

# Piling Risk Assessment

SeAH Monopile Facility, Teesport



L05858-CLK-XX-XX-RP-GT-0002

SeAH Wind Ltd

## Piling Risk Assessment

Report No.

L05858-CLK-XX-XX-RP-GT-0002

Date.

04/04/22

Project

SeAH Monopile Facility, Teesport

Client Name

SeAH Wind Ltd

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## 1 Introduction

### 1.1 Brief

In March 2022 Clarkebond (UK) Limited was commissioned by K2 Consultancy on behalf of SeAH Wind Ltd, to undertake a Piling Risk Assessment for land within the Teesport regeneration area. The land Proposed for development comprises a circa 36ha plot of land formerly referred to as the GE plot.

The land benefits from planning permission reference R/2020/0357/OOM, which contains planning condition 21. This condition is as follows :

*Prior to the commencement of the development, or in accordance with the phasing plan agreed through discharge of condition 4, a Piling Risk Assessment shall be submitted to and approved in writing by the Local Planning Authority. Any mitigation measures identified as part of the assessment shall be implemented throughout the construction phase of the development, unless agreed in writing.*

*REASON: To ensure the satisfactory implementation of the approved scheme in the interests of the amenity of the locality.*

*REASON FOR PRE-COMMENCEMENT: A pre-commencement condition is required so that the final details of piling are agreed in advance of this early part of development.*

The purpose of this piling risk assessment is to meet the requirements of the above planning condition.

### 1.2 Technical Guidance and Standards

This report has been prepared in to meet the anticipated requirements of the local authority and the Environment Agency.

Reference has been made to the following guidance during the report preparation:

- Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention (Environment Agency 2001)
- Piling in Layered Ground: risks to groundwater and archaeology – Environment Agency Science Report SC020074/SR (2006).
- Land contamination risk management (LCRM) (Environment Agency 2021)

### 1.3 Proposed Development

The site is intended for development as a wind turbine monopile manufacturing facility with associated ancillary buildings. Due to the nature of the development it is envisaged that foundation loads will be significant. Given the prevailing ground conditions, which comprise made ground associated with the former industrial land use and alluvial/estuarine soils overlying rock at depth, it is proposed that the main structure be founded upon piles.

### 1.4 Information Sources

During the production of this report the following sources have been reviewed:

- Arcadis, Geo-environmental Assessment of the GE Plot, South Bank, Teesworks, ref 10035117-AUK-XX-XX-RP-ZZ-0395-02-GE Plot A, Rev 2, March 2022
- Allied Exploration & Geotechnics Ltd, Ground Investigation South Bank Area B, Ref 4337, Rev 00, December 2021
- Allied Exploration & Geotechnics Ltd, Ground Investigation South Bank Area C, Ref 4338, Rev 00, November 2021
- Allied Exploration & Geotechnics Ltd, Ground Investigation South Bank Area C Replacement boreholes and BGP Ground Investigation, Teesworks, Ref 4352, Rev 00, November 2021
- Arcadis, South Bank Area C, Teesworks, Redcar, Phase II Environmental Site Assessment, ref 10035117-AUK-XX-XX-RP-ZZ-0318-02-SBC\_ESA, August 2021
- Arcadis, Draft - South Bank Area A, Former Steelworks, Redcar, Phase II Environmental Site Assessment, ref 10035117-AUK-XX-XX-RP-ZZ-0192-01-SBA\_ESA, March 2021
- Arcadis, South Bank, Teesworks, Redcar, Detailed Quantitative Risk Assessment, South Tees Development Corporation, ref 10035117-AUK-XX-XX-RP-ZZ-0331-02-SB\_DQRA, rev 02, September 2021
- Arcadis, Geo-environmental Assessment of the GE Plot, South Bank, Teesworks, 10035117-AUK-XX-XX-RP-ZZ-0395-01-GE Plot, rev 02, March 2022
- Royal Haskoning DVH, Geotechnical Investigation Report, TVCA South Bank, ref PC1084-RHD-SB-SY-RP-GE-0000, status S2/P01, June 2022
- Doran Consulting, Geotechnical Interpretative Report, South Bank Quay Phase 1, ref SBQ1-DCL-CIV-SBKXX-RP-CE-000101-P02, October 2021

It is understood that the site appraisal works undertaken by Arcadis for the South Tees Development Corporation (now known as Teesworks) have been used to characterise the site and to support gaining the outline planning permission.

## 1.5 Limitations

This report is provided for the benefit only of the party to whom it is addressed and we do not accept responsibility to any third party for the whole or any part of the contents and we exercise no duty of care in relation to this report to any third party.

Where intrusive investigations have been completed, information, comments and opinions given in this report are based on the ground conditions encountered during the site work and on the results of laboratory and field tests performed during the investigation. However, subsoils are inherently variable and hidden from view such that no investigation can be exhaustive to the extent that all soil conditions are revealed. Conditions may therefore be present beneath the site that were not apparent in the data reviewed as part of this assessment. In particular, it should be noted that groundwater levels vary due to seasonal and other effects and may at times differ to those measured during the investigation.

## 2 Site Details

The site is located within the Teesport regeneration area, as illustrated in Figure 2.1 below. The development area lies within the South Bank area, highlighted in yellow below:



Figure 2.1 Site Location

### 2.1 Site Description

The development area has undergone remediation as part of the enabling works in advance of construction. The remedial works have required the excavation of the near surface materials to approximately two metres below proposed final level. The resultant void has been backfilled using crushed slag materials derived from processing on site materials, interlayered with mudstone. The backfilling has been undertaken in a controlled engineering manner to produce a development platform.

During the course of the remediation a watching brief was maintained. In the event that grossly contaminated materials were identified, these were to be removed. At the time of writing the remedial works are ongoing, although it is understood no significant contamination has been identified to date.

Upon the completion of the remedial works, the development platform will comprise a nominally level area lying between 9.25 and 9.4 mAOD.

### 3 Ground Conditions

#### 3.1 General

The site has been subject to ground investigation by the South Teesport Development Corporation and their appointed consultants during 2021 and 2022. The resultant ground investigation reports are summarised in Section 1.4 above. Further ground investigation has been undertaken by Clarkebond in 2022, the reporting of which is in progress at the time of writing. However, the initial findings of the current works confirm the previously identified ground conditions.

#### 3.2 Geological Sequence

The ground investigation has identified relatively consistent ground conditions both beneath the proposed development area and the surrounding land. These works may be summarised as follows.

Strata	Thickness (m) (range)	Description
Made Ground	6-10	Slag brick and concrete, occasional clinker and ash; dominated by slag. Typically granular in nature, comprising cobbles and boulders.
Tidal Flat Deposits	0-1	Grey brown silty sand.
Alluvium	2-6	Laminated clays with silt and sand noted on some laminations forming discrete partings. Typically firm, locally soft.
Glacial Till	3-8	Red brown slightly sandy silty gravelly clay, with cobbles. Typically firm to stiff, becoming stiff and very stiff with depth.
Mercia Mudstone	To depth (20m+)	Typically a weak mottled red/green mudstone, distinctly to partially weathered predominately in upper 8-10m across much of the site. Grading from Grade iva/iii weathering to i/ii with depth.

#### 3.3 Ground Contamination

A Geo-environmental assessment of the former GE plot has been undertaken by Arcadis for the South Tees Development Corporation (reference 10035117-AUK-XX-XX-RP-ZZ-0395-01-GE Plot, rev 02, March 2022). Review of the document indicated the following key factors pertaining to this piling risk assessment:

- Occasional NAPL has been identified typically towards the lower portion the made ground/slag deposits and at the interface between the made ground and the underlying tidal flat deposits
- NAPL has not been identified within monitoring wells within the site, although has been identified closer to potential hydrocarbon sources, such as the former South Bank Coke Ovens.

- A DQRA for controlled waters identified the river Tees as the principal receptor, given the brackish nature of the groundwater and the corresponding low potential for extraction, both current and in the future.
- The DQRA concluded that the NAPL does not present a risk to water resources.
- The impact of piling was considered within the DQRA, the nature of the strata is such that any lateral migration will be negligible
- Betterment by means of shallow hotspot removal would be undertaken during enabling earthworks.

These findings have been considered as part of the evidence base upon which the following assessment has been based.

## 4 Conceptual Site Model

### 4.1 Ground conditions

Ground investigations have shown the site to be underlain by made ground derived from the previous land use. This is predominantly comprised from slag derived from iron and steel making, having been tipped in excess of 100 years ago during the initial development and expansion of the Redcar steel works. Consideration of site levels and the nature of the soils directly underlying the made ground suggest that the slag was tipped directly onto the existing estuary foreshore, which lay marginally above sea level.

Below the made ground deposit a natural soil sequence is present. This comprises a thin veneer of granular materials (tidal flat deposits), in turn underlain by laminated clay. At greater depth glacial till is present directly overlying rockhead, with strata of the Mercia Mudstone Group beneath. The Mercia Mudstone comprises a mudstone dominated formation which has been shown to be weathered in its upper levels, weathering decreasing with depth as may be anticipated.

Controlled waters are present in proximity to the site, with the river Tees effectively forming the northern site boundary. The river Tees is tidally influenced at this location, directly linking to the adjacent North Sea. Groundwater beneath the site is present at shallow depths and is brackish in nature, as may be anticipated given the proximity of the North Sea. Monitoring of groundwater elevations within the made ground, superficial deposits and bedrock indicate relatively consistent elevations suggesting a single groundwater body is present below the site at nominally 1 to 2m AOD across the site. Given the relative consistency in groundwater elevation across the various geological units, it is likely that all units are in continuity with each other and a single groundwater body is present.

### 4.2 Contamination Sources

Contaminants have been identified within the made ground materials, comprising a variety of metals, as might be anticipated given the origin of the predominant slag materials, combined with hydrocarbon contamination which is presumed to be associated with discrete site activities.

Where NAPL has been identified, this has been in the form of odours and Sheens rather than extensive thicknesses of free product. The remedial strategy includes allowance for removal of gross hydrocarbon contamination were encountered during enabling earthworks, there enabling therefore enabling betterment as remedial actions progress across the site.

A DQRA with respect to controlled waters has indicated that the observed NAPL and metal contaminants do not pose a significant risk to the River Tees, which is concluded to be the primary receptor from a controlled waters viewpoint. Given the brackish nature of the groundwater below the site and the restricted permeability of the laminated clays, glacial till and Mercia Mudstone, significant lateral migration of contaminants is not anticipated.

## 5 Risk Assessment

### 5.1 Introduction

The proposed development comprises an integrated monopile manufacturing facility. The facility will impose significant foundation loads into the ground both from the foundation slab and individual column loads. Given the compressible nature of the alluvial soils beneath the site, and the attendant risk of unacceptable settlement during construction and subsequent operation of the facility, a piled foundation solution is required.

The presence of a considerable thickness of slag deposits presents a considerable constraint to the selection of a piling method. The compact nature and strength of the made ground is such that a driven pile foundation is not practicable. In addition the magnitude of the foundation loads or such that pile diameters varying from 450mm to 900mm or greater will be required. Given this, a bored pile solution will be required to accommodate the proposed foundation loads.

### 5.2 Risk identification

A conceptual model has been developed based upon the known condition of the land. This seeks to identify sources likely to cause harm, due to pathways existing by which contaminants can reach critical receptors. For land to potentially pose risks, or be at risk, significant pollutant linkages will need to be identified which will include each source/pathway/receptor component of the conceptual model. The absence or removal of a source, or interception of a pathway, will 'break' the pollutant linkage.

For the purposes of a piling risk assessment the conceptual model is characterised by identification of the following:

- **On-site** sources, which may impact **on-site** receptors via plausible pathways.
- **On-site** sources, which may impact **off-site** receptors via plausible pathways.
- **Off-site** sources, which may impact **on-site** receptors via plausible pathways.

