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GROUND INVESTIGATION REPORT
TRUSTEES OF OCEAN ROAD COMMUNITY CENTRE
PROPOSED EXTENSION
OCEAN ROAD COMMUNITY ASSOCIATION
SOUTH SHIELDS
NE33 2DW

Project No: 23-879

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Date: 26th January 2024

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Date: 26th January 2024

The information and / or advice contained in this Ground Investigation Report is based solely on, and is limited to, the boundaries of the site, the immediate area around the site, and the historical use(s) unless otherwise stated. This 'Report' has been prepared in order to collate information relating to the physical, environmental and industrial setting of the site, and to highlight, where possible, the likely problems that might be encountered when considering the future development of this site for the proposed end use. All comments, opinions, diagrams, cross sections and / or sketches contained within the report, and / or any configuration of the findings is conjectural and given for guidance only and confirmation of the anticipated ground conditions should be considered before development proceeds. Agreement for the use or copying of this report by any Third Party must be obtained in writing from Arc Environmental Limited (ARC). If a change in the proposed land use is envisaged, then a reassessment of the site should be carried out.

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1.0 Introduction

January 2024

As requested by Maughan Reynolds Partnership Ltd on behalf of the Trustees of Ocean Road Community Centre Ground Investigation works have been carried out for a parcel of land adjacent to the existing Ocean Road Community centre, South Shields. The proposed development comprises an extension to the existing Community centre.

The intrusive investigation works comprised 3 no. windowless sampling boreholes (WS01 to WS03) & 2 no. Cable Percussive holes (CP01 & CP02) incorporating the installation of 3 no. ground gas and groundwater monitoring installations (WS01, WS02 & CP02).

The positions of the exploratory holes for this investigation can be seen on a copy of the Borehole Location Plan, attached in Appendix II. It should be noted that this plan should be used for orientating purposes only, as the positions shown are approximate, and the plan is not to a standard scale.

2.0 Site Details

Table 2.1

N = north, S = south, etc.

Site Name & Address:	Proposed Extension, Ocean Road Community Association, South Shields, NE33 2DW
National Grid Reference:	436650, 567392 (Representative of the central part of the site).
Description of Location:	The site is within an a mix of commercial & residential setting located within close proximity to the south shields town centre.
Site Boundaries:	N = Access Road with Residential Properties beyond, S= Ocean Rd with Commercial properties beyond, E=Baring St with commercial properties, W= Ocean Rd Community Centre.

3.0 Scope of Works

Table 3.1

Client:	Trustees of Ocean Road Community Centre
Engineers:	Maughan Reynolds Partnership Ltd
Project type:	Proposed Extension
Site Location plan:	See Appendix I.
Layout plan (existing):	See Appendix I.
Layout plan (proposed):	See Appendix I.
Reporting:	Factual & Interpretative.
Laboratory Testing:	Geotechnical and Ground Contamination.
CLEA End-Use Classification:	Level 1 GQRA – Residential with homegrown produce (most stringent criteria).

The information contained in this report is limited to the areas of the site, as indicated on the Existing and Proposed Site Layout Plans shown in Appendix I, and to those areas accessible during the ground investigation. The depths of strata on the record sheets are recorded from current ground levels. When considering the full scope of the development any features and / or issues not specifically mentioned in this report cannot be assumed to have been covered.

4.0 Investigation Rationale

This ground investigation has been designed to provide information on the general ground and groundwater conditions where access would allow, within the boundaries of the site. The rationale behind the location of each exploratory hole is summarised in Table 4.1 below.

Table 4.1

Potential issue	Exploratory hole
Geotechnical considerations across the site.	WS01 to WS03 & CP01 & CP02
Determination of ground gas regime & shallow groundwater monitoring.	WS01, WS02 & CP02
Determine the levels of contamination present within the initial deposits with a view to determining the risks posed towards the future site end-users.	WS01 to WS03 & CP01 & CP02

4.1 Contamination Related Sampling & Site Protocols: -

All works associated with this ground contamination assessment and investigations have generally been completed in accordance with BS10175:2011+A2:2017: Investigation of potentially contaminated sites – Code of practice & Land Contamination Risk Management (LCRM: October 2020), with the precautions below specific to this project.

4.1.1 Ground Contamination Sampling: -

Samples were recovered by a representative of ARC Environmental Ltd. during the intrusive investigation works. All samples were stored at approximately c.2°C to c.8°C using cool boxes and ice packs prior to delivery to a UKAS / MCERTS accredited laboratory. Sampling was carried out in accordance with 'Technical Policy Statement 63: UKAS Policy on Deviating Samples'.

4.1.2 Avoiding Cross-Contamination between Sample Locations: -

To avoid possible cross-contamination of materials between soil horizons, drill casing was used to seal off the made ground. Disposable plastic liners were used to collect samples from the windowless sampling boreholes carried out.

5.0 Ground Conditions

For an accurate description of the ground conditions encountered at each investigation position, reference should be made to the Borehole Record Sheets attached in Appendix II. It should be noted that there is always the possibility of variation in the ground conditions around and between the exploratory hole locations.

5.1 Soil Profile: -

A summary of the soil profile for this site can be seen in Table 5.1 below and continues of the following page.

Table 5.1

BCGL = Below Current Ground Level.

Type of Strata	Depths Recorded (BCGL)	Description & General Comments
MADE GROUND:	From 0.00m up to c.0.90m to c.4.00m.	Site surfacing predominantly comprised of asphalt to depth of c.0.10m bcgl, with the western portion of the site covered with topsoil to a depth of c.0.40m bcgl. Made ground comprised of limestone, brick, rubble, concrete and soft medium brown clay with brick fragments.

5.0 Ground Conditions (Cont'd)

5.1 Soil Profile (Cont'd): -

Table 5.1 (Cont'd)

BCGL = Below Current Ground Level.

<u>Type of Strata</u>	<u>Depths Recorded (BCGL)</u>	<u>Description & General Comments</u>
SUPERFICIAL DEPOSITS	From between c.1.60m and c.4.00m to at least c.20.00m.	Firm to stiff (medium to high strength) sandy silty gravelly CLAY, recorded to depths of at least c.11.65m and c.18.00m below current ground level. Dense clayey silty SAND was recorded in CP02 between depths of c.18.00m and c.20.00m bcgl.
SOLID GEOLOGY	Not encountered	~

Locally deep made ground in CP01 & WS03 to depths of between c.1.83m- c.4.00m bcgl, the presence of relic walls recorded in the inspection pits and the anecdotal information suggests that underground structure(s) may be present within the proposed development area.

There was no evidence of significant or gross contamination such as Asbestos Containing Materials (ACM's), fuels, oils, ash etc. on site.

5.2 Coal Mining Risk Assessment: -

When considering the geological setting and Coal Mining Risk Assessment undertaken it is understood that the site is recorded in a coal mining reporting area however, the site lies out with a Development High Risk Area or Area of Past / Probable Shallow Coal Workings. As a result, the site is not felt to be at significant risk from shallow coal workings and no further assessment should be required.

5.3 Groundwater & Stability: -

Groundwater ingress was noted within the boreholes at depths of between c.0.90m to c.18.00m bcgl. Consequently, shallow water ingress may be encountered within construction related excavations, therefore, it would be prudent to allow groundwater control measures, to take care of any ingress of perched / trapped groundwater which may to occur during the construction period, especially during the wetter periods of the year.

Combined ground gas & groundwater monitoring wells were installed at the locations of borehole WS01, WS02 & CP02 to carry out a subsequent programme of gas and groundwater monitoring. The results are discussed further in Section 6.3.

6.0 Insitu Testing & Sampling

6.1 Insitu Standard Penetration Tests: -

Standard penetration tests (SPT's) were carried out with the use of a normal split spoon sampler on the made ground and natural superficial deposits encountered within the boreholes to determine the relative density / strength of the materials tested. The results are shown as 'N' values on the graphic borehole record sheets, adjacent to the appropriate sample level. A summary of the test results can be seen in Table 6.1 on the following page

6.0 Insitu Testing & Sampling (Cont'd)

6.1 Insitu Standard Penetration Tests (Cont'd): -

Table 6.1

Type of Strata	Range of SPT 'N' Values	Result details
MADE GROUND:	11-30 and 75 blows for limited penetration.	Medium dense and dense to very dense deposits.
SUPERFICIAL DEPOSITS (CLAY):	8-50 and 64 to 75 blows for limited penetration.	Firm to stiff / very stiff deposits
SUPERFICIAL DEPOSITS (SAND):	31 and 39	Dense Deposits

6.2 Insitu Hand Shear Vane Tests: -

Insitu hand vane tests were carried out using portable insitu hand vane tester on the natural superficial deposits encountered in WS01 & WS02. The insitu hand vane tester takes direct readings of shear strength, three vane sizes allow for the direct determination of undrained shear strength of extremely low to high strength clays. The peak vane value is determined by a calibrated scale ring built into the head assembly. The cross handle is used both to push the vane to the desired test depth and apply the shearing torque. The results are summarised in Table 6.2 below and can also be found adjacent to the appropriate sample level, on the borehole record sheets.

Table 6.2

Type of Strata	Range of Shear Strength Values	Result Details
Sandy Silty Clay:	45kN/m ² to 54kN/m ²	Medium strength deposits.

6.3 Insitu Gas & Water Monitoring: -

Although no significant sources of hazardous ground gas are envisaged, when considering the site is underlain by the middles coal measures, in accordance with CIRIA 665 and BS8485:2015+A1:2019 soil gas and water monitoring standpipes were installed within WS01, WS02 and CP02 primarily to check for the possible presence of hazardous ground gas production / migration, as well as to monitor insitu groundwater levels.

A standard 50mm diameter HDPE standpipe, with gravel and geo-wrap surround, bentonite seal, gas valve cap and security cover, was installed within each borehole, and ground gas and water levels were allowed to reach equilibrium, prior to the first monitoring visit. The bentonite seal was taken to a depth of c.1.00m bgl, to prevent excessive surface water ingress or venting of soil gas, with the resulting response zone covering the remaining depths of the installations. Monitoring was undertaken using a Gas Data GFM series infra-red gas analyser, with integral flow meter, and an electronic dipmeter.

In accordance with CIRIA Report C665, November 2007, Report Edition No. 04, March 2007 and BS8485:2015+A1:2019 – Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings, it is felt that an adequate risk assessment can be undertaken based on the following limiting factors:

- The development has been considered as **low sensitivity** i.e. commercial development (Tables 5.5a & 5.5b – Typical/Idealised frequency and period of monitoring, after Wilson et al, 2005).
- The risk associated with the generation potential of a source is considered as **very low** (Based on the findings of intrusive works).

6.0 Insitu Testing & Sampling (Cont'd)

6.3 Insitu Gas & Water Monitoring (Cont'd): -

- Monitoring over a **minimum** of **two months** with **four recorded** readings (Tables 5.5a & 5.5b – Typical /idealised frequency and period of monitoring after Wilson et al, 2005).
- Negligible** flow rates are recorded during the monitoring period (Table 8.5 – Modified Wilson & Card classification).
- A targeted and phased programme of gas monitoring will be completed, which will obtain gas monitoring readings during varying atmospheric conditions, which covers the 'worst case' scenario for ground gas emissions to occur, particularly during rapid falls in atmospheric pressure (i.e. from c.1020mb and c.1010mb), and also during low atmospheric pressure events (i.e. c.1000mb and below).

For this site, the monitoring visits undertaken during falling and rising atmospheric pressure trends. Monitoring of the weather conditions and predicated atmospheric pressures (Met Office Surface Pressure Charts) will be carried out up to 72 hours in advance of proposed monitoring visits, in order that a reasonable period of data is obtained to determine atmospheric trends, and to target the 'worst case' scenario.

A summary of the results for the visits undertaken to date, compared with the 'inert' background gas levels is presented in Table 6.3 below, whilst a copy of the monitoring certificate is attached in Appendix III.

Table 6.3

* Note – Atmospheric trend taken from www.weatheronline.co.uk for Newcastle Airport

Table 6.5

Note – Atmospheric trend taken from www.weatheronline.co.uk for Newcastle Airport

Position	Date	Atmospheric Pressure (mbar)	Water (m bgl)	CH ₄ (%v/v)	LEL (%v/v)	CO ₂ (%v/v)	O ₂ (%v/v)	Flow Rate (l/hr)
Background		~	~	0	0	0	21.0	<0.1
WS01	05/12/23	1010	0.53	0.0	0.0	0.6	19.3	<0.1
WS02		(*trend –falling	1.21	0.0	0.0	0.4	19.6	<0.1
CP02		1015-998)	0.95	0.0	0.0	0.6	19.3	<0.1
WS01	03/01/24	982	0.56	0.0	0.0	0.4	19.4	<0.1
WS02		(*trend – rising	1.63	0.0	0.0	0.6	19.9	<0.1
CP02		980-1082)	0.97	0.0	0.0	0.4	19.4	<0.1
WS01	17/01/24	980	0.64	0.0	0.0	0.5	19.6	<0.1
WS02		(*trend – falling	1.81	0.0	0.0	0.6	20.1	<0.1
CP02		1010-992)	0.98	0.0	0.0	0.5	19.6	<0.1
1 no. outstanding visits to be completed – results to follow as Addendum Letter Report.								

From the results undertaken to date, no levels of Methane (CH₄) have been recorded during the monitoring period. However, detectable concentrations of Carbon Dioxide (CO₂) have been recorded, up to a maximum recorded level of 0.6% v/v, associated with slightly depleted Oxygen (O₂) concentrations (19.3% v/v). Negligible flow rates have been recorded during the monitoring period.

Based on the results undertaken to date, in accordance with CIRIA Report C665, a risk assessment has been completed for this site, by converting the results in Table 6.3 above to a gas screening value (GSV), calculated by multiplying the typical maximum gas concentrations with the recorded maximum positive flow rates (after Wilson & Card). Using the maximum values recorded, as no levels of Methane have been recorded, the GSV for Carbon Dioxide only has been calculated, the results of which are shown below:

$$\text{Carbon Dioxide GSV} = 0.006 (0.6\%) \times 0.1 = 0.0006 \text{ l/hr}$$

6.0 Insitu Testing & Sampling (Cont'd)

6.3 Insitu Gas & Water Monitoring (Cont'd): -

When considering these results, in accordance with CIRIA C665, and considering the, the GSV value for CO₂ is below the assessment GSV of 0.07 l/hr (Characteristic Situation 1 – CS1), resulting in no gas protection measures being required.

