LOCATOR PLAN
 Scale: 1:500
 Date: JULY '90
 No. 90070 / 02 6000

NZ 14NW / 170

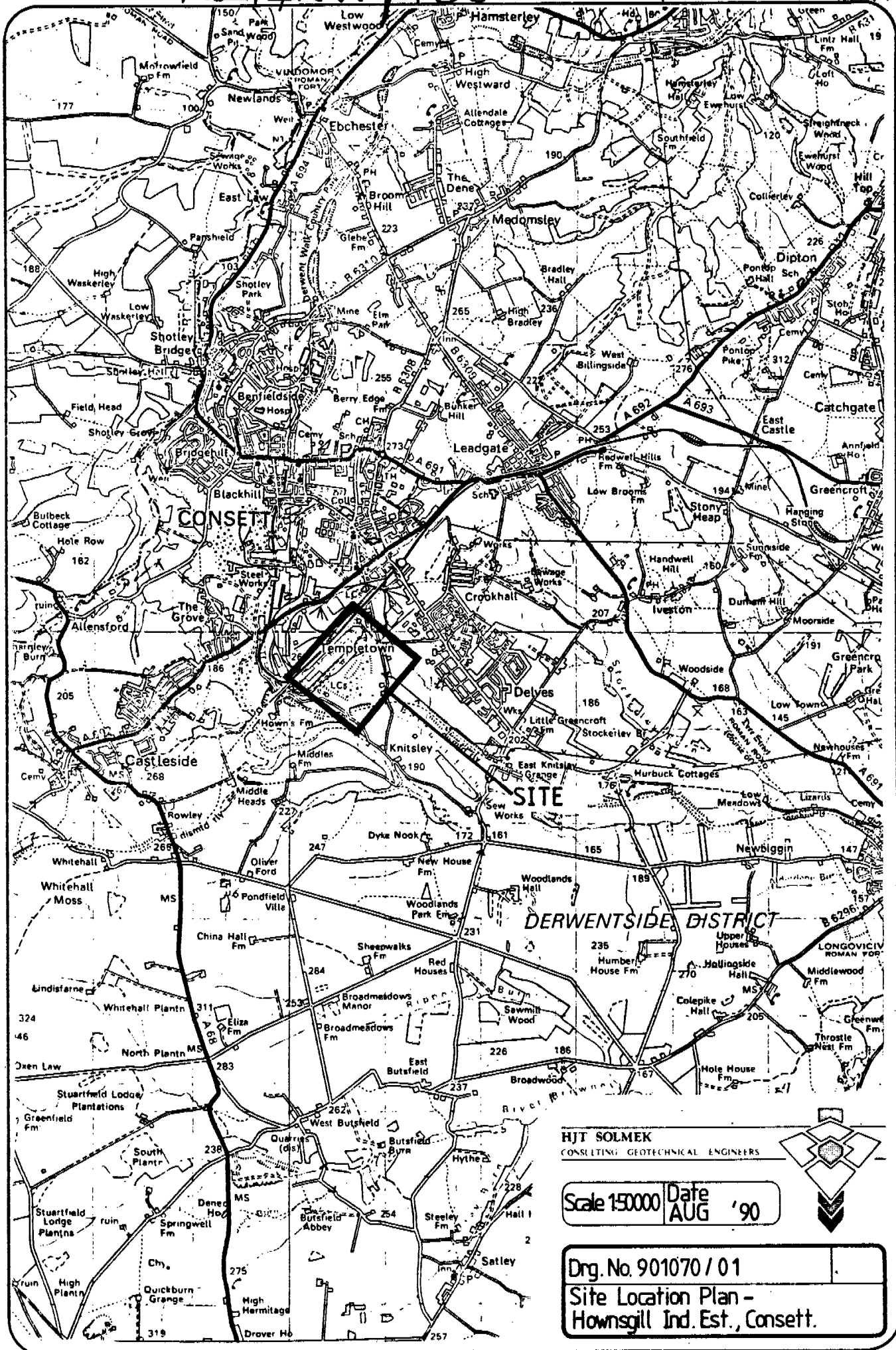
(see N21049)

HJT SOLMEK					Sheet of 1	Borehole No. RH19	
Boring Method ROTARY OPEN HOLE VERTICAL AT 100mm DIAMETER					Site HOWNSGILL INDUSTRIAL ESTATE		
Drilling Commenced 28.4.90			Ground Level 243.97m A.O.D.				
Scale	Samples/Tests		Standing Water Level (m)	Reduced Level (m)	Description of Strata	Depth (m)	Legend
	Sample Type	In situ Test					
0.0					Made Ground	0.00	
2.0				242.39		1.60	
				241.57	Gravelly Clay	2.40	
4.0							
6.0					Sandstone		
8.0					(becomes harder from about 8.00m)		
10.0							
12.0				232.47		11.50	
				231.67	Coal (0.80m)	12.30	
14.0					Dark Shale		
16.0				228.47		15.50	
				227.77	Shale with two bands of shaley coal From 15.50m to 15.75m and from 16.00m to 16.20m	16.00	
18.0					Shale		
20.0					Hole Terminated	20.00	

Remarks No groundwater encountered during drilling.