The method used for risk evaluation is qualitative based on interpretation of the available Geoenvironmental data in order to provide an overall impression of the potential risks present at the site. This is described in terms of two variables as follows:

- **"Probability"** – being the likelihood that a hazard is present on site or in the surroundings.
- **"Consequence"** – being the potential outcome of the hazard.

The combination of these is used to define the risk. Clearly if a hazard is not present there can be no consequence. Similarly hazards that are potentially present will have different degrees of potential consequence. The combination of the presence of a hazard, and the potential severity of outcome of such a hazard within any event, can be used to manage the approach to management of the risk.

The **probability** (likelihood) of an event can be classified on a four point system using the following terms and definitions based on CIRIA C552:

- **Highly likely:** The event appears very likely in the short term and almost inevitable over the long term, or there is evidence at the receptor of harm or pollution;
- **Likely:** It is probable that an event will occur, or circumstances are such that the event is not inevitable, but possible in the short term and likely over the long term;

- **Low likelihood:** Circumstances are possible under which an event could occur, but it is not certain even in the long term that an event would occur and it is less likely in the short term;
- **Unlikely:** Circumstances are such that it is improbable the event would occur even in the long term.

A fifth category has been added to the CIRIA guidance, representing conditions where no contaminant, or linkage is present, thereby negating any risk.

The **consequence** (severity) can be classified using a similar system, also based on CIRIA C552. The terms and definitions relating to consequence are:

- **Severe:** Short term (acute) risk to human health likely to result in 'significant harm'. Short-term risk of pollution of sensitive water resources. Catastrophic damage to buildings or property. Short term risk to an ecosystem or organism forming part of that ecosystem;
- **Medium:** Chronic damage to human health ('significant harm'), pollution of sensitive water resources, significant change in an ecosystem or organism forming part of that ecosystem#;
- **Mild:** Pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services. Damage to sensitive buildings, structures or the environment; and
- **Minor:** Harm, not necessarily significant, but that could result in financial loss or expenditure to resolve. Non-permanent human health effects easily prevented by use of personal protective clothing. Easily repairable damage to buildings, structures and services.

The term 'significant harm' is as defined in Defra Circular on "Contaminated Land", EPA 1990 Part 2a", 01/2006, September 2006.

Once the probability of an event occurring and its consequence have been classified, a risk category can be assigned as in Table 5.1.

**Table 5.1 Risk Classification System (CIRA 552)**

<i>Risk probability x consequence</i>		<b>Consequence</b>			
		<b>Severe</b>	<b>Medium</b>	<b>Mild</b>	<b>Minor</b>
<b>Probability</b>	<b>High Likelihood</b>	Very high risk	High risk	Moderate risk	Low risk
	<b>Likely</b>	High risk	Moderate risk	Low risk	Very low risk
	<b>Low Likelihood</b>	Moderate risk	Low risk	Low risk	Very low risk
	<b>Unlikely</b>	Low risk	Very low risk	Very low risk	Very low risk
	<b>No Linkage</b>	No risk			

Table 5.2 provides a Preliminary Conceptual Model showing the hazard (source), pathway and receptor, then probability and consequence and corresponding degree of risk.

Table 5.2 Source Pathway Receptor Model

Source(s)	Possible Pathway(s)	Receptor(s)	Probability	Consequence	Risk Level	Comments
Made Ground on-site or off-site containing NAPL derived from former land use.	Migration along pile shaft	Geological units at depth	Unlikely	Medium	Very low	Bored piles will effectively set against soils to form a seal minimising any potential migration. An effective seal is inherent in the pie design, which will rely in part on skin friction. Soils are cohesive in nature with low vertical permeability, minimising potential for vertical contaminant migration.
		River Tees	Unlikely	Medium	Very low	Groundwater forms a single unit, with NAPL typically resting on top of impermeable natural soils. Future dissolution and vertical migration very unlikely. Lateral migration has not occurred to any significant degree towards the River Tees to date. Lateral permeability will not be increased due to piling, and therefore no change in current condition envisaged.

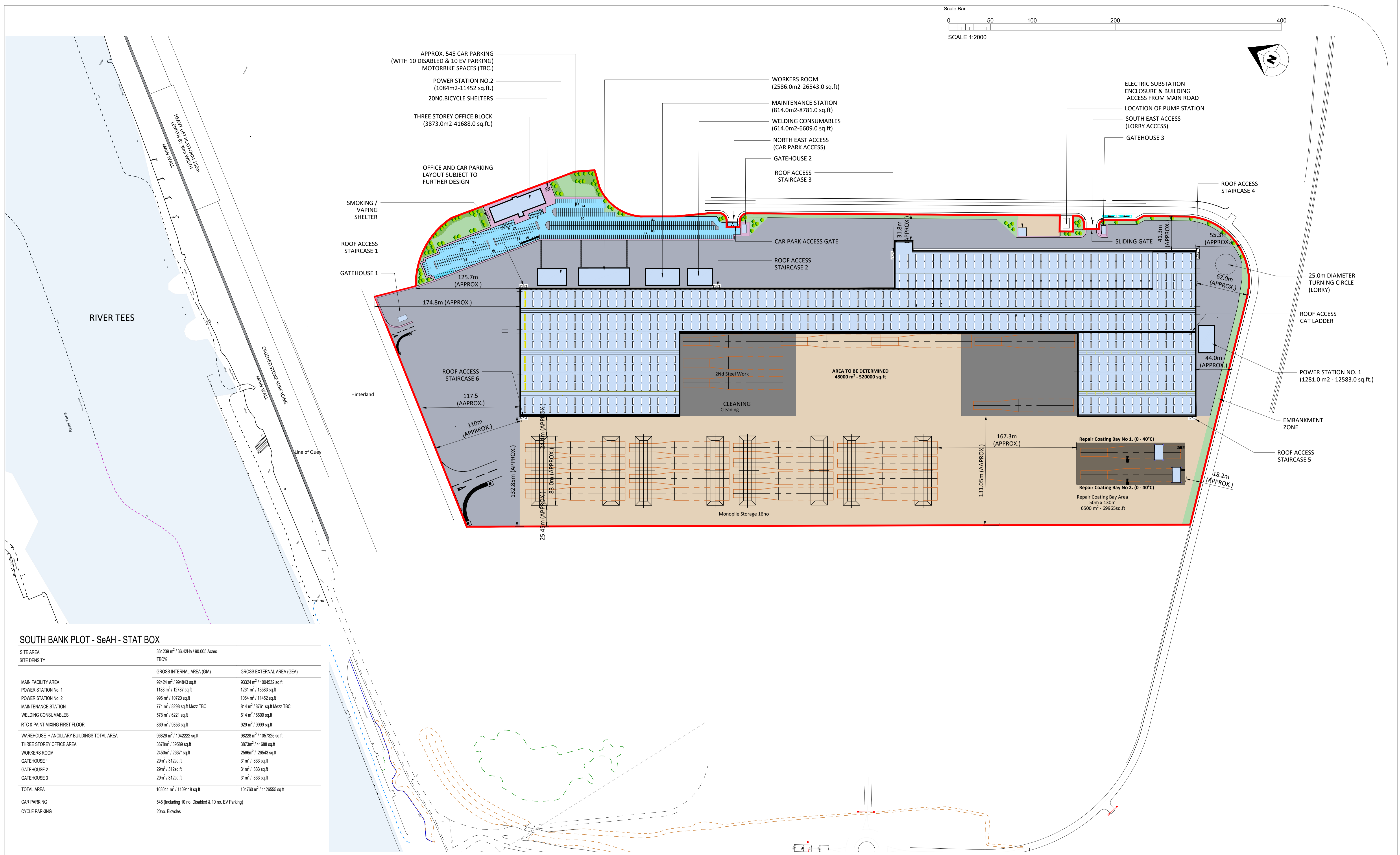
### 5.3 Risk assessment summary

The above consideration of potential source-pathway receptor linkages indicates that the current very low risk to controlled waters posed by the site will not be altered by the process of piling. No remedial actions, or further mitigation measures, are considered necessary.

## **Appendices**

- A    Proposed Development Plan**
- B    Selected Ground Investigation data**

## **A Proposed Development Plan**



SOUTH BANK PLOT - SeAH - STAT BOX

SITE AREA	364239 m <sup>2</sup> / 36.42Ha / 90.005 Acres	
SITE DENSITY	TBC%	
	GROSS INTERNAL AREA (GIA)	GROSS EXTERNAL AREA (GEA)
MAIN FACILITY AREA	92424 m <sup>2</sup> / 994843 sq.ft	93324 m <sup>2</sup> / 1004532 sq.ft
POWER STATION No. 1	1198 m <sup>2</sup> / 12767 sq.ft	1261 m <sup>2</sup> / 13593 sq.ft
POWER STATION No. 2	996 m <sup>2</sup> / 10720 sq.ft	1064 m <sup>2</sup> / 11452 sq.ft
MAINTENANCE STATION	771 m <sup>2</sup> / 8298 sq.ft Mezz TBC	814 m <sup>2</sup> / 8761 sq.ft Mezz TBC
WELDING CONSUMABLES	578 m <sup>2</sup> / 6221 sq.ft	614 m <sup>2</sup> / 6609 sq.ft
RTC & PAINT MIXING FIRST FLOOR	869 m <sup>2</sup> / 9353 sq.ft	929 m <sup>2</sup> / 9999 sq.ft
WAREHOUSE + ANCILLARY BUILDINGS TOTAL AREA	96826 m <sup>2</sup> / 1042222 sq.ft	98228 m <sup>2</sup> / 1057325 sq.ft
THREE STOREY OFFICE AREA	3678m <sup>2</sup> / 39589 sq.ft	3873m <sup>2</sup> / 41688 sq.ft
WORKERS ROOM	2450m <sup>2</sup> / 26371sq.ft	2566m <sup>2</sup> / 26543 sq.ft
GATEHOUSE 1	29m <sup>2</sup> / 312sq.ft	31m <sup>2</sup> / 333 sq.ft
GATEHOUSE 2	29m <sup>2</sup> / 312sq.ft	31m <sup>2</sup> / 333 sq.ft
GATEHOUSE 3	29m <sup>2</sup> / 312sq.ft	31m <sup>2</sup> / 333 sq.ft
TOTAL AREA	103041 m <sup>2</sup> / 1109118 sq.ft	104760 m <sup>2</sup> / 1126555 sq.ft
CAR PARKING	545 (including 10 no. Disabled & 10 no. EV Parking)	
CYCLE PARKING	20no. Bicycles	

Do not scale this drawing  
ashton smith to be notified of discrepancies in figured dimensions  
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LOCATION PLAN:

P1	25/03/2022	PLANNING ISSUE
REV	DATE	DESCRIPTION
REVISIONS		

LD	RB
DRAWN BY	CHECK BY

PROJECT TITLE					
SeAH STDC South Bank Monopile Manufacturing Facility					
DRAWING TITLE					
Proposed Masterplan					
RIBA STAGE	STATUS			DRAWN BY	CHECKED BY
N/A	PLANNING			LD	RB
SHEET	SCALE	DATE	SUITABILITY	REVISION	
A1	1 : 2000	14/02/2022	S0	P1	
DRAWING NO.					
SEAH - ASA - 00 - EX.SI - D - A - 0003 (S0 - P1)					

CLIENT	
AshtonSmith Beyond Design	
Ashton Smith, Belvedere House, 3 Victoria Avenue, Harrogate, North Yorkshire, HG1 1EL. Tel: 01423 522882 Fax: 01423 565104 www.ashtonsmith.co.uk	

## **B      Selected Ground Investigation data**



Hole Locations Approximate. Sizes exaggerated for clarity.