A further monitoring visit has been scheduled for this site and the results along with the final recommendations will be issued as an Addendum Letter Report.

When considering the results of the groundwater monitoring, standing levels were recorded at depths of between c.0.53m and c.1.81m bgl during the monitoring visits undertaken. These levels are likely to be representative of perched water collecting within the stand pipes which will be effectively acting as a conduit for trapped surface infiltration. During completion of the monitoring visit the high water levels recorded were purged of water to open up the response zones so that potential soil losses could be monitored.

From the results of the water monitoring and observations noted during the fieldworks, some shallow water ingress is likely to be experienced during future construction related excavations. Therefore, it would be prudent to allow for the introduction of suitable groundwater control measures in order to take care of any localised ingresses of groundwater which will occur during the construction period, especially during the wetter periods of the year.

7.0 Laboratory Testing

All geotechnical testing was carried out in accordance with BS1377:1990: Parts 1-9 by Professional Soils Laboratory (PSL) of Doncaster (UKAS accredited). Ground contamination was undertaken by Chemtech Environmental of Stanley, Co. Durham (UKAS & MCERTS accredited).

7.1 Determination of pH & SO₄: -

Representative samples (17 no) of made ground materials and natural superficial deposits recovered from across the site, were tested to determine their pH value and Soluble Sulphate (SO₄) levels. The results are shown in Table 7.1 below and are also contained in the Chemtech Environmental Limited Analytical Report (Ref. 129020), a copy of which is attached in Appendix IV.

Table 7.1

Position	Strata	Depth (m)	pH value	SO ₄ (mg/l)	Design SO ₄ Class	ACEC Class
CP01	MG	0.20-1.20	8.2	449	DS-1	AC-1
CP02	MG	0.20-1.00	8.3	278	DS-1	AC-1
WS01	MG	0.50-0.70	8.3	43	DS-1	AC-1
WS03	MG	1.60-1.80	7.9	1543	DS-2	AC-2
CP01	MG	3.50-4.00	8.3	312	DS-1	AC-1
CP01	NS	6.50-7.00	8.3	74	DS-1	AC-1
CP01	NS	11.00	8.7	40	DS-1	AC-1
CP02	NS	2.50-3.00	8.3	103	DS-1	AC-1
CP02	NS	6.50-6.80	8.5	72	DS-1	AC-1
CP02	NS	10.50-10.95	8.5	57	DS-1	AC-1
CP02	NS	15.00-15.45	8.4	48	DS-1	AC-1
WS01	NS	1.40-1.60	8.2	66	DS-1	AC-1
WS01	NS	3.40-3.60	8.1	111	DS-1	AC-1

7.0 Laboratory Testing (Cont'd)

7.1 Determination of pH & SO₄ (Cont'd): -

Table 7.1 (Cont'd)

Position	Strata	Depth (m)	pH value	SO ₄ (mg/l)	Design SO ₄ Class	ACEC Class
WS01	NS	5.60-5.80	8.1	69	DS-1	AC-1
WS02	NS	4.40-4.60	8.1	138	DS-1	AC-1
WS02	MG	1.30-1.50	10.1	335	DS-1	AC-1
WS03	MG	0.20-0.40	9.0	76	DS-1	AC-1

MG = Made Ground, NS = Natural Strata

From these results, the samples tested range in pH from 7.9 to 10.1 and the amount of Soluble Sulphate present ranges between 40mg/l and 1543mg/l. Therefore, in accordance with BRE Special Digest 1: 2005, in a data set of more than ten samples the site can be given a classification of Class DS-2. When considering the pH values of the materials tested, and assuming potentially mobile groundwater, the assessment of the Aggressive Chemical Environment for Concrete (ACEC) classification for this site is AC-2.

7.2 Determination of Liquid & Plastic Limits: -

Representative samples (8 no.) of the natural superficial deposits were tested to determine their liquid and plastic limits, so these materials might be classified. The results can be seen in Table 7.2 below and are also contained in the PSL Analytical Report (Ref. PSL23/10265), a copy of which is attached in Appendix IV.

Table 7.2

Position	Depth (m)	M/C (%)	LL (%)	PL (%)	PI (%)	Class	% Passing 425µm Sieve
CP01	5.50-6.00	30	54	25	29	CH	95
CP01	10.00-10.30	12	33	18	15	CL	82
CP02	2.50-3.00	29	62	27	35	CH	98
CP02	7.50-7.95	9.2	31	15	16	CL	77
CP02	12.00-12.45	17	34	17	17	CL	80
CP02	15.00-15.45	12	29	14	15	CL	83
WS01	5.60-5.80	23	43	20	23	CI	95
WS02	2.40-2.60	30	65	29	36	CH	100

M/C = Moisture Content, LL = Liquid Limit, PL = Plastic Limit, Plastic PI = Plasticity Index, CH = Clay High, CI = Clay Intermediate

The samples tested are inorganic in nature, and when plotted on the plasticity chart, fall within the low, intermediate and high plasticity range, and from the resulting plasticity indices, have a low and moderate volume change potential, when considering the amount passing the 425µm sieve. Therefore, some of the materials tested may undergo changes in volume, if large changes in their natural moisture content were to occur due to seasonal variations or the like and if new foundations were to be based within these materials, they would need to be taken down to a minimum depth of 0.90m below finished ground levels.

However, an increase in founding depth may be required to reach competent homogeneous strata and also if the proposed development is within close proximity to existing or envisaged vegetation. An increase in the minimum foundation depth may also be required, even if trees are to be removed, to ensure no additional future shrinkage and swelling of these materials occurs. Reference should be made to BS5837: 2012, 'Trees in Relation to Design, Demolition and Construction'.

7.0 Laboratory Testing (Cont'd)

7.3 Undrained Shear Strength (Triaxial): -

Representative undisturbed samples (3 no.) of the natural clay deposits recovered during the investigation at various depths were dispatched to the laboratory for examination and subsequent testing. The results obtained are shown in Table 7.3 below, along with the value of moisture contents (as received) and bulk densities, the angle of shearing resistance has been taken as zero, assuming fully saturated conditions. The results can be seen within the PSL analytical report Ref. PSL23/10265, a copy of which can be seen in Appendix IV.

Table 7.3

Position	Depth(m)	M/C (%)	Bulk Density (Mg/m³)	Average Shear Strength c_u (kN/ m²)
CP01	7.50-7.95	14	2.26	71
CP02	4.00-4.45	32	1.93	42
CP02	5.00-5.45	31	1.98	57

In summary, the average undrained shear strength values of the natural clay deposits tested range from 42kN/m² to 71kN/m² and are considered as medium strength deposits.

7.4 Contamination Screening / Screening Strategy: -

Representative samples of the made ground materials recovered from across the site were passed onto Chemtech Environmental of Stanley, Co. Durham, so that soil contamination screening could be carried out. The samples were screened using a standard generic contamination suite (based on the current CLEA SGV listed analytes with historical additions), which is used to assess typical made ground (disturbed natural strata mixed with anthropogenic debris) of an unknown source.

Although no evidence of significant or gross contamination such as Asbestos Containing Materials (ACM's), fuels, oils, ash etc. was noted within the exploratory positions, for completeness and to aid in any assessment for off-site disposal classification, representative samples were tested for Speciated PAH (Polycyclic Aromatic Hydrocarbons), Speciated TPH (Total Petroleum Hydrocarbons) & Asbestos.

The catalogue of testing results can be found in the Chemtech Analytical Report (Ref. 129020), attached in Appendix IV, and the total analysis carried out is summarised below:

- 4 no. soil sample screened for a generic (metals and non-organics) soil suite which includes the following determinants; Arsenic, Cadmium, Chromium (III & VI), Copper, Lead, Mercury, Nickel, Selenium, Zinc, Cyanide and Total Organic Carbon (TOC).
- 4 no. soil sample screened for Speciated Polycyclic Aromatic Hydrocarbons (PAH's)
- 4 no. soil sample screened for Speciated Total Petroleum Hydrocarbons (based on full Aliphatic / Aromatic Split & BTEX).
- 4 no. sample screened for the presence of asbestos.

8.0 Ground Contamination Risk Assessment

8.1 Methodology: -

Following completion of the contamination screening undertaken, A Level 1 quantitative ground contamination risk assessment has been undertaken, generally in accordance with BS10175:2011+A2:2017: Investigation of potentially contaminated sites – Code of practice & Land Contamination Risk Management (LCRM: October 2020). This quantitative ground contamination risk assessment uses the current UK practice for assessing the risks from land contamination, which is based on the established *source-pathway-receptor* pollutant linkage methodology and ‘suitable for use’ approach (Part IIA, EPA 1990 - inserted through Section 57 EA 1995).

Based on the Conceptual Site Model (CSM) for this site (described further in Section 8.3), a site-specific screening strategy for the site has been developed (see Section 7.4) and risks from potential contaminants have been assessed for Human Health (8.3).

8.2 Level 1 Risk Assessment (Human Health): -

The soil screening results have been assessed by comparing the Maximum Concentration values (C_M) recorded for each analyte to the Critical Concentration (C_C) values chosen for this site. The results of the testing are contained in Appendix IV, and the risk assessment has been summarised in Table 8.1 below and on the following page.

Table 8.1

Determinants	Critical Conc. (C_C) mg/kg	No. of Samples Screened	Max. Conc. (C_M) recorded mg/kg	No. of Samples > C_C
Arsenic	640 ⁽¹⁾	4	7.2	0
Cadmium	190 ⁽¹⁾	4	<2	0
Chromium III	8600 ⁽¹⁾	4	31	0
Chromium VI	33 ⁽¹⁾	4	0.18	0
Copper	68000 ⁽¹⁾	4	27	0
Lead	2330 ⁽²⁾	4	97	0
Mercury	1100 ⁽¹⁾	4	<2	0
Nickel	980 ⁽¹⁾	4	22	0
Selenium	12000 ⁽¹⁾	4	<3	0
Zinc	730000 ⁽¹⁾	4	125	0
Cyanide	34 ⁽³⁾	4	<1	0
Acenaphthene	84000 ⁽¹⁾	4	1.59	0
Acenaphthylene	83000 ⁽¹⁾	4	0.11	0
Anthracene	520000 ⁽¹⁾	4	2.05	0
Benzo(a)anthracene	170 ⁽¹⁾	4	4.27	0
Benzo(a)pyrene	35 ⁽¹⁾	4	4.58	0
Benzo(b)fluoranthene	44 ⁽¹⁾	4	5.43	0
Benzo(ghi)perylene	3900 ⁽¹⁾	4	3.07	0
Benzo(k)fluoranthene	1200 ⁽¹⁾	4	2.00	0
Chrysene	350 ⁽¹⁾	4	4.36	0
Dibenz(ah)anthracene	3.5 ⁽¹⁾	4	0.82	0
Fluoranthene	23000 ⁽¹⁾	4	8.37	0
Fluorene	63000 ⁽¹⁾	4	1.22	0
Indeno(123cd)pyrene	500 ⁽¹⁾	4	2.88	0
Naphthalene	190 ⁽¹⁾	4	0.05	0
Phenanthrene	22000 ⁽¹⁾	4	5.09	0
Pyrene	54000 ⁽¹⁾	4	6.20	0
Benzene	27 ⁽¹⁾	4	<0.001	0

8.0 Ground Contamination Risk Assessment (Cont'd)

8.2 Level 1 Risk Assessment (Human Health) (Cont'd): -

Table 8.1 (Cont'd)

Determinants	Critical Conc. (C_c) mg/kg	No. of Samples Screened	Max. Conc. (C_M) recorded mg/kg	No. of Samples > C_c
Toluene	56000 ⁽¹⁾	4	<0.001	0
Ethylbenzene	5700 ⁽¹⁾	4	<0.001	0
m&p-Xylene	5900 ⁽¹⁾	4	<0.001	0
o-Xylene	6600 ⁽¹⁾	4	<0.001	0
VPH Aliphatic (>C5-C6)	3200 ⁽¹⁾	4	<0.05	0
VPH Aliphatic (>C6-C8)	7800 ⁽¹⁾	4	<0.1	0
VPH Aliphatic (>C8-C10)	2000 ⁽¹⁾	4	<0.05	0
EPH Aliphatic (>C10-C12)	9700 ⁽¹⁾	4	<0.5	0
EPH Aliphatic (>C12-C16)	59000 ⁽¹⁾	4	1	0
EPH Aliphatic (>C16-C35)	1600000 ⁽¹⁾	4	139	0
EPH Aliphatic (>C35-C44)	1600000 ⁽¹⁾	4	28	0
VPH Aromatic (>EC5-EC7)	26000 ⁽¹⁾	4	<0.05	0
VPH Aromatic (>EC7-EC8)	56000 ⁽¹⁾	4	<0.05	0
VPH Aromatic (>EC8-EC10)	3500 ⁽¹⁾	4	<0.05	0
EPH Aromatic (>EC10-EC12)	16000 ⁽¹⁾	4	<0.5	0
EPH Aromatic (>EC12-EC16)	36000 ⁽¹⁾	4	10	0
EPH Aromatic (>EC16-EC21)	28000 ⁽¹⁾	4	67	0
EPH Aromatic (>EC21-EC35)	28000 ⁽¹⁾	4	433	0
EPH Aromatic (>EC35-EC44)	28000 ⁽¹⁾	4	113	0
Asbestos	Presence	4	NAD	0

⁽¹⁾ = LQM CIEH Suitable 4 Use Levels (S4UL Nov 2014 (Revised August 2015)) – Commercial 1% SOM, ⁽²⁾ = C4SL Values (Commercial), ⁽³⁾ = ATRISK^{SOIL} SSV, NAD = No Asbestos Detected, Note = All units are mg/kg.

The results have identified the following:

- None of the Concentration Maximum (C_M) values for any of the analytes screened for exceed the Critical Concentration (C_c) values for this site.
- No asbestos was detected within any of the made ground samples tested.

The results of the contamination screening and analysis have confirmed that made ground below the site does not pose a possible risk to Human Health where exposure pathways are available, and therefore no remedial measures and further assessments are required to protect future end users.