See sheets A & B for key to symbols

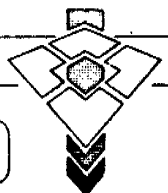
N214NW/138 - 171 (see N21049)



HJT SOLMEK
CONSULTING GEOTECHNICAL ENGINEERS

Scale 1:50000 Date AUG '90

Drng. No. 901070 / 01
Site Location Plan -
Hownsgill Ind. Est., Consett.



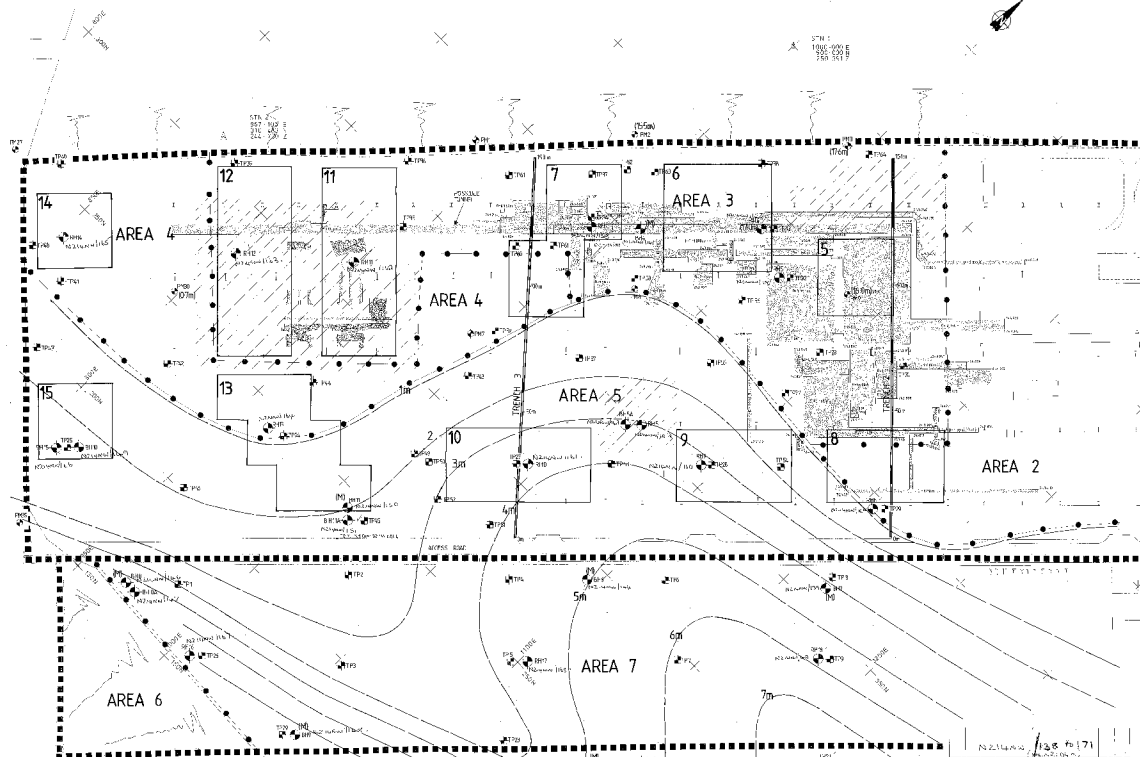
C.D.S Ltd. 3438



British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

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[N214NW BJ 170.]



KEY-

- Borehole - depth given, but not for this investigation. If depth is not given, it is assumed to be 100m.
 - Trial Pit - depth given, but not for this investigation. If depth is not given, it is assumed to be 100m.
 - Trench - depth given, but not for this investigation. If depth is not given, it is assumed to be 100m.
 - Abandoned borehole - shown as a circle with a cross.
 - Borehole in situ - shown as a circle with a dot.
- PROPOSED STEELWORKS FOUNDATIONS**
- Proposed column or pile - shown as a square with a dot.
 - Proposed wall or foundation - shown as a rectangle with a dot.
 - Proposed slab or base - shown as a rectangle with a dot.
 - Proposed trench or pit - shown as a rectangle with a dot.
- AGREEMENTS**
- Agreement of borehole location - shown as a circle with a dot.
 - Agreement of trial pit or trench location - shown as a circle with a dot.
 - Agreement of foundation location - shown as a circle with a dot.
 - Agreement of trench or pit location - shown as a circle with a dot.