Key

- CB CPT Probe
- CB Sonic/Rotary Borhole
- CB Rotary Borhole
- Histoirc SNC/RO/RC Borehole

Note: Coordinates based upon Hall Construction Drawing  
2398\_GEV022\_South Bank Area C Fill Survey.dwg, dated 12.01.22

clarkebond

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K2 Consultancy



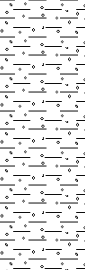

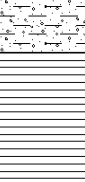
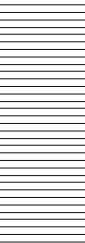
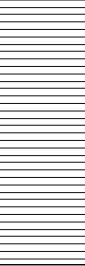
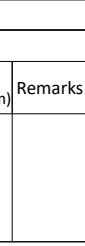
Project  
Teesport - GE Plot

Drawing Title  
Exploratory Hole Location Plan

Purpose of Issue  
Information

Clarkebond Project No. L05858					Status S2	
Project L05858	Originator CLK	Volume XX	Level XX	Type DR	Role GT	Dwg No. 002
Scale N/A		Date 08/03/22			Revision  P1	
Drawn LF	Checked MB		Sheet Size A3			



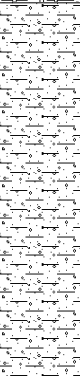
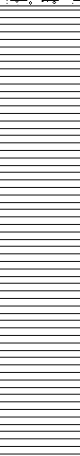
clarkebond		Rotary Core Borehole Log								Borehole No.: <b>CBRB01</b>		
Project Name:    Teesport						Co-Ordinates:       453568.14 E 522291.76 N				Start:   22/02/2022		
Project Number:   L05858						Ground Level:       6.22m OD				End:    22/02/2022		
Samples/Testing		Coring				F.I.	Depth	Level	Legend	Stratum Description	Water Strike	Well
Depth (m) [Level (mOD)]	Type/ Result	Run	TCR	SCR	RQD							
							8.00	-1.78		(1) MADE GROUND (Loose ash soil fill).		
9.50 9.50(SPT) [-3.28]	J N=12						8.50	-2.28		(1) Fine brown grey SAND.		
										(1) Brown grey silty SAND. Sand is fine.		
Drilling Flush Details						Water Strikes			General Remarks:		Logged By:	
Depth Top (m)	Depth Base (m)	Flush Type	Flush Return	Depth Struck (m)	Casing (m)	Depth Sealed (m)	Remarks	(1) Description derived from drillers daily report. (2) Symmetrix drilling 0.00-8.50m BGL. (3) UXO Testing undertaken at 8.50, 9.50, 10.50, 11.50 and 12.50m BGL.		D. Portsmouth		
28.80	30.30	Air/Mist/Foam								Approved By:		
27.30	28.80	Air/Mist/Foam								Scale:		
25.80	27.30	Air/Mist/Foam								1:50		
24.30	25.80	Air/Mist/Foam								Sheet 1 of 4		
22.80	24.30	Air/Mist/Foam						Method/Plant Used:   Boart Longyear DB540				

clarkebond		Rotary Core Borehole Log										Borehole No.: CBRB01	
Project Name: Teesport							Co-Ordinates: 453568.14 E 522291.76 N					Start: 22/02/2022	
Project Number: L05858							Ground Level: 6.22m OD					End: 22/02/2022	
Samples/Testing		Coring				F.I.	Depth	Level	Legend	Stratum Description	Water Strike	Well	
Depth (m) [Level (mOD)]	Type/ Result	Run	TCR	SCR	RQD								
10.50 10.50(SPT) [-4.28]	J N=15						11.15	-4.93		(1) Brown grey silty SAND. Sand is fine.	10.5		
	11.50 11.50(SPT) [-5.28]	J N=17								(1) Firm to stiff red brown gravelly CLAY.	11.0		
13.00 13.00 - 14.00 13.00(SPT) [-6.78]	C J N=17					13.00	-6.78		Stiff brown slightly sandy slightly gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse subangular and includes sandstone and mudstone. Cobbles are subrounded and include sandstone.	11.5			
	14.00 14.00 - 15.50 14.00(SPT) [-7.78]	C N=19									12.0		
15.50 15.50 - 16.10 15.50(SPT) [-9.28]	C N=28	15.50m - 16.10m	100	100	0	15.80	-9.58		Moderately weak to moderately strong laminated green grey red brown fine grained SANDSTONE and MUDSTONE. <i>between 15.80-30.30m BGL ... oblique and subvertical calcitic/gypsum veining 2-25mm fresh.</i>	12.5			
	16.10 - 17.00									C	16.10m - 17.00m		100
17.00 - 18.30	C	17.00m - 18.30m	100	100	85					13.5			
18.30 - 19.80	C	18.30m - 19.80m	100	100	100					14.0			
19.80 - 21.30	C									14.5			
										15.0			
										15.5			
										16.0			
										16.5			
										17.0			
										17.5			
										18.0			
										18.5			
										19.0			
										19.5			
Drilling Flush Details						Water Strikes				General Remarks: (1) Description derived from drillers daily report. (2) Symmetrix drilling 0.00-8.50m BGL. (3) UXO Testing undertaken at 8.50, 9.50, 10.50, 11.50 and 12.50m BGL.	Logged By: D. Portsmouth		
Depth Top (m)	Depth Base (m)	Flush Type	Flush Return	Depth Struck (m)	Casing (m)	Depth Sealed (m)	Remarks	Approved By:					
28.80	30.30	Air/Mist/Foam						Scale: 1:50					
27.30	28.80	Air/Mist/Foam						Method/Plant Used: Boart Longyear DB540					
25.80	27.30	Air/Mist/Foam						Sheet 2 of 4					
24.30	25.80	Air/Mist/Foam											
22.80	24.30	Air/Mist/Foam											


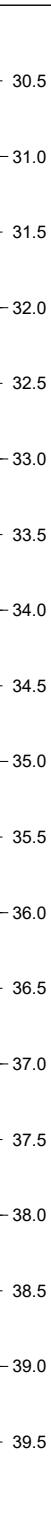










clarkebond		Rotary Core Borehole Log								Borehole No.: <b>CBRB01</b>		
Project Name:     Teesport						Co-Ordinates:     453568.14 E 522291.76 N				Start:    22/02/2022		
Project Number:    L05858						Ground Level:     6.22m OD				End:     22/02/2022		
Samples/Testing		Coring				F.I.	Depth	Level	Legend	Stratum Description	Water Strike	Well
Depth (m) [Level (mOD)]	Type/ Result	Run	TCR	SCR	RQD							
21.30 - 22.80	C	19.80m - 21.30m	100	100	87					Moderately weak to moderately strong laminated green grey red brown fine grained SANDSTONE and MUDSTONE.	20.5	
											21.0	
22.80 - 24.30	C	21.30m - 22.80m	100	100	83						21.5	
											22.0	
24.30 - 25.80	C	22.80m - 24.30m	100	100	87						22.5	
											23.0	
25.80 - 27.30	C	24.30m - 25.80m	100	100	77						23.5	
											24.0	
27.30 - 28.80	C	25.80m - 27.30m	100	100	87						24.5	
											25.0	
28.80 - 30.30	C	27.30m - 28.80m	100	100	87						25.5	
											26.0	
		28.80m - 30.30m	100	100	80						26.5	
											27.0	
											27.5	
											28.0	
						28.5						
						29.0						
						29.5						
Drilling Flush Details						Water Strikes				General Remarks: (1) Description derived from drillers daily report. (2) Symmetrix drilling 0.00-8.50m BGL. (3) UXO Testing undertaken at 8.50, 9.50, 10.50, 11.50 and 12.50m BGL.	Logged By: D. Portsmouth	
Depth Top (m)	Depth Base (m)	Flush Type	Flush Return	Depth Struck (m)	Casing (m)	Depth Sealed (m)	Remarks	Approved By:				
28.80	30.30	Air/Mist/Foam						Scale:				
27.30	28.80	Air/Mist/Foam						1:50				
25.80	27.30	Air/Mist/Foam						Method/Plant Used:    Boart Longyear DB540				
24.30	25.80	Air/Mist/Foam						Sheet 3 of 4				
22.80	24.30	Air/Mist/Foam										

clarkebond		Rotary Core Borehole Log								Borehole No.: <b>CBRB01</b>			
Project Name:     Teesport						Co-Ordinates:     453568.14 E 522291.76 N				Start:   22/02/2022			
Project Number:   L05858						Ground Level:     6.22m OD				End:    22/02/2022			
Samples/Testing		Coring				F.I.	Depth	Level	Legend	Stratum Description	Water Strike	Well	
Depth (m) [Level (mOD)]	Type/ Result	Run	TCR	SCR	RQD								
						30.30	-24.08		Moderately weak to moderately strong laminated green grey red brown fine grained SANDSTONE and MUDSTONE.				
										30.5			
												31.0	
												31.5	
												32.0	
												32.5	
												33.0	
												33.5	
												34.0	
												34.5	
												35.0	
												35.5	
												36.0	
												36.5	
												37.0	
												37.5	
												38.0	
												38.5	
												39.0	
												39.5	
Drilling Flush Details						Water Strikes			General Remarks: (1) Description derived from drillers daily report. (2) Symmetrix drilling 0.00-8.50m BGL. (3) UXO Testing undertaken at 8.50, 9.50, 10.50, 11.50 and 12.50m BGL.	Logged By: D. Portsmouth			
Depth Top (m)	Depth Base (m)	Flush Type	Flush Return	Depth Struck (m)	Casing (m)	Depth Sealed (m)	Remarks	Approved By:					
28.80	30.30	Air/Mist/Foam						Scale:					
27.30	28.80	Air/Mist/Foam						1:50					
25.80	27.30	Air/Mist/Foam						Method/Plant Used:    Boart Longyear DB540					
24.30	25.80	Air/Mist/Foam						Sheet 4 of 4					
22.80	24.30	Air/Mist/Foam											

clarkebond		Rotary Core Borehole Log										Borehole No.: <b>CBRB02</b>					
Project Name:     Teesport							Co-Ordinates:     453682.40 E 522359.05 N					Start:    21/02/2022					
Project Number:    L05858							Ground Level:     8.06m OD					End:     02/03/2022					
Samples/Testing		Coring				F.I.	Depth	Level	Legend	Stratum Description	Water Strike	Well					
Depth (m) [Level (mOD)]	Type/ Result	Run	TCR	SCR	RQD												
										(1) MADE GROUND (Slag).							
											0.5						
											1.0						
											1.5						
											2.0						
											2.5						
											3.0						
											3.5						
											4.0						
											4.5						
											5.0						
											5.5						
											6.0						
											6.5						
											7.0						
											7.5						
											8.0						
											8.5						
							8.70	-0.64	XXXXXX	(1) Soft black sandy SILT.							
							9.10	-1.04	XXXXXX	(1) Brown grey SAND. Sand is fine.							
											9.5						
Drilling Flush Details												Water Strikes		General Remarks:		Logged By:	
Depth Top (m)	Depth Base (m)	Flush Type	Flush Return	Depth Struck (m)	Casing (m)	Depth Sealed (m)	Remarks	(1) Description derived from drillers daily report. (2) Symmetrix drilling 0.00-10.20m BGL. (3) Water strike at 8.70m BGL - moderate inflow.				D. Portsmouth					
30.00	31.50	Air/Mist		8.70			Water strike (moderate inflow).					Approved By:					
28.50	30.00	Air/Mist/Foam										Scale:					
27.00	28.50	Air/Mist/Foam										1:50					
25.50	27.00	Air/Mist/Foam										Sheet 1 of 4					
24.00	25.50	Air/Mist/Foam						Method/Plant Used:    Boart Longyear DB540									