8.3 Conceptual Site Model (CSM): -

From the results of the intrusive investigation works a Conceptual Site Model (CSM) has been developed for this site and table 8.2 on the following page summarises the various contamination sources, plausible migration pathways and potentially sensitive receptors identified for this site, assuming no remediation, additional protection measures and / or removal of the sources of contamination takes place.

8.0 Ground Contamination Risk Assessment (Cont'd)

8.3 Conceptual Site Model (CSM) (Cont'd): -

Table 8.2:-

	<i>Sources (S)</i>		<i>Pathways (P)</i>		<i>Receptors (R)</i>
S1	Made ground comprising disturbed natural strata with occasional anthropogenic debris (i.e. brick) – No elevated levels recorded.	P1	Ingestion & Dermal Contact.	R1	Human health - future end users.
S2	Hazardous ground gas associated with middle coal measures formation. No elevated levels of gas readings were recorded during monitoring visits completed to date.	P2	Plant uptake and attached soils	R2	Controlled Waters: Groundwater within the underlying solid geology, designated as Secondary Aquifer – A, and underlying superficial geology designated as Secondary Undifferentiated.
		P3	Air-inhalation of vapours and direct contact with dust.		
		P4	Migration through existing services / permeable strata.		
		P5	Direct contact with building Materials.	R3	Building materials.
		P6	Surface runoff, infiltration & leachate migration.	R4*	Adjacent sites.
				R5*	Flora and fauna.

8.3.1 Sources: -

The site is covered by a layer of made ground materials (up to depth of between c.0.90m & c.4.00m bcgl in thickness) which represents a source of ground contamination for this site. The majority of the made ground contains some anthropogenic debris mixed with disturbed natural strata, and representative samples of these materials have been assessed using a standard generic soil suite, with the site considered as a single averaging area for these analytes.

Although no evidence of significant or gross contamination such as Asbestos Containing Materials (ACM's), fuels, oils, ash etc. was noted within the exploratory positions, for completeness and to aid in any assessment for off-site disposal classification, the samples were tested for Speciated PAH (Polycyclic Aromatic Hydrocarbons), Speciated TPH (Total Petroleum Hydrocarbons) & Asbestos.

8.3.2 Pathways: -

When considering the proposed end use, and without considering treatment, removal or protection measures, there are some potential plausible pathways available for direct contact, dermal contact, ingestion, inhalation, wind (dust / particulate), volatilization, and vertical and lateral transportation below the site.

Within the CLEA Risk Assessment Model for Human Health, there are 3 exposure mediums considered for on-site receptors, comprising ingestion of soil containing contaminants, inhalation of contaminated dust / vapours and dermal contact, with up to 10 no. exposure pathways considered, as shown below.

1. Ingestion of soil and indoor dust
2. Consumption of homegrown produce and attached soil
3. Dermal contact (indoor)
4. Dermal contact (outdoor)
5. Inhalation of dust (indoor)
6. Inhalation of dust (outdoor)
7. Inhalation of vapour (indoor)
8. Inhalation of vapour (outdoor)
9. Oral background intake
10. Inhalation background intake.

8.0 Ground Contamination Risk Assessment (Cont'd)

8.3 Conceptual Site Model (CSM) (Cont'd): -

8.3.2 Pathways (Cont'd): -

Where the future site has hard cover and below new structures, the majority of these pathways will not be available.

When considering the potential pathways for leachate migration, where either hard cover and / or future surface water drainage systems are present, the potential effects of surface infiltration or contaminated surface water runoff will be greatly reduced.

Similarly, when considering the construction work force, exposure pathways through direct contact, ingestion and dust inhalation will be available during part of the construction process, and therefore adequate PPE should be provided to protect the work force during this period.

8.3.3 Receptors: -

Within the CLEA Risk Assessment Model for Human Health, the potential receptors are assessed initially on site end use, followed by a delineation of age category (i.e. child or adult), with default settings for *Residential*, *Allotment* and *Public Open Space (Park)* end uses based on a child aged 0 to 6 years, *Public Open Space (Residential)* based on a child aged 3 to 9 and *Commercial* end uses based upon a working exposure period of up to 49 years (i.e. 16 to 65).

Key generic assumptions for *Residential* and *Public Open Space (Residential)* are based upon a typical residential property, consisting of a two-storey small, terraced house, with private garden, and a *Commercial* end use based upon a typical commercial or light industrial property, consisting of a three-storey office building (pre-1970). No buildings are anticipated for *Allotment* or *Public Open Space (Park)* end uses.

Within the CLEA Risk Assessment Model for Human Health there are 6 no. generic end use categories presently in use, as shown below.

- 1) *Residential - with home grown produce*, 2) *Residential - without home grown produce*, 3) *Allotments*, 4) *Commercial*
- 5) *Public Open Space – Residential*, 6) *Public Open Space – Park*

When considering the proposed development and the Level 1 Risk Assessment has taken the end use category as:

- 4) *Commercial*

When considering the ground conditions recorded with a significant thickness of impermeable drift deposits underlying the site along with the results of the contamination screening where no elevated levels of any of the analytes screened for were recorded. The risk to controlled waters was deemed negligible with no groundwater / leachate screening deemed necessary.

9.0 Conclusions & Recommendations

9.1 Ground Conditions: -

From the information gained during these intrusive investigation works, made ground was recorded to depths of between c.0.90m to c.4.00m below current ground levels (bcgl) generally comprising site surfacing of asphalt (WS02, WS03 & CP01, CP02), with topsoil recorded at the location of WS01. In turn underlain by limestone, brick rubble, concrete and soft medium brown clay with brick fragments.

Locally deep made ground in CP01 & WS03 to depths of between c.1.83m- c.4.00m bcgl, varying depths of made ground across the site, the presence of relic walls recorded in the inspection pits and the anecdotal information suggests that underground structure(s) may be present within the proposed development area.

The underlying natural superficial deposits comprise firm to stiff (medium to high strength) sandy silty occasionally gravelly clay recorded to depths of at least c.11.65m and c.18.00m bcgl. A band of dense clayey silty sand was recorded in CP02 between depths of c.18.00m and c.20.00m bcgl.

9.2 Groundwater & Stability: -

During the investigation works groundwater ingresses were recorded at depths of between c.0.90m and c.18.00m bcgl, from the results of the water monitoring undertaken, standing water levels have been at depths of between 0.53m and c.1.81m bcgl.

Therefore, it would be prudent to allow for the introduction of groundwater control measures (i.e., sump pumping equipment), to take care of localised ingresses of groundwater, especially during the wetter periods of the year.

9.3 Gas Protection Measures: -

From the results of the gas monitoring undertaken to date, no levels of Methane (CH₄) have been recorded during the monitoring period. However, detectable concentrations of Carbon Dioxide (CO₂) have been recorded, up to a maximum recorded level of 0.6% v/v, with associated depleted oxygen (O₂) concentrations (19.3% v/v). Negligible flow rates have been recorded during the monitoring period undertaken to date.

When considering these results, in accordance with CIRIA C665, and considering the, the GSV value for CO₂ is below the assessment GSV of 0.07 l/hr (Characteristic Situation 1 – CS1), resulting in no gas protection measures being required.

A further monitoring visit has been scheduled for this site and the results along with the final recommendations will be issued as an Addendum Letter Report.

The site is situated within a lower probability radon area, with less than 1-3% of homes estimated to be above the action level. A BGS radon report procured for the site attached in appendix V confirms that ‘no radon protection measures are required for the reported area’.

9.0 Conclusions & Recommendations (Cont'd)

9.4 Foundation Options: -

When considering the ground conditions recorded and proposed development, due to variable depths of made ground recorded across the site with up to c.4.00m of made ground recorded, conventional strip or pad foundations are unlikely to be suitable for the development. In addition, it is understood that the existing community centre is based on a piled foundation. As a result, it is felt that piling is likely to be the most suitable foundation option available, this report should be forwarded on to a specialist piling contractor for their comment and assessment as a detailed pile design is out with the scope of this report.

From the results of the pH and soluble sulphate testing carried out, future foundations and buried concrete across the site should be constructed using a concrete design class of DS-2 and ACEC class of AC-2.

9.5 Ground Contamination: -

From the results of the contamination screening carried out on the made ground materials recorded below the site do not represent a significant risk to the end users, and can therefore remain on site with no further assessment & remedial measures required.

When considering the risks to the construction workforce, standard PPE should prove adequate protection against the levels of potential contaminants recorded during these investigation works. Similarly, the results can also be used by the Main Contractor / Project Coordinator, when devising an adequate Site Health & Safety Plan, in accordance with current CDM Regulations. For further guidance reference should be made to the Health and Safety Executive (HSE) document EH40/2005 Workplace exposure limits.

9.6 General Comments: -

Where we have sampled and tested for asbestos this is discussed in the report, whilst we would target any asbestos sampling and testing in accordance with a Conceptual Site Model and site findings, there is always the possibility, along with other contamination, that undiscovered asbestos exists between sample locations and the possibility of unknown asbestos exists on all sites, particularly brownfield sites where previous buildings have been demolished, where there were previous features that were infilled (old hollows, pits etc) or where significant quantities of materials such as demolition and brick rubble exist.

It is not uncommon for historical asbestos wastes to be deliberately buried on derelict sites or imported old demolition rubble which could contain asbestos to be imported for use as hardstanding / hardcore. Unless otherwise stated we have not assessed any below ground features such as service ducts, culverts, partly demolished or dilapidated structures, spoil heaps, fly tipped materials, etc.

For future site works, adequate lateral trench support will be required for excavations, in order to prevent trench wall collapse or over excavations, as well as to create a safe working environment, and any excavations on this site should remain open for as short a period as possible, since some of these materials may be susceptible to deterioration, if left open to the natural elements for any significant period.

It is also recommended for any new developments, adequate surface drainage should be designed and installed by a competent contractor, in order to prevent surface water 'ponding' or collection, during and post construction, particularly where the existing surface drainage system is disrupted or damaged.

9.0 Conclusions & Recommendations (Cont'd)

9.6 General Comments (Cont'd): -

In addition, for deeper excavations, drainage, service runs or the like that may pass close to or beneath any proposed new foundations, these should be undertaken with care and completed prior to the preparation of any new foundations, so as not to allow any loose or granular material to move or 'flow', thus causing settlement to occur to any new foundations based at a higher level.

An "observational technique" can be applied to the design and construction of this site, and where ground conditions seem to vary from that indicated from the conceptual ground model derived from works to date, then advice from a suitably qualified Engineer should be sought.

END OF REPORT

APPENDIX I

Location Plan

Existing & Proposed Site Layout Plans

Aerial Photograph



ARC ENVIRONMENTAL LTD

Solum House
Unit 1 Elliott Court
St. John's Road
Meadowfield
Durham, DH7 8PN
Tel: (0191) 378 6380
e-mail: admin@arc-environmental.com
web: www.arc-environmental.com

The contractor shall check all dimensions on site before commencement of any works. No dimensions to be scaled off this drawing.
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LEGEND	
	APPROXIMATE SITE BOUNDARY

rev.	date	amendments		drawn	chckd

Client: **TRUSTEES OF OCEAN ROAD
COMMUNITY CENTRE**

Project Title:
Proposed Extension

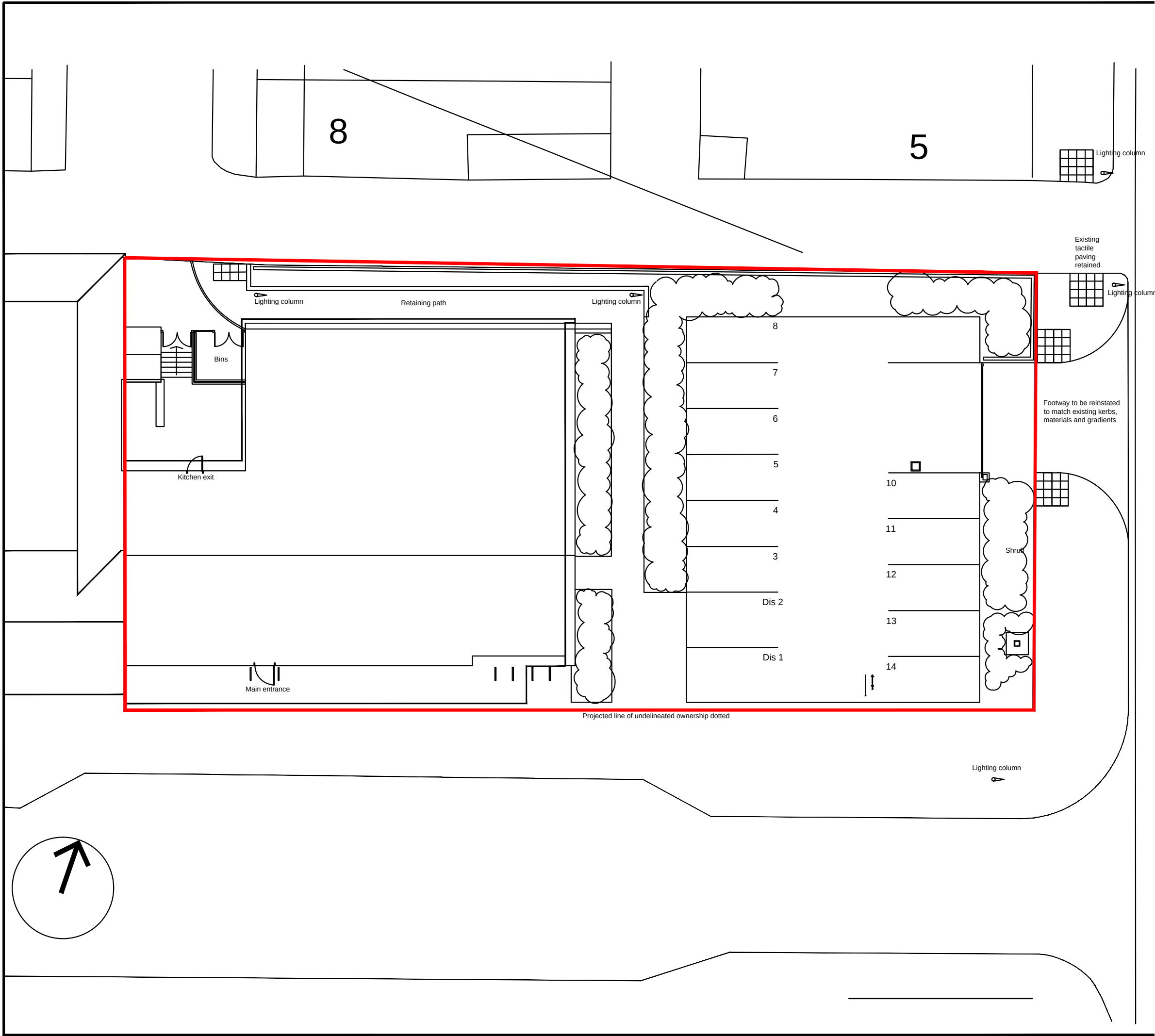
Ocean Road Community Association
South Shields, NE33 2DW