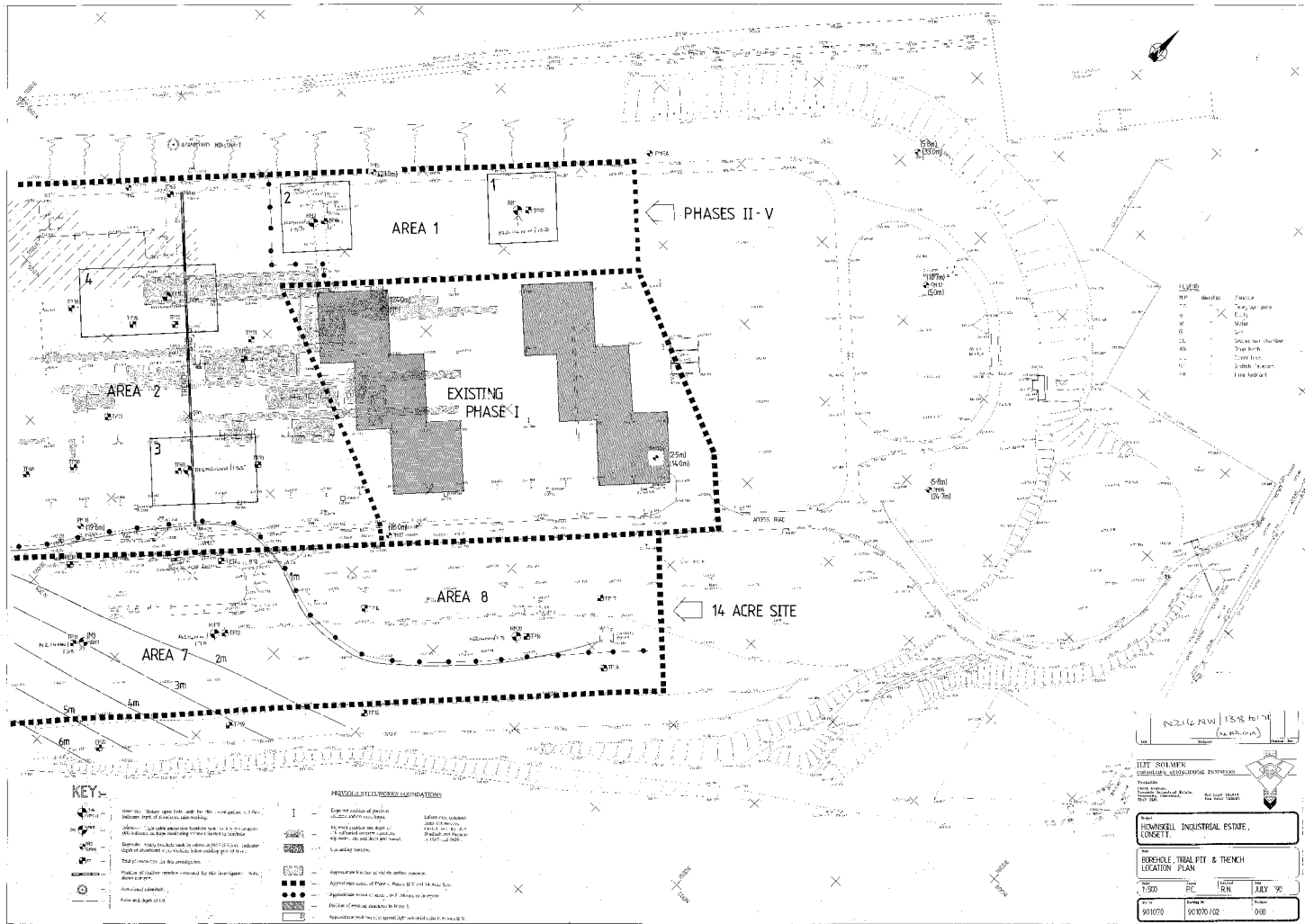
BEEF SOLUTIONS
 CONSULTING CONTRACTORS

1500
 JULY 90

YOUNG & BECKETT
 CONSULTANTS

**BOREHOLE, TRIAL PIT & TRENCH
 LOCATOR PLAN**

Scale	1:500
Date	JULY 90
Drawn by	P.C. R.N.
Checked by	P.C. R.N.
Project No.	98970 / 02
Sheet No.	0100