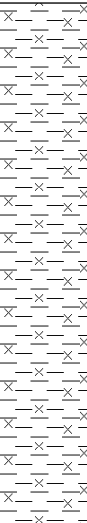
clarkebond		Rotary Core Borehole Log										Borehole No.: <b>CBRB02</b>	
Project Name:     Teesport							Co-Ordinates:     453682.40 E 522359.05 N					Start:    21/02/2022	
Project Number:    L05858							Ground Level:     8.06m OD					End:     02/03/2022	
Samples/Testing		Coring				F.I.	Depth	Level	Legend	Stratum Description	Water Strike	Well	
Depth (m) [Level (mOD)]	Type/ Result	Run	TCR	SCR	RQD								
10.50 10.50(SPT) [-2.44]	J N=11					10.20	-2.14		(1) Brown grey SAND. Sand is fine.				
									(1) Grey silty SAND. Sand is fine.				
11.50 11.50(SPT) [-3.44]	J N=15									10.5			
12.50 12.50(SPT) [-4.44]	J N=16									11.0			
13.50 13.50(SPT) [-5.44]	J N=14									11.5			
14.50 14.50 - 15.30 14.50(SPT) [-6.44]	C J N=20					14.30	-6.24		(1) Firm to stiff brown gravelly CLAY and COBBLES.	12.0			
15.30 - 16.80	C					14.50	-6.44		Stiff brown slightly sandy slightly gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse subangular and includes sandstone and mudstone. Cobbles are subrounded and include sandstone.	12.5			
16.80 16.80 - 18.30 16.80(SPT) [-8.74]	C N=35	16.80m - 18.30m	47	33	0	17.00	-8.94		Weak to moderately strong red brown slightly sandy MUDSTONE partially weathered.	13.0			
18.30 18.30 - 19.80 18.30(SPT) [-10.24]	C	18.30m - 19.80m	100	100	13	17				13.5			
19.80 - 21.30	C									14.0			
										14.5			
										15.0			
										15.5			
										16.0			
										16.5			
										17.0			
										17.5			
										18.0			
										18.5			
										19.0			
										19.5			
Drilling Flush Details										Water Strikes		General Remarks:	
Depth Top (m)	Depth Base (m)	Flush Type	Flush Return	Depth Struck (m)	Casing (m)	Depth Sealed (m)	Remarks	(1) Description derived from drillers daily report. (2) Symmetrix drilling 0.00-10.20m BGL. (3) Water strike at 8.70m BGL - moderate inflow.				Logged By: D. Portsmouth	
30.00	31.50	Air/Mist		8.70			Water strike (moderate inflow).					Approved By:	
28.50	30.00	Air/Mist/Foam										Scale: 1:50	
27.00	28.50	Air/Mist/Foam											
25.50	27.00	Air/Mist/Foam											
24.00	25.50	Air/Mist/Foam											
Method/Plant Used:    Boart Longyear DB540										Sheet 2 of 4			


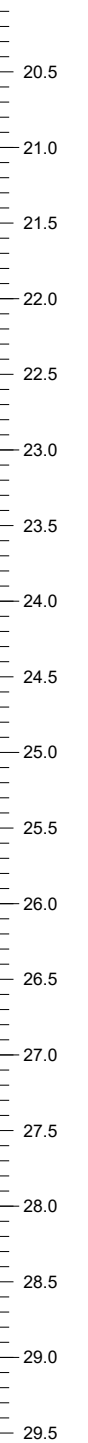
clarkebond		Rotary Core Borehole Log								Borehole No.: <b>CBRB02</b>				
Project Name:     Teesport						Co-Ordinates:     453682.40 E 522359.05 N				Start:    21/02/2022				
Project Number:    L05858						Ground Level:     8.06m OD				End:     02/03/2022				
Samples/Testing		Coring				F.I.	Depth	Level	Legend	Stratum Description	Water Strike	Well		
Depth (m) [Level (mOD)]	Type/ Result	Run	TCR	SCR	RQD									
21.30 21.30 - 22.50 21.30(SPT) [-13.24]	C	19.80m - 21.30m	73	60	7	7				Weak to moderately strong red brown slightly sandy MUDSTONE partially weathered.	20.5			
													21.0	
													21.5	
	22.50 - 24.00	C	21.30m - 22.50m	100	100	100					4		22.0	
														22.5
														23.0
	24.00 - 25.50	C	22.50m - 24.00m	100	100	87							23.5	
														24.0
														24.5
	25.50 - 27.00	C	24.00m - 25.50m	100	100	87							25.0	
														25.5
														26.0
27.00 - 28.50	C	25.50m - 27.00m	100	100	87	4	26.5							
								27.0						
								27.5						
28.50 - 30.00	C	27.00m - 28.50m	100	100	83		28.0							
								28.5						
								29.0						
30.00 - 31.50	C	28.50m - 30.00m	100	100	80					29.5				
Drilling Flush Details						Water Strikes			General Remarks:		Logged By:			
Depth Top (m)	Depth Base (m)	Flush Type	Flush Return	Depth Struck (m)	Casing (m)	Depth Sealed (m)	Remarks	(1) Description derived from drillers daily report. (2) Symmetrix drilling 0.00-10.20m BGL. (3) Water strike at 8.70m BGL - moderate inflow.		D. Portsmouth				
30.00	31.50	Air/Mist		8.70			Water strike (moderate inflow).			Approved By:				
28.50	30.00	Air/Mist/Foam								Scale:				
27.00	28.50	Air/Mist/Foam								1:50				
25.50	27.00	Air/Mist/Foam								Sheet 3 of 4				
24.00	25.50	Air/Mist/Foam						Method/Plant Used:    Boart Longyear DB540						

clarkebond		Rotary Core Borehole Log										Borehole No.: <b>CBRB02</b>	
Project Name:     Teesport							Co-Ordinates:            453682.40 E 522359.05 N					Start:    21/02/2022	
Project Number:    L05858							Ground Level:            8.06m OD					End:     02/03/2022	
Samples/Testing		Coring				F.I.	Depth	Level	Legend	Stratum Description	Water Strike	Well	
Depth (m) [Level (mOD)]	Type/ Result	Run	TCR	SCR	RQD								
		30.00m - 31.50m	100	100	93		31.50	-23.44		Weak to moderately strong red brown slightly sandy MUDSTONE partially weathered.			
													
													
													
													
													
													
													
													
													

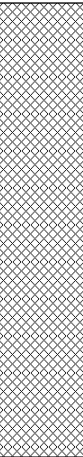
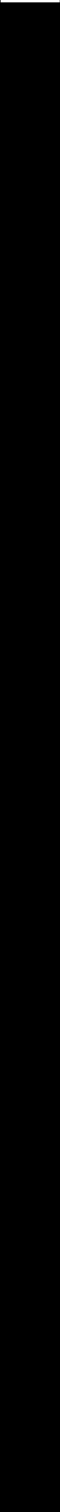
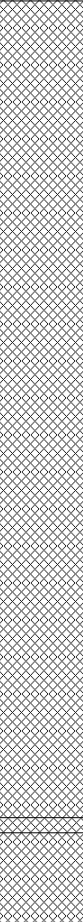
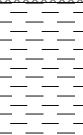

Drilling Flush Details				Water Strikes				General Remarks:				Logged By:	
Depth Top (m)	Depth Base (m)	Flush Type	Flush Return	Depth Struck (m)	Casing (m)	Depth Sealed (m)	Remarks	(1) Description derived from drillers daily report. (2) Symmetrix drilling 0.00-10.20m BGL. (3) Water strike at 8.70m BGL - moderate inflow.				D. Portsmouth	
30.00	31.50	Air/Mist		8.70			Water strike (moderate inflow).					Approved By:	
28.50	30.00	Air/Mist/Foam										Scale: 1:50	
27.00	28.50	Air/Mist/Foam											
25.50	27.00	Air/Mist/Foam											
24.00	25.50	Air/Mist/Foam						Method/Plant Used:    Boart Longyear DB540				Sheet 4 of 4	


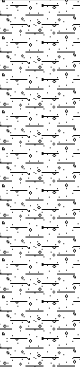
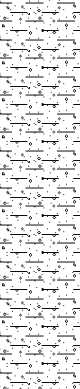
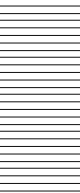
clarkebond		Rotary Core Borehole Log										Borehole No.: <b>CBRB03</b>	
Project Name:     Teesport							Co-Ordinates:       453747.28 E 521935.10 N					Start:   01/02/2022	
Project Number:   L05858							Ground Level:       9.75m OD					End:     18/02/2022	
Samples/Testing		Coring				F.I.	Depth	Level	Legend	Stratum Description	Water Strike	Well	
Depth (m) [Level (mOD)]	Type/ Result	Run	TCR	SCR	RQD								
						3.00	6.75		(1) MADE GROUND (Mudstone fill).				
						5.40	4.35		(1) MADE GROUND (Black brown ash).				
8.50 - 9.50	L					8.00	1.75		(1) MADE GROUND (Red ash).				
9.50 - 10.50	J L N=14					8.50	1.25		(1) Brown sandy CLAY.				
9.50 - 9.95 9.50(SPT) [0.25]						9.30	0.45		Brown black very silty SAND with fragments of shell. Sand is fine to medium.				
									Firm laminated brown CLAY with silt dustings on laminae.				
Drilling Flush Details						Water Strikes			General Remarks: (1) Description derived from drillers daily report. (2) Symmetrix drilling 0.00-8.50m BGL.		Logged By:		
Depth Top (m)	Depth Base (m)	Flush Type	Flush Return	Depth Struck (m)	Casing (m)	Depth Sealed (m)	Remarks	Approved By:					
35.40	37.00	Air/Mist						Scale:					
33.80	35.40	Air/Mist						1:50					
32.30	33.80	Air/Mist						Method/Plant Used:   Comacchio GEO 305					
30.80	32.30	Air/Mist						Sheet 1 of 4					
29.30	30.80	Air/Mist											

clarkebond		Rotary Core Borehole Log								Borehole No.: <b>CBRB03</b>			
Project Name:     Teesport						Co-Ordinates:     453747.28 E 521935.10 N				Start:    01/02/2022			
Project Number:    L05858						Ground Level:     9.75m OD				End:     18/02/2022			
Samples/Testing		Coring				F.I.	Depth	Level	Legend	Stratum Description	Water Strike	Well	
Depth (m) [Level (mOD)]	Type/ Result	Run	TCR	SCR	RQD								
10.50 - 10.95 10.50 - 11.50 10.50(SPT) [-0.75]	J L N=8									Firm laminated brown CLAY with silt dustings on laminae.			
11.50 - 11.95 11.50 - 12.50 11.50(SPT) [-1.75]	J L N=17												
12.50 - 12.95 12.50 - 13.50 12.50(SPT) [-2.75]	J L N=20												
13.50 - 13.95 13.50 - 15.20 13.50(SPT) [-3.75]	C J N=23					13.50 13.60	-3.75 -3.85						
15.20 - 15.65 15.20 - 16.70 15.20(SPT) [-5.45]	C J N=31												
16.70 - 17.15 16.70 - 18.20 16.70(SPT) [-6.95]	C J N=50												
18.20 18.20 - 19.70 18.20(SPT) [-8.45]	C J												
19.70 19.70 - 21.20 19.70(SPT)	C N=30												
Drilling Flush Details						Water Strikes					General Remarks:		Logged By:
Depth Top (m)	Depth Base (m)	Flush Type	Flush Return	Depth Struck (m)	Casing (m)	Depth Sealed (m)	Remarks	(1) Description derived from drillers daily report. (2) Symmetrix drilling 0.00-8.50m BGL.				Approved By:	
35.40	37.00	Air/Mist										Scale:	
33.80	35.40	Air/Mist										1:50	
32.30	33.80	Air/Mist										Sheet 2 of 4	
30.80	32.30	Air/Mist											
29.30	30.80	Air/Mist											
Method/Plant Used:    Comacchio GEO 305													