Drawing Title:

Aerial Photograph

Scale at A3: NTS @ A3	Date: 26.01.24	Drawn by: P.D	Approved by: S.T
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Job Ref: 23-879	Drg no: —	Rev: —
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LEGEND	
	APPROXIMATE SITE BOUNDARY

rev.	date	amendments	drawn	chckd

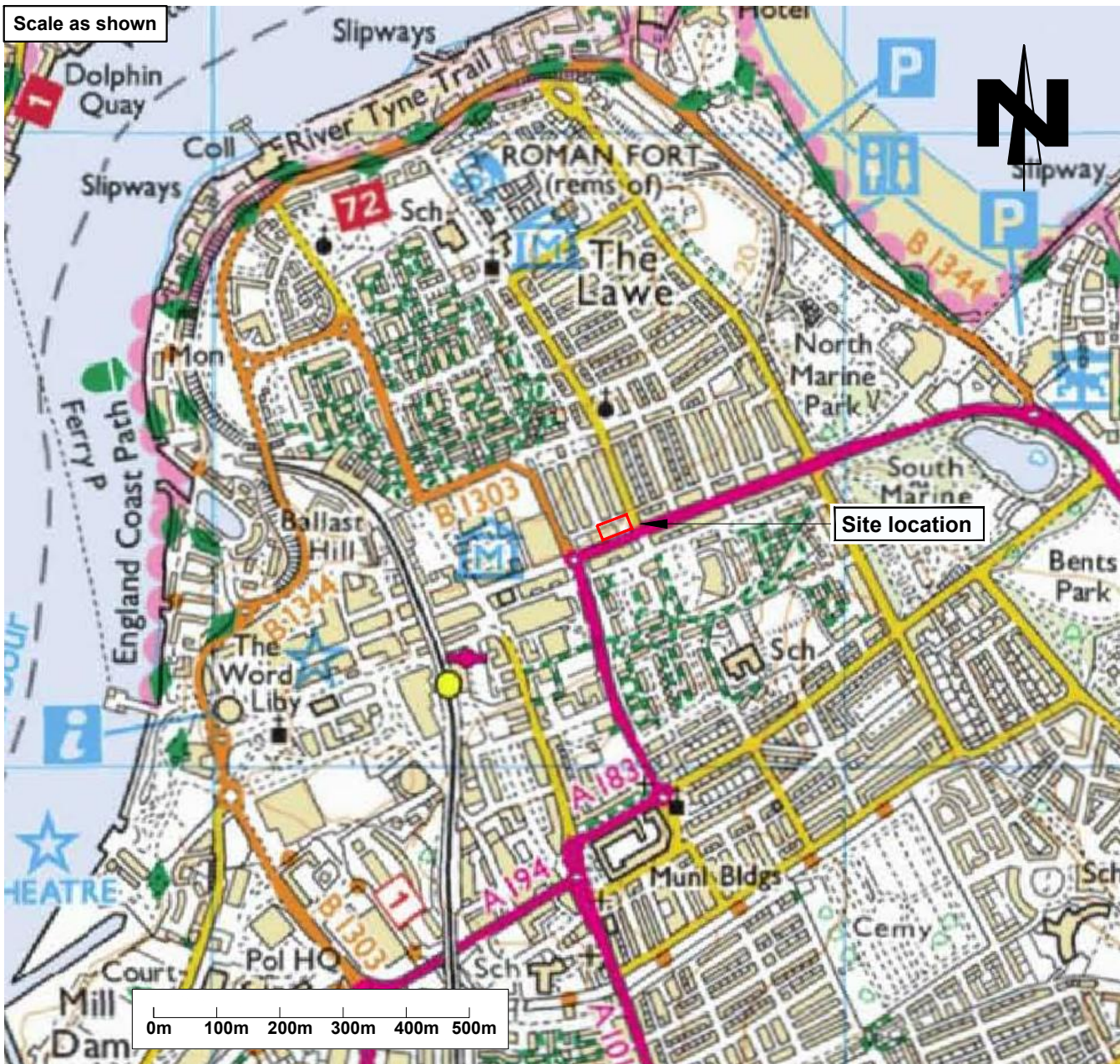
Client: **TRUSTEES OF OCEAN ROAD COMMUNITY CENTRE**

Project Title:
Proposed Extension
Ocean Road Community Association
South Shields, NE33 2DW

Drawing Title:
Existing Site Layout Plan

Scale at A3: NTS @ A3	Date: 26.01.24	Drawn by: P.D	Approved by: S.T
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Job Ref: 23-879	Drg no: -	Rev: -
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Client: **TRUSTEES OF OCEAN ROAD COMMUNITY CENTRE**

Project Title:
Proposed Extension
Ocean Road Community Association
South Shields, NE33 2DW

Drawing Title:
Location Plan

Job Reference:
23-879

Drawing Number:
-

Revision:
-

Drawn by:
P.D

Date:
26.01.24

Scale at A4:
As Shown

Checked by:
S.T

Approved by:
S.T

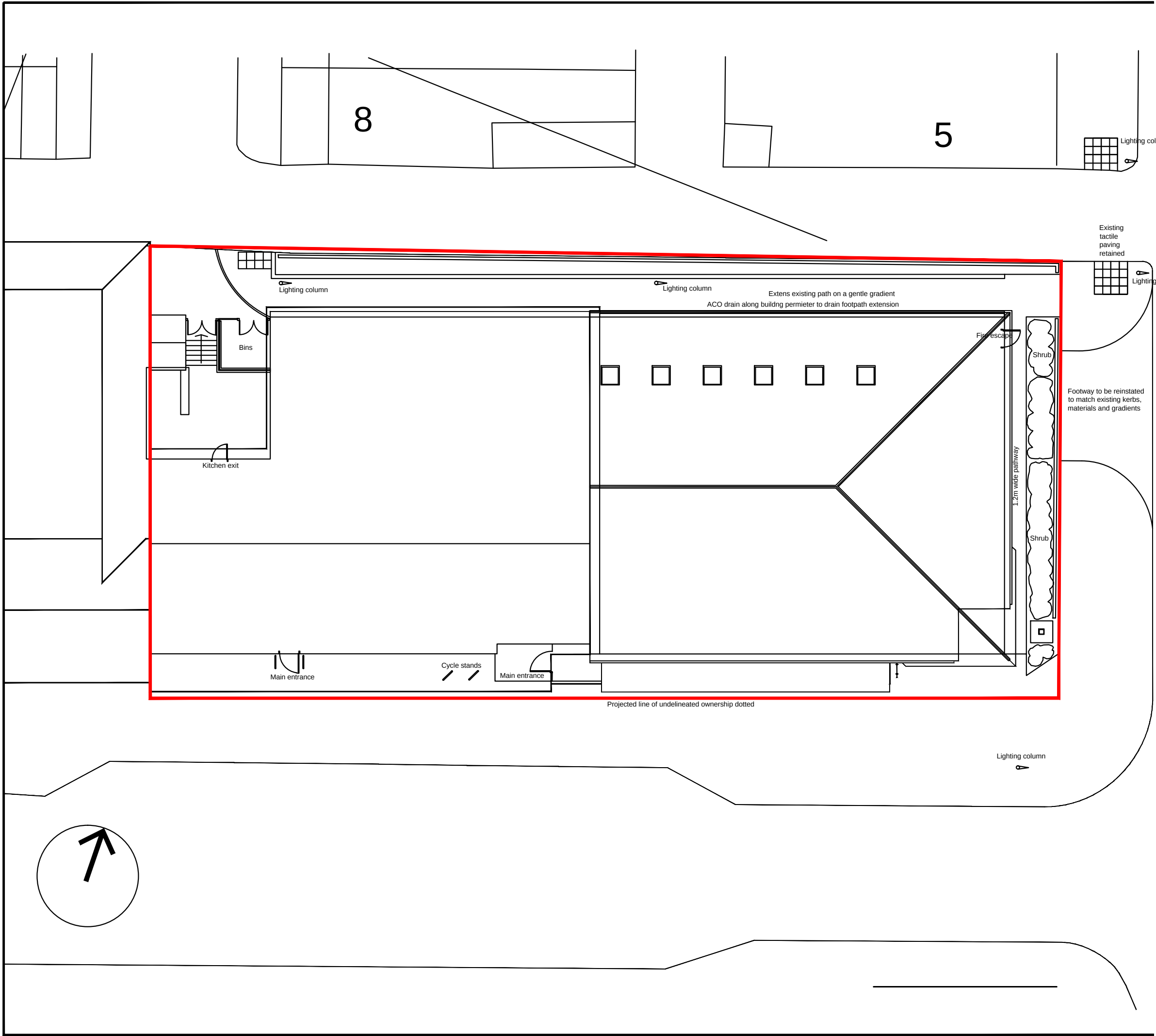
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LEGEND	
	APPROXIMATE SITE BOUNDARY

rev.	date	amendments	drawn	chckd

Client: **TRUSTEES OF OCEAN ROAD COMMUNITY CENTRE**

Project Title:
Proposed Extension

Ocean Road Community Association
South Shields, NE33 2DW

Drawing Title:

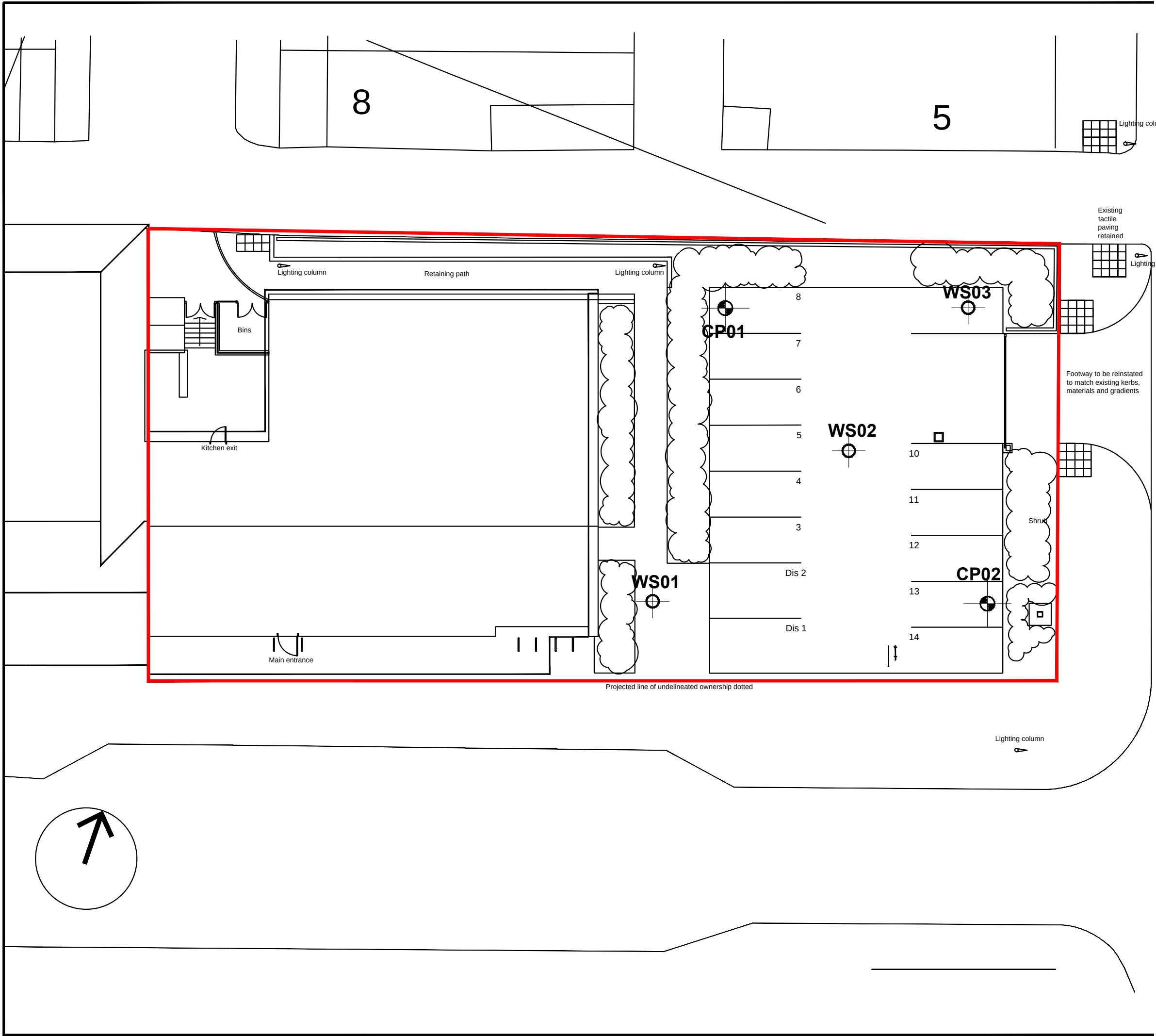
Proposed Development Layout Plan

Scale at A3: NTS @ A3	Date: 26.01.24	Drawn by: P.D	Approved by: S.T
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Job Ref: 23-879	Drg no: -	Rev: -
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APPENDIX II