N210678 49778

NZ14NW/171

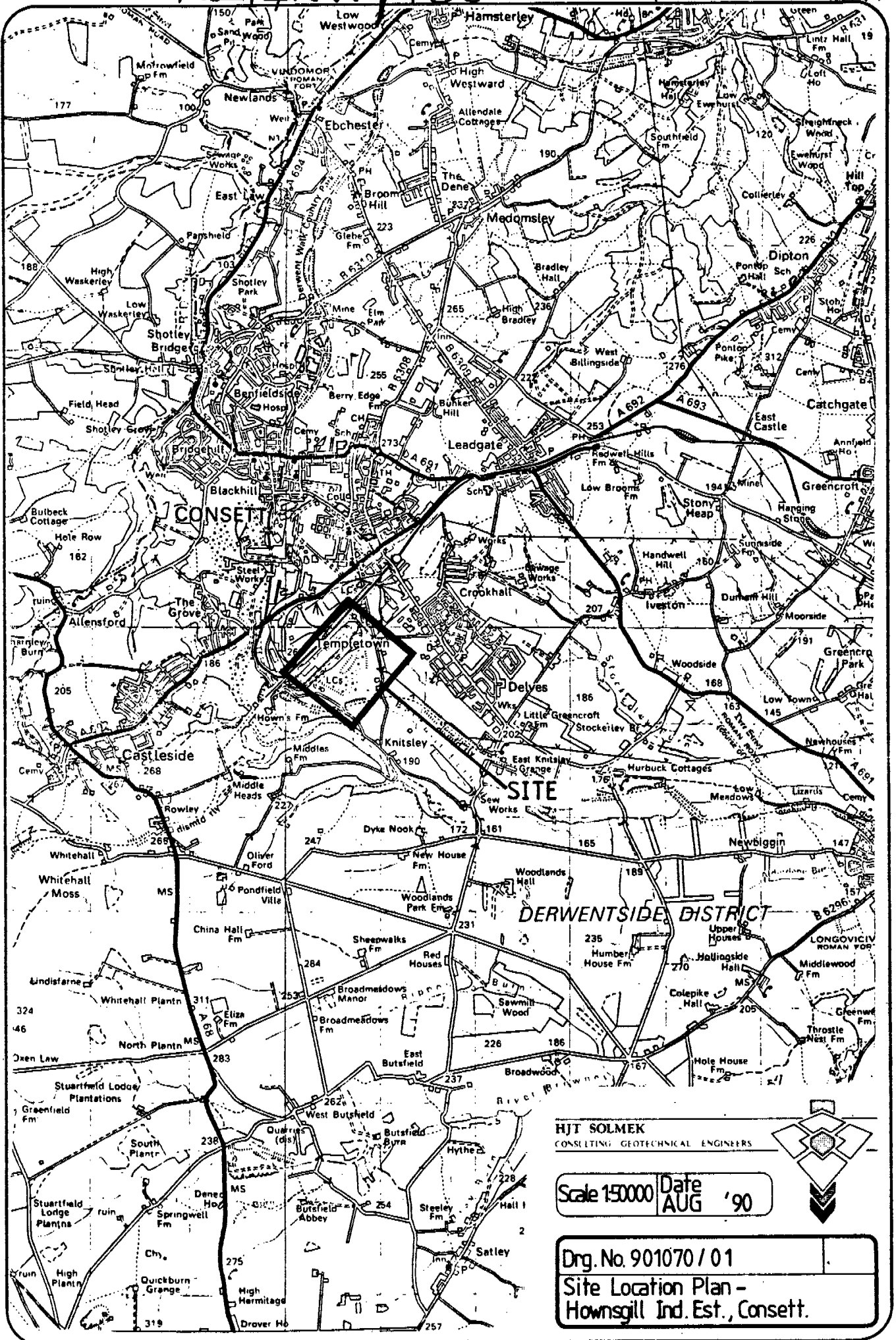
(see N2104A)

HJT SOLMEK				Sheet of 1	Borehole No. RH20		
Boring Method ROTARY OPEN HOLE VERTICAL AT 100mm DIAMETER				Site HOWNSGILL INDUSTRIAL ESTATE			
Drilling Commenced 26.4.90		Ground Level 243.82m A.O.D.					
Scale	Samples/Tests		Standing Water Level (m)	Reduced Level (m)	Description of Strata	Depth (m)	Legend
	Sample Type	In situ Test					
2.0				243.12	Made Ground	0.70	
				242.97	Gravelly clay	0.85	
4.0					Light grey Shale		
6.0							
8.0				236.12	Sandstone	7.70	
				235.82	Shale and Sandstone	8.00	
10.0							
12.0							
14.0				229.62	Coal/shale (0.60m)	14.20	
				229.02	Hard Shale/white Sandstone	14.80	
16.0							
18.0							
					Coal (0.30m)	18.80	
20.0					Grey Shale		
					Hole Terminated	20.50	

Remarks:- No groundwater encountered during drilling.