clarkebond		Rotary Core Borehole Log								Borehole No.: <b>CBRB03</b>		
Project Name:     Teesport						Co-Ordinates:     453747.28 E 521935.10 N				Start:    01/02/2022		
Project Number:    L05858						Ground Level:     9.75m OD				End:     18/02/2022		
Samples/Testing		Coring				F.I.	Depth	Level	Legend	Stratum Description	Water Strike	Well
Depth (m) [Level (mOD)]	Type/ Result	Run	TCR	SCR	RQD							
[-9.95] 20.20(SPT) [-10.45]	C									Stiff brown slightly sandy slightly gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse subangular and includes sandstone and mudstone. Cobbles are subrounded and include sandstone.	20.5	
21.20	C					21.20	-11.45		Stiff red slightly sandy slightly gravelly CLAY/ MUDSTONE weathered. Sand is fine to medium. Gravel is fine to medium subangular and includes sandstone and mudstone. (Engineer notes weathering profile from boulder clay to rock head). Weak red brown slightly sandy MUDSTONE partially weathered.	21.5		
21.20 - 22.20		21.20m - 22.20m	100	100	0	11	21.50	-11.75			22.0	
22.20 - 23.20	C									22.5		
	C	22.20m - 23.20m	100	70	0	11				23.0		
23.20 - 24.20										23.5		
	C	23.20m - 24.20m	100	80	40	6				24.0		
24.20 - 24.70										24.5		
24.70 - 26.20	C	24.20m - 24.70m	100	0	0					25.0		
	C									25.5		
		24.70m - 26.20m	100	0	0					26.0		
26.20 - 27.80	C									26.5		
	C	26.20m - 27.80m	100	100	31					27.0		
										27.5		
27.80 - 29.30	C									28.0		
	C	27.80m - 29.30m	100	100	87					28.5		
										29.0		
29.30 - 30.80	C									29.5		
Drilling Flush Details						Water Strikes				General Remarks: (1) Description derived from drillers daily report. (2) Symmetrix drilling 0.00-8.50m BGL.	Logged By:	
Depth Top (m)	Depth Base (m)	Flush Type	Flush Return	Depth Struck (m)	Casing (m)	Depth Sealed (m)	Remarks	Approved By:				
35.40	37.00	Air/Mist						Scale:				
33.80	35.40	Air/Mist						1:50				
32.30	33.80	Air/Mist						Method/Plant Used:    Comacchio GEO 305				
30.80	32.30	Air/Mist						Sheet 3 of 4				
29.30	30.80	Air/Mist										

[illegible]

































clarkebond		Rotary Core Borehole Log										Borehole No.: <b>CBRB04</b>		
Project Name:     Teesport							Co-Ordinates:     453917.92 E 521886.11 N					Start:    01/02/2022		
Project Number:    L05858							Ground Level:     9.85m OD					End:     10/02/2022		
Samples/Testing		Coring				F.I.	Depth	Level	Legend	Stratum Description	Water Strike	Well		
Depth (m) [Level (mOD)]	Type/ Result	Run	TCR	SCR	RQD									
							3.00	6.85		(1) MADE GROUND (Mudstone fill).	0.5 1.0 1.5 2.0 2.5 3.0			
									(1) MADE GROUND (Slag and ash fill).	3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0				
							8.40 8.50	1.45 1.35		(1) MADE GROUND (Brown sand). (1) MADE GROUND (Ash fill and crushed slag).	8.5 9.0			
							9.10	0.75		(1) Laminated CLAY.	9.5			
10.00 - 11.00	L						10.00	-0.15						
Drilling Flush Details						Water Strikes				General Remarks:			Logged By:	
Depth Top (m)	Depth Base (m)	Flush Type	Flush Return	Depth Struck (m)	Casing (m)	Depth Sealed (m)	Remarks	(1) Description derived from drillers daily report. (2) Symmetrix drilling 0.00-10.00m BGL.					D. Portsmouth	
36.00	37.50	Air/Mist											Approved By:	
34.50	36.00	Air/Mist											Scale:	
33.00	34.50	Air/Mist											1:50	
31.50	33.00	Water										Method/Plant Used:    Comacchio GEO 305		
30.00	31.50	Water										Sheet 1 of 4		

clarkebond		Rotary Core Borehole Log								Borehole No.: <b>CBRB04</b>			
Project Name:     Teesport						Co-Ordinates:     453917.92 E 521886.11 N				Start:    01/02/2022			
Project Number:    L05858						Ground Level:     9.85m OD				End:     10/02/2022			
Samples/Testing		Coring				F.I.	Depth	Level	Legend	Stratum Description	Water Strike	Well	
Depth (m) [Level (mOD)]	Type/ Result	Run	TCR	SCR	RQD								
11.00 - 11.45 11.00 - 12.00 11.00(SPT) [-1.15]	J L N=18									Firm laminated brown CLAY with silt dustings on laminae.	10.5		
											11.0		
											11.5		
12.00 - 12.45 12.00 - 13.50 12.00(SPT) [-2.15]	C J N=22										12.0		
											12.5		
											13.0		
13.50 - 13.95 13.50 - 15.00 13.50(SPT) [-3.65]	C J N=26					13.50	-3.65		Firm to stiff red brown slightly sandy slightly gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse subangular and includes sandstone and mudstone. Cobbles are subrounded and include sandstone.		13.5		
											14.0		
											14.5		
15.00 - 15.45 15.00 - 16.00 15.00(SPT) [-5.15]	C J N=23										15.0		
											15.5		
											16.0		
16.00 - 16.50	C					16.00	-6.15		Stiff brown slightly sandy slightly gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse subangular and includes sandstone and mudstone. Cobbles are subrounded and include sandstone.		16.0		
											16.5		
											17.0		
16.50 - 16.95 16.50 - 18.00 16.50(SPT) [-6.65]	C J N=29										17.5		
											18.0		
											18.5		
18.00 - 18.45 18.00 - 19.50 18.00(SPT) [-8.15]	C J N=35	18.00m - 19.50m	100	57	0				Weak red brown slightly sandy MUDSTONE partially weathered.		19.0		
											19.5		
											8		
19.50 - 21.00	C												
Drilling Flush Details						Water Strikes				General Remarks:		Logged By:	
Depth Top (m)	Depth Base (m)	Flush Type	Flush Return	Depth Struck (m)	Casing (m)	Depth Sealed (m)	Remarks	(1) Description derived from drillers daily report. (2) Symmetrix drilling 0.00-10.00m BGL.				D. Portsmouth	
36.00	37.50	Air/Mist										Approved By:	
34.50	36.00	Air/Mist										Scale:	
33.00	34.50	Air/Mist										1:50	
31.50	33.00	Water										Method/Plant Used:    Comacchio GEO 305	
30.00	31.50	Water										Sheet 2 of 4	

clarkebond		Rotary Core Borehole Log								Borehole No.: <b>CBRB04</b>			
Project Name:     Teesport						Co-Ordinates:     453917.92 E 521886.11 N				Start:    01/02/2022			
Project Number:    L05858						Ground Level:     9.85m OD				End:     10/02/2022			
Samples/Testing		Coring				F.I.	Depth	Level	Legend	Stratum Description	Water Strike	Well	
Depth (m) [Level (mOD)]	Type/ Result	Run	TCR	SCR	RQD								
21.00 - 22.50	C	19.50m - 21.00m	100	47	0					Weak red brown slightly sandy MUDSTONE partially weathered.	20.5		
						13							
22.50 - 24.00	C	21.00m - 22.50m	100	43	20	10					21.0		
						9							
24.00 - 25.50	C	22.50m - 24.00m	100	57	20	13					21.5		
25.50 - 27.00	C	24.00m - 25.50m	93	33	20	11					22.0		
						8							
27.00 - 28.50	C	25.50m - 27.00m	83	27	10	13					22.5		
						20							
28.50 - 30.00	C	27.00m - 28.50m	73	27	10	13					23.0		
						20							
30.00 - 31.50	C	28.50m - 30.00m	100	100	50						23.5		
Drilling Flush Details						Water Strikes				General Remarks:		Logged By:	
Depth Top (m)	Depth Base (m)	Flush Type	Flush Return			Depth Struck (m)	Casing (m)	Depth Sealed (m)	Remarks	(1) Description derived from drillers daily report. (2) Symmetrix drilling 0.00-10.00m BGL.		D. Portsmouth	
36.00	37.50	Air/Mist										Approved By:	
34.50	36.00	Air/Mist											
33.00	34.50	Air/Mist										Scale:	
31.50	33.00	Water										1:50	
30.00	31.50	Water								Method/Plant Used:    Comacchio GEO 305		Sheet 3 of 4	

clarkebond		Rotary Core Borehole Log								Borehole No.: <b>CBRB04</b>					
Project Name:    Teesport						Co-Ordinates:       453917.92 E 521886.11 N				Start:   01/02/2022					
Project Number:   L05858						Ground Level:       9.85m OD				End:    10/02/2022					
Samples/Testing		Coring				F.I.	Depth	Level	Legend	Stratum Description	Water Strike	Well			
Depth (m) [Level (mOD)]	Type/ Result	Run	TCR	SCR	RQD										
31.50 - 33.00	C	30.00m - 31.50m	100	100	67	7				Weak red brown slightly sandy MUDSTONE partially weathered.	30.5				
											31.0				
33.00 - 34.50	C	31.50m - 33.00m	100	80	63						31.5				
											32.0				
34.50 - 36.00	C	33.00m - 34.50m	100	100	100	9					32.5				
											33.0				
36.00 - 37.50	C	34.50m - 36.00m	100	100	100						33.5				
											34.0				
		36.00m - 37.50m	80	80	80						34.5				
											35.0				
											35.5				
											36.0				
											36.5				
											37.0				
							37.50	-27.65			37.5				
											38.0				
											38.5				
											39.0				
											39.5				
Drilling Flush Details										Water Strikes		General Remarks:		Logged By:	
Depth Top (m)	Depth Base (m)	Flush Type	Flush Return	Depth Struck (m)	Casing (m)	Depth Sealed (m)	Remarks		(1) Description derived from drillers daily report. (2) Symmetrix drilling 0.00-10.00m BGL.				D. Portsmouth		
36.00	37.50	Air/Mist											Approved By:		
34.50	36.00	Air/Mist													
33.00	34.50	Air/Mist											Scale:		
31.50	33.00	Water											1:50		
30.00	31.50	Water							Method/Plant Used:   Comacchio GEO 305				Sheet 4 of 4		