Borehole Location plan & Borehole Record Sheets



ARC ENVIRONMENTAL LTD

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LEGEND	
	APPROXIMATE SITE BOUNDARY
	CABLE PERCUSSIVE BOREHOLE POSITION
	WINDOWLESS SAMPLING BOREHOLE POSITION

rev.	date	amendments	drawn	chckd

Client: **TRUSTEES OF OCEAN ROAD COMMUNITY CENTRE**

Project Title:
Proposed Extension

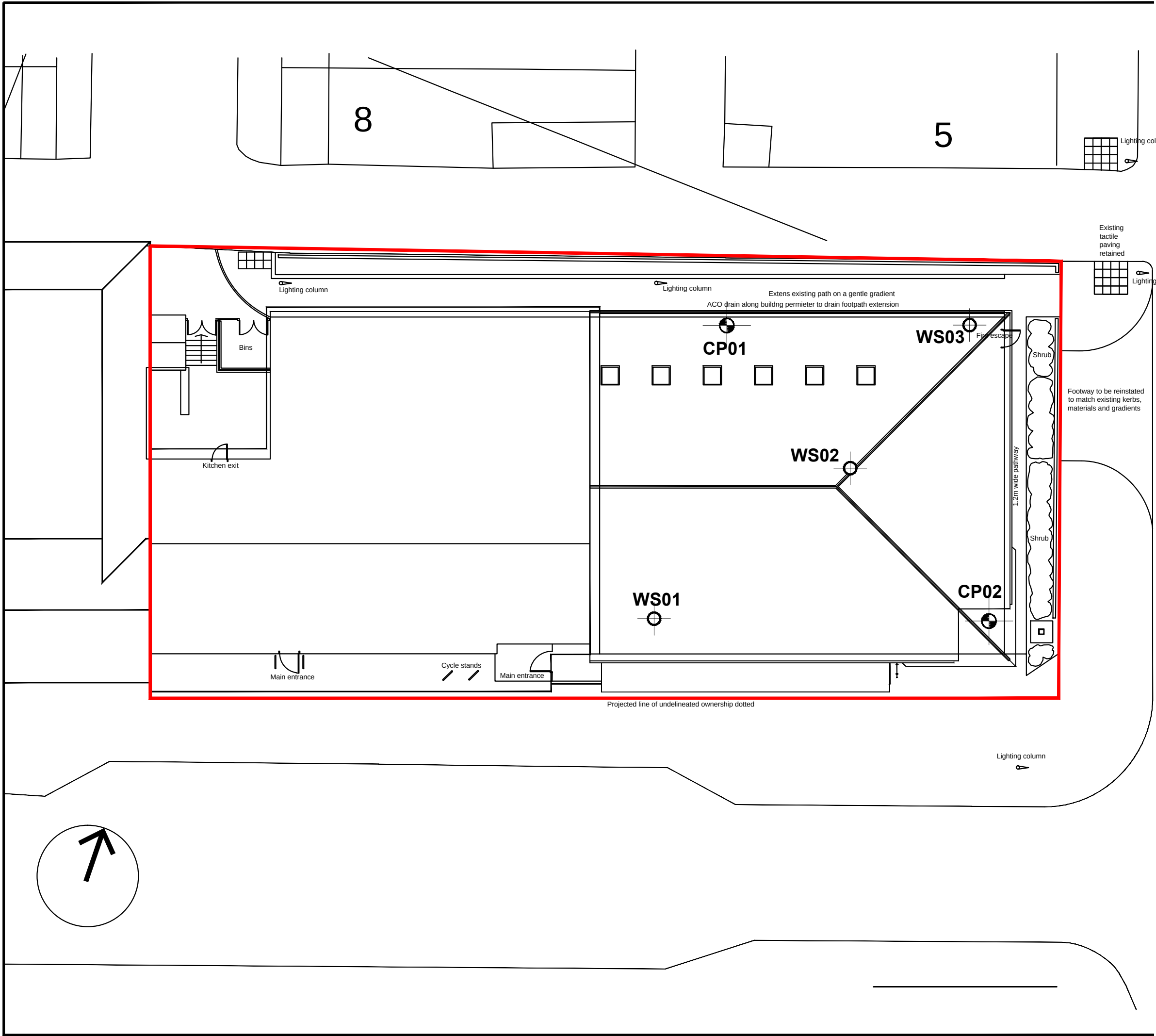
Ocean Road Community Association
South Shields, NE33 2DW

Drawing Title:

Exploratory Hole Location Plan (Existing Layout)

Scale at A3: NTS @ A3	Date: 26.01.24	Drawn by: P.D	Approved by: S.T
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Job Ref: 23-879	Drg no: -	Rev: -
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LEGEND	
	APPROXIMATE SITE BOUNDARY
	CABLE PERCUSSIVE BOREHOLE POSITION
	WINDOWLESS SAMPLING BOREHOLE POSITION

rev.	date	amendments	drawn	chckd

Client: **TRUSTEES OF OCEAN ROAD COMMUNITY CENTRE**

Project Title:
Proposed Extension
Ocean Road Community Association
South Shields, NE33 2DW

Drawing Title:
Exploratory Hole Location Plan (Proposed Layout)

Scale at A3: NTS @ A3	Date: 26.01.24	Drawn by: P.D	Approved by: S.T
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Job Ref: 23-879	Drg no: -	Rev: -
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APPENDIX III

Gas & Ground Water Monitoring Certificate

Site:	Southshields
Ref:	23-879

[illegible]

Notes:

Detection limits - Methane = 0.0%, Carbon Dioxide = 0.0%, LEL = 0.0%, Oxygen = 0.0%, Flow = 0.1l/hr

Monitoring order is from **Left to Right** across table

Monitoring should be for **Not Less** than 3 minutes. However, if high concentrations of gases initially recorded, monitoring should be for up to 10 minutes.

N/A = Not applicable

= Off the scale

Cf = PID compensation Factor (1-10) - Must be used to multiply the PID reading to give an accurate measure of the total hydrocarbons in the borehole when methane is present

Hex = Hexane (Valid and in range up to 2.000%) - Recorded when abnormally high methane is present.

PID = Photo Ionisation Detector (Calibrated to Isobutylene)

APPENDIX IV

Laboratory Test Results (Geotechnical & Ground Contamination)



ANALYTICAL TEST REPORT

Contract no: 129020

Contract name: Ocean Road, South Shields

Client reference: 23-879

Clients name: ARC Environmental

Clients address: Solum House, Unit 1 Elliott Court
St Johns Road
Meadowfield
DH7 8PN

Samples received: 08 December 2023

Analysis started: 08 December 2023

Analysis completed: 19 December 2023

Report issued: 19 December 2023

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:

Ellis McCulloch
Senior Reporting Administrator

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.

Lab ref	Sample id	Depth (m)	Sample description	Material removed	% Removed	% Moisture
129020-1	CP01	0.20-1.20	Sandy Clay with Gravel	-	-	17.1
129020-2	CP02	0.20-1.00	Sandy Clay with Gravel	-	-	19.5
129020-3	WS01	0.50-0.70	Sandy Clay with Gravel	-	-	10.5
129020-4	WS03	1.60-1.80	Sand with Gravel	-	-	12.8
129020-5	CP01	3.50-4.00	Clay	-	-	21.2
129020-6	CP01	6.50-7.00	Clay	-	-	10.1
129020-7	CP01	11.00	Gravel	-	-	0.4
129020-8	CP02	2.50-3.00	Clay	-	-	21.4
129020-9	CP02	6.50-6.80	Clay	-	-	10.1
129020-10	CP02	10.50-10.95	Clay	-	-	10.8
129020-11	CP02	15.00-15.45	Clay	-	-	10.6
129020-12	WS01	1.40-1.60	Clay	-	-	16.8
129020-13	WS01	3.40-3.60	Clay	-	-	22.9
129020-14	WS01	5.60-5.80	Clay	-	-	16.8
129020-15	WS02	4.40-4.60	Clay	-	-	20.2
129020-16	WS02	1.30-1.50	Sand with Gravel	-	-	15.3
129020-17	WS03	0.20-0.40	Sand with Gravel	-	-	8.2

Chemtech Environmental Limited

SOILS

Lab number Sample id Depth (m) Date sampled			129020-1 CP01 0.20-1.20 04/12/2023	129020-2 CP02 0.20-1.00 04/12/2023	129020-3 WS01 0.50-0.70 04/12/2023	129020-4 WS03 1.60-1.80 04/12/2023	129020-5 CP01 3.50-4.00 04/12/2023	129020-6 CP01 6.50-7.00 04/12/2023
Test	Method	Units						
Moisture Content	CE001	% w/w	17.1	19.5	10.5	12.8	-	-
Arsenic (total)	CE264 ^M	mg/kg As	7.2	5.7	<3	4.7	-	-
Cadmium (total)	CE264 ^M	mg/kg Cd	<2	<2	<2	<2	-	-
Chromium (total)	CE264 ^U	mg/kg Cr	29	31	12	20	-	-
Chromium (III)	CE208	mg/kg CrIII	29	31	12	20	-	-
Chromium (VI)	CE263	mg/kg CrVI	<0.04	0.18	<0.04	0.07	-	-
Copper (total)	CE264 ^M	mg/kg Cu	24	27	14	19	-	-
Lead (total)	CE264 ^U	mg/kg Pb	74	56	97	54	-	-
Mercury (total)	CE264 ^U	mg/kg Hg	<2	<2	<2	<2	-	-
Nickel (total)	CE264 ^M	mg/kg Ni	16	22	6.3	12	-	-
Selenium (total)	CE264	mg/kg Se	<3	<3	<3	<3	-	-
Zinc (total)	CE264 ^M	mg/kg Zn	125	109	103	112	-	-
pH	CE004 ^M	units	8.2	8.3	8.3	7.9	8.3	8.3
Sulphate (2:1 water soluble)	CE061 ^U	mg/l SO ₄	449	278	43	1543	312	74
Cyanide (free)	CE077	mg/kg CN	<1	<1	<1	<1	-	-
Total Organic Carbon (TOC)	CE197	% w/w C	1.8	1.5	0.7	0.7	-	-
PAH								
Acenaphthene	CE087 ^M	mg/kg	<0.02	<0.02	<0.02	1.59	-	-
Acenaphthylene	CE087 ^M	mg/kg	<0.02	<0.02	<0.02	0.11	-	-
Anthracene	CE087 ^U	mg/kg	0.02	0.04	<0.02	2.05	-	-
Benzo(a)anthracene	CE087 ^U	mg/kg	0.06	0.13	0.03	4.27	-	-
Benzo(a)pyrene	CE087 ^U	mg/kg	0.07	0.14	0.04	4.58	-	-
Benzo(b)fluoranthene	CE087 ^M	mg/kg	0.08	0.17	0.04	5.43	-	-
Benzo(ghi)perylene	CE087 ^M	mg/kg	0.06	0.13	0.04	3.07	-	-
Benzo(k)fluoranthene	CE087 ^M	mg/kg	0.03	0.07	<0.03	2.00	-	-
Chrysene	CE087 ^M	mg/kg	0.07	0.12	<0.03	4.36	-	-
Dibenz(ah)anthracene	CE087 ^M	mg/kg	<0.02	0.02	<0.02	0.82	-	-
Fluoranthene	CE087 ^M	mg/kg	0.13	0.26	0.05	8.37	-	-
Fluorene	CE087 ^U	mg/kg	<0.02	<0.02	<0.02	1.22	-	-
Indeno(123cd)pyrene	CE087 ^M	mg/kg	0.05	0.09	0.03	2.88	-	-
Naphthalene	CE087 ^M	mg/kg	<0.02	0.03	<0.02	0.05	-	-
Phenanthrene	CE087 ^M	mg/kg	0.10	0.16	0.04	5.09	-	-
Pyrene	CE087 ^M	mg/kg	0.12	0.26	0.05	6.20	-	-
PAH (total of USEPA 16)	CE087	mg/kg	0.80	1.64	<0.34	52.1	-	-
BTEX & TPH								
Benzene	\$	mg/kg	<0.001	<0.001	<0.001	<0.001	-	-
Toluene	\$	mg/kg	<0.001	<0.001	<0.001	<0.001	-	-
Ethylbenzene	\$	mg/kg	<0.001	<0.001	<0.001	<0.001	-	-
m & p-Xylene	\$	mg/kg	<0.001	<0.001	<0.001	<0.001	-	-
o-Xylene	\$	mg/kg	<0.001	<0.001	<0.001	<0.001	-	-
VPH Aliphatic (>C5-C6)	\$	mg/kg	<0.05	<0.05	<0.05	<0.05	-	-

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SOILS

Lab number Sample id Depth (m) Date sampled			129020-1 CP01 0.20-1.20 04/12/2023	129020-2 CP02 0.20-1.00 04/12/2023	129020-3 WS01 0.50-0.70 04/12/2023	129020-4 WS03 1.60-1.80 04/12/2023	129020-5 CP01 3.50-4.00 04/12/2023	129020-6 CP01 6.50-7.00 04/12/2023
Test	Method	Units						
VPH Aliphatic (>C6-C8)	\$	mg/kg	<0.1	<0.1	<0.1	<0.1	-	-
VPH Aliphatic (>C8-C10)	\$	mg/kg	<0.05	<0.05	<0.05	<0.05	-	-
EPH Aliphatic (>C10-C12)	CE250	mg/kg	<0.5	<0.5	<0.5	<0.5	-	-
EPH Aliphatic (>C12-C16)	CE250	mg/kg	<0.5	<0.5	<0.5	1	-	-
EPH Aliphatic (>C16-C35)	CE250	mg/kg	65	8	<4.5	139	-	-
EPH Aliphatic (>C35-C44)	CE250	mg/kg	17	3	<1	28	-	-
VPH Aromatic (>EC5-EC7)	\$	mg/kg	<0.05	<0.05	<0.05	<0.05	-	-
VPH Aromatic (>EC7-EC8)	\$	mg/kg	<0.05	<0.05	<0.05	<0.05	-	-
VPH Aromatic (>EC8-EC10)	\$	mg/kg	<0.05	<0.05	<0.05	<0.05	-	-
EPH Aromatic (>EC10-EC12)	CE250	mg/kg	<0.5	<0.5	<0.5	<0.5	-	-
EPH Aromatic (>EC12-EC16)	CE250	mg/kg	2	1	<1	10	-	-
EPH Aromatic (>EC16-EC21)	CE250	mg/kg	10	8	3	67	-	-
EPH Aromatic (>EC21-EC35)	CE250	mg/kg	92	50	12	433	-	-
EPH Aromatic (>EC35-EC44)	CE250	mg/kg	23	5	<1.5	113	-	-
Subcontracted analysis								
Asbestos (qualitative)	\$	-	NAD	NAD	NAD	NAD	-	-