See sheets A & B for key to symbols

N214NW/138 - 171 (see N21049)

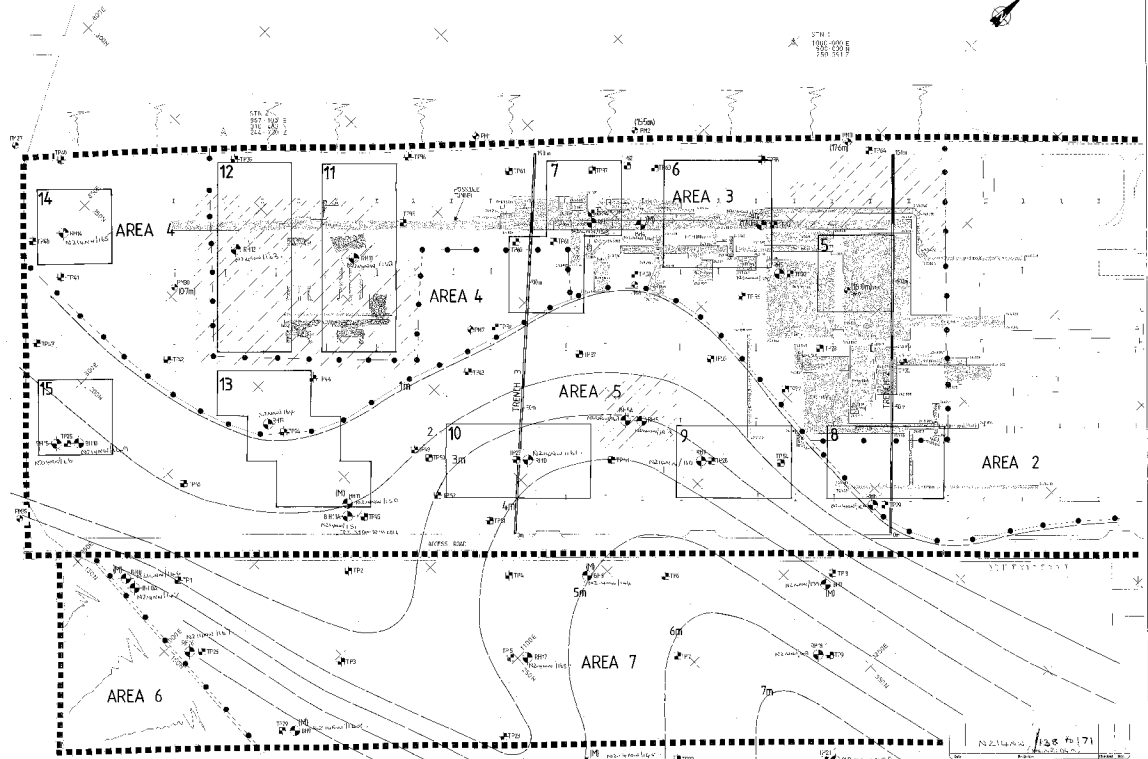


HJT SOLMEK
CONSULTING GEOTECHNICAL ENGINEERS

Scale 1:50000 Date AUG '90

Drng. No. 901070 / 01
Site Location Plan -
Hownsgill Ind. Est., Consett.