clarkebond		Rotary Core Borehole Log								Borehole No.: CBSB02			
Project Name: Teesport						Co-Ordinates: 453843.59 E 522020.90 N				Start: 09/02/2022			
Project Number: L05858						Ground Level: 9.76m OD				End: 25/02/2022			
Samples/Testing		Coring				F.I.	Depth	Level	Legend	Stratum Description	Water Strike	Well	
Depth (m) [Level (mOD)]	Type/ Result	Run	TCR	SCR	RQD								
0.00 0.00 - 1.20	ES SL									MADE GROUND (Black brown sandy gravel and cobbles. Sand is fine to coarse. Gravel is fine to coarse subangular and includes mudstone, concrete and slag. Slag is vesicular (50%) Cobbles are subangular and include slag. Slag is vesicular (100%)). (Engineer notes slag and mudstone layers of approx 300mm - exact depths difficult to perceive).	0.5		
1.20 1.20 1.20 - 2.70 1.20(SPT) [8.56]	ES SL								1.0				
2.70 2.70 2.70 - 4.20 2.70(SPT) [7.06]	ES SL								1.5				
									2.0				
										2.5			
										3.0			
										3.5			
										4.0			
4.20 4.20 4.20 - 5.70 4.20(SPT) [5.56]	ES SL N=29					4.20	5.56		MADE GROUND (Brown grey green sandy gravel and cobbles. Sand is fine to coarse. Gravel is fine to coarse subangular and includes concrete, ash and slag. Slag is vesicular (75-100%). Cobbles are subangular and include slag. Slag is vesicular (100%)).	4.5			
										5.0			
										5.5			
										6.0			
5.70 5.70 - 7.20 5.70(SPT) [4.06]	SL									6.5			
										7.0			
7.20 7.20 - 8.20 7.20(SPT) [2.56]	SL N=8									7.5			
										8.0			
										8.5			
8.70 8.70 8.70 - 10.20 8.70(SPT) [1.06]	ES SL N=6					8.30	1.46		Black brown very silty SAND with fragments of shell. Sand is fine to medium.	9.0			
										9.5			
Drilling Flush Details						Water Strikes				General Remarks:		Logged By:	
Depth Top (m)	Depth Base (m)	Flush Type	Flush Return	Depth Struck (m)	Casing (m)	Depth Sealed (m)	Remarks	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling.				D. Portsmouth	
39.50	40.00	Air/Mist										Approved By:	
38.00	39.50	Air/Mist											
36.50	38.00	Air/Mist										Scale:	
35.00	36.50	Air/Mist										1:50	
33.50	35.00	Air/Mist										Sheet 1 of 4	
Method/Plant Used: Comacchio GEO 305													

clarkebond		Rotary Core Borehole Log								Borehole No.: CBSB02			
Project Name: Teesport						Co-Ordinates: 453843.59 E 522020.90 N				Start: 09/02/2022			
Project Number: L05858						Ground Level: 9.76m OD				End: 25/02/2022			
Samples/Testing		Coring				F.I.	Depth	Level	Legend	Stratum Description	Water Strike	Well	
Depth (m) [Level (mOD)]	Type/ Result	Run	TCR	SCR	RQD								
10.20 10.20 - 10.65 10.20 - 11.20	ES L SL						10.20	-0.44		Firm laminated brown CLAY with silt dustings on laminae.			
										Firm laminated brown CLAY with silt dustings on laminae.	10.5		
											11.0		
11.20 - 11.65 11.20 - 12.20 11.20(SPT) [-1.44]	J L N=16										11.5		
											12.0		
12.20 - 12.65 12.20 - 13.20 12.20(SPT) [-2.44]	J L N=16										12.5		
											13.0		
13.20 - 13.65 13.20 - 14.20 13.20(SPT) [-3.44]	J L N=18						13.80	-4.04		Firm to stiff red brown slightly sandy slightly gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse subangular and includes sandstone and mudstone. Cobbles are subrounded and include sandstone.	13.5		
											14.0		
14.20 - 14.65 14.20(SPT) [-4.44]	J N=22										14.5		
14.80 - 15.30	C										15.0		
											15.5		
15.30 - 16.80	C										16.0		
											16.5		
											17.0		
16.80 - 17.25 16.80 - 17.70 16.80(SPT) [-7.04]	C J N=37						16.80	-7.04		Stiff brown slightly sandy slightly gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse subangular and includes sandstone and mudstone. Cobbles are subrounded and include sandstone.	17.5		
											18.0		
17.70 - 18.20	C										18.5		
18.20 - 18.65 18.20 - 18.80 18.20(SPT) [-8.44]	C J N=40										19.0		
18.80 - 19.80	C										19.5		
													
19.80 - 21.40	C												
													
													
													
													
													
													
													
													
													
													
Drilling Flush Details						Water Strikes				General Remarks:		Logged By:	
Depth Top (m)	Depth Base (m)	Flush Type	Flush Return	Depth Struck (m)	Casing (m)	Depth Sealed (m)	Remarks	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling.				D. Portsmouth	
39.50	40.00	Air/Mist										Approved By:	
38.00	39.50	Air/Mist											
36.50	38.00	Air/Mist										Scale:	
35.00	36.50	Air/Mist										1:50	
33.50	35.00	Air/Mist										Sheet 2 of 4	
Method/Plant Used: Comacchio GEO 305													

clarkebond		Rotary Core Borehole Log								Borehole No.: CBSB02			
Project Name: Teesport						Co-Ordinates: 453843.59 E 522020.90 N				Start: 09/02/2022			
Project Number: L05858						Ground Level: 9.76m OD				End: 25/02/2022			
Samples/Testing		Coring				F.I.	Depth	Level	Legend	Stratum Description	Water Strike	Well	
Depth (m) [Level (mOD)]	Type/ Result	Run	TCR	SCR	RQD								
21.40 - 22.90	C	19.80m - 21.40m	100	88	0	14				Extremely weak to weak red brown with green inclusions slightly sandy MUDSTONE partially to distinctly weathered.	20.5		
											21.0		
22.90 - 24.40	C	21.40m - 22.90m	87	20	0					21.5			
						10				22.0			
24.40 - 25.90	C	22.90m - 24.40m	100	40	27					22.5			
						6				23.0			
25.90 - 27.40	C	24.40m - 25.90m	100	73	47					23.5			
						6				24.0			
27.40 - 28.90	C	25.90m - 27.40m	100	87	7	6				24.5			
										25.0			
28.90 - 30.40	C	27.40m - 28.90m	67	10	0					25.5			
						13				26.0			
		28.90m - 30.40m	100	67	0	12				26.5			
										27.0			
										27.5			
										28.0			
										28.5			
										29.0			
										29.5			
Drilling Flush Details						Water Strikes			General Remarks:		Logged By:		
Depth Top (m)	Depth Base (m)	Flush Type	Flush Return	Depth Struck (m)	Casing (m)	Depth Sealed (m)	Remarks	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling.		D. Portsmouth			
39.50	40.00	Air/Mist								Approved By:			
38.00	39.50	Air/Mist								Scale:			
36.50	38.00	Air/Mist								1:50			
35.00	36.50	Air/Mist								Sheet 3 of 4			
33.50	35.00	Air/Mist						Method/Plant Used: Comacchio GEO 305					

clarkebond		Rotary Core Borehole Log								Borehole No.: CBSB02		
Project Name: Teesport						Co-Ordinates: 453843.59 E 522020.90 N				Start: 09/02/2022		
Project Number: L05858						Ground Level: 9.76m OD				End: 25/02/2022		
Samples/Testing		Coring				F.I.	Depth	Level	Legend	Stratum Description	Water Strike	Well
Depth (m) [Level (mOD)]	Type/ Result	Run	TCR	SCR	RQD							
30.40 - 31.90	C					30.90	-21.14		Extremely weak to weak red brown with green inclusions slightly sandy MUDSTONE partially to distinctly weathered.	30.5		
		30.40m - 31.90m	100	67	20				Weak to moderately weak red green MUDSTONE. <i>between 30.90-39.50m BGL ... oblique and subvertical calcitic/gypsum veining 2-15mm partially weathered.</i>	31.0		
31.90 - 33.50	C					31.90m - 33.50m	100	100	88	31.5		
										32.0		
33.50 - 35.00	C					33.50m - 35.00m	100	100	93	32.5		
										33.0		
35.00 - 36.50	C					35.00m - 36.50m	100	100	100	33.5		
										34.0		
36.50 - 38.00	C					36.50m - 38.00m	100	100	100	34.5		
										35.0		
38.00 - 39.50	C					38.00m - 39.50m	100	100	93	35.5		
										36.0		
39.50 - 40.00	C					39.50m - 40.00m	100	100	100	36.5		
										37.0		
						40.00	-30.24		Moderately weak to medium strong green grey very muddy fine grained SANDSTONE.	37.5		
										38.0		
										38.5		
										39.0		
										39.5		
Drilling Flush Details						Water Strikes			General Remarks:			Logged By:
Depth Top (m)	Depth Base (m)	Flush Type	Flush Return	Depth Struck (m)	Casing (m)	Depth Sealed (m)	Remarks	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling.		D. Portsmouth		
39.50	40.00	Air/Mist								Approved By:		
38.00	39.50	Air/Mist								Scale:		
36.50	38.00	Air/Mist								1:50		
35.00	36.50	Air/Mist								Sheet 4 of 4		
33.50	35.00	Air/Mist										
Method/Plant Used: Comacchio GEO 305												

clarkebond		Rotary Core Borehole Log								Borehole No.: CBSB03			
Project Name: Teesport						Co-Ordinates: 453823.59 E 521796.26 N				Start: 08/02/2022			
Project Number: L05858						Ground Level: 9.76m OD				End: 15/02/2022			
Samples/Testing		Coring				F.I.	Depth	Level	Legend	Stratum Description	Water Strike	Well	
Depth (m) [Level (mOD)]	Type/ Result	Run	TCR	SCR	RQD								
0.00 0.00 - 1.20	ES SL									MADE GROUND (Black brown sandy gravel and cobbles. Sand is fine to coarse. Gravel is fine to coarse subangular and includes mudstone, concrete and slag. Slag is vesicular (50%). Cobbles are subangular and includes slag. Slag is vesicular (100%). (Engineer notes slag and mudstone have been down in layers of approx 300mm - exact depths of each layer is difficult to perceive).	0.5		
1.20 1.20 1.20 - 2.70 1.20(SPT) [8.56]	ES SL N=44										1.0		
2.70 2.70 - 4.20 2.70(SPT) [7.06]	SL					2.70	7.06		MADE GROUND (Brown grey green sandy gravel and cobbles. Sand is fine to coarse. Gravel is fine to coarse subangular and includes concrete, ash and slag. Slag is vesicular (75-100%). Cobbles are subangular and include concrete and slag. Slag is vesicular (75-100%).	1.5			
4.20 4.20 4.20 - 5.70 4.20(SPT) [5.56]	ES SL N=13									2.0			
5.70 5.70 - 7.20 5.70(SPT) [4.06]	SL N=20									2.5			
7.20 7.20 7.20 - 8.70 7.20(SPT) [2.56]	ES SL									3.0			
8.70 - 10.20 8.70 - 9.15	SL UT					8.50 8.60 9.00	1.26 1.16 0.76			3.5			
										4.0			
										4.5			
										5.0			
										5.5			
										6.0			
										6.5			
										7.0			
										7.5			
										8.0			
										8.5			
										9.0			
										9.5			
Drilling Flush Details						Water Strikes				General Remarks:		Logged By:	
Depth Top (m)	Depth Base (m)	Flush Type	Flush Return	Depth Struck (m)	Casing (m)	Depth Sealed (m)	Remarks	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling.				D. Portsmouth	
35.70	37.20	Air/Mist										Approved By:	
34.20	35.70	Air/Mist										Scale:	
32.70	34.20	Air/Mist										1:50	
31.20	32.70	Air/Mist										Sheet 1 of 4	
29.70	31.20	Air/Mist						Method/Plant Used: LS 250					