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SOILS

Lab number Sample id Depth (m) Date sampled			129020-7 CP01 11.00 04/12/2023	129020-8 CP02 2.50-3.00 04/12/2023	129020-9 CP02 6.50-6.80 04/12/2023	129020-10 CP02 10.50-10.95 04/12/2023	129020-11 CP02 15.00-15.45 04/12/2023	129020-12 WS01 1.40-1.60 04/12/2023
Test	Method	Units						
Moisture Content	CE001	% w/w	-	-	-	-	-	-
Arsenic (total)	CE264 ^M	mg/kg As	-	-	-	-	-	-
Cadmium (total)	CE264 ^M	mg/kg Cd	-	-	-	-	-	-
Chromium (total)	CE264 ^U	mg/kg Cr	-	-	-	-	-	-
Chromium (III)	CE208	mg/kg CrIII	-	-	-	-	-	-
Chromium (VI)	CE263	mg/kg CrVI	-	-	-	-	-	-
Copper (total)	CE264 ^M	mg/kg Cu	-	-	-	-	-	-
Lead (total)	CE264 ^U	mg/kg Pb	-	-	-	-	-	-
Mercury (total)	CE264 ^U	mg/kg Hg	-	-	-	-	-	-
Nickel (total)	CE264 ^M	mg/kg Ni	-	-	-	-	-	-
Selenium (total)	CE264	mg/kg Se	-	-	-	-	-	-
Zinc (total)	CE264 ^M	mg/kg Zn	-	-	-	-	-	-
pH	CE004 ^M	units	8.7	8.3	8.5	8.5	8.4	8.2
Sulphate (2:1 water soluble)	CE061 ^U	mg/l SO ₄	40	103	72	57	48	66
Cyanide (free)	CE077	mg/kg CN	-	-	-	-	-	-
Total Organic Carbon (TOC)	CE197	% w/w C	-	-	-	-	-	-
PAH								
Acenaphthene	CE087 ^M	mg/kg	-	-	-	-	-	-
Acenaphthylene	CE087 ^M	mg/kg	-	-	-	-	-	-
Anthracene	CE087 ^U	mg/kg	-	-	-	-	-	-
Benzo(a)anthracene	CE087 ^U	mg/kg	-	-	-	-	-	-
Benzo(a)pyrene	CE087 ^U	mg/kg	-	-	-	-	-	-
Benzo(b)fluoranthene	CE087 ^M	mg/kg	-	-	-	-	-	-
Benzo(ghi)perylene	CE087 ^M	mg/kg	-	-	-	-	-	-
Benzo(k)fluoranthene	CE087 ^M	mg/kg	-	-	-	-	-	-
Chrysene	CE087 ^M	mg/kg	-	-	-	-	-	-
Dibenz(ah)anthracene	CE087 ^M	mg/kg	-	-	-	-	-	-
Fluoranthene	CE087 ^M	mg/kg	-	-	-	-	-	-
Fluorene	CE087 ^U	mg/kg	-	-	-	-	-	-
Indeno(123cd)pyrene	CE087 ^M	mg/kg	-	-	-	-	-	-
Naphthalene	CE087 ^M	mg/kg	-	-	-	-	-	-
Phenanthrene	CE087 ^M	mg/kg	-	-	-	-	-	-
Pyrene	CE087 ^M	mg/kg	-	-	-	-	-	-
PAH (total of USEPA 16)	CE087	mg/kg	-	-	-	-	-	-
BTEX & TPH								
Benzene	\$	mg/kg	-	-	-	-	-	-
Toluene	\$	mg/kg	-	-	-	-	-	-
Ethylbenzene	\$	mg/kg	-	-	-	-	-	-
m & p-Xylene	\$	mg/kg	-	-	-	-	-	-
o-Xylene	\$	mg/kg	-	-	-	-	-	-
VPH Aliphatic (>C5-C6)	\$	mg/kg	-	-	-	-	-	-

Chemtech Environmental Limited

SOILS

Lab number Sample id Depth (m) Date sampled			129020-7 CP01 11.00 04/12/2023	129020-8 CP02 2.50-3.00 04/12/2023	129020-9 CP02 6.50-6.80 04/12/2023	129020-10 CP02 10.50-10.95 04/12/2023	129020-11 CP02 15.00-15.45 04/12/2023	129020-12 WS01 1.40-1.60 04/12/2023
Test	Method	Units						
VPH Aliphatic (>C6-C8)	\$	mg/kg	-	-	-	-	-	-
VPH Aliphatic (>C8-C10)	\$	mg/kg	-	-	-	-	-	-
EPH Aliphatic (>C10-C12)	CE250	mg/kg	-	-	-	-	-	-
EPH Aliphatic (>C12-C16)	CE250	mg/kg	-	-	-	-	-	-
EPH Aliphatic (>C16-C35)	CE250	mg/kg	-	-	-	-	-	-
EPH Aliphatic (>C35-C44)	CE250	mg/kg	-	-	-	-	-	-
VPH Aromatic (>EC5-EC7)	\$	mg/kg	-	-	-	-	-	-
VPH Aromatic (>EC7-EC8)	\$	mg/kg	-	-	-	-	-	-
VPH Aromatic (>EC8-EC10)	\$	mg/kg	-	-	-	-	-	-
EPH Aromatic (>EC10-EC12)	CE250	mg/kg	-	-	-	-	-	-
EPH Aromatic (>EC12-EC16)	CE250	mg/kg	-	-	-	-	-	-
EPH Aromatic (>EC16-EC21)	CE250	mg/kg	-	-	-	-	-	-
EPH Aromatic (>EC21-EC35)	CE250	mg/kg	-	-	-	-	-	-
EPH Aromatic (>EC35-EC44)	CE250	mg/kg	-	-	-	-	-	-
Subcontracted analysis								
Asbestos (qualitative)	\$	-	-	-	-	-	-	-

Chemtech Environmental Limited

SOILS

Lab number Sample id Depth (m) Date sampled			129020-13 WS01 3.40-3.60 04/12/2023	129020-14 WS01 5.60-5.80 04/12/2023	129020-15 WS02 4.40-4.60 04/12/2023	129020-16 WS02 1.30-1.50 04/12/2023	129020-17 WS03 0.20-0.40 04/12/2023
Test	Method	Units					
Moisture Content	CE001	% w/w	-	-	-	-	-
Arsenic (total)	CE264 ^M	mg/kg As	-	-	-	-	-
Cadmium (total)	CE264 ^M	mg/kg Cd	-	-	-	-	-
Chromium (total)	CE264 ^U	mg/kg Cr	-	-	-	-	-
Chromium (III)	CE208	mg/kg CrIII	-	-	-	-	-
Chromium (VI)	CE263	mg/kg CrVI	-	-	-	-	-
Copper (total)	CE264 ^M	mg/kg Cu	-	-	-	-	-
Lead (total)	CE264 ^U	mg/kg Pb	-	-	-	-	-
Mercury (total)	CE264 ^U	mg/kg Hg	-	-	-	-	-
Nickel (total)	CE264 ^M	mg/kg Ni	-	-	-	-	-
Selenium (total)	CE264	mg/kg Se	-	-	-	-	-
Zinc (total)	CE264 ^M	mg/kg Zn	-	-	-	-	-
pH	CE004 ^M	units	8.1	8.1	8.1	10.1	9.0
Sulphate (2:1 water soluble)	CE061 ^U	mg/l SO ₄	111	69	138	335	76
Cyanide (free)	CE077	mg/kg CN	-	-	-	-	-
Total Organic Carbon (TOC)	CE197	% w/w C	-	-	-	-	-
PAH							
Acenaphthene	CE087 ^M	mg/kg	-	-	-	-	-
Acenaphthylene	CE087 ^M	mg/kg	-	-	-	-	-
Anthracene	CE087 ^U	mg/kg	-	-	-	-	-
Benzo(a)anthracene	CE087 ^U	mg/kg	-	-	-	-	-
Benzo(a)pyrene	CE087 ^U	mg/kg	-	-	-	-	-
Benzo(b)fluoranthene	CE087 ^M	mg/kg	-	-	-	-	-
Benzo(ghi)perylene	CE087 ^M	mg/kg	-	-	-	-	-
Benzo(k)fluoranthene	CE087 ^M	mg/kg	-	-	-	-	-
Chrysene	CE087 ^M	mg/kg	-	-	-	-	-
Dibenz(ah)anthracene	CE087 ^M	mg/kg	-	-	-	-	-
Fluoranthene	CE087 ^M	mg/kg	-	-	-	-	-
Fluorene	CE087 ^U	mg/kg	-	-	-	-	-
Indeno(123cd)pyrene	CE087 ^M	mg/kg	-	-	-	-	-
Naphthalene	CE087 ^M	mg/kg	-	-	-	-	-
Phenanthrene	CE087 ^M	mg/kg	-	-	-	-	-
Pyrene	CE087 ^M	mg/kg	-	-	-	-	-
PAH (total of USEPA 16)	CE087	mg/kg	-	-	-	-	-
BTEX & TPH							
Benzene	\$	mg/kg	-	-	-	-	-
Toluene	\$	mg/kg	-	-	-	-	-
Ethylbenzene	\$	mg/kg	-	-	-	-	-
m & p-Xylene	\$	mg/kg	-	-	-	-	-
o-Xylene	\$	mg/kg	-	-	-	-	-
VPH Aliphatic (>C5-C6)	\$	mg/kg	-	-	-	-	-

Chemtech Environmental Limited

SOILS

Lab number Sample id Depth (m) Date sampled			129020-13 WS01 3.40-3.60 04/12/2023	129020-14 WS01 5.60-5.80 04/12/2023	129020-15 WS02 4.40-4.60 04/12/2023	129020-16 WS02 1.30-1.50 04/12/2023	129020-17 WS03 0.20-0.40 04/12/2023
Test	Method	Units					
VPH Aliphatic (>C6-C8)	\$	mg/kg	-	-	-	-	-
VPH Aliphatic (>C8-C10)	\$	mg/kg	-	-	-	-	-
EPH Aliphatic (>C10-C12)	CE250	mg/kg	-	-	-	-	-
EPH Aliphatic (>C12-C16)	CE250	mg/kg	-	-	-	-	-
EPH Aliphatic (>C16-C35)	CE250	mg/kg	-	-	-	-	-
EPH Aliphatic (>C35-C44)	CE250	mg/kg	-	-	-	-	-
VPH Aromatic (>EC5-EC7)	\$	mg/kg	-	-	-	-	-
VPH Aromatic (>EC7-EC8)	\$	mg/kg	-	-	-	-	-
VPH Aromatic (>EC8-EC10)	\$	mg/kg	-	-	-	-	-
EPH Aromatic (>EC10-EC12)	CE250	mg/kg	-	-	-	-	-
EPH Aromatic (>EC12-EC16)	CE250	mg/kg	-	-	-	-	-
EPH Aromatic (>EC16-EC21)	CE250	mg/kg	-	-	-	-	-
EPH Aromatic (>EC21-EC35)	CE250	mg/kg	-	-	-	-	-
EPH Aromatic (>EC35-EC44)	CE250	mg/kg	-	-	-	-	-
Subcontracted analysis							
Asbestos (qualitative)	\$	-	-	-	-	-	-

Chemtech Environmental Limited

METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE001	Moisture Content	Gravimetry	As received		0.1	% w/w
CE264	Arsenic (total)	Aqua Regia Extraction, ICPOES	Dry	M	3	mg/kg As
CE264	Cadmium (total)	Aqua Regia Extraction, ICPOES	Dry	M	2	mg/kg Cd
CE264	Chromium (total)	Aqua Regia Extraction, ICPOES	Dry	U	2	mg/kg Cr
CE208	Chromium (III)	Calculation: Cr (total) - Cr (VI)	Dry		1	mg/kg CrIII
CE263	Chromium (VI)	Discrete Analyser	Dry			mg/kg CrVI
CE264	Copper (total)	Aqua Regia Extraction, ICPOES	Dry	M	2	mg/kg Cu
CE264	Lead (total)	Aqua Regia Extraction, ICPOES	Dry	U	3	mg/kg Pb
CE264	Mercury (total)	Aqua Regia Extraction, ICPOES	Dry	U	2	mg/kg Hg
CE264	Nickel (total)	Aqua Regia Extraction, ICPOES	Dry	M	3	mg/kg Ni
CE264	Selenium (total)	Aqua Regia Extraction, ICPOES	Dry	U	3	mg/kg Se
CE264	Zinc (total)	Aqua Regia Extraction, ICPOES	Dry	M	4	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	U	10	mg/l SO ₄
CE077	Cyanide (free)	Extraction, Continuous Flow Colorimetry	As received		1	mg/kg CN
CE197	Total Organic Carbon (TOC)	Carbon Analyser	Dry		0.1	% w/w C
CE087	Acenaphthene	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	Anthracene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Benzo(a)anthracene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Benzo(a)pyrene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Benzo(b)fluoranthene	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	Benzo(k)fluoranthene	Solvent extraction, GC-MS	As received	M	0.03	mg/kg
CE087	Chrysene	Solvent extraction, GC-MS	As received	M	0.03	mg/kg
CE087	Dibenz(ah)anthracene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Fluoranthene	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	Indeno(123cd)pyrene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Naphthalene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Phenanthrene	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	PAH (total of USEPA 16)	Solvent extraction, GC-MS	As received		0.34	mg/kg
\$	Benzene	Headspace GC-FID	As received	U	0.001	mg/kg
\$	Toluene	Headspace GC-FID	As received	U	0.001	mg/kg
\$	Ethylbenzene	Headspace GC-FID	As received	U	0.001	mg/kg
\$	m & p-Xylene	Headspace GC-FID	As received	U	0.001	mg/kg
\$	o-Xylene	Headspace GC-FID	As received	U	0.001	mg/kg
\$	VPH Aliphatic (>C5-C6)	Headspace GC-FID	As received		0.05	mg/kg
\$	VPH Aliphatic (>C6-C8)	Headspace GC-FID	As received		0.1	mg/kg
\$	VPH Aliphatic (>C8-C10)	Headspace GC-FID	As received		0.05	mg/kg
CE250	EPH Aliphatic (>C10-C12)	Solvent extraction, GCxGC-FID	As received		6	mg/kg
CE250	EPH Aliphatic (>C12-C16)	Solvent extraction, GCxGC-FID	As received		6	mg/kg
CE250	EPH Aliphatic (>C16-C35)	Solvent extraction, GCxGC-FID	As received		15	mg/kg