C.D.S Ltd. 3438

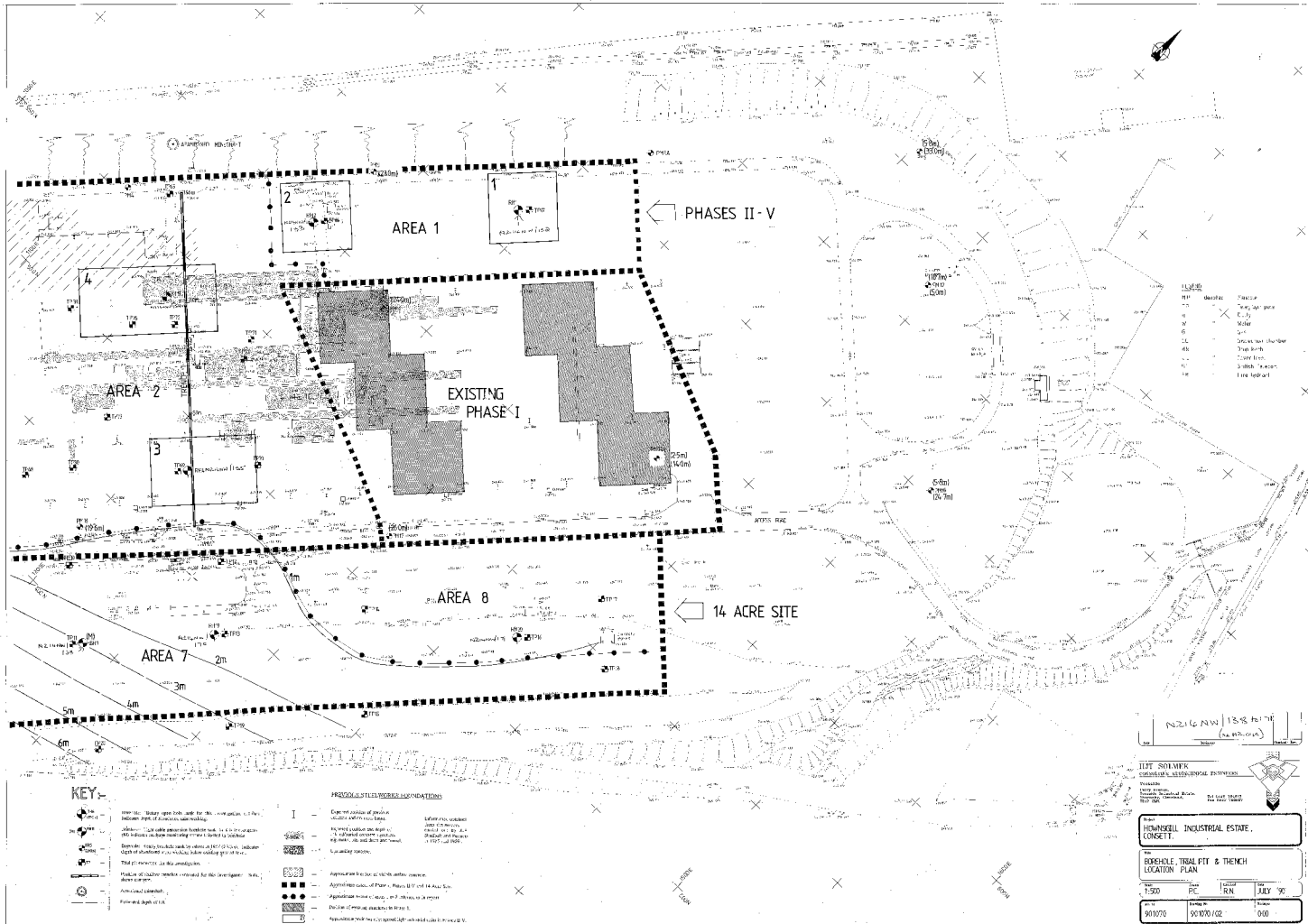


- KEY-**
- Boundary - shown only for the site boundary. (Other boundaries are shown as dashed lines)
 - Structure - shown only for the site boundary. (Other structures are shown as dashed lines)
 - Road - shown only for the site boundary. (Other roads are shown as dashed lines)
 - Fence - shown only for the site boundary. (Other fences are shown as dashed lines)
 - Utility - shown only for the site boundary. (Other utilities are shown as dashed lines)
 - Boundary - shown only for the site boundary. (Other boundaries are shown as dashed lines)
 - Structure - shown only for the site boundary. (Other structures are shown as dashed lines)
 - Road - shown only for the site boundary. (Other roads are shown as dashed lines)
 - Fence - shown only for the site boundary. (Other fences are shown as dashed lines)
 - Utility - shown only for the site boundary. (Other utilities are shown as dashed lines)
- PERMANENT STRUCTURES FOUNDATIONS**
- Foundation - shown only for the site boundary. (Other foundations are shown as dashed lines)
 - Foundation - shown only for the site boundary. (Other foundations are shown as dashed lines)
 - Foundation - shown only for the site boundary. (Other foundations are shown as dashed lines)
 - Foundation - shown only for the site boundary. (Other foundations are shown as dashed lines)
 - Foundation - shown only for the site boundary. (Other foundations are shown as dashed lines)

NS 2116A (171)

BRIEF DESCRIPTION
 BOROUGH & TRENCH
 LOCATOR PLAN
 Scale: 1:500
 Date: JULY 90

TOWNSHIRE INDUSTRIAL ESTATE, LORSTI.
 BOROUGH & TRENCH
 LOCATOR PLAN
 Scale: 1:500
 Date: JULY 90
 Author: R08070 / GZ
 Date: 9/00



KEY-

- Boundary line
- Boundary line with offset
- Boundary line with offset and arrow
- Boundary line with offset and arrow and text
- Boundary line with offset and arrow and text and arrow
- Boundary line with offset and arrow and text and arrow and text
- Boundary line with offset and arrow and text and arrow and text and arrow
- Boundary line with offset and arrow and text and arrow and text and arrow and text
- Boundary line with offset and arrow and text and arrow and text and arrow and text and arrow
- Boundary line with offset and arrow and text and arrow and text and arrow and text and arrow and text

PROPOSED UTILITIES AND SERVICES

- Proposed utility
- Proposed utility
- Proposed utility
- Proposed utility
- Proposed utility
- Proposed utility
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- Proposed utility
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- Proposed utility

NZ14NW BJ 171
 (Scale 1:500)