clarkebond		Rotary Core Borehole Log								Borehole No.: CBSB03			
Project Name: Teesport						Co-Ordinates: 453823.59 E 521796.26 N				Start: 08/02/2022			
Project Number: L05858						Ground Level: 9.76m OD				End: 15/02/2022			
Samples/Testing		Coring				F.I.	Depth	Level	Legend	Stratum Description	Water Strike	Well	
Depth (m) [Level (mOD)]	Type/ Result	Run	TCR	SCR	RQD								
10.20 10.20 - 11.20	ES U									Firm brown laminated CLAY with silt dustings on laminae.	10.5		
11.20 11.20 - 12.20 11.20(SPT) [-1.44]	U N=15					11.50	-1.74			Firm to stiff red brown slightly sandy slightly gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse subangular and includes sandstone and mudstone. Cobbles are subrounded and include sandstone.	11.0 11.5 12.0 12.5 13.0 13.5 14.0 14.5		
12.20 12.20 - 13.20 12.20(SPT) [-2.44]	U N=30												
13.20 13.20 - 14.20 13.20(SPT) [-3.44]	U N=33												
14.20 14.20(SPT) [-4.44] 14.70 - 16.20	N=30 C												
16.20 16.20 - 17.70 16.20(SPT) [-6.44]	C N=36					15.50	-5.74			Stiff brown slightly sandy slightly gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse subangular and includes sandstone and mudstone. Cobbles are subrounded and include sandstone.	15.0 15.5 16.0 16.5 17.0 17.5		
17.70 17.70 - 19.20 17.70(SPT) [-7.94]	C N=24	17.70m - 19.20m	100	87	20								
19.20 - 20.70	C	19.20m - 20.70m	100	50	17	6	18.50	-8.74		Weak red brown slightly sandy MUDSTONE partially weathered.	18.0 18.5 19.0 19.5		
Drilling Flush Details						Water Strikes				General Remarks:		Logged By:	
Depth Top (m)	Depth Base (m)	Flush Type	Flush Return	Depth Struck (m)	Casing (m)	Depth Sealed (m)	Remarks	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling.				D. Portsmouth	
35.70	37.20	Air/Mist										Approved By:	
34.20	35.70	Air/Mist										Scale:	
32.70	34.20	Air/Mist										1:50	
31.20	32.70	Air/Mist										Sheet 2 of 4	
29.70	31.20	Air/Mist						Method/Plant Used: LS 250					

clarkebond		Rotary Core Borehole Log								Borehole No.: CBSB03		
Project Name: Teesport						Co-Ordinates: 453823.59 E 521796.26 N				Start: 08/02/2022		
Project Number: L05858						Ground Level: 9.76m OD				End: 15/02/2022		
Samples/Testing		Coring				F.I.	Depth	Level	Legend	Stratum Description	Water Strike	Well
Depth (m) [Level (mOD)]	Type/ Result	Run	TCR	SCR	RQD							
20.70 - 22.20	C					7				Weak red brown slightly sandy MUDSTONE partially weathered.	20.5	
		20.70m - 22.20m	100	40	7	7			21.0			
22.20 - 23.70	C						22.20m - 23.70m	100	73	47	4	
		23.70 - 25.20	C	23.70m - 25.20m	100	73						
25.20 - 26.70	C						25.20m - 26.70m	100	17	7	12	
		26.70 - 28.20	C	26.70m - 28.20m	100	53						
28.20 - 29.70	C						28.20m - 29.70m	100	67	67		
		29.70 - 31.20	C									
											25.0	
											25.5	
											26.0	
											26.5	
											27.0	
											27.5	
											28.0	
											28.5	
											29.0	
											29.5	
Drilling Flush Details						Water Strikes				General Remarks: (1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling.	Logged By: D. Portsmouth	
Depth Top (m)	Depth Base (m)	Flush Type	Flush Return	Depth Struck (m)	Casing (m)	Depth Sealed (m)	Remarks	Approved By:				
35.70	37.20	Air/Mist						Scale:				
34.20	35.70	Air/Mist						1:50				
32.70	34.20	Air/Mist						Method/Plant Used: LS 250				
31.20	32.70	Air/Mist						Sheet 3 of 4				
29.70	31.20	Air/Mist										

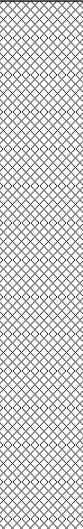
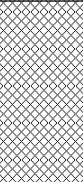


clarkebond		Rotary Core Borehole Log								Borehole No.: CBSB03					
Project Name: Teesport						Co-Ordinates: 453823.59 E 521796.26 N				Start: 08/02/2022					
Project Number: L05858						Ground Level: 9.76m OD				End: 15/02/2022					
Samples/Testing		Coring				F.I.	Depth	Level	Legend	Stratum Description	Water Strike	Well			
Depth (m) [Level (mOD)]	Type/ Result	Run	TCR	SCR	RQD										
31.20 - 32.70	C	29.70m - 31.20m	100	100	93	3	37.20	-27.44		Weak red brown slightly sandy MUDSTONE partially weathered.	30.5				
		31.20m - 32.70m	100	100	100						31.0				
32.70 - 34.20	C	32.70m - 34.20m	100	100	100						31.5				
											32.0				
34.20 - 35.70	C	34.20m - 35.70m	100	100	87						32.5				
											33.0				
35.70 - 37.20	C	35.70m - 37.20m	100	100	100						33.5				
											34.0				
											34.5				
											35.0				
						35.5									
						36.0									
						36.5									
						37.0									
						37.5									
						38.0									
						38.5									
						39.0									
						39.5									
Drilling Flush Details										Water Strikes		General Remarks:		Logged By:	
Depth Top (m)	Depth Base (m)	Flush Type	Flush Return	Depth Struck (m)	Casing (m)	Depth Sealed (m)	Remarks	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling.				D. Portsmouth			
35.70	37.20	Air/Mist										Approved By:			
34.20	35.70	Air/Mist										Scale:			
32.70	34.20	Air/Mist										1:50			
31.20	32.70	Air/Mist										Sheet 4 of 4			
29.70	31.20	Air/Mist													





clarkebond		Rotary Core Borehole Log								Borehole No.: CBSB04			
Project Name: Teesport						Co-Ordinates: 454036.72 E 521643.63 N				Start: 08/02/2022			
Project Number: L05858						Ground Level: 7.50m OD				End: 16/02/2022			
Samples/Testing		Coring				F.I.	Depth	Level	Legend	Stratum Description	Water Strike	Well	
Depth (m) [Level (mOD)]	Type/ Result	Run	TCR	SCR	RQD								
0.00 0.00 - 1.20	ES SL									MADE GROUND (Brown grey green sandy gravel and cobbles. Sand is fine to coarse. Gravel is fine to coarse subangular and includes concrete, ash and slag. Slag is vesicular (75-100%). Cobbles are subangular and include concrete and slag. Slag is vesicular (75-100%)).	0.5		
1.20 1.20 1.20 - 2.70 1.20(SPT) [6.30]	ES SL N=11							1.0					
2.70 2.70 2.70 - 4.20 2.70(SPT) [4.80]	ES SL N=9							1.5					
								2.0					
								2.5					
								3.0					
								3.5					
								4.0					
								4.5					
								5.0					
4.20 4.20 4.20 - 5.70 4.20(SPT) [3.30]	ES SL N=17					4.90	2.60		at c.4.80m BGL ... slight hydrocarbon odour. Firm laminated brown CLAY with silt dustings on laminae.	5.5			
5.70 - 6.15	UT									6.0			
						6.15	1.34		Firm laminated brown CLAY with silt dustings on laminae.	6.5			
7.00 - 8.00	U									7.0			
										7.5			
8.00 8.00 8.00 - 9.00 8.00(SPT) [-0.50]	ES J U N=8									8.0			
										8.5			
9.00 9.00 - 10.00 9.00(SPT) [-1.50]	J U N=5									9.0			
										9.5			
10.00	J												
Drilling Flush Details						Water Strikes				General Remarks:		Logged By:	
Depth Top (m)	Depth Base (m)	Flush Type	Flush Return	Depth Struck (m)	Casing (m)	Depth Sealed (m)	Remarks	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) UXO Testing undertaken at 7.00, 8.00, 9.00, 10.00, 11.00 and 12.00m BGL.  Method/Plant Used: Boart Longyear DB540				D. Portsmouth	
37.80	39.30	Air										Approved By:	
36.30	37.80	Air										Scale:	
34.80	36.30	Air										1:50	
33.30	34.80	Air										Sheet 1 of 4	
31.80	33.30	Water											

clarkebond		Rotary Core Borehole Log								Borehole No.: CBSB04			
Project Name: Teesport						Co-Ordinates: 454036.72 E 521643.63 N				Start: 08/02/2022			
Project Number: L05858						Ground Level: 7.50m OD				End: 16/02/2022			
Samples/Testing		Coring				F.I.	Depth	Level	Legend	Stratum Description	Water Strike	Well	
Depth (m) [Level (mOD)]	Type/ Result	Run	TCR	SCR	RQD								
10.00 - 11.00 10.00(SPT) [-2.50]	U N=7									Firm laminated brown CLAY with silt dustings on laminae.	10.5		
11.00 - 11.20 11.00(SPT) [-3.50]	J U N=11					11.10	-3.60			Firm to stiff red brown slightly sandy slightly gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse subangular and includes sandstone and mudstone. Cobbles are subrounded and include sandstone.	11.0		
12.00 - 12.30 12.00(SPT) [-4.50]	C N=23										11.5		
12.30 - 13.60	C										12.0		
13.60 - 14.60 13.60(SPT) [-6.10]	C N=25					13.60	-6.10			Stiff brown slightly sandy slightly gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse subangular and includes sandstone and mudstone. Cobbles are subrounded and include sandstone.	12.5		
14.60 - 15.30	C										13.0		
15.30 - 16.80 15.30(SPT) [-7.80]	C N=19										13.5		
16.80 - 18.10 16.80(SPT) [-9.30]	C J N=45	16.80m - 18.10m	100	92	0						14.0		
18.10 - 19.00	C										14.5		
19.00 - 19.80	C	18.10m - 19.00m	89	44	0						15.0		
19.80 - 21.30	C	19.00m - 19.80m	100	100	100	7					15.5		
											16.0		
											16.5		
											17.0		
											17.5		
											18.0		
											18.5		
											19.0		
											19.5		
Drilling Flush Details						Water Strikes				General Remarks:		Logged By:	
Depth Top (m)	Depth Base (m)	Flush Type	Flush Return	Depth Struck (m)	Casing (m)	Depth Sealed (m)	Remarks	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) UXO Testing undertaken at 7.00, 8.00, 9.00, 10.00, 11.00 and 12.00m BGL.				D. Portsmouth	
37.80	39.30	Air										Approved By:	
36.30	37.80	Air										Scale:	
34.80	36.30	Air										1:50	
33.30	34.80	Air										Method/Plant Used: Boart Longyear DB540	
31.80	33.30	Water										Sheet 2 of 4	

clarkebond		Rotary Core Borehole Log								Borehole No.: CBSB04			
Project Name: Teesport						Co-Ordinates: 454036.72 E 521643.63 N				Start: 08/02/2022			
Project Number: L05858						Ground Level: 7.50m OD				End: 16/02/2022			
Samples/Testing		Coring				F.I.	Depth	Level	Legend	Stratum Description	Water Strike	Well	
Depth (m) [Level (mOD)]	Type/ Result	Run	TCR	SCR	RQD								
21.30 - 22.30	C	19.80m - 21.30m	100	87	33					Weak red brown slightly sandy MUDSTONE partially weathered.	20.5		
						18							
22.30 - 24.30	C	21.30m - 22.30m	100	50	40						21.0		
						10							
24.30 - 25.80	C	22.30m - 22.80m	90	40	20						21.5		
						10							
25.80 - 27.30	C	22.80m - 24.30m	100	67	27						22.0		
						6							
27.30 - 28.80	C	24.30m - 25.80m	43	27	7						22.5		
						8							
28.80 - 30.30	C	25.80m - 26.30m	70	10	0						23.0		
						11							
30.30 - 31.80	C	26.30m - 26.60m	100	100	33						23.5		
						10							
31.80 - 33.30	C	26.60m - 27.30m	100	79	29						24.0		
						10							
33.30 - 34.80	C	27.30m - 27.80m	100	0	0						24.5		
34.80 - 36.30	C	27.80m - 28.80m	100	20	0						25.0		
						10							
36.30 - 37.80	C	28.80m - 30.30m	60	27	13						25.5		
Drilling Flush Details		Water Strikes				General Remarks:				Logged By:			
Depth Top (m)	Depth Base (m)	Flush Type	Flush Return	Depth Struck (m)	Casing (m)	Depth Sealed (m)	Remarks	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) UXO Testing undertaken at 7.00, 8.00, 9.00, 10.00, 11.00 and 12.00m BGL.				D. Portsmouth	
37.80	39.30	Air										Approved By:	
36.30	37.80	Air										Scale:	
34.80	36.30	Air										1:50	
33.30	34.80	Air										Sheet 3 of 4	
31.80	33.30	Water						Method/Plant Used: Boart Longyear DB540					