Chemtech Environmental Limited

METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE250	EPH Aliphatic (>C35-C44)	Solvent extraction, GCxGC-FID	As received		10	mg/kg
\$	VPH Aromatic (>EC5-EC7)	Headspace GC-FID	As received		0.05	mg/kg
\$	VPH Aromatic (>EC7-EC8)	Headspace GC-FID	As received		0.05	mg/kg
\$	VPH Aromatic (>EC8-EC10)	Headspace GC-FID	As received		0.05	mg/kg
CE250	EPH Aromatic (>EC10-EC12)	Solvent extraction, GCxGC-FID	As received		1	mg/kg
CE250	EPH Aromatic (>EC12-EC16)	Solvent extraction, GCxGC-FID	As received		1	mg/kg
CE250	EPH Aromatic (>EC16-EC21)	Solvent extraction, GCxGC-FID	As received		1	mg/kg
CE250	EPH Aromatic (>EC21-EC35)	Solvent extraction, GCxGC-FID	As received		1	mg/kg
CE250	EPH Aromatic (>EC35-EC44)	Solvent extraction, GCxGC-FID	As received		1	mg/kg
\$	Asbestos (qualitative)	HSG 248, Microscopy	Dry	U	-	-

Chemtech Environmental Limited

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)
129020-1	CP01	0.20-1.20	N	
129020-2	CP02	0.20-1.00	N	
129020-3	WS01	0.50-0.70	N	
129020-4	WS03	1.60-1.80	N	
129020-5	CP01	3.50-4.00	N	
129020-6	CP01	6.50-7.00	N	
129020-7	CP01	11.00	N	
129020-8	CP02	2.50-3.00	N	
129020-9	CP02	6.50-6.80	N	
129020-10	CP02	10.50-10.95	N	
129020-11	CP02	15.00-15.45	N	
129020-12	WS01	1.40-1.60	N	
129020-13	WS01	3.40-3.60	N	
129020-14	WS01	5.60-5.80	N	
129020-15	WS02	4.40-4.60	N	
129020-16	WS02	1.30-1.50	N	
129020-17	WS03	0.20-0.40	N	

Chemtech Environmental Limited

ADDITIONAL INFORMATION

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 4 weeks from initial receipt unless otherwise instructed.

BTEX compounds are identified by retention time only and may include interference from co-eluting compounds.

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, where applicable.



LABORATORY REPORT



Contract Number: PSL23/10265

Report Date: 19 December 2023
Client's Reference: 23-879
Client Name: Arc Environmental
Solum House
Unit 1 Elliott Court
St Johns Road, Meadowfield
Durham
DH7 8PN

For the attention of: Sai Turlapati

Contract Title: Ocean Road, South Shields

Date Received: 6/12/2023
Date Commenced: 6/12/2023
Date Completed: 19/12/2023

Notes: Opinions and Interpretations are outside the UKAS Accreditation

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

Checked and Approved Signatories:

A Watkins
(Director)

R Berriman
(Quality Manager)

S Royle
(Laboratory Manager)


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SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
CP01		U100	7.50	7.95	Firm brown gravelly very sandy CLAY.
CP02		U100	4.00	4.45	Firm brown slightly gravelly slightly sandy CLAY.
CP02		U100	5.00	5.45	Firm brown slightly gravelly slightly sandy CLAY.
CP01		B	5.50	6.00	Brown slightly gravelly sandy CLAY.
CP01		B	10.00	10.30	Dark brown gravelly very sandy CLAY.
CP02		B	2.50	3.00	Brown slightly gravelly slightly sandy CLAY.
CP02		B	7.50	7.95	Dark brown gravelly very sandy CLAY.
CP02		B	12.00	12.45	Dark brown gravelly very sandy CLAY.
CP02		B	15.00	15.45	Dark brown gravelly very sandy CLAY.
WS01		B	5.60	5.80	Brown slightly gravelly sandy CLAY.
WS02		B	2.40	2.60	Brown slightly sandy CLAY.



Ocean Rd, South Shields

Contract No:

PSL23/10265

Client Ref:

23-879

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

[illegible]

SYMBOLS : NP : Non Plastic

*** : Liquid Limit and Plastic Limit Wet Sieved.**



Ocean Rd, South Shields

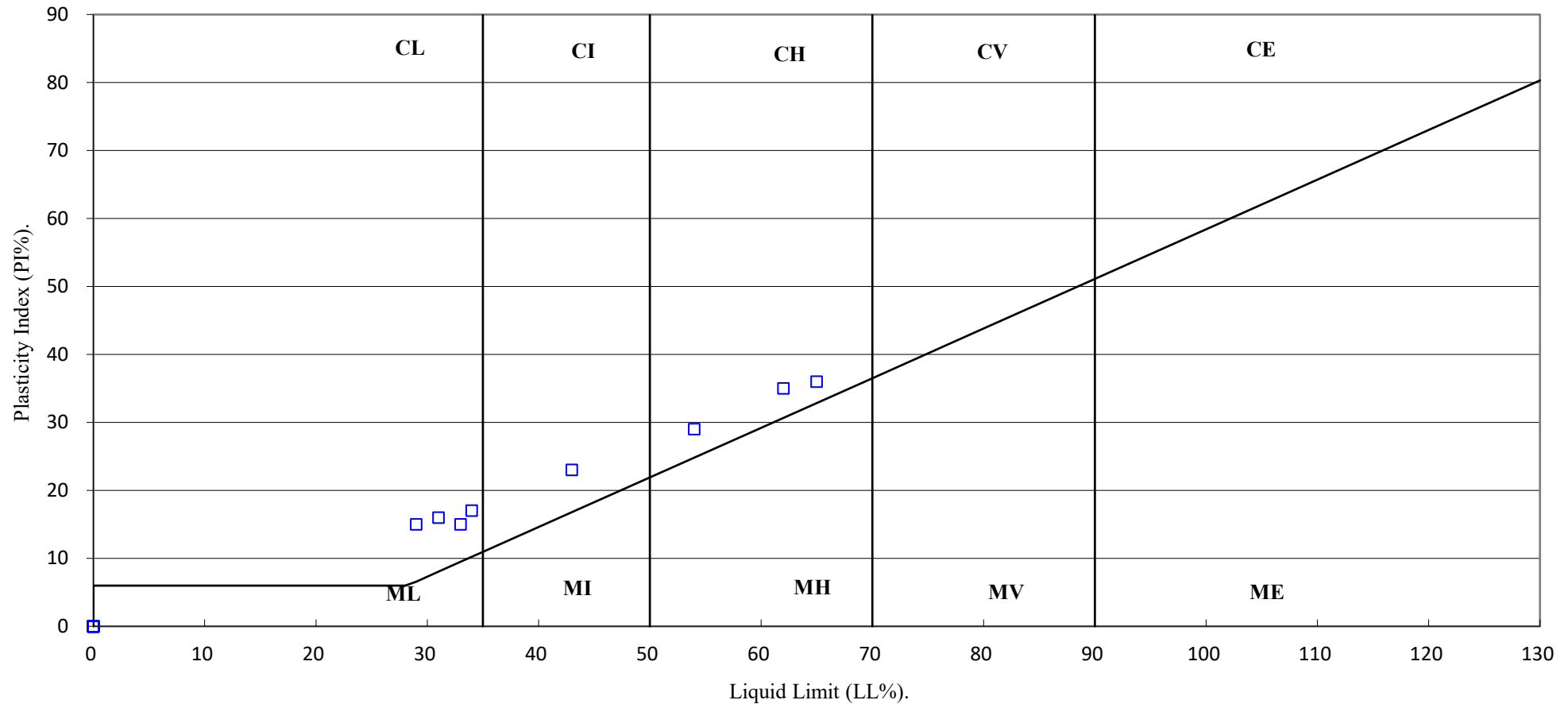
Contract No:

PSL23/10265

Client Ref:

23-879

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



Ocean Rd, South Shields

Contract No:

PSL23/10265

Client Ref:

23-879

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 9

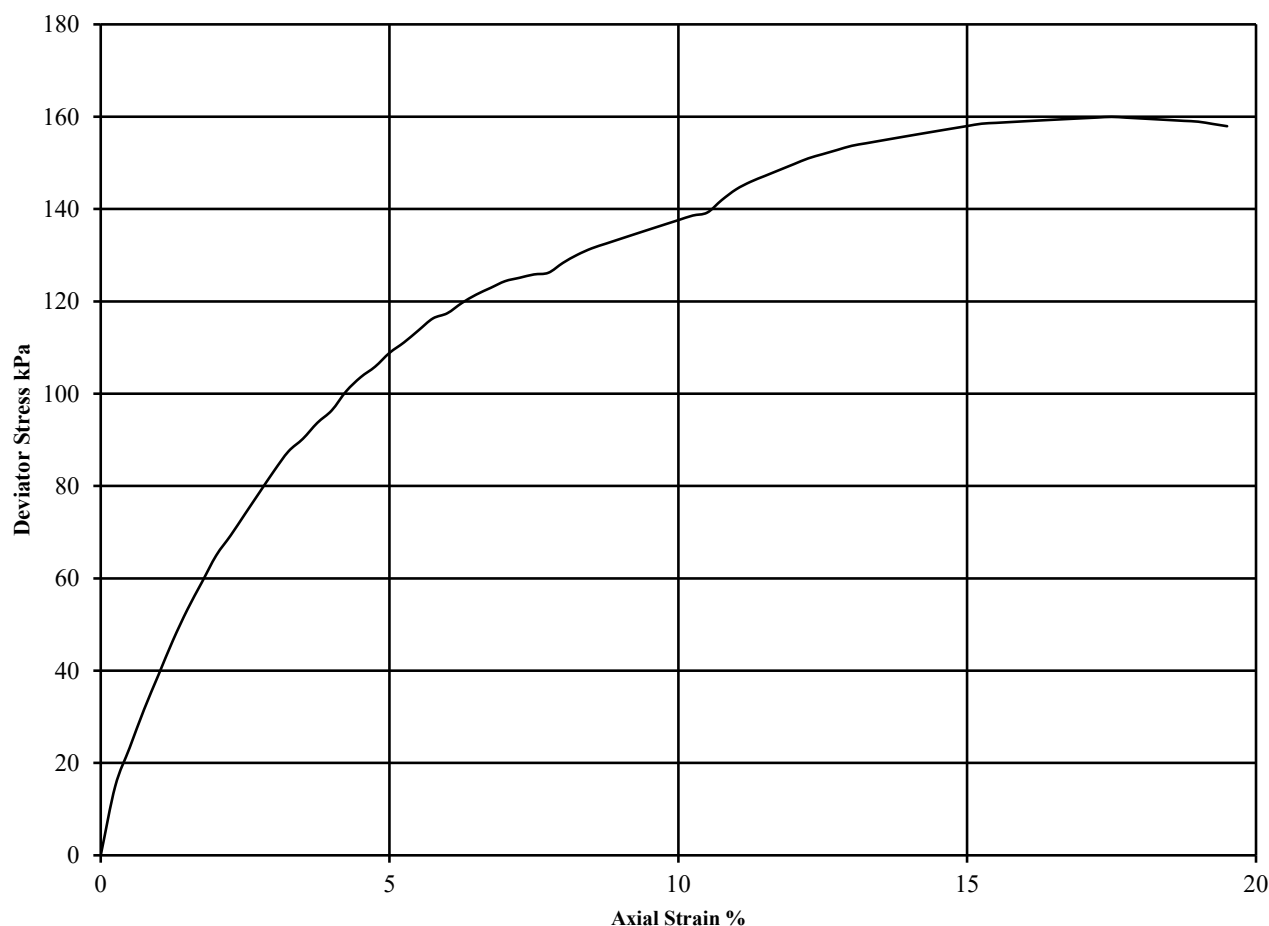
Hole Number: CP01

Top Depth (m): 7.50

Sample Number:

Base Depth (m): 7.95

Sample Type UT100



Diameter (mm):		102	Height (mm):		204	Test:	UU Multistage		Remarks
Specimen	Moisture Content (%)	Bulk Density (Mg/m ³)	Dry Density (Mg/m ³)	Cell Pressure (kPa)	Corr. Max. Deviator Stress (kPa)	Shear Strength Cu (kPa)	Failure Strain (%)	Mode of Failure	Undisturbed Sample Sample taken from top of tube Rate of strain = 2 %/min Latex Membrane used 0.2 mm thick Membrane Correction applied (kPa) 0.36 0.35 0.34 See summary of soil descriptions
1	14	2.26	1.97	75	126	63	7.8		
				150	139	70	10.5		
				300	160	80	17.5	Plastic	



Ocean Rd, South Shields

Contract No:
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Client Ref:
23-879