1:117500
 NATIONAL GRID
 EASTING: 501070
 NORTHING: 901070

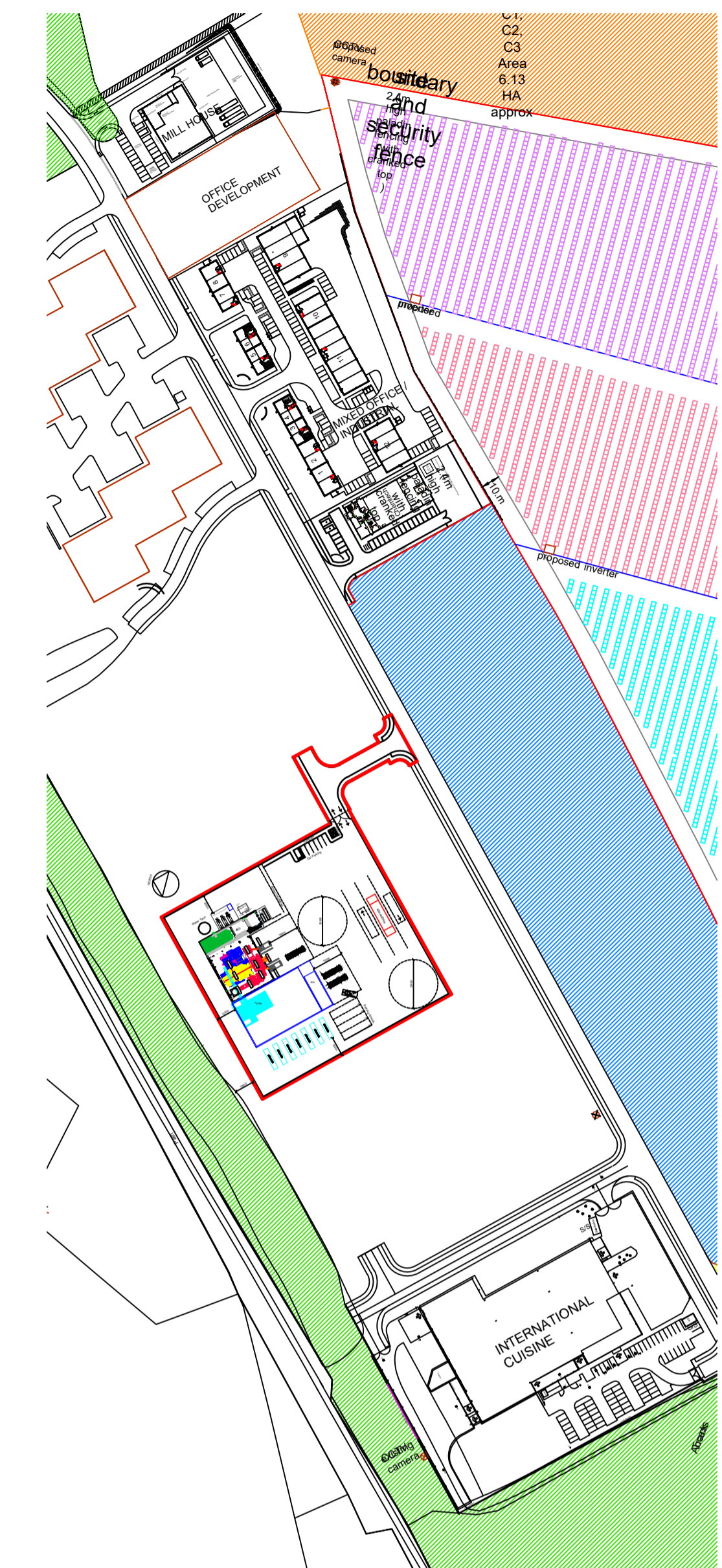
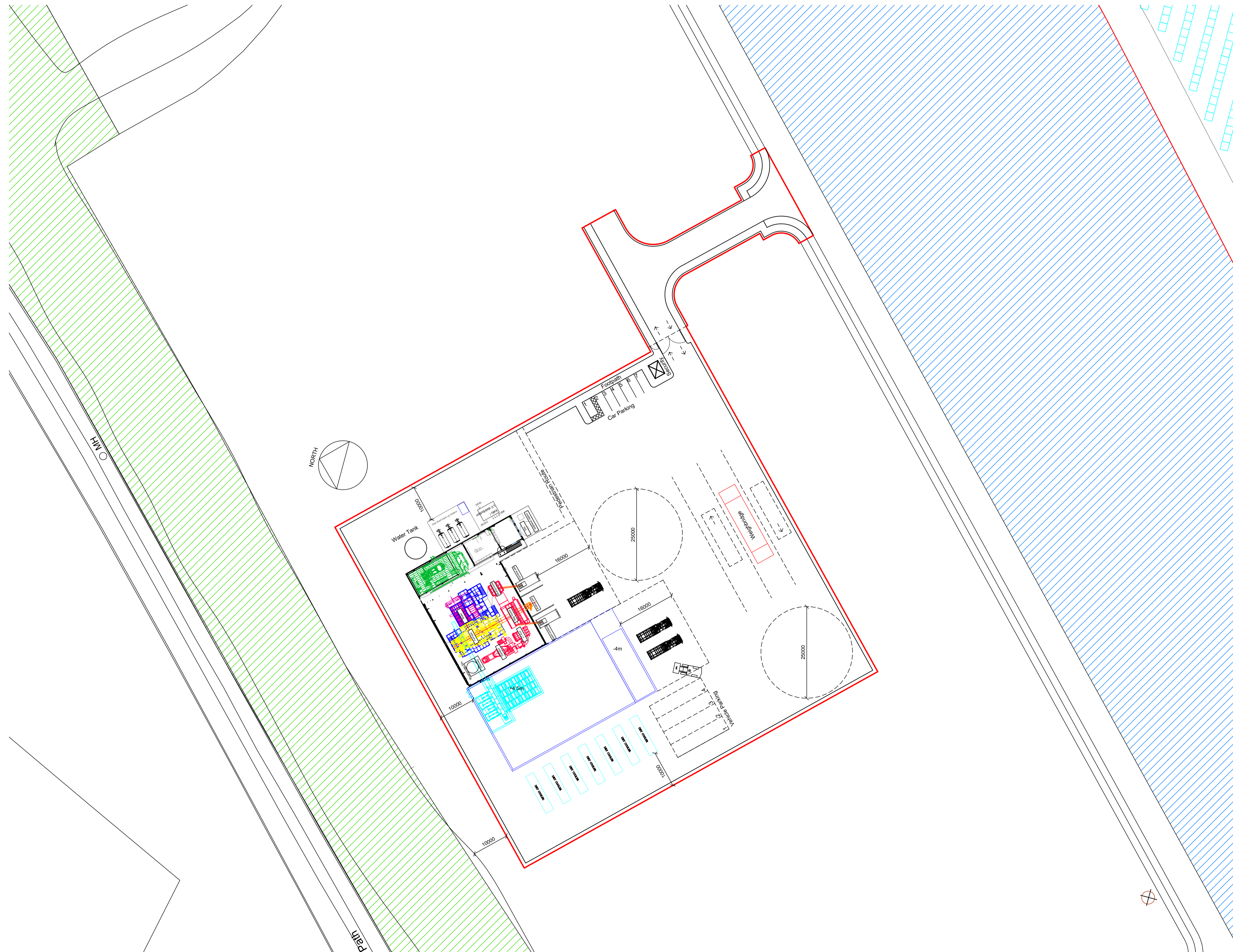
BORSHELE INDUSTRIAL ESTATE, LOCUS 11