clarkebond		Rotary Core Borehole Log								Borehole No.: CBSB04			
Project Name: Teesport						Co-Ordinates: 454036.72 E 521643.63 N				Start: 08/02/2022			
Project Number: L05858						Ground Level: 7.50m OD				End: 16/02/2022			
Samples/Testing		Coring				F.I.	Depth	Level	Legend	Stratum Description	Water Strike	Well	
Depth (m) [Level (mOD)]	Type/ Result	Run	TCR	SCR	RQD								
30.30 30.30 - 31.80 30.30(SPT) [-22.80]	C					10				Weak red brown slightly sandy MUDSTONE partially weathered.			
											30.5		
		30.30m - 31.80m	100	73	47						31.0		
						9					31.5		
31.80 - 33.30	C										32.0		
		31.80m - 33.30m	87	87	80						32.5		
											33.0		
33.30 - 34.80	C										33.5		
		33.30m - 34.80m	100	100	87						34.0		
											34.5		
34.80 - 36.30	C										35.0		
		34.80m - 36.30m	100	100	97	3					35.5		
											36.0		
36.30 - 37.80	C										36.5		
		36.30m - 37.80m	100	100	100					37.0			
										37.5			
37.80 - 39.30	C									38.0			
		37.80m - 39.30m	100	100	100					38.5			
										39.0			
							39.30	-31.80		39.5			
Drilling Flush Details						Water Strikes				General Remarks:		Logged By:	
Depth Top (m)	Depth Base (m)	Flush Type	Flush Return	Depth Struck (m)	Casing (m)	Depth Sealed (m)	Remarks	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) UXO Testing undertaken at 7.00, 8.00, 9.00, 10.00, 11.00 and 12.00m BGL.				D. Portsmouth	
37.80	39.30	Air										Approved By:	
36.30	37.80	Air										Scale:	
34.80	36.30	Air										1:50	
33.30	34.80	Air										Method/Plant Used: Boart Longyear DB540	
31.80	33.30	Water										Sheet 4 of 4	

clarkebond		Rotary Core Borehole Log										Borehole No.: <b>CBRB05A</b>	
Project Name:     Teesport							Co-Ordinates:     453981.11 E 521743.20 N					Start:   02/02/2022	
Project Number:   L05858							Ground Level:     9.88m OD					End:     21/02/2022	
Samples/Testing		Coring				F.I.	Depth	Level	Legend	Stratum Description	Water Strike	Well	
Depth (m) [Level (mOD)]	Type/ Result	Run	TCR	SCR	RQD								
						3.50	6.38		(1) MADE GROUND (Mudstone fill).	0.5 1.0 1.5 2.0 2.5 3.0 3.5			
									(1) MADE GROUND (Crushed slag).			4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5	
									(1) MADE GROUND (Brown ash and crushed slag).	8.0 8.5 9.0			
										(1) Laminated CLAY.		9.5	
10.00 - 11.00	L					10.00	-0.12						
Drilling Flush Details						Water Strikes			General Remarks: (1) Description derived from drillers daily report. (2) Symmetrix drilling 0.00-10.00m BGL. (3) Seepage at c.8.00m BGL - damp. (4) UXO Testing undertaken at 11.00, 12.00, 13.00, 14.00, 15.00 and 16.00m BGL.  Method/Plant Used:    Boart Longyear DB540		Logged By:		
Depth Top (m)	Depth Base (m)	Flush Type	Flush Return	Depth Struck (m)	Casing (m)	Depth Sealed (m)	Remarks	Approved By:					
39.00	40.00	Air/Mist						Scale:					
37.50	39.00	Air/Mist						1:50					
36.00	37.50	Air/Mist						Sheet 1 of 4					
34.50	36.00	Water/Polymer											

clarkebond		Rotary Core Borehole Log										Borehole No.: <b>CBRB05A</b>	
Project Name: Teesport							Co-Ordinates: 453981.11 E 521743.20 N					Start: 02/02/2022	
Project Number: L05858							Ground Level: 9.88m OD					End: 21/02/2022	
Samples/Testing		Coring				F.I.	Depth	Level	Legend	Stratum Description	Water Strike	Well	
Depth (m) [Level (mOD)]	Type/ Result	Run	TCR	SCR	RQD								
11.00 11.00 - 12.00 11.00(SPT) [-1.12]	J L N=7									Firm laminated brown CLAY with silt dustings on laminae.	10.5 11.0 11.5		
12.00 12.00 - 13.00 12.00(SPT) [-2.12]	J L N=7					13.95	-4.07		Firm to stiff red brown slightly sandy slightly gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse subangular and includes sandstone and mudstone. Cobbles are subrounded and include sandstone.	12.0 12.5 13.0 13.5 14.0 14.5			
13.00 13.00 - 14.00 13.00(SPT) [-3.12]	J L N=6					15.00	-5.12		Stiff brown slightly sandy slightly gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse subangular and includes sandstone and mudstone. Cobbles are subrounded and include sandstone.	15.0 15.5 16.0 16.5 17.0			
14.00 14.00 - 15.00 14.00(SPT) [-4.12]	C J N=24								Extremely weak to weak red brown with green inclusions slightly sandy MUDSTONE partially to distinctly weathered.	14.0 14.5 15.0 15.5 16.0 16.5 17.0 17.5 18.0 18.5 19.0 19.5			
15.00 15.00 - 16.50 15.00(SPT) [-5.12]	C N=31												
16.50 16.50 - 17.50 16.50(SPT) [-6.62]	C N=41												
17.50 - 18.50	C	17.50m - 18.50m	100	100	80	2	17.50	-7.62					
18.50 - 20.00	C	18.50m - 20.00m	100	87	27								
20.00 - 21.50	C					6							
Drilling Flush Details						Water Strikes				General Remarks:			Logged By:
Depth Top (m)	Depth Base (m)	Flush Type	Flush Return			Depth Struck (m)	Casing (m)	Depth Sealed (m)	Remarks	(1) Description derived from drillers daily report. (2) Symmetrix drilling 0.00-10.00m BGL. (3) Seepage at c.8.00m BGL - damp. (4) UXO Testing undertaken at 11.00, 12.00, 13.00, 14.00, 15.00 and 16.00m BGL.		Approved By:	
39.00	40.00	Air/Mist								Method/Plant Used: Boart Longyear DB540		Scale: 1:50	
37.50	39.00	Air/Mist										Sheet 2 of 4	
36.00	37.50	Air/Mist											
34.50	36.00	Water/Polymer											
33.00	34.50	Water/Polymer											

clarkebond		Rotary Core Borehole Log								Borehole No.: <b>CBRB05A</b>		
Project Name:     Teesport						Co-Ordinates:     453981.11 E 521743.20 N				Start:    02/02/2022		
Project Number:    L05858						Ground Level:     9.88m OD				End:     21/02/2022		
Samples/Testing		Coring				F.I.	Depth	Level	Legend	Stratum Description	Water Strike	Well
Depth (m) [Level (mOD)]	Type/ Result	Run	TCR	SCR	RQD							
21.50 - 23.00	C	20.00m - 21.50m	100	33	13					Extremely weak to weak red brown with green inclusions slightly sandy MUDSTONE partially to distinctly weathered.	20.5	
						6					21.0	
23.00 - 24.50	C	21.50m - 23.00m	100	20	7						21.5	
						10					22.0	
24.50 - 26.00	C	23.00m - 24.50m	100	7	0						22.5	
						20					23.0	
26.00 - 27.50	C	24.50m - 26.00m	100	40	7						23.5	
						7					24.0	
27.50 - 29.00	C	26.00m - 27.50m	100	33	27						24.5	
						6					25.0	
29.00 - 30.50	C	27.50m - 29.00m	100	33	7						25.5	
						10					26.0	
											26.5	
						13					27.0	
											27.5	
											28.0	
											28.5	
											29.0	
											29.5	
Drilling Flush Details						Water Strikes			General Remarks:		Logged By:	
Depth Top (m)	Depth Base (m)	Flush Type	Flush Return		Depth Struck (m)	Casing (m)	Depth Sealed (m)	Remarks	(1) Description derived from drillers daily report. (2) Symmetrix drilling 0.00-10.00m BGL. (3) Seepage at c.8.00m BGL - damp. (4) UXO Testing undertaken at 11.00, 12.00, 13.00, 14.00, 15.00 and 16.00m BGL.		Approved By:	
39.00	40.00	Air/Mist										
37.50	39.00	Air/Mist										
36.00	37.50	Air/Mist										
34.50	36.00	Water/Polymer										
33.00	34.50	Water/Polymer							Method/Plant Used:    Boart Longyear DB540		Sheet 3 of 4	

clarkebond		Rotary Core Borehole Log								Borehole No.: <b>CBRB05A</b>			
Project Name:    Teesport						Co-Ordinates:       453981.11 E  521743.20 N				Start:   02/02/2022			
Project Number:   L05858						Ground Level:       9.88m OD				End:     21/02/2022			
Samples/Testing		Coring				F.I.	Depth	Level	Legend	Stratum Description	Water Strike	Well	
Depth (m) [Level (mOD)]	Type/ Result	Run	TCR	SCR	RQD								
30.50 - 32.00	C					10	32.00	-22.12		Extremely weak to weak red brown with green inclusions slightly sandy MUDSTONE partially to distinctly weathered.	30.5		
		30.50m - 32.00m	100	7	0						31.0		
32.00 - 33.00	C					20				10	Weak to moderately weak red green sandy MUDSTONE. (Engineer notes oblique and subvertical calcitic/gypsum veining 2015mm partially weathered to fresh.		31.5
		32.00m - 33.00m	100	80	20								32.0
33.00 - 34.50	C									47			32.5
		33.00m - 34.50m	100	67									33.0
34.50 - 36.00	C									80			33.5
		34.50m - 36.00m	100	100									34.0
36.00 - 37.50	C					4				87			34.5
		36.00m - 37.50m	100	100									35.0
37.50 - 39.00	C									87			35.5
		37.50m - 39.00m	100	100									36.0
39.00 - 40.00	C						80		36.5				
		39.00m - 40.00m	100	100					37.0				
										37.5			
										38.0			
										38.5			
										39.0			
										39.5			
							40.00	-30.12					
Drilling Flush Details						Water Strikes			General Remarks:		Logged By:		
Depth Top (m)	Depth Base (m)	Flush Type	Flush Return	Depth Struck (m)	Casing (m)	Depth Sealed (m)	Remarks	(1) Description derived from drillers daily report. (2) Symmetrix drilling 0.00-10.00m BGL. (3) Seepage at c.8.00m BGL - damp. (4) UXO Testing undertaken at 11.00, 12.00, 13.00, 14.00, 15.00 and 16.00m BGL.		Approved By:			
39.00	40.00	Air/Mist											
37.50	39.00	Air/Mist											
36.00	37.50	Air/Mist											
34.50	36.00	Water/Polymer											
33.00	34.50	Water/Polymer						Method/Plant Used:   Boart Longyear DB540		Sheet 4 of 4			



clarkebond

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