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

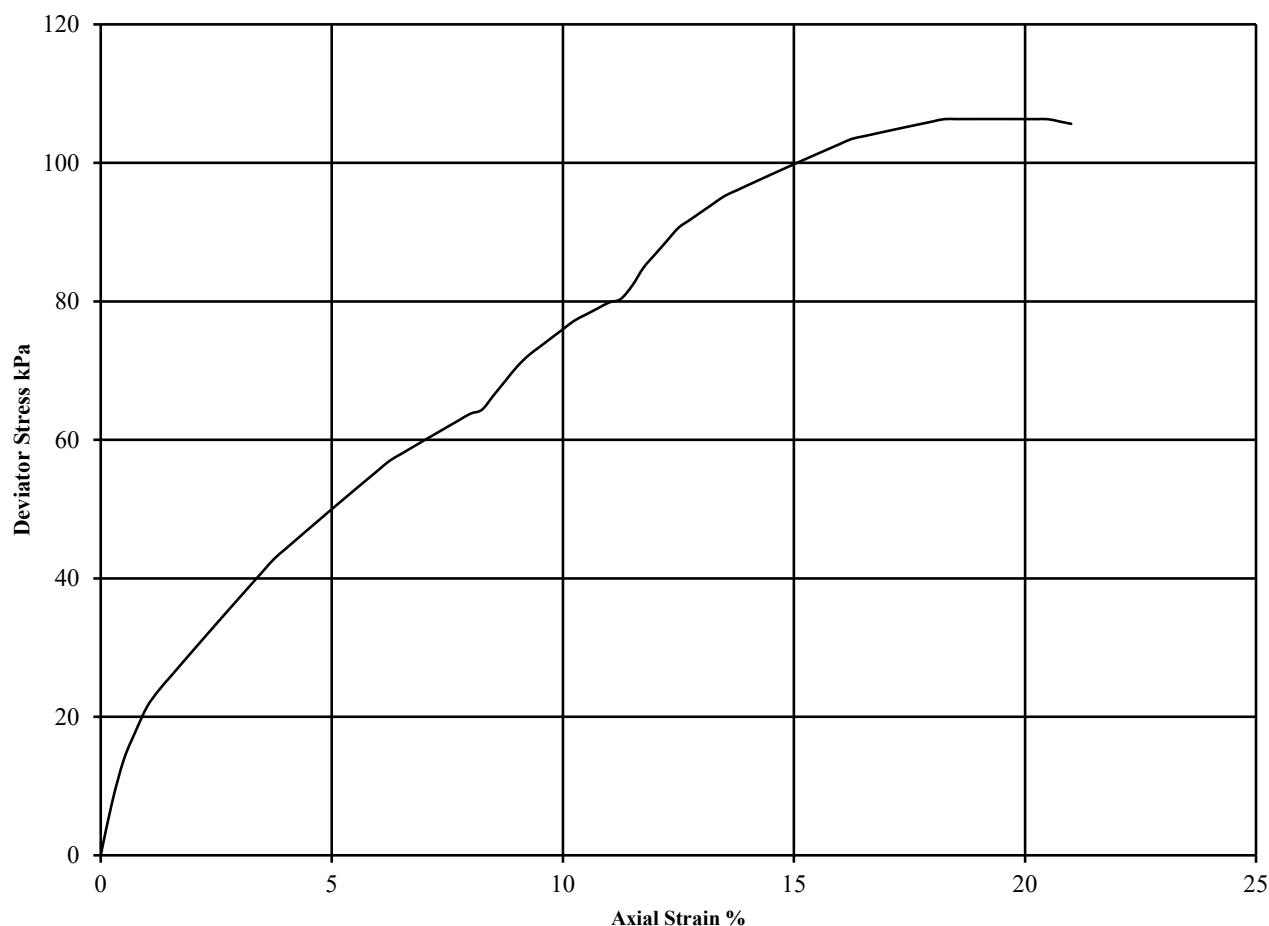
WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 9

Hole Number: CP02 Top Depth (m): 4.00

Sample Number: Base Depth (m): 4.45

Sample Type UT100



Diameter (mm):		102	Height (mm):		204	Test:	UU Multistage		Remarks
Specimen	Moisture Content (%)	Bulk Density (Mg/m ³)	Dry Density (Mg/m ³)	Cell Pressure (kPa)	Corr. Max. Deviator Stress (kPa)	Shear Strength Cu (kPa)	Failure Strain (%)	Mode of Failure	Undisturbed Sample Sample taken from top of tube Rate of strain = 2 %/min Latex Membrane used 0.2 mm thick Membrane Correction applied (kPa) 0.36 0.35 0.33 See summary of soil descriptions
1	32	1.93	1.47	40	64	32	8.3		
				80	80	40	11.3		
				160	106	53	19.3	Plastic	



Ocean Rd, South Shields

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UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

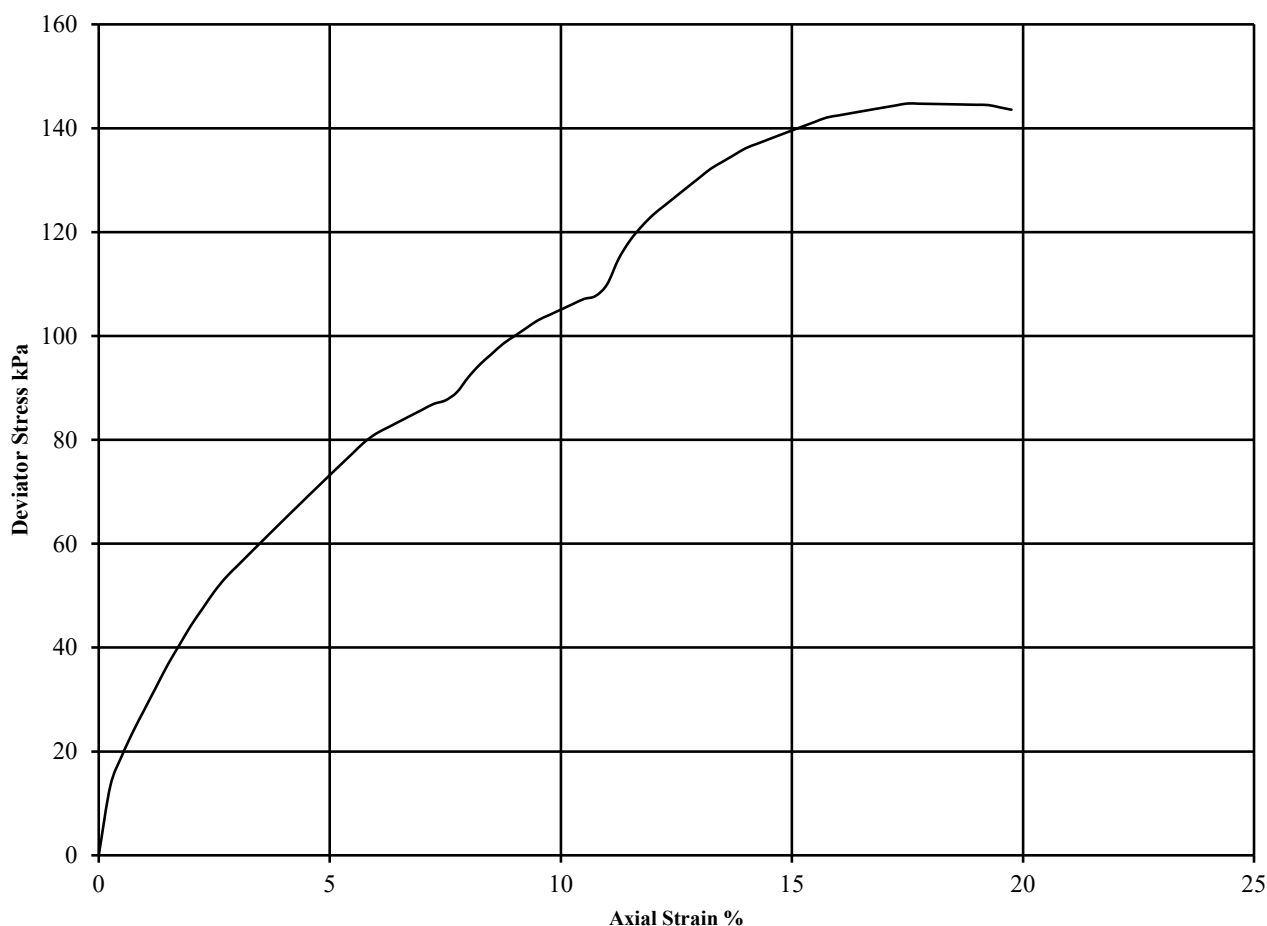
WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 9

Hole Number: CP02 Top Depth (m): 5.00

Sample Number: Base Depth (m): 5.45

Sample Type UT100



Diameter (mm):		102		Height (mm):		204	Test:	UU Multistage		Remarks
Specimen	Moisture Content (%)	Bulk Density (Mg/m ³)	Dry Density (Mg/m ³)	Cell Pressure (kPa)	Corr. Max. Deviator Stress (kPa)	Shear Strength Cu (kPa)	Failure Strain (%)	Mode of Failure		Undisturbed Sample Sample taken from top of tube Rate of strain = 2 %/min Latex Membrane used 0.2 mm thick Membrane Correction applied (kPa) 0.36 0.35 0.34 See summary of soil descriptions
1	31	1.98	1.51	50	88	44	7.5			
				100	108	54	10.8			
				200	145	72	17.5	Plastic		



Ocean Rd, South Shields

Contract No:
PSL23/10265
Client Ref:
23-879

APPENDIX V

Radon Report

Report of address search for radon risk

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Address searched: Ocean Road Community Association, Ocean Road, South Shields, NE33 2DW

Date of report: 26 January 2024

Guidance for existing properties

Is this property in a radon Affected Area? - No

A radon Affected Area is defined as where the radon level in at least one property in every hundred is estimated to exceed the Action Level.

The estimated probability of the property being above the Action Level for radon is: 0-1%

The probability result is only valid for properties above ground. All basement and cellar areas are considered to be at additional risk from high radon levels.

The result may not be valid for buildings larger than 25 metres.

If this site is for redevelopment, you should undertake a GeoReport provided by the British Geological Survey.

This report informs you of the estimated probability that this particular property is above the Action Level for radon. This does not necessarily mean there is a radon problem in the property; the only way to find out whether it is above or below the Action Level is to carry out a radon measurement in an existing property.

Radon Affected Areas are designated by the UK Health Security Agency. UKHSA advises that radon gas should be measured in all properties within Radon Affected Areas.

If you are buying a currently occupied property in a Radon Affected Area, you should ask the present owner whether radon levels have been measured in the property. If they have, ask whether the results were above the Radon Action Level and if so, whether remedial measures were installed, radon levels were re-tested, and the results of re-testing confirmed the effectiveness of the measures.

Further information is available from UKHSA or <https://www.ukradon.org>

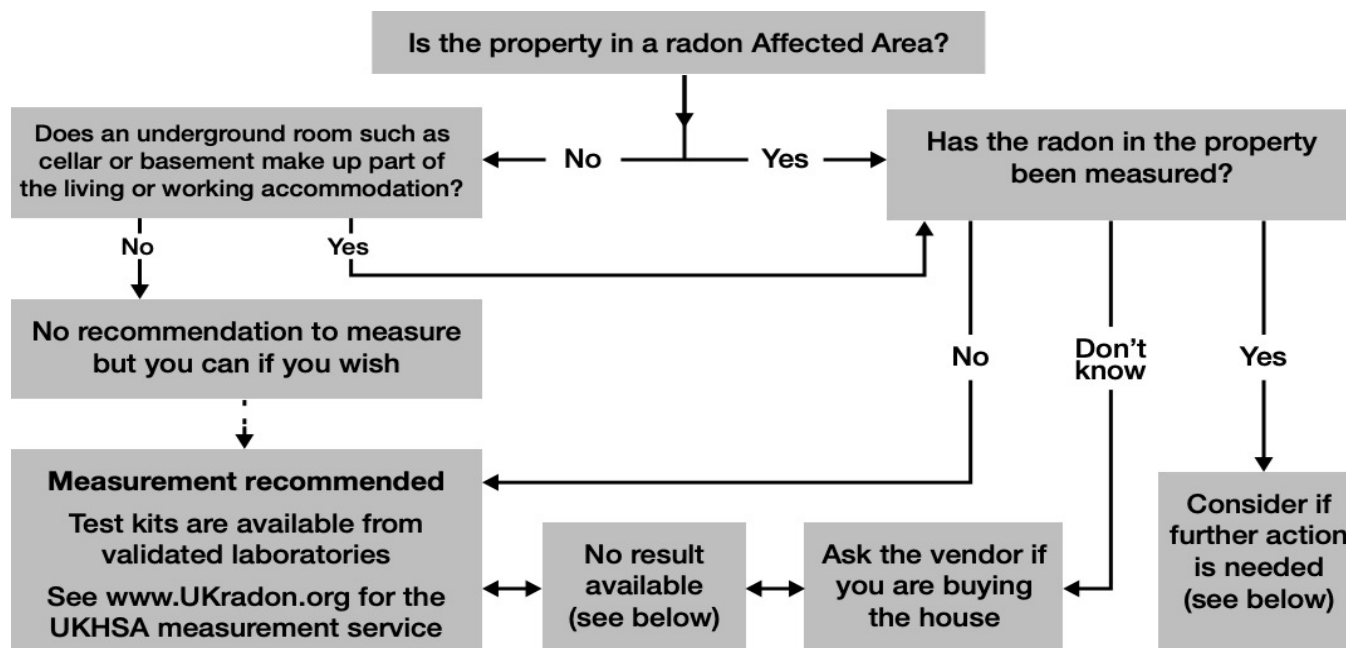
Guidance for new buildings and extensions to existing properties

What is the requirement under Building Regulations for radon protection in new buildings and extensions at the property location? - None

If you are buying a new property in a Radon Affected Area, you should ask the builder whether radon protective measures were incorporated in the construction of the property.

See the Radon and Building Regulations for more details.

UKHSA guidance for occupiers and prospective purchases



Existing radon test results: There is no public record of individual radon measurements. Results of previous tests can only be obtained from the seller. Radon levels can be significantly affected by changes to the building or its use, particularly by alterations to the heating and ventilation which can also be affected by changes in occupier. If in doubt, test again for reassurance.

Radon Bond: This is simply a retained fund, the terms of which are negotiated between the purchaser and the vendor. It allows the conveyance of the property to proceed without undue delay. The purchaser is protected against the possible cost of radon reduction work and the seller does not lose sale proceeds if the result is low. Make sure the agreement allows enough time to complete the test, get the result and arrange the work if needed.

High Results: Exposure to high levels of radon increases the risk of developing lung cancer. If a test in a home gives a result at or above the Action Level of 200 Becquerels per cubic metre of air (Bq/m³), formal advice will be given to lower the level. Radon reduction will also be recommended if the occupants include smokers or ex-smokers when the radon level is at or above the Target Level of 100 Bq/m³; these groups have a higher risk. Information on health risks and radon reduction work is available from UKHSA. Guidance about radon reduction work is also available from some Local Authorities, the Building Research Establishment and specialist contractors.

UKHSA designated radon website: <https://www.ukradon.org>

Building Research Establishment: <http://www.bre.co.uk/page.jsp?id=3137>