BORSHELE, TRAIL PTY & THEMCH LOCATION PLAN

1:500 PC RN JULY '90

901070 901070/02 000

APPENDIX H
OUTLINE DEVELOPMENT PROPOSALS



Key Location Plan
1:2500

NOTE:
Site area
3.16 acres
1.28 hectares

Proposed Site Plan
1:500

NOTES:
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CHECK ALL DIMENSIONS ON SITE.
DRAWING TO BE READ IN CONJUNCTION WITH HEALTH AND SAFETY PLAN AND ALL RELEVANT RISK ASSESSMENTS.

Residual Risks
In addition to the hazards/tricks normally associated with the types of work detailed on this drawing take note of the above. It is assumed that all works on this drawing will be carried out by a competent contractor working, where appropriate, to an appropriate method statement.
Safety Health and Environmental Information Box

Rev	Revision	Date	Drawn	Checked
-	First Issue	14/05/2020	FC/DD	DD
A	Updated in line with client comments. Proposal repositioned 100m to South West of previous revision. 1:2500 key location plan added.	19/05/2020	DD	DD
B	South West boundary moved 10m further from line of buildings to improve vehicular movements based on swept path analysis. Weightbridge position amended. Site area figures revised.	19/05/2020	DD	DD
C	Updated in line with client comments. Proposal rotated 90 degrees anti-clockwise. Site access moved to North boundary of the site. Water tank added to drawing.	26/05/2020	FC	DD
D	Updated in line with comments from Design Team Meeting on 28/05/2020. Security lodge and car parking repositioned. Bicarbonate site added.	29/05/2020	FC	DD

Rev	Revision	Date	Drawn	Checked	Project
					EFW Facility, Consett
					Client: Project Genesis Ltd
					Layout Title: Proposed Site Plan

Scale in m. 0 5 10 15 20 25
1:500

Drawing Number
project originator zone level type note number rev
*** -SBAKA- 00 - GF - DR - A AL(0) 001 D
SBAJKA Project No. Scale @ A1 Status PRELIMINARY
2200033 1:500
1 Newcastle Head Office: 0191 265 7560 / 0191 213 0133
e: info@sadlerbrown.co.uk / mail@sadlerbrown.co.uk
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